Earnings quality and earnings management: the role of accounting accruals
Bissessur, S.W.

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Accruals are at the heart of Financial Reporting. Accruals shift or adjust the recognition of cash flows over time, so that the adjusted number, i.e. earnings, better measures firm performance. As a result, accruals play a major role in the determination of the quality of reported earnings. This study provides an overview of the role of accruals in financial reporting. In the empirical analysis, the manner in which accruals adjust cash flows is examined for respectively the prediction of future cash flows, growth and losses.

Sanjay Bissessur graduated from the University of Amsterdam in the Netherlands, where he received Master’s degrees in Accounting and Finance. He started his PhD project at the University of Amsterdam in 2002. He was also affiliated to the Tinbergen Institute. He is currently an Assistant Professor at the Accounting Section of the University of Amsterdam.
EARNINGS QUALITY AND EARNINGS MANAGEMENT: 
THE ROLE OF ACCOUNTING ACCRUALS
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EARNINGS QUALITY AND EARNINGS MANAGEMENT: THE ROLE OF ACCOUNTING ACCRUALS

ACADEMISCH PROEFSCHRIFT

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Sanjay Bissessur

January 2008, Amsterdam
For

My father Stanley Bissessur
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Chapter 1 Introduction

1.1 Introduction

In this dissertation I examine how managers exercise judgment in financial reporting through accounting accruals to report earnings that best measure firm performance. Accruals shift or adjust recognition of cash flows over time to make financial reports more informative about the performance of the firm (Dechow, 1994; Dechow et al., 1998; Liu et al., 2002). However, the professional literature and the financial press have raised questions on whether the effect of accruals is to increase earnings quality and make financial reports more informative or if accruals are used for earnings management, which is defined as a deliberate intervention of management in the financial reporting process to further a private gain of the management itself (Schipper, 1989). Thus, given that implementing Generally Accepted Accounting Principles (GAAP) requires management to make judgments and estimates, the crucial issue seems to be one of how managers use accruals to produce earnings that are of high quality.

There are many ways that managers can exercise judgment in financial reporting. For example, judgment is required to estimate numerous future economic events, such as expected lives and salvage values of long-term assets, obligations for pension benefits and other post-employment benefits, deferred taxes, and losses from bad debts and asset impairments. Managers must also choose among acceptable accounting methods for reporting the same economic transactions, such as the straight-line or accelerated depreciation methods or the LIFO, FIFO, or weighted-average inventory valuation methods. In addition, managers must exercise judgment in working capital management (such as inventory levels, the timing of inventory shipments or purchases, and receivable policies), which affects cost allocations and net revenues. Managers must also choose to make or defer expenditures, such as research and development (R&D), advertising, or maintenance. Finally, they must decide how to structure corporate transactions. For example, lease contracts can be structured so that lease obligations are on- or off-balance sheet, and equity investments can be structured to avoid or require consolidation (Healy and Wahlen, 1999).

Managers can use accounting judgment to make financial reports more informative for users. This can arise if certain accounting choices or estimates are perceived to be credible signals.

---

1 The term accrual is used here in a general sense and includes both accrual accounts (for which recognition in the income statement precedes cash receipts or disbursements) and deferral accounts (for which cash receipts or disbursements precede recognition in the income statement). One can also view accrual accounting from a "balance sheet" perspective, in the sense that accrual accounting involves the recognition of an entity's rights and obligations as they occur.
of a firm’s financial performance. In this case, management communicates its private information about the firm’s performance through financial reporting (Demski, 1998; Fields et al., 2001; Arya et al., 2003; Beaver and Ryan, 2005; Guay, 2006). However, managers can also use their 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 (Schipper, 1989; Healy and Whalen, 1999; Dechow and Skinner, 2000; Nelson et al., 2002). In this case, management uses its private information to distort signals about firm performance through financial reporting. Accruals allow earnings to provide better information about economic performance to investors than cash flows do. However, key questions are how far management should go in helping investors form rational expectations about firm’s performance through their accruals choices and when does this activity become earnings management?

Research in accrual accounting has been a very active field of research, providing insights in the financial reporting process in general and accrual accounting in particular. However, there remain questions about the role of accruals in (1) improving earnings quality to assist the users of financial reports in predicting future performance (e.g. Desai et al., 2004; Barth and Hutton, 2004; Callen and Segal, 2004; Francis et al, 2005, Lev and Nissem, 2006), (2) the effect of growth on financial reporting and earning management (e.g. McNichols, 2000; Beaver, 2002; Fairfield et al. 2003b; Richardson et al., 2006, Dechow and Ge, 2006) and (3) the role of accruals in accounting conservatism and loss firms (e.g. Burgsthaler and Dichev, 1997; Beaver et al., 2003, Joos and Plesko, 2005; Durtschi and Easton, 2005; Ball and Shivakumar, 2006). With this dissertation I provide empirical evidence on the role of accruals in financial accounting to fill these gaps in the extant financial accounting literature, and assist users of financial reports in assessing the performance of a firm using financial statements.

1.2 Research objectives and contributions

In this dissertation I examine the manner in which accruals adjust cash flows to produce earnings that best reflect firm performance. More specifically, in three empirical studies I further examine the relationship between cash flows and accruals in relation to respectively accrual quality, growth and accounting losses. In the first study, accruals are the independent variable in an examination of the effect of accrual quality on future cash flows as the dependent variable. In the second and the third study, accruals are the dependent variable and cash flows are the
independent variable in an examination of the effect of respectively growth and accounting conservatism on accrual adjustments.

This dissertation builds on a large body of evidence on the role of accruals in financial accounting. Almost all studies that are referred to in this dissertation use US data taken from the Compustat Annual Industrial And Research Files database. I extent the literature by providing empirical evidence using the same Compustat US data as previous studies, making my results comparable to previous studies.

In the first study, I examine if the quality of accruals affects the ability of earnings to predict future cash flows, where earnings are decomposed in cash flows and accruals. Earnings are of good quality if they are a good indication of future earnings (Penman, 2003). One of the ways managers can improve financial reporting is to use accruals to improve the prediction of future cash flows. The Financial Accounting Standards Board (FASB) considers cash flow projection as a desirable characteristic of accounting information by stating that “financial reporting should provide information to help investors, creditors, and others assess the amounts, timing and uncertainty of prospective net cash inflows to the related enterprise” (1978).

Dechow et al. (1998) and Barth et al. (2001) show that accruals improve the prediction of future cash flows over current cash flows. However, Sloan (1996) argues that high accrual are associated with lower future performance, Fairfield et al. (2003a) suggest that a high level of accruals on the balance sheet indicates earnings that are not sustainable, Hirshleifer et al. (2004) argue that a high level of accruals on the balance sheet indicates a lack of sustainability of recent earnings performance, while Desai et al. (2004) show that the ability of cash flows to predict future returns subsumes accruals in predicting future returns.

I show that the ability of accruals to be informative in predicting future cash flows incremental to current cash flows is conditional on accrual quality. Accrual quality is the extent that accruals map into cash flows (Dechow and Dichev, 2002; Francis et al., 2004; Francis et al., 2005). When accrual quality is low, future cash flows are less likely to be predicted from current cash flows, and accruals are incremental to current cash flows in predicting future cash flows. When accrual quality is high, current cash flows are more likely to persist, and accruals are less relevant in predicting future cash flows relative to cash flows. This can be explained by the fact that, when accrual quality is low, accruals are not likely to be converted in future cash flows, and therefore cash flows are shown to be less persistent. In this case, accruals are relevant incremental to cash flows in predicting future cash flows. However, when accrual quality is high, the likelihood of the conversion of assets in cash flows is high, and it is shown that cash flows are highly persistent when accrual quality is high. In the case of high accrual quality, accruals are less
relevant for the prediction of future cash flows, incremental to current cash flows. I also show that accrual quality does not affect the ability of abnormal accruals to predict future cash flows, indicating that abnormal accruals may reflect private information about future cash flows rather than earnings management.

In the second empirical examination, I examine the effect of growth on the manner in which accruals adjust cash flows to produce earnings. Firms with greater expected earnings growth are likely to have greater than expected accruals than firms with less expected earnings growth (McNichols, 2000). The higher than expected amount of accruals for growth firms, and the reversal of accruals in consequent periods, could be wrongly interpreted as earnings management (Beaver, 2002; Fairfield et al., 2003b). For instance, the variation in growth rates rather than earnings management is likely to cause the lower persistence of accruals (Richardson et al., 2006).

Accrual adjustments made by firms are fundamentally linked to underlying economics. Firms with large positive accruals relative to their asset base are typically growing firms, while firms with large negative accruals are typically firms that are exiting businesses and are in a state of decline. The accounting rules applicable to growing and declining firms have very different perspectives. Dechow and Ge (2006) point out that the difference in accounting perspective for accruals is likely to be dependent on the life cycle the company is in. They argue that accruals for growing firms have an income statement perspective, focusing on revenue recognition and the matching of costs to revenue. Value (low growth) firms however, use accruals from a balance sheet perspective, where the focus is on changes in the value of assets, as reflected in earnings. The difference in accounting perspective is presumably driven by differences in demand for reporting quality. Growth firms typically have more growth opportunities than value firms. Generally, there is little demand to fair-value these growth opportunities, as stakeholders focus on the realization of the growth opportunities. However, value firms facing a decline in business are likely to have assets in place that have a lower market value than book value. Demand for reporting quality will be based on financial reporting reflecting fair value. This exercise of caution in the recognition and measurement of income and assets is reflected in accruals.

Accruals perform two major functions in financial accounting (Ball and Shivakumar, 2006). Accruals are used to ameliorate the noise in earnings caused by transitory cash flows, and for the timely recognition of unrealized gains and losses. I argue that difference in accounting perspective for firms with high growth and firms with low growth cause a difference in accrual accounting. I show that the noise reduction role of accruals is less prevalent for firms with high growth. I also show that since underlying economics adjust the accrual process, causing a
significant lower association between accruals and underlying cash flows and higher than expected specific accruals. This could be interpreted as earnings management. However, accrual based earnings management measures are affected by the effect of growth on accounting accruals, and may in fact reflect differences in accrual accounting rather than earnings management. This result suggests that growth is an omitted correlated variable in earnings management research.

Third, I examine the role of accruals in accounting conservatism and loss firms. The frequency of loss firms has increased markedly in recent years, from 15% to 35% of all firm-year observations in the Compustat database of U.S. firms in the last 30 years (Joos and Plesko, 2005). Loss firms are expected to be more likely to engage in earnings management (Burghstahler and Dichev, 1997; DeGeorge et al., 1999; Phillips et al., 2003). However, evidence for the earnings management hypothesis has been questioned (Dechow et al., 2003; Durtschi and Easton, 2005). The higher incidence of loss firms seems to be caused by an increase in accounting conservatism (Basu, 1997; Givoly and Hayn, 2000; Ball and Shivakumar, 2006). Conservatism can be considered an accounting bias toward reporting low book values on the balance sheet (Penman, 2003). One consequence of conservatism is the differential verifiability required for the recognition of profits versus losses (Watts, 2003). Two types of accounting conservatism can be distinguished (Beaver and Ryan, 2005). First, unconditional conservatism reflects GAAP principles or policies that reduce earnings independent of current economic news, e.g. immediate expensing of R&D expenses. The second type of conservatism is conditional conservatism, which reflects the reduction of accounting income due to a contemporaneous economic loss, e.g. more timely earnings recognition of bad news than of good news. Timely loss recognition is considered a key attribute of financial reporting quality (Ball and Shivakumar 2005). The timely recognition of unrealized gains and losses is a major role of accruals (Ball and Shivakumar, 2006). I show that the differences in demand for reporting quality is reflected in differences in timely loss recognition between profit firms and loss firms. More specifically, my results indicate that the role of accruals for the recognition of conditional conservatism, or timely loss recognition, is predominantly applicable to loss firms, whereas profit firms do not seem to use accruals to reflect conditional conservatism. I further show that this is reflected in the use of special items, a specific class of accruals. Firms with an accounting profit on average do not have substantial use of special items, whereas for loss firms, special items are substantially negative. Since special items are associated with accounting conservatism (Givoly and Hayn, 2000), this further shows the difference in conditional conservatism between loss firms and profit firms.

This dissertation provides a contribution to research in financial accounting and to the practice of financial statement analysis. First, the role of accruals in the prediction of future cash
flows is further explained. I show that accruals are relevant for the prediction of future cash flows especially when accrual quality is low, i.e. when the extent that accruals map into cash flows is low, and less relevant when accrual quality is high. This is the case for both accruals on the income statement and on the balance sheet. I show that users of financial statements should not only examine the amount of accruals when considering future performance, but also the quality of accruals. Second, I further provide evidence on the relevance of abnormal accruals. In his review on capital market research, Kothari (2001) states that discretionary accruals are synonymous with earnings management. However, Subramanyam (1996) shows that discretionary accruals improve earnings as a signal of performance. The net effect (i.e. good or bad) of this managerial discretion remains an empirical question. I show that abnormal accruals are not necessarily a signal of earnings management, but also a signal of private information about future cash flows. This is consistent with Arya et al. (2003), who argue that in certain instances a managed earnings stream can convey more information than an unmanaged earnings stream. Under the “Conservation of Income” principle, the sum of accounting earnings over the firm’s life is not affected by accounting choices (ignoring the effect of taxes and changes in the firm’s opportunity set). As a result, the assumption of this principle, manipulation catches up with the manager. Thus, when a manager manages earnings (e.g. to smooth the earnings stream), this is a demonstration of his ability to run the firm and predict future earnings. Therefore, researchers and users of financial statements should caution equating abnormal accruals with earnings management. Third, I show that the higher the growth, the more managers use accruals to adjust cash flows over time to reduce the noise in cash flows as a measure of performance. This systematic effect of growth on accruals also affects accruals-based measures of earnings management. McNichols (2000) and Beaver (2002) argue that the effects of growth on accruals should be further examined, at the risk of spuriously concluding to earnings management. My results show the importance of adjusting the evaluation of accounting numbers for growth. I show that growth will cause systematic differences in accrual-based accounting numbers between firms with low growth and firms with high growth. A better understanding of the effect of growth also allows the users to better assess the quality of earnings, making my results also important for the practice of financial statement analysis. A fourth and final contribution of this dissertation is empirical evidence on the difference of conditional conservatism between profit firms and loss firms. Ball and Shivakumar (2006) show that accruals play an important role in the timely recognition of economic losses, i.e. conditional conservatism. My results indicate that the timely loss recognition role of accruals is especially relevant for firms with an accounting loss. In contrast, conditional conservatism via accruals is not applied by profit firms. This is consistent with evidence from capital market
research that investors do not react to losses in the same manner as to profits (Hayn, 1995). The earnings response coefficient (ERC) for loss firms is zero, indicating that the stock price reaction to earnings news is zero. Therefore, there is an incentive for managers to recognize economic losses in income, since this will not affect the stock price of the company. However, the ERC for profit firms is high, so for profit firms, conditional conservatism will affect the stock price, given managers the incentive not to recognize economic losses in a timely manner. This result is important for researchers in financial accounting. It shows that loss firms and profit firms have different properties of accruals, and therefore should not be pooled automatically. The explanatory power of the model is shown to improve dramatically by partitioning the sample on loss firms and profit firms. I also present evidence against the earnings management hypothesis that is presented in prior research. I argue that accrual choices that previously may have been considered earnings management may in fact represent the application of conditional conservatism, or timely loss recognition. For instance, McVay (2006) argues that managers opportunistically shift expenses from core expenses to special items. I show that accrual choices are likely to represent conditional conservatism rather than earnings management. Also, my results are important for investors and other users of financial reports. I show that earnings quality in terms of timely loss recognition through accruals is higher for loss firms than for profit firms. This could for instance affect accounting based valuation. My results help users of financial statements to better interpret the accounting numbers.

1.3 Outline of the dissertation

The remainder of the dissertation is organized in the following manner. Chapter 2 discusses the role of accruals and cash flows in financial reporting. Chapter 3 discusses the role of accruals for accounting conservatism. Chapter 4 examines the quality of earnings and accruals. Chapter 5 reviews prior literature on earnings management. Chapter 6 examines the effect of accrual quality on cash flow persistence and the prediction of future cash flows. Chapter 7 examines the effect of growth on accounting accruals. Chapter 8 examines differences in the role of accruals for conditional conservatism between profit firms and loss firms. Chapter 9 presents the summary and the conclusions. A brief summary of the dissertation in Dutch is presented at the end of this dissertation.
Chapter 2 The role of accruals and cash flows in financial reporting

2.1 Introduction

In this chapter, I present the main theoretical arguments and empirical evidence on the role of accounting accruals in financial reporting. In the first part of the chapter, I discuss a model of the relation between earnings, cash flows and accruals. I then present the results of the empirical literature that evaluates the usefulness of accrual accounting. The aim of this chapter is to explain the effect business transactions have on financial reporting. More specifically, I demonstrate that cash flow as a performance measure is subject to fluctuations, and that accruals are introduced to accounting to mitigate those fluctuations in earnings. As a result of the accounting accruals, earnings are a better indicator of performance than cash flow.

2.2 The accrual process modeled

The primary product of financial reporting is net income or earnings as a measure of performance. Earnings are the summary measure of firm performance produced under the accrual basis of accounting. Earnings are important since they are used as a summary measure of firm performance by a wide range of users, for instance for executive compensation plans or in debt covenants. Another explanation for the prominence of accounting earnings is that earnings reflect cash flow forecasts and has a higher correlation with value than current cash flow (Dechow, 1994). Earnings’ inclusion of those forecasts causes earnings to be a better forecast of (and so a better proxy for) future cash flows than current cash flows. Dechow, Kothari and Watts (1998) (hereafter DKW) therefore argue that this is one of the reasons why earnings are often used in valuation models and as performance measures instead of operating cash flows.

Information asymmetry between management and other contracting parties create a demand for an internally generated measure of firm performance over finite intervals. The success of a firm depends ultimately on its ability to generate cash receipts in excess of disbursements. Therefore, one performance measure that could be used is net cash receipts (realized cash flows). However, over finite intervals, reporting realized cash flows is not necessarily informative. This is because realized cash flows have timing and matching problems.
that cause them to be a ‘noisy’ measure of firm performance. Accruals are used in financial reporting to overcome problems with measuring firm performance when firms are in continuous operation.

Generally accepted accounting principles have evolved to enhance performance measurement by using accruals to alter the timing of cash flows recognition in earnings. Two important accounting principles that guide the production of earnings are the revenue recognition principle and the matching principle. By having such principles, the accrual process is hypothesized to mitigate timing and matching problems inherent in cash flows so that earnings more closely reflects firm performance (Dechow, 1994).

DKW formally model the accrual accounting process. More specifically, they model operating cash flows and the accounting process by which operating cash flow forecasts are incorporated into accounting earnings. The study of DKW is based on a model by Bernard and Stober (1989), who described a model of the operating cycle of the firm, in order to identify the value-relevance of current accruals (i.e. accounts receivable and inventory).  

DKW model forecasted operating cash flows starting with the sales generating process, rather than the operating cash flow generating process.  

Sales for period $t$, $S_t$, are assumed to follow a random walk process:

$$S_t = S_{t-1} + \varepsilon_t$$  \hspace{1cm} (2.1)

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2 More specifically, Bernard and Stober (1989) model how current accruals could provide information about future period sales incremental to that in current period sales, thus conveying management’s expectations about future performance. They model an optimal balance of inventory, given management’s expectations of future sales, and a deviation from the optimal balance, e.g. from unplanned inventory buildup or liquidation. DKW build on the inventory model.

3 As DKW point out, the sales contract determines both the timing and amount of cash inflows (and often related cash outflows) and the recognition of earnings. The sales contract specifies when and under what conditions the customer has to pay. Those conditions determine the pattern of cash receipts and so the sales contract is more primitive than the cash receipts. The sales conditions also determine when a future cash inflow is verifiable and so included in earnings (along with associated cash outflows). Some financial textbooks mark sales as one of the key drivers in forecasting earnings, cash flows and the balance sheet. Palepu, Healy and Bernard (2000, p.10-2) for instance point out that when asset turnover is expected to be stable, as is often realistic, working capital accounts and investments in plant should track the growth in sales closely. Most major expenses also track sales, subject to expected shifts in profit margins.

4 The average serial correlation in sales changes for the DKW sample firms is 0.17, with a t-statistic of 21.1 assuming cross-sectional independence. The small degree of positive serial correlation in sales changes suggests that a random walk in sales is an approximate description of the data. Even if sales follow an autoregressive process in first differences, accruals still offset the negative serial correlation in operating cash flow changes induced by inventory and working capital financing policies. This produces earnings that are better forecasts of future operating cash flows than current operating cash flows and moves earnings changes closer to being serially uncorrelated (DKW, 1998, p. 139).
where \( \varepsilon_t \) is a random variable with variance \( \sigma^2 \) and \( \text{cov} (\varepsilon_t, \varepsilon_{t+\tau}) = 0 \) for \( |\tau| > 0 \).

Under the method of cash accounting, revenues are reported in the period in which cash is received, and expenses are reported in the period in which cash is paid. Taxable income, therefore, is calculated as the difference between cash receipts from revenues and cash payments for expenses. However, the relation between sales and cash flow from sales is not one-to-one because some sales are made on credit. To measure income adequately, revenues and expenses must be assigned to the appropriate accounting period. The accountants solve this problem by applying the matching principle. To apply the matching principle, accountants have developed accrual accounting. Accrual accounting is the basis under which the effects of transactions and other events are recognized when they occur (and not as cash or its equivalent is received or paid) and they are recorded in the accounting records and reported in the financial statements of the periods to which they relate. That is, accrual accounting consists of all the techniques developed by accountants to apply the matching rule. This process is formalized in the DKW model for working capital accruals.

Specifically, it is assumed that proportion \( \alpha \) of the firm’s sales remains uncollected at the end of the period so that accounts receivable for period \( t \), \( AR_t \), is:

\[
AR_t = \alpha S_t
\]  

(2.2)

The accounts receivable accrual incorporates future cash flow forecasts (collection of accounts receivable) into earnings.

In this model, it is assumed that all expenses vary with sales so the expense for period \( t \) is \((1 - \pi) S_t\) where \( \pi \) is the net profit margin on sales and earnings (\( E_t \)) are \( \pi S_t \). Inventory policies introduce differences between expense and cash outflows and hence between earnings and cash flows. Inventory is a case where future cash proceeds are not verifiable and so are not included in earnings. Instead, if it is likely that cost will be recovered, the cost is capitalized and excluded from the expense. In essence, the inventory cost is a conservative forecast of the future cash flows from inventory. Inventory is assumed to be carried at full cost.

Following Bernard and Stober (1989), it is assumed that a firm’s inventory at the end of period \( t \) consists of a target level and a deviation from that target. Target inventory is a constant fraction, \( \gamma_1 \), of next period’s forecasted cost of sales. Since it is assumed that sales follow a random walk, target inventory is \( \gamma_1(1 - \pi)S_t \), where \( \gamma_1 > 0 \). Target inventory is maintained if a firm

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5 Throughout this text, I will use the same symbols as DKW.
increases its inventory in response to sales changes by \( \gamma_1 (1-\pi) \Delta S_t \), where \( \Delta S_t = S_t - S_{t-1} = \epsilon_t \). Actual inventory deviates from the target because actual sales differ from forecasts and there is an inventory build up or inventory liquidation. The deviation is given by \( \gamma_2 \gamma_1 (1-\pi)[S_t - E_t - 1(S_t)] = \gamma_2 \gamma_1 (1-\pi) \epsilon_t \), where \( \gamma_2 \) is a constant that captures the speed with which a firm adjusts its inventory to the target level. If \( \gamma_2 = 0 \) the firm does not deviate from the target, while if \( \gamma_2 = 1 \), the firm makes no inventory adjustment.\(^6\) Inventory for period \( t \), \( \text{INV}_t \), is then

\[
\text{INV}_t = \gamma_1 (1-\pi) S_t - \gamma_1 \gamma_2 (1-\pi) \epsilon_t
\]  

(2.3)

The credit terms for purchases are a third factor causing a difference between earnings and cash flows. Purchases for period \( t \), \( P_t \), are

\[
P_t = (1-\pi) S_t + \gamma_1 (1-\pi) \epsilon_t - \gamma_1 \gamma_2 (1-\pi) \Delta \epsilon_t.
\]

(2.4)

Purchases of a firm thus consist of expenses and the inventory adjustment. If a firm purchases all its inputs just in time so inventory is zero \( (\gamma_1 = 0) \), purchases just equal expense for the period \( (1-\pi)S_t \). The second term in Eq. (2.4) consists of the purchases necessary to adjust inventory for the change in target inventory, \( \gamma_1 (1-\pi) \epsilon_t \). The third term is the purchases that represent the deviation from target inventory, \( -\gamma_2 \gamma_1 (1-\pi) \epsilon_t \). Barth et al. (2001) rewrites equation (2.4) by noting that \( \gamma_2 \) is the fraction of the current sales shock, \( \epsilon_t \), not included in inventory in the current period because it is deferred to the next period. Therefore, current period purchases should equal current period cost of sales, plus the initial inventory adjustment for the current sales shock, plus lagged adjustments for the prior sales shock:

\[
P_t = (1-\pi) S_t + \gamma_1 (1-\pi)[(1 - \gamma_2) \epsilon_t + \gamma_2 \epsilon_{t-1}]
\]

(2.4a)

Since purchases are on credit, like sales, the cash flow associated with purchases differs from \( P_t \). Assuming proportion \( \beta \) of the firm’s purchases remains unpaid at the end of the period, \( \text{AP}_t \), is

\(^6\) As Barth et al. (2001) point out: “although the inventory assumptions might not mirror precisely the policies of real firms, they capture the notion that not all accruals reverse in a single period and that, as explained below, accruals reflect more information than simply the one-period delayed payments or receipts associated with past purchases or sales. In particular, accruals can reflect information related to management’s expected future activity (p. 31)”.

12
\[ AP_t = \beta P_t = \beta [(1 - \pi) S_t + \gamma_1 (1 - \pi)e_t - \gamma_1 \gamma_2 (1 - \pi) \Delta e_t] \] (2.5)

The accounts payable accrual is a forecast of future cash outflow. Combining the cash inflows from sales and outflows for purchases, the (net operating) cash flow for period \( t \) (\( CF_t \)) is

\[ CF_t = \pi S_t - \left[ \alpha + (1 - \pi) \gamma_1 - \beta (1 - \pi) \right] e_t + \gamma_1 (1 - \pi) [\beta + \gamma_2 (1 - \beta)] \Delta e_t \\
+ \beta \gamma_1 \gamma_2 (1 - \pi) \Delta e_{t-1} \] (2.6)

The first term in expression (2.6), \( \pi S_t \), is the firm’s earnings for the period (\( E_t \)) and so the remaining terms are accruals. Rearranging Eq. (6) to show the earnings calculation is helpful:

\[ E_t = CF_t + \left[ \alpha + (1 - \pi) \gamma_1 - \beta (1 - \pi) \right] e_t - \gamma_1 (1 - \pi) [\beta + \gamma_2 (1 - \beta)] \Delta e_t \\
- \beta \gamma_1 \gamma_2 (1 - \pi) \Delta e_{t-1} \] (2.7)

If there are no accruals (sales and purchases are cash so \( \alpha = \beta = 0 \), and no inventory (so \( \gamma_1 = 0 \)), earnings and cash flows for the period are equal.

The second, third and fourth terms express the period’s accruals as a function of the current shock to sales and differences in current and lagged sales shocks. The second term is the temporary cash flow due to the change in expected long-term working capital (i.e., the working capital once all the cash flows due to lagged adjustment of inventory and credit terms have occurred). It is the shock to sales for the period, \( e_t \), multiplied by a measure of the firm’s expected long-term operating cash cycle expressed as a fraction of a year, \( [\alpha + (1 - \pi) \gamma_1 - \beta (1 - \pi)] \), which is denoted by \( \delta \). The third and fourth terms are temporary cash flows due to the lagged adjustment of inventory and credit terms.

Empirically, the coefficients of the differences in sales shocks in the third and fourth terms in Eq. (2.7) are close to zero and do not affect relative predictive ability or the predicted signs of the correlations. Given that, ignoring these two terms allows for modeling cash flow and earnings parsimoniously by

\[ CF_t = \pi S_t - \delta e_t \] (2.8)

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7 In the dataset used for the empirical examinations in chapters 6, 7 and 8, the value of \( \alpha \) is 0.174, \( \pi \) is -0.123, \( \gamma_1 \) is 0.089, \( \gamma_2 \) is 0.015, \( \beta \) is 0.086 and \( \delta \) is 0.163.
\[ E_t = CF_t + \delta \varepsilon_t. \] (2.9)

Following equation (2.8), DKW states that the best one-period-ahead forecast of \( CF_{t+1} \) is \( \pi S_t \), since accruals adjust cash flows for temporary shocks due to the outlay for the increase in long-term working capital and the difference in timing of cash outflows for purchases and inflows from sales. Barth, Nelson and Cram (2001) (hereafter BNC) extend DKW by showing that the parsimonious relation between cash flows and earnings in equation (2.8) leaves out the incremental role accruals can play in predicting future cash flows, causing earnings \( \text{EARN}_t \) (i.e. \( \pi S_t \)) not to be an unbiased estimator of \( CF_{t+1} \).

BNC models next period cash flow, \( CF_{t+1} \), equal to cash inflows from sales, adjusted for uncollected amounts reflected in the change in accounts receivables, minus outflows from purchases, adjusted for unpaid amounts reflected in the change in accounts payable:

\[ CF_{t+1} = (S_{t+1} - \Delta AR_{t+1}) - (P_{t+1} - \Delta AP_{t+1}) \] (2.10)

Following equations (2.1) through (2.9), equation (2.10) can be rewritten as:

\[
\begin{align*}
CF_{t+1} & = \pi_t S_{t+1} - [\alpha + (1 - \pi) \gamma_1 - \beta (1 - \pi)] \varepsilon_{t+1} - \gamma_1 (1 - \pi) [\beta + \gamma_2 (1 - \beta)] \Delta \varepsilon_{t+1} \\
& + \beta \gamma_1 \gamma_2 (1 - \pi) \Delta \varepsilon_t
\end{align*}
\] (2.11)

As stated above, DKW assumes the coefficients of the differences in sales shocks in the third and fourth terms in Eq. (11) are close to zero and do not affect relative predictive ability. However, BCN states that these coefficients do not equal 0 in expectations at time t. Specifically, \( E_t [\Delta \varepsilon_{t+1}] = - \varepsilon_t \) and \( E_t [\Delta \varepsilon_t] = \varepsilon_t - \varepsilon_{t-1} \), where \( \varepsilon_t \) and \( \varepsilon_{t-1} \) are the time t and t-1 realizations of the random variable \( \varepsilon \), which only equal 0 by chance. By using equation (2.11) to express expected next period cash flows as a function current and two lags of earnings, BCN shows that including these terms reveal that expected next period cash flow does not equal current earnings:

\[
E_t [CF_t] = \pi_t S_t - \gamma_1 (1 - \pi) [\beta + \gamma_2 (1 - \beta) - \beta \gamma_1 \gamma_2] \varepsilon_t - \beta \gamma_1 \gamma_2 (1 - \pi) \varepsilon_{t-1}
\] (2.12)
Since \( E_{\text{ARN}} = \pi S_t \) and \( S_t = S_{(t-1)} + \varepsilon_t \), \( \varepsilon_t = \pi^{-1} (E_{\text{ARN}} - E_{\text{ARN},t}) \) and \( \varepsilon_{t-1} = \pi^{-1} (E_{\text{ARN}} - E_{\text{ARN},t-1}) \). Thus, equation (12) can be rewritten in terms of earnings:

\[
E_t[CF_t] = (1 - \gamma_1 (1 - \pi) \pi^{-1} [\beta + \gamma_2 (1 - \beta) - \beta \gamma_2]) E_{\text{ARN}} + \gamma_1 (1 - \pi) \pi^{-1} [\beta + \gamma_2 (1 - \beta) - \beta \gamma_2] E_{\text{ARN},t-1} + \gamma_1 (1 - \pi) \pi^{-1} \beta \gamma_2 E_{\text{ARN},t-2}
\]

As BNC point out, this equation shows that expected next period cash flow equals current earnings, adjusted for the one- and two-year effects of inventory changes and associated payments. For example, if the two prior years’ sales changes, i.e. \( \varepsilon_t \) and \( \varepsilon_{t-1} \) are positive, then \( E_{\text{ARN}} \) overstates expected cash flows in period \( t + 1 \) because \( E_{\text{ARN}} \) omits the future cash flow effects of payments related to delayed inventory increases. In this case, cash flow in period \( t + 1 \) will be less than earnings in period \( t \) because of payments related to (1) the period \( t + 1 \) inventory increase arising from the period \( t \) sales increase, (2) the period \( t \) accounts payable for the period \( t \) inventory increase arising from the period \( t \) sales increase, and (3) the period \( t \) accounts payable for the period \( t \) inventory increase arising from the period \( t - 1 \) sales increase.

An important observation from equation (14) is also that earnings (\( E_{\text{ARN}} \)) can overstate expected future cash flows as a result from business performance deviating from expectations, i.e. sales that are higher than expected, causing positive or negative \( \varepsilon_t \). Since stock prices reflect expected future cash flows, this could mean that earnings can be a biased predictor of stock prices. When in \( t + 1 \) cash flows are indeed lower than expectations based on current earnings, this can also be interpreted as earnings management. Instead of explaining lower cash flows in \( t + 1 \) as earnings being managed upward in period \( t \), and subsequently lower cash flows in period \( t + 1 \) when accruals reverse, the reversal of earnings can also be explained by business performance deviating from expectations.\(^8\)

Next period cash flow can also be expressed in terms of components of current earnings, since next period cash flow is expected to differ from current period cash flow because of the transactions involving current period accruals:

\[
E_t[CF_{t+1}] = CF_t + \Delta AR_t - \Delta AP_t - (1 - \beta)(E_t[\Delta INV_{t+1}] - \Delta INV_t)
\]

\(^8\) See for instance Teoh et al. (1998).
Under the assumptions of the model, expected cash flows can be expressed as a function of either current and two lags of aggregate earnings, or as current earnings disaggregated into cash flow and components of accruals, which each having equal predictive ability (BNC). Thus, accruals not only reflect delayed cash flows effects of past transactions. Accruals also reflect information about expected future cash flows relating to management’s expected future purchasing activity (i.e. inventory), as well as collections and payments associated with current period transactions (i.e. collecting accounts receivable and paying accounts payable).

2.3 The noise reducing role of accruals

Generally speaking, accruals perform two functions in financial accounting. The primary function of accruals is to reduce the noise in transitory cash flows to produce earnings. The other major function of accruals is the timely recognition of unrealized gains and losses (Ball and Shivakumar, 2006). Dechow (1994) examines the role of reducing noise in cash flows. She starts with investigating whether cash flows have time-series properties consistent with cash flows suffering from matching problems. The results indicate that changes in net cash flow per share exhibit on average a negative autocorrelation. Changes in operating cash flow per share exhibit a slightly smaller average negative autocorrelation, while changes in earnings per share has an even smaller negative autocorrelation than the cash measures. This suggest cash flows suffer from temporary mismatching of cash receipts and disbursements, therefore changes in cash flows exhibit negative autocorrelation, i.e., a large cash outflow this period is more likely to be followed by a large cash inflow next period. Accruals are employed to reduce the transitory nature of cash flow changes. Since changes in cash flows are likely to contain temporary components that are reversed over time, and accruals are used to match cash receipts and disbursements associated with the same economic event, changes in accruals will also exhibit negative autocorrelation. Since the change in cash flows is expected to be temporary, accruals will be negatively correlated with changes in cash flows. This negative correlation declines over longer intervals as matching problems in cash flows become less severe.

Dechow (1994) also reports the correlation between changes in cash from operations and changes in earnings. Over longer intervals, as the temporary components in cash flows ‘cancel each other out’, changes in earnings and changes in cash from operations will have a higher positive correlation with each other (if clean surplus holds). The average correlation between these measures increases from the quarterly interval to the four-year interval. These results are
consistent with the matching principle, since accruals ‘smooth’ the temporary components in cash flow. However, they are also consistent with the alternative view that management uses accruals to opportunistically ‘smooth’ earnings regardless of whether this improves earnings’ ability to measure firm performance. That is, for a reason other than reflecting firm performance, management desires to reduce the variability in earnings (e.g. to reduce borrowing costs).

DKW provide an explanation for the negative serial correlation of cash flow. Based on their model, they state that the serial correlation pattern is the net result of two effects. The first is the spreading of the collection of the net cash generated by the profit on the current period sales shock across adjacent periods which, absent any difference in the timing of cash outlays and inflows, leads to positive serial correlation in cash flow changes. The second effect is due to differences in the timing of the cash outlays and inflows generated by the shock which, absent the first effect, leads to negative serial correlation in cash flow changes. Their results show that in most firms the timing effect dominates the profit-spread effect. So, the negative serial correlation in operating cash flow changes is generated by most firms being long (having a positive net investment) in working capital.

DKW also provide an explanation for the negative correlation between cash flow and accruals. Increases (decreases) in sales generate contemporaneous outlays (inflows) for working capital increases (decreases) that are followed in the next period by cash inflows (outflows). The result is negative serial correlation in cash flow changes. They state that the correlation between working capital changes and cash flow changes is negative so long as the profit margin, (i.e. \( \pi \) in the model) is less than twice the operating cash cycle (i.e. \( \delta \) in the model). Their results show that for most firms, the profit margin is considerably smaller than the operating cash cycle for the average firm. Accruals exclude the contemporaneous one-time outflows for working capital from the current period’s earnings and incorporate forecasts of future cash inflows. This causes earnings to be a relatively better predictor of future cash flows than is current cash flows. It also generates negative serial correlation in accrual changes that offsets the negative serial correlation in operating cash flow changes.

It is interesting to note that their results indicate a wide spread in the distribution of the correlation between earnings and cash flow in a cross-sectional investigation, while the cross-correlation’s of the first differences of accruals and cash flows do not display a wide variance. It seems that accruals are indeed used to reduce timing and matching problems in earnings, and therefore the correlations of cash flows and accruals do not display such a wide spread. The other major role of accruals, the use of accruals for the timely recognition of unrealized gains and losses, is discussed in-depth in chapter 3.
2.4 The information content of cash flows and accruals

Financial accounting provides a summary of the events that have affected the firm in the fiscal year of the financial report. The events that affect the firm are reflected in the value of the firm. One measure of the value of the firm is the book value of the equity of the firm. This measure reflects the value of the firm according to the accountants, and can be considered the accounting summary of events.

To evaluate the effectiveness of the accounting summary of events, empirical research requires a benchmark against which the financial report can be evaluated. Since the events that have affected the firm are reflected in firm value, an obvious benchmark is the market value of the firm, as reflected in the stock price (Easton, 1999). The stock price reflects all the future pay-outs to the holder of the stock, i.e. all future cash flows generated by the firm that will be distributed to shareholders. Therefore, changes in the stock price reflect changes in the expectations of future cash flows, or future pay-outs to the holders of the stock. Information is considered to be relevant if it is associated with (changes in) the value of the firm. This information perspective was initiated by the seminal paper by Ball and Brown (1968), who evaluate the information content of accounting income by showing the association between unexpected earnings and unexpected stock returns.

A major issue with accounting income as a summary measure of firm performance is that Generally Accepted Accounting Principles (GAAP) provides a variety of methods to calculate accounting earnings. In the previous paragraph, it is shown that accounting earnings are cash flows generated by the operations of the firm, adjusted by accruals. The accrual adjustment enables earnings to be a better predictor of future cash flows than current cash flows. Accruals reflect the expectations of future cash flows of the managers of the firm, where GAAP provides a variety of methods to managers to calculate accruals based on their expectations of future cash flows. However, the use of accruals introduces potential problems, since management typically has some discretion over the recognition of accruals. This discretion can be used by management to signal their private information or to opportunistically manipulate earnings. Signalling is

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9 Easton et al. (1992) argue that there are two reasons why earnings will not be a perfect summary of events of the corresponding return interval: (1) value-relevant events observed by the market (and therefore captured in returns) in a prior period may affect accounting earnings of the current period, and (2) value-relevant events observed by the market in the current period may not be reported in accounting earnings of the current period. In short, accounting reports the effects of economic events with a lag.
expected to improve the ability of earnings to measure firm performance since management presumably have superior information about their firm’s cash generating ability. However, if management uses their discretion to opportunistically manipulate accruals, earnings will become a less reliable measure of firm performance (Dechow, 1994). The accrual process is in those cases not beneficial in predicting future cash flows and current cash flows could be preferred over current earnings when forming expectations of future pay-offs to holders of a stock.

Capital market research has examined the empirical question as to whether the net effect of accruals is to improve or reduce the ability of earnings to measure firm performance. A major assumption in this type of research is that stock prices accurately reflect the economic performance of a firm. That is, the stock price reflects economic income. Early research focused on whether accruals have information content. In their seminal work, Ball and Brown (1968) find that the association between security returns and earnings is higher than the association between security returns and operating cash flows. Since the difference between earnings and cash flows equals accruals, this result suggest that accruals improve the ability of accounting income to reflect firm performance. Research by Wilson (1986), Rayburn (1986), Bowen et al. (1986), Wilson (1987), Bernard and Stober (1989) and Livnat and Zarowin (1990) showed that that the accrual and cash flow components of earnings have information content. Ali (1994) extends this previous research by allowing for nonlinear relations between returns and the performance variables earning, accruals and cash flows. Ali (1994) shows nonlinear relations between returns and earning, accruals and cash flows. Furthermore, consistent with previous research, when he uses a linear model, the results are not consistent with cash flows having incremental information content beyond earnings and accruals, suggesting that nonlinear relations may be found between returns and other non-earnings data as well. Cheng et al. (1996) focused on the incremental information content of cash flow from operations when earnings are transitory. They suggest that cash flows from operations may play a larger role as an additional value signal (p. 173). The explanation for these findings is according to Cheng et al. (1996) that earnings may contain

\[ \text{Freeman and Tse (1992) document a nonlinear relation between abnormal returns and unexpected earnings. They argue that as the absolute value of unexpected earnings increases, the persistence of earnings declines, and so does the marginal price response to unexpected earnings. They also note that the slope coefficient on unexpected earnings form a linear model would predominantly reflect the effects of transitory, rather than permanent, earnings, because a linear model heavily weights the coefficient on high-magnitude transitory earnings. They show that forcing a linear specification on an abnormal return-unexpected earnings model biases the slope coefficient on unexpected earnings toward zero. If other performance measures, such as unexpected accruals and unexpected cash flows, also have high concentrations of transitory components in high magnitude observations, regression coefficients from the multivariate linear models in prior studies would also be biased toward zero.} \]
transitory items with limited valuation implications. Examples of transitory items in earnings include current and long-term accruals such as losses due to restructuring, current recognition (through asset sales) of previous period’s (or current period’s) increases in market value, one time impact on income from changes in accounting standards, and so on. Moreover, as compensation contracts and debt covenants are often based on accounting income, incentives exist for managers to introduce transitory elements in earnings.

The research discussed up till now examines whether unexpected cash flows and accruals are significant in a regression where abnormal stock returns are the dependent variable. Also, the focus of these studies is to test for incremental information content, they do not directly assess whether reported earnings is a superior summary measure relative to realized cash flows.

In her paper, Dechow (1994) uses stock price performance as the benchmark against which to compare realized cash flows and realized earnings. Stock prices are viewed as encompassing the information in realized cash flows and earnings concerning firm performance. Therefore, the focus of this paper is to assess the ability of each measure to reflect firm performance in their realized form, as opposed to their innovative or unexpected form. Specifically, the paper examines how accruals improve earnings’ ability to reflect firm performance and the circumstances in which accruals are important in performing this role, and it aims to formally establishing that earnings is a superior summary measure of firm performance relative to cash flows.

Results show that earnings have a stronger association with stock returns than net cash flows or cash from operations over short measurement intervals (i.e. quarterly). The explanatory power of realized cash flows relative to earnings will increase as the measurement interval is increased from a quarterly interval, to an annually interval and a four year period, respectively. However, over each measurement interval, earnings are more strongly associated with stock returns than either cash flow measure. One of the premises of the paper is that neither earnings nor cash flows are a perfect measure of firm performance because both suffer to varying degrees from timing and matching problems. Since cash from operations is rejected in favor of earnings, this suggests that the accrual adjustments made to cash from operations to obtain earnings are relatively important for mitigating the timing and matching problems inherent in cash from operations.

Dechow’s (1994) results demonstrate that cash flows are not a poor measure of firm performance per se. In steady-state firms, where the magnitude of accruals is small and cash flows and earnings are most similar, cash flows are a relatively useful measure of firm performance. However, when the magnitude of accruals increases, indicating that the firm has
large changes in its operating-, investment-, and financing activities, cash flows suffer more severely from timing and matching problems. Therefore, as accruals increase in magnitude net cash flows’ association with stock returns declines. Overall, the results are consistent with the hypothesis that accountants accrue revenues and match expenditures to revenues so as to produce a performance measure (earnings) that better reflects firm performance than realized cash flows. Apparently, cash flows suffer from greater timing and matching problems than earnings. Thus, the negative correlation between cash flows and accruals is not due solely to management ‘arbitrarily’ smoothing earnings. This suggests that management manipulation of accruals is of second-order importance and the first-order effect of the accrual process is to produce a summary measure that more closely reflects firm performance.

Barth et al. (2001) extend the analysis by Dechow (1994) by showing that different accrual components reflects different information relating to future cash flows, and that aggregate earnings mask this information. As the stock price reflects the discounted value of future cash flows, they show that disaggregating accruals into major components, i.e. accounts receivables, accounts payables, inventory, depreciation, amortization and other accruals, enhances the predictive ability to predict cash flows, and therefore stock prices. Barth et al. (2001) show that earnings is still superior in predicting returns over cash flows, demonstrating the different roles individual accruals can play in enhancing the association of earnings with stock returns and therefore firms performance.

Dechow (1994) hypothesizes that if accruals correctly employ accountants’ matching principle, then the cash flow and accrual components of earnings should have similar forecasting properties, such that no information should be lost in aggregating these two components of earnings. Sloan (1996) challenges this hypothesis, suggesting that accruals may be less informative than cash flows because they are less reliable and thus more susceptible to estimation error and managerial manipulation. In support of this hypothesis, Sloan shows that accruals are, on average, less informative than cash flows in forecasting future earnings. The results indicate that earnings performance attributable to the accrual component of earnings exhibits lower persistence than earnings performance attributable to the cash flow component of earnings. However, stock prices do not fully reflect information in accruals and cash flows about future earnings. The results indicate stock prices act as if investors fixate on earnings, failing to distinguish fully between the different properties of the accrual and cash flow components of earnings. Consequently, firms with relatively high (low) levels of accruals experience negative (positive) future abnormal returns that are concentrated around future earnings announcements. This negative association between accounting accruals and subsequent stock returns is known as
the accrual anomaly in the accounting literature. Given the relatively simple exploitation strategy of the accruals anomaly — acquiring long positions in low accruals companies and short positions in high accruals companies — some researchers expect that sophisticated and well endowed investors will cause the anomaly to quickly dissipate and ultimately vanish. Instead, the accruals anomaly persists to the present, and its magnitude has not diminished over time (Lev and Nissem, 2006).

Xie (2001) extends Sloan (1996) by suggesting that the lack of persistence and the overpricing of accruals are due to abnormal accruals. Abnormal accruals are accruals that are considered not to follow from the sales process of the company. Rather, abnormal accruals are considered to be booked by managers to reflect their discretion of the financial statements. Xie (2001) claims that abnormal accruals are less persistent than normal accruals, which in turn are less persistent than cash from operations. Moreover, the market overestimates the persistence of, and thus overprices, both abnormal and normal accruals, although the overpricing of abnormal accruals is more severe.

Defond and Park (2001) further investigates the mispricing of abnormal accruals by testing whether the market’s pricing of earnings surprises anticipates the reversing implications of abnormal accruals. They show that investors anticipate in part the reversing implications of abnormal accruals. Thomas and Zhang (2002) find that the negative relation between accruals and future abnormal returns documented by Sloan (1996) is due mainly to one specific accrual, namely inventory. Beneish and Vargus (2002) show that the accrual mispricing phenomenon is primarily due to the mispricing of income-increasing accruals. Hanlon (2005) examines the difference between financial reporting earnings (book earnings) and taxable earnings (tax earnings), i.e. the book-tax difference, and earnings persistence and shows that the lower persistence of earnings is caused in part by the book-tax difference. More specifically, firms with large book-tax differences have earnings that are less persistent than firms with small book – tax differences.

In prior research, abnormal accruals estimated by the Jones (1991) model were often termed as ‘discretionary accruals’, and were used as proxy to measure earnings management, or managerial discretion (e.g. Jones, 1991). In fact, in his review on capital market research, Kothari (2001) states that discretionary accruals are synonymous with earnings management. However, as pointed out by Healy (1996), Bernard and Skinner (1996) and Xie (2001), Jones model residuals capture not only managerial discretion, but also unusual nondiscretionary accruals and unintentional misstatements. Subramayam (1996) shows that discretionary accruals can also be the result of efficient contracting considerations. He shows that discretionary accruals improve earnings as a signal of performance, as discretionary accruals improve the contemporaneous returns-earnings relation, and concludes that discretionary accruals are on average informative, not opportunistic. Healy (1996) observes that ‘abnormal’ is more accurate because ‘discretionary’ connotes purposeful intervention by management.
Farfield, Whisenant and Yohn, hereafter FWY, (2003a) argue that the accrual anomaly of Sloan (1996) is a special case of a more general growth anomaly. They show that not only current accruals have a negative association with one-year-ahead profitability. Current accruals are a component of net operating assets (NOA), and the change in working capital is part of the growth in net operating assets. The other part of growth in net operating assets is growth in long term operating assets (i.e. long term accruals). FWY (2003a) show that both current accruals and long term accruals have equivalent negative associations with one-year-ahead profitability.

Hirshleifer et al. (2004) propose that the level of net operating assets—defined as the difference on the balance sheet between all operating assets and all operating liabilities—measures the accumulation over time of the difference between net operating income (i.e. accounting value added) and free cash flow (i.e. cash value added). An accumulation of accounting earnings without a commensurate accumulation of free cash flows raises doubts about future profitability. They document that high normalized net operating assets (indicating relative weakness of cumulative free cash flow relative to cumulative earnings) is associated with a rising trend in earnings that is not subsequently sustained. Thus, a high level of net operating assets, scaled to control for firm size, indicates a lack of sustainability of recent earnings performance. It appears that investors do not fully discount for this fact, implying that investors weight NOA much too positively in forecasting future earnings. Hirschleifer et al. (2004) show that this overoptimistic perception of NOA is significantly larger than the over-weighting of accruals.

The empirical evidence shows that accruals do not only have an income statement effect, i.e. to produce earnings. Accruals also have a balance sheet effect, as they increase the net operating assets of a firm. However, the rate of return of theses assets is not constant. It appears that high levels of net operating assets have an adverse effect on future profitability. For instance, a firm that is growing may acquire higher inventory to meet sales. However, if the firm keeps on getting more inventory, at a certain point, it will have more inventory that it can sell. Those assets will have to be written down, causing a lower return on assets for the firm. As an effect, higher levels of net operating assets make it harder to predict future earnings. This is documented in the literature, as investors appear to overvalue firms with high levels of accruals, both current and long term.
2.6 Summary and implications for this study

This chapter provided an overview of the role of accounting accruals in financial accounting. In this chapter, it is established that accruals augment cash flow from operations to produce earnings, and it is shown how this improves the measurement of performance.

A model is presented, that shows how cash flow, accruals and earnings are related. In the model, accruals adjust cash flows for temporary shocks due to the outlay for the increase in long-term working capital and the difference in timing of cash outflows for purchases and inflows from sales. The accrual adjustments result in earnings being a better predictor of future cash flows than current cash flows.

One of the main points of the model is that earnings can overstate expected future cash flows as a result of business performance deviating from expectations, i.e. sales that are higher than expected. This has often been explained by the earnings management hypothesis, where the reversal of earnings can also be explained by business performance deviating from expectations. This raises the question how business activity influences the role of earnings in predicting future cash flows. The current literature does not provide a good understanding of the business activity on the role of accruals in predicting future cash flows. In chapter 6, an empirical analysis of the effect of a firm-specific measure of accrual quality on the prediction of future cash flows is performed. This measure reflects in part the firms-specific transitory nature of accounting, and should be related to future cash flows.

In the next chapter, the consequence of changes in expected future cash flows on the role of accruals is further developed as the theory of accounting conservatism is explained. In chapter 4, the concept of earnings quality in relation to the prediction of future cash flows is presented, and in chapter 5, the role of expectations and earnings management is further discussed.
Chapter 3 Accruals and Conservatism

3.1 Introduction

In this chapter, I discuss the role of accruals for the timely recognition of unrealized gains and losses. As stated in the previous chapter, the primary role of accruals is to overcome problems with measuring firm performance when firms are in continuous operation. Realized cash flows have timing and matching problems that cause them to be a ‘noisy’ measure of firm performance. Accruals alter the timing of cash flows recognition in earnings to mitigate the noise in cash flows. This results in a negative correlation between accruals and cash flow from operations (Dechow, 1994).

However, accruals are not only used to reduce noise in earnings, but are also used for unrealized gain and loss recognition (Ball and Shivakumar, 2005 and 2006; Kothari et al., 2005). The economic gain or loss during a period can be thought of as the current-period cash flow plus or minus any upward or downward revision in the present value of expected future cash flows. By definition, timely gains and loss recognition must occur around the time of revisions in expectations of future cash flows. The revision in cash flow expectations normally will be made prior to the actual realization of those losses in cash, so timely recognition of an economic loss in accounting income generally requires accounting accruals. Examples of timely recognition involving working capital assets and liabilities include gains and losses on trading securities, inventory write-downs due to factors such as spoilage, obsolescence or declines in market value, receivables revaluations, and provisions for operating costs arising from adverse events in the current period. Examples of timely recognition involving long term assets and liabilities include gains and losses on trading securities, restructuring charges arising from attending to failed strategies or excessive headcounts, goodwill impairment charges arising from negative-net present value (NPV) acquisitions, and asset impairment charges arising from negative-NPV investments in long term assets (Ball and Shivakumar, 2006). In contrast to noise-reducing operating accruals, gain and loss accruals are a source of positive correlation between accruals and current-period operating cash flow.

Ball and Shivakumar (2006) show that accruals are indeed used to reflect the timely recognition of economic losses. This role of accrual accounting has important implications for the interpretation of accruals. Timely loss recognition has the opposite effect of the noise mitigating role discussed by Dechow (1994). It increases the variance of earnings conditional on the variance of periodic cash flows, by including capitalized losses in earnings. By increasing the volatility of accruals, and of earnings relative to cash flows, timely loss recognition could be
mistaken for poor earnings quality (e.g., Leuz et al., 2003; Graham et al., 2005). Ball and Shivakumar (2006) instead argue that timely gain and loss accruals directly improve the timeliness of accounting earnings and that timely recognition through accounting accruals actually improves reporting quality. Ball and Shivakumar (2005) argue that timely gain recognition is less of a concern than timely loss recognition. Ball and Shivakumar state that “the reason for this asymmetry is not totally clear. Ball and Shivakumar (2005) argue that the demand for timely loss recognition arising from debt and compensation contracting exceeds the equivalent demand for timely gain recognition. Because accrual accounting is a costly activity unrealized gains and losses are not costlessly observable, involving accounting, independent verification, and litigation costs), the optimal quantity of timely loss recognition exceeds that of timely gain recognition (p. 209)”. Research in asymmetric timely gain and loss recognition focuses predominantly on timely loss recognition, and less on timely gain recognition. Ball and Shivakumar (2005) provide three related reasons why timely gain recognition is of lesser concern. First, there is lower demand for timely gain recognition. Managers have a greater incentive to disclose timely information about unrealized economic gains than unrealized losses (they can realize gains by selling), so external parties are likely to demand an offsetting asymmetry in the financial statements (i.e. timely loss recognition). Second, accounting rules and practice are fundamentally asymmetric, and third, empirical evidence is consistent with timely gain not being a priority in accounting. Throughout this chapter and the remainder of the thesis, the focus will therefore be on the timely recognition of losses.

3.2 Timely loss recognition, Conservatism and Accruals

Timeliness of loss recognition is a summary indicator of the speed with which adverse economic events are reflected in both income statements and balance sheets. It is considered to be an important attribute of financial reporting quality (Ball and Shivakumar 2005). The demand for reporting quality is based on the information asymmetry between management and stakeholders of the company (e.g. shareholders and lenders). Stakeholders require timely measures of performance for compensation purposes, debt agreements and other contracts with the firm. The principles of accrual accounting are used in financial reporting to provide a timely measure of

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12 Ball and Shivakumar (2005) consider timely loss recognition an important attribute of reporting quality. Timely gain and loss accruals directly improve the timeliness of accounting earnings, and thereby (subject to cost considerations) increase its efficiency in debt and compensation contracting (see Basu, 1997; Ball et al., 2000; Ball and Shivakumar 2005).
performance. Via the use of accruals, accounting standards supply flexibility in financial reporting quality to meet demand for reporting quality.

Accounting income is the main indicator of financial reporting. Accounting income consists of the cash flow generated by the operations of a firm, and accruals adjustments on cash flow from operations based on expectations of cash flows. Accounting income differs from economic income, which can broadly be defined as the change of the market value of equity, adjusted for dividends and capital contributions (Ball and Shivakumar, 2005). Economic income incorporates both current period cash flow and any revision in the present value of expected future cash flows. The economic gain or loss during a period can be thought of as the current-period cash flow plus or minus any upward or downward revision in the present value of expected future cash flows.

Accounting recognizes (economic) income under two broad models: deferred and timely recognition. Deferred recognition largely ignores revisions in expectations and awaits the realization of the revised cash flows themselves. Timely recognition incorporates unrealized gains or losses in income (and hence the balance sheet) on an accrued basis, for example as inventory write-downs or as restructuring or asset impairment charges.

There is a difference in accounting practice in the timely recognition of losses and the timely recognition of gains. Financial reporting normally modifies the revenue recognition rules by adopting a lower verification standard for information about decreases in expected future cash flows (i.e. economic losses) than for increases (i.e. economic gains) (Basu, 1997). Thus, the accounting treatment of gains and losses is asymmetric when concerning the verification requirement. This difference is induced by the conservatism principle of accounting. In fact, Watts (2003) defines conservatism as the differential verifiability required for the recognition of profits versus losses.
Conservatism is an important convention of US GAAP financial reporting. It implies the exercise of caution in the recognition and measurement of income and assets. However, despite its central role in accounting theory and practice, no authoritative definition of conservatism exists (Givoly and Hayn, 2000). As a result, different interpretations of conservatism have developed in the literature. Givoly and Hayn argue that the only ‘official’ definition is that offered in the glossary of Statement of Concepts No. 2 of the FASB, namely, that conservatism is ‘a prudent reaction to uncertainty to try to ensure that uncertainty and risks inherent in business situations are adequately considered’. However, this definition does not specify the nature of the ‘prudent reaction’ called for by conservatism nor does it explain how such a ‘reaction’ may ensure that risks are ‘adequately considered’ (Givoly and Hayn, 2000).

Absent a definitive definition of conservatism, more distinct definitions have developed. Traditionally, accounting conservatism is defined by the adage “anticipate no profit, but anticipate all losses” (Bliss, 1924). Anticipating profits means recognizing profits before there is legal claim to the revenues generating them and that the revenues are verifiable. Conservatism does not imply that all revenue cash flows should be received before profits are recognized—credit sales are recognized—but rather that those cash flows should be verifiable (Watts, 2003).

In the recent literature, two related but distinct definitions of conservatism have developed. One definition of conservatism is an accounting bias toward reporting low book

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13 Researchers advance a number of explanations for conservative reporting; all of them suggest that conservatism benefits users of the firm's accounting reports (Watts, 2003). One explanation is that conservatism arises because it is part of the efficient technology employed in the organization of the firm and its contracts with various parties. Under this contracting explanation, conservative accounting is a means of addressing moral hazard caused by parties to the firm having asymmetric information, asymmetric payoffs, limited horizons, and limited liability. Conservatism can contain management's opportunistic behavior in reporting accounting measures used in a contract. For instance, in debt covenants, conservatism reduces the likelihood management will forgo positive net present value projects, overstate earnings and assets, and make what is effectively a liquidating dividend payment to shareholders at the expense of debt holders. In compensation contracts, conservatism reduces the likelihood that managers will exert effort to overstate net assets and cumulative earnings in order to distribute the net assets of the firm to themselves instead of exerting effort to take positive net present value projects. In corporate governance, conservatism provides timely signals for investigating the existence of negative net present value projects and taking appropriate actions if they exist. Conservatism protects the shareholders' option to exercise their property rights. Shareholder litigation is another source of conservatism. Shareholders’ right to sue for financial statement misrepresentation creates a demand for conservative accounting to limit litigation losses stemming from allegations of overstated net assets or income. Financial reporting standard setters and regulators have their own incentives to favour conservative accounting and reporting. Regulators demand conservative accounting because they face political costs when investors suffer losses due to alleged net asset overstatements. Other explanations for conservatism are taxation, earnings management (management understates assets by taking excessive charges and excessive write-offs, perhaps in a “big bath,” in order to overstate earnings in the future) and the option that management elects to abandon operations that are not profitable (Watts, 2003).
values of stockholder equity (and hence, if clean surplus accounting is being followed, low average net incomes). Watts and Zimmerman (1986) provide the following definition:

“Conservatism means that the accountant should report the lowest value among the possible alternative values for assets and the highest alternative value for liabilities. Revenues should be recognized later rather than sooner and expenses sooner than later (pp. 205-206).”

This kind of conservatism is called ex ante conservatism (Richardson and Tinaikar, 2004), also called news-independent conservatism (Chandra et al., 2004) and unconditional conservatism (Beaver and Ryan, 2005). Ex ante conservatism stems from the application of generally accepted accounting principles (GAAP) or policies that reduce earnings independent of current economic news. As a result, these aspects of the accounting process determined at the inception of assets and liabilities yield expected unrecorded goodwill. Examples include the immediate expensing of advertising expenditures and research and development (R&D) expenditures and other internally developed intangibles, even if they are associated with positive expected future cash flows, depreciation of property, plant, and equipment that is more accelerated than economic depreciation (accelerated depreciation), and historical cost accounting for positive net present value projects.

In his seminal paper, Basu (1997, p. 4) makes an important contribution to the understanding of the conservatism concept. He defines conservatism as follows:

“I interpret conservatism as capturing accountants’ tendency to require a higher degree of verification for recognizing good news than bad news in financial statements. Under my interpretation of conservatism, earnings reflect bad news more quickly than good news.”

His definition stresses the asymmetric timeliness of loss recognition. This second kind of earnings conservatism is also called ex post conservatism (Richardson and Tinaikar, 2004), news-dependent conservatism (Chandra et al., 2004) and conditional conservatism (Beaver and Ryan, 2005). The additional requirement of this conditional conservatism definition is that the reduction in accounting income reflects a contemporaneous economic loss. This requirement is not satisfied by expensing early, by deferring revenue, or by under-reporting income or book value on a regular basis (e.g., creating excessive provisions in all years), none of which is correlated with contemporaneous real income. Asymmetric loss recognition or ex post conservatism implies more timely earnings recognition of bad news than of good news. In this case book values are written
down under sufficiently adverse circumstances but not written up under favorable circumstances, with the latter being the conservative behavior. An important consequence of conservatism's asymmetric treatment of gains and losses is the persistent understatement of net asset values.

The difference in definitions is most apparent in Basu’s primary research design, which studies the asymmetric incorporation of economic gains and losses proxied by positive and negative stock returns over the fiscal year, in current-year accounting income. Examples of asymmetric loss recognition under US GAAP include the lower-of-cost-or-market rule for inventories, write-downs of goodwill following impairment testing, and the asymmetric recognition of contingent losses and contingent gains. Generally, accounting principles under US GAAP require write-downs to recognize bad news regarding inventory, goodwill, and loss contingencies, but prohibit write-ups to recognize good news (See also Ball and Shivakumar, p. 213).

The two types of conservatism have many of the same purposes, including capturing investors’ and others’ perceived asymmetric loss functions, minimizing firms’ litigation, tax, or regulatory costs, and enabling accounting and industry regulators to minimize economic instability and avoid criticism. The literature on unconditional conservatism puts greater emphasis on the difficulty of valuing certain types of economic assets and liabilities and determining their effects on future income. The literature on conditional conservatism puts greater emphasis on improving contracting efficiency given managers’ incentives to report upward-biased accounting numbers (Beaver and Ryan, 2005).

Beaver and Ryan (2005) examine the interactions between the two types of conservatism and observe that unconditional (ex ante) conservatism in prior periods preempts conditional (ex post) conservatism in later periods: if a firm is ex ante conservative in writing off an expenditure in one period, there will not be any capitalized amount on its balance sheet to write off in response to bad news later, ex post. Also important but less obvious, the model captures the fact

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14 Chandra et al. (2004) point out that because ex ante conservatism is independent of current-period news, one expects the application of ex ante conservatism to lower the intercept in a regression of earnings on returns but not to affect the slope coefficient. Thus, the implementation of ex ante conservatism does not result in any direct relation in the current period between earnings and either negative or positive returns, or in any difference between the two relations. However, for ex post conservatism, the application of ex post conservatism results in the slope coefficient in the regression of earnings on returns being higher for firms with negative returns (bad news firms) than for those with positive returns (good news firms), provided that equity prices efficiently impound bad and good news (see also Pae et al., 2005).

15 For example, earnings cannot recognize bad news with asset impairment charges if ex ante conservatism resulted in not recognizing a now impaired asset to begin with. In contrast, suppose that the firm is not ex ante conservative but instead capitalizes an expenditure as an asset in one period. Then, if there is bad news relating to the projected benefits associated with the asset in a later period, one expects to observe ex post conservatism in the later period under standard asset impairment accounting (Pae et al., 2005).

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that conditional conservatism resets the cost bases of net assets and so affects subsequent unconditional conservatism.

The Beaver and Ryan (2005) model and subsequent simulations demonstrate that the piece-wise linear analysis in Basu (1997) is only a first-order approximation of a much richer dynamic process. In his discussion of Beaver and Ryan (2005), Basu (2005) argues that since conditional conservatism strongly influences the properties of accounting numbers, a better understanding of its underlying dynamics is likely important to all accounting constituencies. In particular, empirical researchers stand to benefit from better-specified models for event and association studies, earnings time-series and forecasting studies, and “discretionary” accruals and earnings management tests, based on a richer description of fundamental accounting processes.

One possible outcome of this observation is that sudden earnings reversals which have been identified as earnings management are in fact the effect of conditional conservatism on the balance sheet of previous low unconditional conservatism firms. As Givoly and Hayn (2000) point out, the sum of earnings over the life of the firm (or over a full business cycle) must be the same regardless of the accounting choice. Therefore, what constitutes conservatism in one period may lead to non-conservative results in subsequent periods. Likewise, since conditional conservatism can be reflected in accruals, “discretionary” accruals could also reflect accounting conservatism instead of earnings management.

3.3 Measuring of accounting conservatism

There seems to be different vantage points of what constitutes conservatism. As a result, several empirical measures have been used to gauge the degree of accounting conservatism. In general, researchers use four types of measures to assess conservatism: (1) net asset measures (e.g. book-to-market ratio, see Pae et al, 2005 and Watts en Roychoudary, 2005); (2) earnings/stock returns relation measures (explanatory power regression stock prices earnings change); (3) earnings measures (earnings slope, earnings distribution); (4) accrual measures. All measures rely on the effect of conservatism’s asymmetric recognition of gains and losses on reported accounting numbers, in particular net assets, earnings, and accruals.
3.3.1 Net asset measures

Net asset measures of conservatism are based on the balance-sheet-oriented definition of conservative accounting suggested by the theoretical framework developed by Feltham and Ohlson (1995). They argue that conservative accounting concerns the valuation of operating assets relative to the present value of expected cash flows. The market value is considered a proxy for the present value of expected cash flows, so this definition views accounting as being conservative if the expected value at time $t$ of the excess of the market value over the book value of the firm's equity at time $t+T$ is greater than zero as $T$ approaches infinity. This notion of conservatism points to the use of the market-to-book ratio as a proxy for the degree of conservatism. Although the market values of the assets and liabilities comprising net assets change every period, all these changes are not recorded in the accounts and reflected in financial reports. Under conservatism, increases in asset values (gains) that are not sufficiently verifiable are not recorded, while decreases of similar verifiability are recorded. The result is that net assets are understated and thus carried below market value. A market-to-book ratio greater than one indicates conservative accounting and, other things being equal, an increase in the ratio over time suggests an increase in the degree of reporting conservatism. Watts and Roychoudary (2005) show that the market-to-book is an indicator of conservatism.

3.3.2 Earnings/ Stock return relations

Stock market prices tend to reflect asset value changes at the time those changes occur whether those changes imply losses or gains in asset value, that is, stock returns tend to be timely. Since conservatism predicts recognition of accounting losses on a more timely basis than gains, accounting losses are predicted to be more contemporaneous with stock returns than accounting gains. Basu (1997) predicts that stock returns and earnings tend to reflect losses in the same period, but stock returns reflect gains earlier than earnings. To provide estimates of his conservatism measure, Basu (1997) runs a regression of annual earnings on stock returns of the same year. He predicts a higher coefficient of stock returns and a higher $R^2$ from this regression for a sample of firms with negative stock returns than for a sample of firms with positive returns. Using U.S. data, Basu (1997) finds results consistent with his predictions.
3.3.3 Earnings measures

Conservatism implies that gains tend to be more persistent than losses, because financial statements do not recognize unverifiable increases in asset values (gains) at the time they occur, but over future periods as the cash flows generating those increases are realized. For example, if an asset’s value increases because it is expected to throw off more future cash flows, then the gain is recognized over the future years as the increased cash flows come in. This means that gains tend to be persistent. Since firms with positive earnings or earnings changes are likely to have recognized gains, positive earnings and earnings increases are also likely to be persistent.

Losses of the same degree of verifiability as the unverifiable gains tend to be recognized as they occur rather than in the future as the cash flow decreases are realized there is a lump sum drop in earnings at the time of the loss rather than a flow of reduced earnings in the future. Firms with negative or decreasing earnings are more likely to have recognized losses. Since, on average, these losses do not recur in future periods, negative earnings and earnings decreases are less likely to persist than positive earnings and earnings increases. Because those negative earnings and earnings decreases are transitory, the persistence or transience of earnings and earnings changes provides measures of conservatism (Watts, 2003).

Basu (1997) provides evidence that negative earnings changes are more likely to reverse than positive earnings changes. Basu (1997) regresses earnings changes, on lagged earnings changes for samples of positive and negative earnings changes. The estimated lagged earnings coefficient for positive earnings changes is insignificantly different from zero, consistent with positive earnings changes being permanent and not reversing. In contrast, the estimated lagged earnings coefficient for negative earnings changes is significantly negative, but is not significantly different from one, the value expected when negative earnings changes are completely transitory.

Givoly and Hayn (2000) argue that if conservatism leads to an immediate and complete recognition of negative events and a delayed and gradual recognition of positive events, it is likely to result in a negatively skewed earnings distribution. Second, to the extent that increased conservatism takes the form of either a more immediate (rather than gradual) recognition of bad news, or a greater tendency to provide for anticipated future costs or losses, such an increase will be associated with increased variability of the earnings series. Accordingly, two additional measures of conservatism are the skewness and variability of the earnings distribution. Givoly and Hayn (2000) find that the distribution of return on assets, whether derived from time-series of individual firms or the cross-section of firm-years, is negatively skewed for most of the periods
they examine. They report a significant increase in firms reporting losses and a decline in the
total rate of return (return on assets) from the 1950s to the 1990s, with the increased
skewness indicating an increase in conservatism over time.

3.3.4 Accrual Measures

Conservatism’s asymmetrical treatment of gains and losses produces an asymmetry in accruals. Because losses tend to be fully accrued while gains are not, periodic accruals tend to be negative and cumulative accruals tend to be understated. As a result, negative periodic net accruals and negative cumulative accruals accumulated over periods can be used as measures of conservatism. In addition, conservatism suggests that losses, which effectively capitalize reductions in future cash flows, generate more very large accruals than gains, which reflect only the cash flow increase in the period it occurs. For this reason, one predicts negatively skewed distributions of accruals and earnings and suggests that the negative skewness of distributions of earnings, earnings changes, and accruals are measures of conservatism (Watts, 2003).

Givoly and Hayn (2000) report a significant increase in firms reporting losses and a
decline in the total rate of return (return on assets). In contrast to earnings, there is no
increase in the incidence of negative cash flows nor is there a decrease in the CFO-to-assets ratio
over the 48-year period examined. These results strongly suggest that the decline in profitability
found in the US of the period that is examined is not a result of a change in the distribution of the
underlying cash flows, but rather stems from a change in the relation between cash flows and
earnings, that is, a change in accounting accruals. For firms in a steady state with no growth and
neutral accounting, earnings converge to cash flows and periodic accruals converge to zero. A
consistent predominance of negative accruals across firms over a long period is an indication of
conservatism. Their results show an almost continuous accumulation of negative accruals since
the 1980s. Not only is net income before depreciation systematically and consistently below cash
flows from operations, the pace of accumulation accruals is accelerating in the later periods,
indicating a shift in the degree of conservatism over time. The results by Givoly and Hayn (2000)
highlight the importance of accruals for accounting conservatism.

An important role of accrual accounting in conservative accounting is the use of accruals
for the timely recognition of unrealized gains and losses. This is due to revisions in the current-
period cash flow from a durable asset being positively correlated with current-period revisions in
its expected future cash flows. For example, a plant with decreased current-period cash flow due
to becoming uncompetitive most likely faces a downward revision in its expected future cash
flows as well. Timely recognition of the impaired future cash flows requires an income-
decreasing accrual (Ball and Shivakumar, 2006). Implication of the gain and loss recognition role of accruals is that other things equal (notably, exogenous working capital changes) accruals are positively correlated with current-period operating cash flows.\textsuperscript{16} This role of accruals is the opposite of the Dechow (1994) noise reduction role of accruals, even though both roles serve to increase financial reporting quality. For example, timely gain and loss recognition induces positive correlation between accruals and current-period operating cash flow, but noise mitigation induces negative; and one increases earnings volatile relative to cash flows, but the other decreases it. Discriminating between the two roles of accruals can be quite challenging, because earnings only exhibit the net effect of two offsetting processes.

Ball and Shivakumar (2006) show that conditional conservatism introduces an asymmetry in the relation between accruals and cash flow. Economic losses are more likely to be recognized on a timely basis, as accrued (i.e., non-cash) charges against income, whereas economic gains are more likely to await recognition until realized in cash. This asymmetry holds for both working capital accruals (e.g., the lower-of-cost-or-market rule for inventories requires income-decreasing but not income-increasing accruals) and longer cycle accruals (e.g., impairing but not revaluing property, plant and equipment, or goodwill). It implies that the positive correlation between cash flows and accruals arising from the timely recognition role of accruals is greater in periods with economic losses than in periods with economic gains. In turn, this implies that accruals models that are linear in cash flows are mis-specified, and that the correct specification most likely is piecewise linear. No such asymmetry is predicted by the noise reduction role of accruals.

Ball and Shivakumar (2005) show that there is a difference in the use of accruals for timely loss recognition between private companies and public companies. Private companies face a lower demand for reporting quality, as information asymmetry is more likely to be solved by insider access to performance information. They show that timely loss recognition is substantially less prevalent in private companies than in public companies. This result reinforces the estimation by Dechow and Dichev (2002), who argue and subsequently show that accrual quality will be systematically related to firm and industry characteristics.

Accounting, and thus the accrual adjustments made by firms, is fundamentally linked to underlying economics. A firm that is raising capital and growing will also be a firm that is recording large positive accruals relative to assets. In contrast a firm that is declining or

\textsuperscript{16} Other implications of the gain and loss recognition role of accruals are that, other things equal (notably, noise-reducing working capital accruals): earnings changes are more negatively serially correlated than cash flows, because they incorporate transitory accrued losses; earnings are more volatile than cash flows; and earnings are more highly correlated with stock returns (Basu, 1997).
downsizing will be recording large negative accruals relative to assets. The philosophy behind the accounting rules that apply to growing and declining firms differ fundamentally and this difference likely stems from the historical emphasis on reliability and conservatism in accounting. It seems possible that the difference in timely loss recognition between private firms and public firms is driven by differences in the underlying economics of the firm in which these two companies operate. Dechow and Ge (2006) point out that the difference in accounting perspective for accruals is likely to be dependent on the life cycle the company is in. Young, growing firms are typically reporting large positive accruals (also likely abnormal accruals). These firms are purchasing assets, generating sales, and expanding their businesses. Accrual accounting generally does not attempt to fair-value these growth opportunities on the balance sheet. Growing firms only record assets that meet certain criteria and these assets are generally recorded at capitalized cost. Accrual accounting for high accrual firms tends to have an income statement perspective, focusing on revenue recognition and matching costs that generate the revenue.

In contrast, when firms are downsizing, the accounting rules have a strong balance sheet perspective. As a firm exits lines of businesses, assets such as inventory, goodwill, property, plant, and equipment are likely to have market values less than their book values. In such circumstances, assets are typically written down to their fair value. Marking assets and liabilities to fair value results in changes in value being reflected in earnings. These accrual adjustments result in impairment charges, restructuring charges, and other special items being recorded in the income statement. This reflects the role of accruals in timely loss recognition.\[17\]

### 3.4 Summary and implications for this study

In this chapter, the role of accruals for accounting conservatism is discussed. Accounting conservatism does not have a specific definition, and is therefore implemented in various ways. One of the ways conservatism is implemented is through the use of accruals. More specifically, one of the roles of accounting accruals is the timely recognition of unrealized losses.

Accounting conservatism implies the exercise of caution in the recognition and measurement of income and assets. Two forms of accounting conservatism have emerged in the literature. One is an accounting bias toward reporting low book values of stockholder equity. This

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\[17\] This is also likely to affect the persistence of earnings, as well as the differential persistence of cash flows and accruals. As pointed out by Schipper and Vincent (2003), the more assets and liabilities that accounting rules mark to fair value, the more likely it is that earnings reflects changes in fair value, and so the lower the persistence of earnings. In contrast, cash flows are not affected by these accounting rules.
kind of conservatism is called ex ante conservatism, also called news-independent conservatism and unconditional conservatism (Beaver and Ryan, 2005). The second form of conservatism is the asymmetric timeliness of loss recognition. Timeliness of loss recognition is a summary indicator of the speed with which adverse changes in the expectation of future cash flows are reflected in both income statements and balance sheets. This second kind of earnings conservatism is called ex post conservatism, news-dependent conservatism and conditional conservatism (Beaver and Ryan, 2005).

Several empirical measures have been used to gauge the degree of accounting conservatism. In general, researchers use four types of measures to assess conservatism: (1) net asset measures (e.g. book-to-market ratio); (2) earnings/stock returns relation measures (e.g. the explanatory power of a regression of stock prices on earnings changes); (3) earnings measures (e.g. the earnings distribution); (4) accrual measures.

One of the accrual measures is the use of accruals for conditional conservatism, or timely loss recognition (Ball and Shivakumar, 2006). Accruals reflect managerial discretion in showing a revision in expected future cash flows in current earnings. This has resulted in a high amount of firms reporting overall net losses. However, since investors react differently to net losses than to net profits (Hayn, 1995), it remains an empirical question if the incentive for profit firms to effect conditional conservatism through accruals is similar to the incentive for conditional conservatism for loss firms. In chapter 8, I examine differences in conditional conservatism, or timely loss recognition, between profit firms and loss firms. I expect conditional conservatism through accruals to be more relevant for loss firms than for profit firms.

Timely loss recognition is one measure of earnings quality (Ball and Shivakumar, 2005). In the next chapter, I further discuss the role of accruals in earnings quality. In chapter 5, I discuss the role of accruals for firms with low earnings quality, i.e. firms that engage in earnings management.
Chapter 4 Accruals and Earnings Quality

4.1 Introduction

In this chapter, I discuss the role of accruals for the determination of earnings quality. As discussed in chapters 2 and 3, accruals are used to give a better view of the performance of a company. The primary product of financial reporting is net income or earnings as a measure of performance, where earnings are the summary measure of firm performance produced under the accrual basis of accounting. However, accruals can also introduce a transitory element in earnings that reduces the use of earnings for the evaluation of future performance. As a result, accruals can affect the quality of earnings. In this chapter, I first discuss how the time-series properties of earnings can be used as a measure of earnings quality. Then, I discuss empirical evidence of the effect of accrual on one specific time-series property of earnings, the persistence of earnings.

4.2 Measuring Earnings Quality

The purpose of financial reporting is to provide information that is useful for business decisions (Schipper and Vincent, 2003).\(^\text{18}\) Given the focus on decision usefulness, the quality of financial reporting is of interest of those who use financial reports for contracting purposes and for investment decision making. A major interest in financial reporting is the earnings quality, which is part of the overall financial reporting quality.

There are several constructs that attempt to reflect earnings quality in accounting research.\(^\text{19}\) One construct typically used in financial accounting research to examine earnings quality is related to the time series properties of earnings (e.g. Sloan 1996).\(^\text{20}\) Lipe (1990) considers the autocorrelation in earnings to be the persistence in earnings: regardless of the

\(^{18}\) The Financial Accounting Standards Board’s (FASB) Conceptual Framework states that the purpose of financial reporting is to provide information that is useful for business decisions (Concepts Statement No.1, FASB 1978, par. 34 and following), and considers decision usefulness the overriding criterion for judging accounting choices (Concepts Statements No.2, FASB, 1980, par. 30 and 32). Schipper and Vincent (2003) conclude that:” Decision usefulness thus presumably captures the intent of financial reporting standards (p. 97).”

\(^{19}\) Schipper and Vincent (2003) distinguish two types of earnings quality constructs. First, there are earnings quality constructs that depend on both accounting treatment and underlying events and transactions, such as the persistence of earnings. Second, there are earnings quality constructs that depend primarily or entirely on accounting treatments, such as smoothing and abnormal or discretionary accruals.

\(^{20}\) Other constructs that aim to reflect earnings quality are selected qualitative characteristics in the FASB’s Conceptual Framework, the relations among income, cash and accruals, and implementation decisions (Schipper and Vincent, 2003).
magnitude and sign of an earnings innovation, persistence captures the extent to which the current period innovation becomes a permanent part of the earnings series.

Persistent earnings are often referred to as sustainable or core earnings, where sustainable earnings are considered high quality earnings. Penman and Zhang (2002, p. 238) for instance define earnings quality:

“to mean that reported earnings, before extraordinary items that are readily identified on the income statement, is of good quality if it is a good indicator of future earnings. Thus we consider high-quality earnings to be “sustainable earnings” (..) Correspondingly, when an accounting treatment produces unsustainable earnings, we deem those unsustainable earnings to be of poor quality.”

Persistent earnings are associated with larger investor responses to reported earnings. This larger response is attributed to a larger valuation multiple attached to persistent earnings. A higher persistent earnings number is viewed by investors as sustainable, that is more permanent and less transitory, so a given realization from a persistent earnings series is a readily usable shortcut to valuation, for instance by a price-to-earnings multiple (Schipper and Vincent, 2003).

It is commonly suggested in the accounting-finance literature that the time series behavior of earnings are well approximated by a “random walk” model, that is, changes in earnings cannot be predicted. Freeman et al. (1982) is one of the first studies that examined and disputed this notion. Freeman et al. (1982) note that the existence of vast differences in price/earnings ratios (P/E ratios) across firms at any given point in time suggest that future earnings are priced differently, i.e. investors indeed have different expectations for future earnings for different companies. Similarly, the P/E ratio of any given firm typically has substantial time-series variability. This suggests that if future expected earnings are of importance in security valuation, then firms with high P/E ratios would be expected to have relatively high

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21 An earnings innovation is the deviation of the reported earnings form expected earnings, i.e. unexpected earnings.
22 Other time-series constructs associated with earnings quality are the variability and predictability of earnings. See Schipper and Vincent (2003) for a discussion of these constructs.
23 Earnings persistence is a value relevant characteristic of earnings as made explicit in the Ohlson (1995) valuation model (Barth and Hutton, 2004).
24 Easton and Zmijewski (1989) call the slope coefficient in a regression of stock returns on the change and/or levels of earnings the Earnings Response Coefficient (ERC). The ERC reflect the dollar response on the stock price of 1 dollar of unexpected earnings, this reflecting the multiple investors assigns to (unexpected) earnings.
25 A random walk is highly persistent, opposed to a mean reverting series, which has no persistence.
26 Studies before this paper include Beaver and Morse (1978) and Beaver, Lambert and Morse (1980).
expected increases in earnings compared to those firms with relatively low P/E ratios. The argument is consistent with existing empirical evidence. Beaver and Morse (1978) for instance showed that year-end P/E ratios are positively correlated with subsequent years’ growth in earnings.

Freeman et al (1983) show that current book rate-of-return provides a basis for predicting future earnings changes. A relatively low rate-of-return implies that earnings are "temporarily depressed"; similarly, a high rate-of-return implies that earnings are "unusually good". The evidence thus suggests that, while the "random walk hypothesis" is quite robust with respect to past earnings, more successful predictions can be made by expanding the conditioning information set to include book value of net assets. Based on this information set, earnings are considered to be predictable.

Ou and Penman (1989) expand this analysis by showing that not only return-on-assets determines future earnings. Rather, a large set of financial statement items determine future earnings. They outline a method of financial statement analysis that extracts a summary value measure from financial statements. Specifically, they identify those financial statement attributes that are correlated with future payoffs and combine these into one 'positive-value' measure. This measure is an assessment of the relative ability of firms to generate earnings in the subsequent year. The measure is an indicator of the direction of future earnings. Their results indicate that the summary measure robustly predicts future stock returns. This suggests that future earnings can be predicted by analyzing financial statements.

### 4.3 Earnings Persistence

In his seminal paper, Sloan (1996) follows up on Ou and Penman (1989) in examining financial statements for the determination of future earnings. Sloan (1996) examines the role of cash flows and accruals in the time-series behavior of earnings. He shows that the accrual portion of earnings is less persistent than the cash portion of earnings, leading to lower profitability in the subsequent period when the accrual reverses. Persistence of earnings is measured as the persistence of profitability (i.e. ROA), since the metric used for measuring earnings persistence is earnings deflated by some measure of asset, for instance average total assets.

27 This has been interpreted as indicative of higher levels of accruals relative to cash flows foreshadowing a subsequent earnings reversal and thus signalling earnings management, or at least lower quality of earnings (FWY03b). For instance, Thomas and Zhang (2002) show that demand shift and earnings management cause the earnings reversal.
Sloan (1996) looks at the information contained in the cash flow component and the accruals component of earnings. Furthermore, he also examines whether the investors’ expectations of future earnings, i.e. stock prices, reflect this information. The results indicate that earnings performance attributable to the accrual component of earnings exhibits lower persistence than earnings performance attributable to the cash flow component of earnings. The common theme underlying this reasoning is that the accrual and cash flow components of current earnings have different implications for the assessment of future earnings. While both components contribute to current earnings, current earnings performance is less likely to persist if it is attributable primarily to the accrual component of earnings as opposed to the cash flow component. This is because accruals are less likely to recur in future periods’ earnings. For example, high earnings performance that is attributable to the cash flow component of earnings is more likely to persist than high earnings performance that is attributable to the accrual component of earnings. Sloan (1996) actually shows that the persistence of current earnings performance is decreasing in the magnitude of the accrual component of earnings and increasing in the magnitude of the cash flow component of earnings.

Sloan (1996) documents differential persistence in the components of current profitability for explaining future profitability. He shows that operating accruals are less persistent than operating cash flows for one-year-ahead earnings performance. More recent research extends this finding to total accruals, suggesting that profitability attributable to either operating or non-operating accruals is less sustainable in the subsequent period than is profitability attributable to operating cash flows (Barth et al., 2001; Collins and Hribar, 2000; Xie, 2001).

Xie (2001) extends Sloan (1996) by suggesting that the lack of persistence, or one-year-ahead implications, and the overpricing of accruals are due to abnormal accruals. He concludes that the market fails to anticipate the future reversal of accruals that are the result of managerial

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28 Research by Dechow et al. (2005) and Kraft et al. (2005) question the earnings fixation hypothesis. Dechow et al. (2005) show that the higher persistence of the cash component of earnings is attributable to net cash distributions to equity holders, and that investors correctly anticipate the lower persistence of the remaining cash component of earnings, contradicting Sloan’s hypotheses that investors naively fixate on earnings. Kraft et al. (2005) argue that a selection bias causes the results. However, Lev and Nissim (2006) argue that the accrual anomaly continues to exist and appears to have become even more pervasive.

29 Subsequent research (e.g. FWY, 2003b, Francis and Smith, 2005) shows that it is important to have a good understanding of how the various measures of accounting information are defined in accounting research, because using different measures lead to different inferences regarding the persistence of earnings.

30 Ali (1994) shows that this relation might be non-linear. Using a different methodology than Sloan (1991), he shows that persistence of earnings, accruals and cash flows declines as the absolute value of changes in these numbers increases.
discretion. Xie (2001) thus provides evidence that the differential persistence of accruals and the subsequent mispricing is caused by earnings management.

Thomas and Zhang (2002) find that the negative relation between accruals and future abnormal returns documented by Sloan (1996) is due mainly to one specific accrual, namely inventory. They find that inventory changes represent the one component that exhibits a consistent and substantial relation with future returns. Finding this result for inventory changes is interesting, because in many instances, such as inventory acquisitions, there is no direct link between this accrual component and earnings (Thomas and Zhang, 2002, p.163). They suggest that earnings management is the cause of their results.

Beneish and Vargus (2002) provide further evidence on the effect of managerial discretion on the persistence of earnings by examining insider trading by the top executives of a firm. Beneish and Vargus (2002) propose that their trading is informative ex ante about their firm’s earnings quality, since a firm’s top executives likely possess private information regarding the underlying economic factors associated with the nature and persistence of accounting accruals. These managers make strategic operating decisions and will most likely possess private information regarding economic factors underlying the likelihood that accounting accruals will result in future earnings.31

If managers expect higher reported earnings to persist and lead to higher future stock prices, then they have incentives to purchase their firm’s stock. Alternatively, if the income-increasing accruals arise because managers manipulate earnings to hide deteriorating firm performance, one can expect managers to act on their knowledge that the accruals are unlikely to persist and sell their firm’s stock.

Test of earnings persistence reveal that income-increasing accruals are significantly more persistent for firms with abnormal insider buying and significantly less persistent for firms with abnormal insider selling, relative to firms for which there is no abnormal insider trading. In contrast, insider trading provides little indication of the persistence of income-decreasing accruals.32

31 For instance, an increase in accounts receivables causes an increase in earnings. Beneish and Vargus (2002) note that an increase in receivables could mean that sales are increasing and could point to solid future sales growth. On the other hand, increasing receivables could be the result of actions, such as relaxing credit checks or granting easier credit terms, taken to avoid reporting lower sales growth. Managers have the best information on which of these two scenarios are the cause of the increase in the accounts receivable accrual. It is therefore expected that managers have private information about the likelihood that income-increasing accruals will result in higher future earnings, and the likelihood that income-decreasing accruals will result in lower future earnings.

32 Beneish and Vargus also show that the accrual mispricing phenomenon is primarily due to the mispricing of income-increasing accruals. It seems that investors price all income-increasing accruals as though they
The lower persistence of certain income-increasing accruals can be caused by either changes in the firm’s economic environment that render accruals less informative about one-year-ahead earnings, or managers engaging in opportunistic earnings management. As Beneish and Vargus (2002) note, it is difficult to distinguish between these two possibilities. However, accruals that increase income in firms that have abnormal insider trading are most overpriced by the market, suggesting that managers of those firms have a better view on the reliability of those accruals than investors, suggesting some form of management discretion. Indeed, Beneish and Vargus show that firms with income-increasing accruals accompanied by abnormal insider selling have abnormal accruals suggestive of upward earnings management, a higher propensity to make income-increasing accounting choices, and a higher propensity to report profits and year-to-year increases in earnings. The evidence suggests that the lower persistence of income-increasing accruals accompanied by abnormal insider selling is at least partly attributable to opportunistic earnings management.

However, the lack of persistence of accruals does not necessarily have to be caused by earnings management. Dechow and Dichev (2002) (hereafter DD) show that it can also be caused by errors in estimation the accruals. DD look at the quality of earnings from the standpoint of the quality of accruals and the role of the estimation error. This paper suggests a new measure of one aspect of the quality of working capital accruals and earnings. One role of accruals is to shift or adjust the recognition of cash flows over time so that the adjusted numbers (earnings) better measure firm performance. However, accruals require assumptions and estimates of future cash flows. For example, recording a receivable accelerates the recognition of a future cash flow in earnings, and matches the timing of the accounting recognition with the timing of the economic benefits from the sale. However, accruals are frequently based on assumptions and estimates that, if wrong, must be corrected in future accruals and earnings. If the net proceeds from the receivable are less than the original estimate, then the subsequent entry records both the cash collected and the correction of the estimation error.

DD argue that estimation errors and their subsequent corrections are noise that reduces the beneficial role of accruals. Therefore, the quality of accruals and earnings is decreasing in the magnitude of accrual estimation errors. Their empirical measure of accrual quality is the extent to which working capital accruals map into operating cash flow realizations, where a poor match signifies low accrual quality. They derive an empirical measure of accrual quality as the residuals are of high quality. Investors fail to incorporate the information in insiders trading, because income-increasing accruals appear to be overpriced when managers engage in abnormal selling and rationally priced when managers engage in abnormal buying.
from firm-specific regressions of changes in working capital on past, present, and future operating cash flows. They also document that observable firm characteristics can be used as instruments for accrual quality (e.g., volatility of accruals and volatility of earnings).

Studies like Xie (2001) use models of “discretionary accruals” to investigate the manipulation of accruals to achieve earnings management goals. Studies that employ discretionary accruals models focus on the opportunistic use of accruals to window-dress and mislead users of financial statements. This stream of research suggests that managerial intent affects the incidence and magnitude of accrual estimation errors.

In contrast, DD argue that even in the absence of intentional earnings management, accrual quality will be systematically related to firm and industry characteristics. This distinction is important because such characteristics are likely to be both observable and recurring (e.g., the volatility of operations is systematically related to the propensity to make estimation errors) as compared to the determinants of managerial opportunism that are often unobservable and/or sporadic (e.g., before stock offerings). They do not attempt to disentangle “intentional” estimation errors from unintentional errors because both imply low-quality accruals and earnings.

DD focus on working capital accruals and operating cash flows for tractability: the initiation and reversal of these accruals occurs within a year. The measure of accrual estimation errors is the residuals from firm-specific regressions of changes in working capital on last year, present, and one-year-ahead cash flows from operations. These residuals are unrelated to cash flow realizations, and include the estimation errors and their reversals. The standard deviation of these residuals is the firm-specific measure of quality of accruals and earnings, where a higher standard deviation signifies lower quality.

They illustrate the usefulness of their analysis in two ways. First, they explore the relation between their measure of accrual quality and firm characteristics. They find that accrual quality is negatively related to the absolute magnitude of accruals, the length of the operating cycle, loss incidence, and the standard deviation of sales, cash flows, accruals, and earnings, and positively related to firm size. Their results suggest that these observable firm characteristics can be used as instruments for accrual quality.

Second, they illustrate the usefulness of their analysis by exploring the relation between their measure of accrual quality and earnings persistence. Firms with low accrual quality have more accruals that are unrelated to cash flow realizations, and so have more noise and less

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33 This line of reasoning is similar to Schipper and Vincent’s (2003) assessment that there are earnings quality constructs that depend on both accounting treatment and underlying events and transactions, where “the economics of some business models significantly reduce the predictive ability of earnings (p. 99).
persistence in their earnings. They find a strong positive relation between accrual quality and earnings persistence. However, their measure of accrual quality is theoretically and empirically related to the absolute magnitude of accruals, and Sloan (1996) documents that the level of accruals is less persistent than cash flows. Probing further, they find that accrual quality and level of accruals are incremental to each other in explaining earnings persistence, with accrual quality the more powerful determinant.

Their investigation of the interrelations between accrual quality, level of accruals, and earnings persistence suggests a reconciliation of the findings of Dechow (1994) and Sloan (1996). Dechow (1994) finds that accruals improve earnings’ ability to measure performance relative to cash flows. Sloan (1996) finds that the accrual portion is less persistent than the cash flow portion of earnings, which suggests that firms with high levels of accruals have low quality of earnings. Their reconciliation is based on the observation that a high level of accruals signifies both earnings that are a greater improvement over underlying cash flows, and low-quality earnings. The reason is that accruals are largest when the underlying cash flows have the most timing and mismatching problems, so more accruals signify greater improvement over the underlying cash flows. However, this benefit comes at the cost of incurring estimation errors, and there will be a positive correlation between levels of accruals and the magnitude of these estimation errors. Thus, everything else equal, large accruals signify both low quality of earnings, and less persistent earnings.

Richardson, Sloan, Soliman and Tuna (hereafter RSST) (2005) also examine the relation between accrual reliability and earnings persistence, predicting that less reliable accruals cause the lower persistence of accruals. They categorize accruals on reliability, decomposing accruals along broad balance sheet categories and use knowledge of the measurement issues underlying each accrual category to make qualitative assessments concerning the relative reliability of each category. This is a different approach than Dechow and Dichev’s (2002) method of determining accrual reliability. Where Dechow and Dichev (2002) determine the quality of accruals as the extent in which accruals map in cash flows, RSST (2005) look at the way accruals behave as to determine the reliability.

Another big difference is RSST’s (2005) comprehensive definition of accruals. Following Healy (1985), a large body of research used a narrow definition of accruals that focuses on current operating accruals. Long-term operating accruals, such as capitalized expenditures on property, plant and equipment are ignored under this definition. Ignoring such accruals can result in noisy measures of both accruals and cash flows, since cash flows are typically computed as the difference between earnings and accruals. RSST (2005) shows that many of the accruals that are
omitted from Healy's (1985) definition are of low reliability, suggesting that accrual-based research should incorporate these omitted accruals. RSST (2005) defines accruals as the change in non-cash working capital (ΔWC), the change in net non-current operating assets (ΔNCO) and the change in net financial assets (ΔFIN).³⁴

The results from the test on the persistence of these categories of accruals by RSST (2005) confirm that accruals with lower reliability cause the lower persistence of accruals. The coefficient on ΔWC is significantly negative as is the coefficient on ΔNCO. The coefficient on ΔFIN however, is positive, and close to zero. These results do not only confirm the role of accrual reliability in earnings persistence, but also shows that researchers using accruals, for instance to measure earnings management, should consider broader measures of accruals to maximize the power of their tests.³⁵

Hanlon (2005) examines the difference between financial reporting earnings (book earnings) and taxable earnings (tax earnings), i.e. the book-tax difference, and earnings persistence. She shows that the lower persistence of earnings is caused in part by the book-tax difference.³⁶

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³⁴ ΔWC represents the change in current operating assets, net of cash and short-term investments, less the change in current operating liabilities, net of short-term debt. These accruals form the core of the traditional measure of accruals used by Sloan (1996). ΔWC is determined to have a rating a medium reliability. ΔNCO is measured as the change in non-current assets, net of long-term non-equity investments and advances, less the change in non-current liabilities, net of long-term debt. It contains accruals that have generally been ignored in previous research. ΔNCO receives a rating of low/ medium reliability. ΔFIN is the change in short-term investments and long-term investments less the change in short-term debt, long-term debt and preferred stock. These accruals are determined to be measured with high reliability.

³⁵ For instance, non-current operating accruals were used to manage the earnings in the accounting scandal at WorldCom (i.e. operating cost were capitalized as long term). These accruals were excluded in Healy's (1985) definition of accruals, that was used in a lot of research on accrual based earnings management. Future research can use this new definition of accruals for earnings management research.

³⁶ Examining the book-tax difference in this context is interesting because it can reflect the discretion management has of financial reporting. Management calculates corporate income for two purposes each year. The first is for financial reporting purposes under Generally Accepted Accounting Principles (GAAP) and the second is done in accordance with the Internal Revenue Code (IRC) to determine the corporation's tax liabilities. Both book and taxable income are being prepared on an accrual basis. However, there will be differences between book and taxable incomes, both temporary and permanent. Permanent differences are items included in one measure of income but never included in the other, such as tax-exempt interest. Temporary differences between book and taxable incomes each year are changes in the firm's book-basis balance sheet relative to its tax-basis balance sheet. Basis differences arise because of differing requirements for the timing of recognition of income and expense items. For book purposes, revenue is recognized when earned and expense recognition is either matched against the related revenue or recorded in the accounting period in which the expense is incurred. GAAP provides managers with considerable discretion in their choice of accounting procedures. Managers may choose between different accounting methods, use varying periods and estimates for cost amortization (e.g., for depreciation and goodwill) and exercise judgment with respect to recording reserve allowances (e.g., bad debt allowances, warranty reserves, accrued compensation, etc.). For tax purposes, however, managers have less discretion. Revenue is generally recorded when cash is received: thus, deferred (or unearned) revenue does not exist under the
Given the relation between book-tax difference and persistence, Hanlon (2005) concludes that book-tax difference can be considered a measure of earnings quality (p. 139) assuming that there is cross-sectional variation in the ability of firm managers to manipulate financial reporting income, but that there is not cross-sectional variation in managers' ability to manipulate taxable income. As she explains, this does not imply that taxable income is a better measure of economic performance of the firm than is financial reporting income. Rather, in contexts where the divergence between tax and financial reporting income is large, earnings management is more likely and additional scrutiny is warranted.

The literature discussed so far examined the differential persistence in the components of current profitability for explaining future profitability. FWY (2003b), argue that most tests of the differential persistence of accruals and cash flows use dependent and explanatory variables scaled by a measure of contemporaneous invested capital. Thus the dependent variable is one-year-ahead operating income divided by one-year-ahead invested capital, or a measure of profitability. FWY (2003b) note that one-year-ahead profitability is affected by not only income in the numerator (income effect), but also by growth in invested capital (growth effect) in the denominator of the ratio. They find that operating accruals exhibit a stronger association with growth in net operating assets than do operating cash flows. In contrast, operating accruals are no less persistent than operating cash flows for explaining one-year ahead operating income. Thus, the documented lower persistence of scaled accruals could be due to one of two effects. First, it could be due to the lower persistence of unscaled accruals (a numerator effect), which is the commonly accepted explanation. Alternatively, FWY (2003b) suggests that the lower persistence of scaled accruals could be due to the relation between accruals and growth in the investment base (a denominator effect). The results are more consistent with the interpretation that operating accruals capture growth in net operating assets and that growth tends to cause profitability to converge to normal profitability levels (e.g., the effect of conservative accounting or diminishing/increasing marginal returns to investments). This implies that the accrual effect in

IRC. In addition, for tax purposes conservatism is not an objective and thus an item may not be deducted until more stringent conditions are satisfied, reducing the level of discretion in the calculation of taxable income. Temporary book-tax differences include future taxable and future deductible amounts. Future taxable amounts create or increase deferred tax liabilities and require recognition of a deferred tax expense. In contrast, future deductible accounts create or increase deferred tax assets and require the recognition of a deferred tax benefit (credit to deferred tax expense). All else equal, an increase in deferred tax liabilities is consistent with a firm currently recognizing revenue and/or deferring expense for book purposes relative to its tax reporting (book income in excess of taxable income) (Phillips et al. 2003).
Sloan (1996) is at least partly due to the fact that accruals signify an increase in (less-productive) net operating assets (i.e. a balance sheet effect), signifying that accruals have both earnings and balance sheet effects.\footnote{FWY(2003a) also suggest that the documented market mispricing of accruals may not be due to investors’ inability to detect earnings management (e.g. Xie (2001), but rather to investors’ inability to extrapolate growth rates or to consider the effects of diminishing marginal returns or conservative accounting on new investments (see also FWY, 2003b).}

RSST (2006) tries to discriminate between the various explanations that have been presented for the differential persistence of accruals relative to cash flows. Specifically, they try to discriminate between the explanation by Xie (2001), that the lower persistence of accruals is caused by managerial discretion through the use of discretionary accruals, the FWY (2003b) explanation that not only working capital accruals are less persistence, but also other non-current operating accruals, and that this lower persistence is attributable to the conservative bias in accounting and/or diminishing returns on new investment opportunities, and the Dechow and Dichev (2002) and RSST (2005) explanation that the lower persistence is caused by the transitory estimation error in accruals. Their results indicate that diminishing marginal returns to new investment provides, are at best, an incomplete explanation for the lower persistence of the accrual component of earnings, and that the transitory accounting distortions caused by the estimation error can also explain the lower persistence of the accrual component of earnings. Their results also suggest however that managerial discretion may also be the cause of the differential persistence of accruals relative to cash flows.

Francis and Smith (2005) reexamine the differential persistence between accruals and cash, focusing on two aspects of persistence that are crucial to determining its properties: time-specificity and firm-specificity. They observe that traditional measures of accruals are functions of current- and non-current-period transactions.\footnote{For instance, Dechow and Dichev (2002) measure of accrual estimation error by examining the changes in working capital on last year, present, and one-year ahead cash flows from operations.} Persistence however, describes how current period transactions are related to next period income. The inclusion of non-current period transactions in accruals causes the contemporary relation between accruals and performance to be biased\footnote{For example, the ending balances of deferral accounts (unearned revenues and prepaid expenses) affect next period’s income, and the beginning balances of accrual accounts (accounts receivable and warranty liabilities) affect last period’s income. Hence, the accounting-based measures of cash and accruals do not align with current-period income (see Francis and Smith, 2005).}. More specifically, Francis and Smith (2005) show that the lack of time-specificity in traditional accrual measures cause the persistence of accruals to be biased downward, and the
persistence of cash flows to be biased upwards. They develop “time-specific” measures of accruals and cash that capture current-period transactions only.\textsuperscript{40}

Using this definition of accruals, Francis and Smith (2005) show the bias in persistence. The differential persistence between accruals and cash flows remains reliably positive using the time specific accruals, indicating that the Sloan’s (1996) result is robust to the time-specificity of Francis and Smith (2005). However, the magnitude of the difference is 70% to 88% smaller than the differential persistence using traditional measures of accruals.

Equally important is the firm-specificity of the differential persistence of accruals and cash flows. Given that prior research largely views the persistence of income as firm specific, it is reasonable to believe that the persistence of the accrual and cash components of income is also firm specific. Using firm-specific time-series estimations, rather than pooled or annual cross-sectional estimations, Francis and Smith (2005) show that over 85% of the firms in their sample do not exhibit lower persistence of accruals compared to cash flows. This result highlights the importance of firm specificity.\textsuperscript{41}

Chambers (2005) further examines the firm-specificity of the differential persistence of accruals and cash flows. Using the Sloan (1996) definition of accruals, he shows that the difference between cash flow persistence and accrual persistence is highly variable across firm-years. He finds significant differences between low and high differential persistence firms. High differential persistence firms tend to be larger, have lower book-to-market ratios have less volatile cash flows, and have a lower correlation between accruals and cash flows. His results confirm that firm-specific information is an important determinant for the persistence of earnings.

\textsuperscript{40}Their measure of accruals uses the ending balance of asset accruals and the beginning balance of asset deferrals as the construct for the accrual component of income. In their measure of accruals, different types of accruals are treated differently depending on whether their recognition in current-period income precedes cash (an accrual account (A) e.g. accounts receivables, or follows, their cash consequences (a deferral account (D), e.g. unearned revenue). This definition of accruals essentially uses balance sheet accounts to reconstruct income summary journal entries. The current asset (CA) and current liability (CL) accounts exclude inventory and accounts payable, respectively, because the balances of these accounts do not map neatly into cost of goods sold (Francis and Smith, 2005).

\textsuperscript{41}In should be noted that it is possible that the auto-regressive (AR) model does not fully capture the relationship between firm characteristics and earnings persistence. Baginski et al (1999) show that low order autoregressive integrated moving average (ARIMA) models do not measure the association between earnings persistence and economic characteristics as well as high order ARIMA models. It may very well be the case that firm characteristics, as opposed to economic characteristics, are understated in the model used to measure earnings persistence.
4.3 Summary and implications for this study

In this chapter, the relation between accruals and earnings quality is discussed. There are several constructs that attempt to reflect earnings quality in accounting research. It is established that one way of measuring earnings quality is examining the persistence of earnings.

Empirical evidence on earnings persistence that is presented in this chapter shows that the cash flow component of earnings is more persistent than the accrual component of earnings. Research attributes this difference to specific accruals like inventory, earnings management, accrual quality, accrual reliability and book-tax differences. Further, it is shown that this difference is firm-specific.

It seems that the specific situation of the firm affects accounting on many level, among which the persistence of earnings. It therefore seems an interesting question to examine the effect of the state in which the firm is on its accounting. In the next three chapters, empirical examinations of the role of accruals in three different states of a firm are examined. The firm-specific nature of accounting and its effect on cash flow persistence is examined in chapter 6. In chapter 6, a firm-specific measure of accrual quality is employed that reflects the accounting state of the firm, i.e. whether the firm is in a volatile accounting state or a stable accounting state. I examine the effect of the accounting state of the firm on the prediction of future cash flows. In chapter 7, I examine the effect of growth on accounting accruals. Growth affects the perspective of accounting from a balance sheet perspective for low-growth firms to an income statement perspective for high-growth firms. In chapter 7, I examine how this affects the use of accruals. Finally, in chapter 8, I examine how the incidence of an accounting loss affects the role accounting conservatism. Loss firms have a different investor perspective than profit firms. I examine if having an accounting loss affect the role of accruals in financial reporting in terms of accounting conservatism.
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 Sivaramakrishnan, 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).\footnote{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.}

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.
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.

<table>
<thead>
<tr>
<th>Accounting Choices</th>
<th>&quot;Real&quot; Cash Flow Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Conservative&quot; Accounting</td>
<td>-Delaying sales</td>
</tr>
<tr>
<td>&quot;Neutral&quot; Earnings</td>
<td>-Recording sales before they are &quot;realizable&quot;</td>
</tr>
<tr>
<td>&quot;Aggressive&quot; Accounting</td>
<td>-Recording fictitious sales</td>
</tr>
<tr>
<td>&quot;Fraudulent&quot; Accounting</td>
<td>-Backdating sales invoices</td>
</tr>
<tr>
<td>Within GAAP</td>
<td>-Overstating inventory by recording fictitious inventory</td>
</tr>
<tr>
<td>-Overly aggressive recognition of provisions or reserves</td>
<td>-Violates GAAP</td>
</tr>
<tr>
<td>-Overevaluation of acquired in-process R&amp;D in purchase acquisitions</td>
<td>-Recording fictitious sales</td>
</tr>
<tr>
<td>-Overstatement of restructuring charges and asset write-offs</td>
<td>-Backdating sales invoices</td>
</tr>
<tr>
<td>-Earnings that result from a neutral operation of the process</td>
<td>-Understatement of the provision for bad debts</td>
</tr>
<tr>
<td>-Understatement of the provision for bad debts</td>
<td>-Drawing down provisions or reserves in an overly aggressive manner</td>
</tr>
<tr>
<td>Violates GAAP</td>
<td>-Accelerating R&amp;D or advertising expenditures</td>
</tr>
<tr>
<td>-Recording sales before they are &quot;realizable&quot;</td>
<td>-Postponing R&amp;D or advertising expenditures</td>
</tr>
<tr>
<td>-Recording fictitious sales</td>
<td>-Accelerating sales</td>
</tr>
<tr>
<td>-Backdating sales invoices</td>
<td>-Overstating inventory by recording fictitious inventory</td>
</tr>
</tbody>
</table>

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. 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):

\[
DA_t = \alpha + \beta \text{PART}_t + \sum_{k=1}^{K} \gamma_k X_{kt} + \epsilon_t, \tag{3.1}
\]

where
- \(DA = \) discretionary accruals (typically deflated by lagged total assets);
- \(\text{PART} = \) a dummy variable partitioning the data set into two groups for which earnings management predictions are specified by the researcher;
- \(X_k = \) (for \(k = 1, \ldots, K\)) other relevant variables influencing discretionary accruals; and
- \(\epsilon = \) an error term that is independently and identically normally distributed.

In most research contexts, \(\text{PART} \) 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 \(\text{PART} \), has the hypothesized sign and is statistically significant at conventional levels.

Unfortunately, the researcher cannot readily identify the other relevant variables, \((X_k)\), 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, \((u)\):
\[ DAP_t = DA_t + \mu_t \]  

(3.2)

The error, \( \mu_t \), 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:

\[ DAP = A - NAEST \]  

(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

\[ DA_t = \alpha + \beta PART_t + \sum_{k=1}^{K} \gamma_k X_{kt} + \mu_t + \epsilon_t \]  

(3.4)

This model can be summarized as:

\[ DA_t = \alpha + \beta PART_t + \mu_t + \epsilon_t \]  

(3.5)

where \( \mu_t \) 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 \( \beta \), \( \hat{\beta} \), from a multiple regression of DAP on PART and \( \mu \) is the best unbiased estimator of \( \beta \). 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 \( \mu \) is omitted from the regression. The model of earnings management typically estimated by the researcher can be represented as

\[ DAP_t = \hat{a} + \hat{\beta} PART_t + \mu_t \]  

(3.6)
Were:

\[ \hat{\beta} = \beta + \rho(PART, \eta) \frac{\sigma_\eta}{\sigma_{PART}} \]  

(3.7)

Which can be written as:

\[ \hat{\beta} = \beta + \text{bias} \]  

(3.8)

The error term \( \eta \) 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, \( \gamma \) is a biased estimate of \( \beta \) if the partitioning variable is correlated with \( \eta \), 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 \( \mu \). Recall that the \( \mu \) can represent either measurement error in DAP or omitted relevant variables influencing DA. Estimating model (2) using (OLS) has two undesirable consequences: First, \( \hat{b} \) is a biased estimator of \( \beta \), with the direction of the bias being of the same sign as the correlation between PART and \( \mu \), and second, the standard error of \( (\hat{b}^{-1}) \) is a biased estimator of the standard error of \( (\hat{\beta}^{-1}) \). In particular, if PART and \( \mu \) are uncorrelated, the standard error of \( (\hat{b}) \) 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 \( \mu \) 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 $\mu$ 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., $\mu$) 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 $\mu$ 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).

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

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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. 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

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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.\(^\text{47}\)

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.\(^\text{48}\) 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.\(^\text{49}\) Researchers can estimate the discretionary component without a specification of either discretionary or nondiscretionary variables (i.e. the revised estimate can than 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. the 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.
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 combing 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. 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

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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.
Chapter 6 Accrual Quality, Cash Flow Persistence and the Prediction of Future Cash Flows

6.1 Introduction

In chapters 6, 7 and 8 of the thesis I perform the empirical analysis. The empirical analysis examines in three parts the relation between accruals and cash flows in relation to earnings quality and earnings management. In the previous chapters, I discussed the theory embodied in previous research on the different measures of earnings quality and earnings management. In the following chapters, I perform tests on the relation between accruals and cash flows in terms of earnings quality and earnings management as measured by the ability to predict future cash flows, growth and accrual accounting and conditional conservatism using accruals. More specifically, I will examine in this chapter the effects of accruals on the ability of earnings to predict future cash flows. In the next chapter, I will examine the effect of growth on accrual accounting and earnings management. Finally, in the final chapter of the empirical analysis, I examine the difference between firms with an accounting profit and firms with an accounting loss on the role of accruals for the timely recognition of unrealized losses.

In this chapter, I further investigate the role of accruals in predicting future cash flows. More specifically, I examine how the relationship between accruals and cash flows affects the prediction of future cash flows. I investigate whether the extent that accruals map into operational cash flows affects the ability of current cash flows and several measures of accruals to predict future cash flows. The manner in which accruals map into cash flows is referred to as the accrual quality in the accounting literature (Dechow and Dichev, 2002; Francis et al., 2004; Francis et al., 2005). I find that when there is a strong fit between accruals and operational cash flows, and thus accrual quality is high, cash flows are highly persistent in terms of future cash flows, and accruals are less relevant for predicting future cash flows. When accrual quality is low, cash flows are shown to be less persistent, and accruals are more relevant for predicting future cash flows. I then further distinguish accruals into total accruals, abnormal accruals, and the amount of accruals on the balance sheet. I show that the relevance of total accruals and the amount of accruals on the balance sheet for predicting future cash flows is related to the accrual quality. However, the relevance of abnormal accruals for predicting future cash flows is not related to the accrual quality, indicating that abnormal accruals are used to provide private information about future cash flows.
My results further the understanding on how cash flows and accruals contribute to predicting future cash flows. One of the primary objectives of financial reporting is to provide information to help investors, creditors, and others assess the amount and timing of prospective cash flows (Barth et al., 2001). For instance, stock prices reflect the current value of future cash flows. Therefore, the ability to predict future cash flows is essential for the valuation of securities. The results in this chapter assist users of financial reports in understanding how the quality of accruals can be informative for the prediction of future cash flows.

Earnings are the best predictor of future cash flows (Dechow, 1994; Finger, 1994; Dechow et al., 1998; Barth et al., 2001). Earnings that are a good indicator of prospective earnings are considered to be of high quality (Penman and Zhang, 2002). However, decomposing earnings in current cash flow from operations and accruals enhances the ability of earnings to predict future cash flows (Barth et al., 2001; Callen and Segal, 2004). In this chapter, I argue that accrual quality is related to the ability of both current cash flows and accruals to predict future cash flows.

Earnings are cash flows adjusted by accruals, and future cash flows are best predicted by the information contained in current cash flows and current period accruals, where accruals have an incremental role to cash flows (Barth et al., 2001). However, research has provided mixed results on the incremental role of current accruals to cash flows in predicting future cash flows. Sloan (1996) for instance shows that future stock returns are dependent on the magnitude of current accruals relative to cash earnings. Callen and Segal (2004) argue that the time series of accruals is potentially value relevant, because it may contain information helpful in predicting future cash flows beyond the information contained in the time series of current cash flows.

Generally speaking, accrual accounting is a technology for improving financial reporting and disclosure by ameliorating transitory changes in operating cash flows (Ball and Shivakumar, 2006). Accruals are expected to be a function of firm’s real business activity (Guay, 2006). Accrual adjustments made by firms are fundamentally linked to underlying economics (Dechow and Ge, 2006). Accrual quality reflects the effect accrual accounting has on financial reporting, based on the firm’s real business activity. I examine accrual quality using a measure based on the Dechow and Dichev (2002) accrual quality measure to examine the effect of accrual quality on the predictive ability of accruals on future cash flows.

I expect that when accrual quality is low, firms are likely to operate in volatile environments, and accruals have relevance in predicting future cash flows incremental to current

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51 See also equation 7 in chapter 2.
52 See also equation 15 in chapter 2.
cash flows. Firms with low accrual quality are typically firms with a volatile sales process, with high volatility for cash flows, accruals and earnings and with more shocks to earnings caused by losses. I expect that the higher volatility of the underlying economics cause lower persistence of current cash flows, since low quality accruals do not have a good fit of mapping into operational cash flows. In the case of low accrual quality, accruals can assist in predicting future cash flows. However, firms with high accrual quality typically have less volatile underlying economics. I expect that for high accrual quality firms, current cash flows are more persistent due to the fact that there is a good fit in the mapping of high quality accruals into operational cash flows. Therefore, accruals are less relevant for predicting future cash flows for high quality firms than for low accrual firms.

My results confirm this. I form deciles of accrual quality and examine the relation between future cash flows and current cash flows and accruals. For the decile with the highest accrual quality, the persistence of cash from operations is almost three times as high as the decile with the lowest accrual quality. For the decile with the lowest accrual quality, the coefficient on accruals is highly incremental to cash flow from operations for the prediction of future cash flows. Furthermore, the coefficient on accruals declines in an almost monotonic fashion along the increase of the accrual quality, indicating that incremental relevance of accruals for predicting future cash flows decrease with an increase in accrual quality.

Then, I examine the ability of abnormal accruals to predict future cash flows. Abnormal accruals are commonly used to investigate earnings management (Kothari, 2001). However, abnormal accruals could also contain private information of managers about future prospects of the firm (Subramanyam, 1996; Demski, 1998). If abnormal accruals reflect earnings management, the ability of abnormal accruals to predict future cash flows should be affected by accrual quality. That is, when earnings are managed, accrual quality should be low. When accrual quality is low, abnormal accruals should have high incremental relevance for predicting future cash flows, as predicted in the first hypothesis. Conversely, when accrual quality is high, the incremental relevance of abnormal accruals in predicting future cash flows should be low. However, if abnormal accruals are used to reflect the firm’s business activity, the predictive power of abnormal accruals for future cash flows should remain unaffected by accrual quality, since managers use abnormal accruals to reflect their private information about future performance, which is not affected by accrual quality. I report that the predictive ability of abnormal accruals for future cash flows incremental to normal accruals is not affected by the accrual quality. My

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53 This could either be a transitory estimation error in accruals (Dechow and Dichev, 2002) or information on the business activity reflected in abnormal accruals (Demski, 1998).
results indicate that abnormal accruals reflect more than just earnings management. Rather, abnormal accruals can also reflect private information of managers about future cash flows. This is consistent with Subramanyam (1996).

Finally, I examine the extent that the level of net operating assets (NOA), i.e. the accruals on the balance sheet, assist in predicting future cash flows. NOA reflect the difference between all operating assets and all operating liabilities on the balance sheet. NOA is employed by a firm to generate earnings. For instance, a trading firm that acquires inventory employs that asset to sell the goods at a higher price than the cost price to generate a profit. However, if the firms acquires more assets than it can sell (e.g. too much inventory), it may have to sell its assets at a lower price, or write it off the balance sheet. As such, marginal future cash flows could be lower for high levels of NOA. Hirshleifer et al. (2004) argue that a high level of NOA indicates a lack of sustainability of recent earnings performance. Fairfield et al. (2003a) suggest diminishing return on assets or conservatism cause the lower persistence of accruals relative to cash flows, indicating that a high level of NOA indicates earnings that are not sustainable. Hirschleifer et al. (2004) term these accruals ‘balance sheet bloat’. I examine if accrual quality can help explain the extent that NOA is relevant in predicting future cash flows. My results show that the relevance of the level of NOA, i.e. the accruals on the balance sheet, in predicting future cash flows is related to accrual quality. When accrual quality is high, NOA is not relevant. However, when accrual quality is low, NOA has incremental relevance to cash flows and accruals with respect to the prediction of future cash flows.

My analysis makes several contributions. First, the research furthers the knowledge of the function of accounting accruals, which occupy a central position in financial reporting. Accrual quality is a measure of earnings quality. I show that accrual quality reflects the state of the firm, and reflects the relevance of current cash flows and accruals in predicting future cash flows, an important measure of the quality of earnings as well.

Second, my results further the insights in the use of abnormal accruals. Kothari (2001) states that abnormal accruals are synonymous with earnings management. However, Demski (1998) argues that abnormal accruals could reflect the private information of managers about the firm. I show that abnormal accruals reflect the private information on future cash flows. Finally, I show that accruals on the balance sheet, the level of net operating assets, can be as relevant in predicting future cash flows as accruals in the income statement, which reflect the change in net operating assets.

The remainder of the chapter is as follows. Paragraph 6.2 develops the hypotheses in this chapter. Paragraph 6.3 describes the data and methodology employed in this research. Paragraph
6.4 discusses the results of my analysis. Paragraph 6.5 discusses the robustness checks of the empirical examination. Paragraph 6.6 concludes.

6.2 Hypothesis Development

In chapter 2, a model is discussed that shows the relation between earnings and cash flows. The model indicates that decomposing earnings in cash flow from operations and accruals enhances the ability of earnings to predict future cash flows. The magnitude of accruals is an important determinant of the accrual quality (Dechow and Dichev, 2002). Accrual quality is the extent to which accruals are converted into cash flows.

Accrual quality is an indicator of the (financial) accounting state of the firm. Firms in a steady state (i.e. firms with cash requirements for working capital, investments, and financing that are relatively stable), have few timing and matching problems and cash flows are a relatively useful measure of firm performance (Dechow, 1994). However, for firms operating in volatile environments cash flows will have more severe matching and timing problems, and accruals are used to mitigate timing and matching problems with cash flows. Current cash flows are in part a function of lagged accruals that have been converted into cash flows (Dechow and Dichev, 2002). Accruals typically incorporate estimates of future cash flows and deferrals of past cash flows.

In the seminal paper by Sloan (1996), it is shown that high accruals lead to lower stock returns. This is caused by the reversal of the accrual component of current earnings, which leads to lower future earnings. This result suggests that a high level of the accrual component of earnings leads to lower future cash flows, since earnings are the best predictor for future cash flows (Dechow et al, 1998). For example, high levels of inventory may lead to a write off, which results in lower future cash receipts. Therefore, accruals may not be relevant in predicting future cash flows.

Desai et al. (2004) confirm this empirically. They examine the ability of cash flows (as opposed to accruals) to predict future returns and suggest that cash flows subsume accruals in predicting future returns. They state that accruals are not related to future returns after controlling for their measure of cash from operations.

However, Callen and Segal (2004) argue that the time series of accruals is potentially value relevant, because it may contain information helpful in predicting future cash flows beyond the information contained in the time series of current cash flows. They show that accrual earnings news is a more important factor than cash flows earnings news in driving current stock returns.
Accruals only lack future earnings performance if these assets are not converted into cash flows. If for instance an accrual is written off, as required by accounting rules governed by accounting conservatism, it will not provide information incremental to current cash flows for determining future cash flows.

Dechow and Dichev (2002) argue that the extent to which accruals map into operating cash flow realizations reflects the accrual quality of the firm, where a poor match signifies low accrual quality. Francis et al. (2005) show that accrual quality is priced by investors. If share prices reflect future cash flows, this would suggest that the accrual quality is an important determining factor for future cash flows. Francis et al. (2004) show that accrual quality reflects firm-specific information. They examine the relation between the cost of equity and accrual quality, and other accounting based and market-based attributes of earnings. They show that an unfavorable outcome for each earnings attribute is associated with a higher cost of equity, to the extent that attribute captures one or more aspects of uncertainty about future free cash flows. They conclude that accounting-based attributes have more pronounced cost of equity effects than market-based attributes, and that among accounting-based attributes, accrual quality has the largest effects.

Previous research thus suggests that accrual quality is related to the prediction of future cash flows. I build on this notion by hypothesizing that the value of current cash flows relative to accruals in predicting future cash flows is related to the accrual quality. This is because accrual quality reflects the accounting state of the firms, and thus whether operating cash flow is generated by current accruals that are more likely to generate cash flows again in the subsequent period, i.e. persistent cash flows. When accrual quality is high, cash flows are persistent and are relevant for predicting future cash flows.

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54 This also follows from equation 14 in chapter two, which equates future cash flows to current cash flows plus the accrual components of earnings.

55 Their results are predicated on a relation between the cost of equity and properties of firm-specific information and on the presumption that earnings are a premier source of such information. In particular, they view each earnings attribute as proxying either for the uncertainty in earnings as an informative signal about the pay-off structure that is of interest to investors (as captured by the accounting-based attributes) or for investors' perception of that uncertainty (as captured by the market-based attributes). Among the accounting-based earnings attributes considered, they view accrual quality as having the most direct link to information risk. Accrual quality captures variation in the mapping of earnings into operating cash flows, a key element of the pay-off structure that is of interest to investors.
When accrual quality is low, current cash flow is less likely to be persistent, and therefore accruals can play a more incremental role to operating cash flows in predicting future cash flows.

My first hypothesis is:

**H6.1:** There is a positive association between accrual quality and the persistence of cash flows and a negative association between accrual quality and the incremental relevance of accruals to cash flows in predicting future cash flows.

As Guay (2006) notes, within the accounting literature, the most commonly examined aspect of accrual expectation models is the residual of the model, or abnormal accruals. Numerous studies use estimates of abnormal accruals as proxies for the discretionary use of accruals, i.e. to measure earnings management. However, abnormal accruals contain error, and may also contain nondiscretionary accruals. One way of examining the relevance of abnormal accruals is to look at the ability of abnormal accruals to predict future cash flows. If abnormal accruals reflect earnings management, they should have no predictive power for future cash flows.

The total amount of accruals for an accounting period can by decomposed in long term accruals and short term accruals, where short term accruals are often decomposed in normal accruals and abnormal accruals in the accounting literature (Guay, 2006). Abnormal accruals are commonly used as a proxy for managerial discretion. Research suggests that managers use abnormal accruals for earnings management. Barton and Simko (2002) for instance use the beginning balance of NOA relative to sales as a proxy for managers’ previous biased reporting choices. This proxy is consistent with overstated net assets being less efficient at generating a given level of sales, all else equal. If this proxy is valid, then firms with larger levels of NOA relative to sales will have reported larger cumulative levels of income-increasing accruals in the past. They find that firms with larger levels of net operating assets (relative to sales) reported larger cumulative levels of abnormal accruals in the previous 20 quarters, consistent with prior income-increasing earnings management leading to overstated net assets. However, it is unclear if managers use abnormal accruals for earnings management, or to signal inside information. Beneish and Vargus (2002) for instance show that managers can use income-increasing accruals to reflect inside information. Subramanyam (1996) shows that investors price abnormal accruals, suggesting that abnormal accruals are informative of future cash flows. Since investors also price accrual quality (Francis et al., 2005), it seems likely that if abnormal accruals are used for earnings management, abnormal accruals would not be informative for predicting future cash flows relative to current cash flows when accrual quality is high, and very informative when...
accrual quality is low. However, if abnormal accruals are used as a signal of private information by managers, abnormal accruals should not be associated to the accrual quality in the predictive ability of future cash flows, since managers would use abnormal accrual to reflect private information regardless of the accounting state of the firm. My second hypothesis is:

**H6.2:** The incremental relevance of abnormal accruals for the prediction of future cash flows incremental to current cash flow is not related to accrual quality

Finally, I examine the extent that the level of NOA assists in predicting future cash flows. NOA reflect the difference between all operating assets and all operating liabilities on the balance sheet. NOA is employed by a firm to generate earnings. For instance, a trading firm that acquires inventory employs that asset to sell the goods at a higher price than the cost price to generate a profit. However, if the firm acquires more assets than it can sell (e.g. too much inventory), it may have to sell its assets at a lower price, or write it off the balance sheet. As such, marginal future cash flows could be lower for high levels of NOA. Fairfield et al. (2003a) suggest that diminishing return on assets cause the lower persistence of accruals relative to cash flows, indicating that a high level of NOA indicates earnings that are not sustainable. Hirshleifer et al. (2004) argue that a high level of NOA indicates a lack of sustainability of recent earnings performance. NOA are equal to the accumulation over time of the difference between net operating income and free cash flow Thus, NOA are a cumulative measure of the deviation between accounting value added and cash value added.56 Hirshleifer et al. (2004) term these accruals ‘balance sheet bloat’. They show that the level of NOA is a strong negative predictor of long-run stock returns. I examine if accrual quality can help explain the extent that NOA is relevant in predicting future cash flows. The third hypothesis is:

**H6.3:** The level of net operating assets (NOA) is informative for the prediction of future cash flows dependent on the level of accrual quality

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56 See appendix A for a more detailed elaboration of this concept.
6.3 Research Methodology

The empirical tests employ data obtained from the Compustat annual industrial and research files over 1972 to 2001. Consistent with prior literature, the extreme 1% of the observations are deleted on either side of the distribution for all variables. All variables are deflated by average total assets. Excluded from the sample are financial firms (SIC codes 6000-6999) and firms without complete data. The computation of the accrual quality requires that the sample is restricted to firms with at least 7 years of data. After these reductions, the sample yields 40,730 firm-year observations.

This paper examines the effect of accrual quality on the predictive ability of future cash flows. Dechow and Dichev (2002) developed a regression-based measure for accrual quality that is based on the residual from an accrual model, and therefore suffers from some of the specification issues mentioned in chapter 5 for aggregate accrual models. For instance, the accrual measure may suffer from potential omitted correlated variable problems. Ball and Shivakumar (2006) show that the model is mis-specified to the extent that the model is a linear model. They show that incorporating a non-linear variable improves the model. As a result, the Dechow and Dichev (2002) accrual quality measure may be biased. Furthermore, since the Dechow and Dichev (2002) measure is based on the residual, given the mechanics of OLS regression, this measure will be larger for firms with large absolute accruals, holding relative estimation error constant (McNichols, 2002). This would result in a mechanical relation in tests sorting on accrual quality. To mitigate these issues with their accrual quality measure, Dechow and Dichev (2002) provide observable firm characteristics that can be used as an instrument for accrual quality.

Instead of using the regression-based method, I employ an accrual quality measure based on the firm characteristics that Dechow and Dichev (2002) identified as characteristics that determine accrual quality: firm size, the volatility of sales, working capital accruals, cash flow from operations and earnings, the magnitude of accruals, the operating cycle and the frequency of reporting negative earnings. As a robustness test, I also use the Dechow and Dichev (2002) regression-based accrual measure to examine the validity of my results.

Based on existing theory, results and economic intuition, Dechow and Dichev (2002) hypothesize what the effect of these firm characteristics is on accrual quality. For instance, concerning the operating cycle, they hypothesize that the longer the operating cycle, the lower
accrual quality. This is the case because longer operating cycles indicate more uncertainty, more estimation and errors of estimation, and therefore lower quality of accruals. For each firm, I score each of these firm characteristics on a scale of 1 to 5, with a score of 1 representing a low accrual quality score for that firm characteristic, and a score of 5 representing a high accrual quality score for that firm characteristic. The accrual quality score, AQ_Score is a composite score for the firm-specific accrual quality for each year:

\[ AQ\_Score_t = \Sigma\ Size\_score_t + Sales\_Volatility\_score_t + Earnings\_Volatility\_score_t + \]
\[ Cash\_Flow\_Volatility\_score_t + Accruals\_Volatility\_score_t + Accrual\_Magnitude\_score_t + \]
\[ Operating\_Cycle\_score_t + Negative\_Earnings\_score_t \] (6.1)

The firm characteristics are taken from Dechow and Dichev (2002) and are defined as follows:

- **Size** = log of Total Assets (Compustat item #6);
- **Sales volatility** = the standard deviation of Sales (Compustat item #12), from years t-4 to t;
- **Earnings volatility** = the standard deviation of Net Earnings before Extraordinary Items (Compustat item #18), from years t-4 to t;
- **Cash flow volatility** = the standard deviation of Cash flow from operations from years t-4 to t. Cash from operations is calculated as \( CFO_t = NI_t - TA_t \).
- **Earnings** is firm j’s net income before extraordinary items

57 The effect of the other firm characteristics on accrual quality discussed by Dechow and Dichev (2002) are as follows: concerning (1) firm size, “the smaller the firm, the lower accrual quality. Large firms are expected to have more stable and predictable operations and, therefore, fewer and smaller estimation errors. In addition, large firms are likely to be more diversified and various portfolio effects across divisions and business activities reduce the relative effect of estimation errors.” Concerning (2) sales volatility, “the greater the magnitude of sales volatility, the lower accrual quality. Sales volatility indicates a volatile operating environment and the likelihood of greater use of approximations and estimation, with corresponding large errors of estimation and low accrual quality.” Concerning (3) cash flow volatility, “the greater the magnitude of cash flow volatility, the lower accrual quality. High standard deviation of cash flows is another measure of high uncertainty in the operating environment.” Concerning (4) accrual volatility, “the greater the magnitude of accrual volatility, the lower accrual quality.” Concerning (5) earnings volatility, “the greater the magnitude of earnings volatility, the lower accrual quality.” Earnings is the sum of cash flows and accruals. Since the volatility of both components is predicted to be negatively related to earnings quality, it is expected that greater volatility in earnings signifies lower accrual quality. Concerning (6) negative earnings, “the greater the frequency of reporting negative earnings, the lower accrual quality.” Losses are indicative of severe negative shocks in the firm’s operating environment. Accruals made in response to such shocks are likely to involve substantial estimation error (e.g., restructuring charges). Thus, losses are indicative of low accrual quality. Finally, concerning (7) the magnitude of accruals, “the greater the magnitude of accruals, the lower accrual quality. More accruals indicate more estimation and errors of estimation, and therefore lower quality of accruals.”

84
\( TA = (\Delta CA_t - \Delta Cash_t) - (\Delta CL_t - \Delta STDebt_t) - \text{DEPN}_t \)

where \( \Delta CA_t \) = change in current assets (Compustat data item \# 4), \( \Delta Cash_t \) = change in cash/cash (Compustat data item \# 1), \( \Delta CL_t \) = change in current liabilities (Compustat data item \# 5), \( \Delta STDebt_t \) = change in debt included in current liabilities (Compustat data item \# 34) and \( \text{DEPN}_t \) = depreciation and amortization expense (Compustat data item \# 14)

Accruals volatility = the standard deviation of Total Accruals, as defined above, from years t-4 to t;

Accruals magnitude = the level of Total Accruals, as defined above;

Operating cycle = firm j's operating cycle in days:

\[
\text{Operating\_Cycle} = \frac{(AR_t + AR_{t+1})/2}{(Sales/360)} + \frac{(INV_t + INV_{t+1})/2}{(COGS/360)}
\]

Negative Earnings = incidence of negative earnings.

The aim of this paper is to examine the effect of accruals on the prediction of future cash flows. This is done by looking at accruals in the income statement, that is, the change in NOA, and accruals on the balance sheet, that is, the level of NOA on the balance sheet. For the first hypothesis, I examine total accruals as the change in NOA. Richardson et al. (2005) suggest that the change in net operating assets is a more comprehensive measure of accruals, and implore future research to use this measure of total accruals. To test for the influence of accrual quality on the relevance of the change in NOA in predicting future cash flows relative to current cash flows, I form deciles of accrual quality, and I run annual cross-sectional regression with time-series standard errors for each decile of the following model:

\[
CFO_{t+1} = \alpha_0 + \delta_1 CFO_t + \delta_2 \Delta NOA_t + \epsilon_t
\]

(6.2)

NOA are measured as followed (Fairfield et al. 2003a):

\[
\text{NOA}_t = \text{AR}_t + \text{INV}_t + \text{OTHERCA}_t + \text{PPE}_t + \text{INTANG}_t + \text{OTHERLTA}_t - \text{AP}_t - \text{OTHERCL}_t - \text{OTHERLTL}_t
\]

(6.3)
Where the variables are defined as follows:

\[ AR_t = \text{accounts receivable (Compustat item #2)}; \]
\[ INV_t = \text{inventories (Compustat item #3)}; \]
\[ OTHERCA_t = \text{other current assets (Compustat item #68)}; \]
\[ PPE_t = \text{property, plant, and equipment (Compustat item #7)}; \]
\[ INTANG_t = \text{intangibles (Compustat item #33)}; \]
\[ OTHERLTA_t = \text{other long-term assets (Compustat item #69)}; \]
\[ AP_t = \text{accounts payable (Compustat item #70)}; \]
\[ OTHERCL_t = \text{other current liabilities (Compustat item #72)}; \]
\[ OTHERLTL_t = \text{other long-term liabilities (Compustat item #75)}; \]

To test for the relevance of abnormal accruals in predicting future cash flows, conditional on accrual quality, I decompose the change in net operating assets (i.e. total accruals) into the change in net operating assets excluding abnormal accruals and abnormal accruals from the Jones (1991) model. This test allows me to extract the abnormal accruals from total accruals, and examine individually the relevance of the different accrual components for future cash flows. Similar to the previous model, I run annual cross-sectional regression with time-series standard errors for deciles of accrual quality of the following model:

\[ CFO_{t+1} = \alpha_0 + \delta_1 CFO_t + \delta_2 \Delta NOA_{ExAbnAccr} + \delta_3 AbnAccr_t + \nu_t \quad (6.4) \]

Abnormal accruals are measured by the Jones (1991) model as the residual of a regression of accruals on the change in sales and plant, property and equipment (PPE). I run the cross-sectional estimation by two-digit SIC- industry and year of the Jones model (McNichols, 2000):

\[ TA_t = \frac{\alpha_0}{\text{Total Assets}_{t-1}} + \phi_1 \Delta Sales_t + \phi_2 PPE_t + \epsilon_t \quad (6.5) \]

All variables are as above.

It should be noted however that the accrual quality measure used in this model is based on the measure of accrual quality by Dechow and Dichev (2002), who examine the mapping of working capital accruals in operating cash flows. Their measure therefore does not include the effects of long term accruals into accrual quality. To fully examine the effect of accrual quality on the
prediction of future cash flows, I further decompose the change in net operating assets into long term accruals, current accrual excluding abnormal accruals, and abnormal accruals, allowing each of the components to have different coefficients. Decomposing the change in net operating assets in long term accruals, current accruals and abnormal accruals is done as follows:

\[ \text{LTAccruals}_t = \Delta \text{NOA}_t - \text{TCA}_t \]  \hspace{1cm} (6.6)

TCA is total current accruals calculated from the balance sheet as follows:

\[ \text{TCA}_t = (\Delta \text{CA}_t - \Delta \text{Cash}_t) - (\Delta \text{CL}_t - \Delta \text{STDebt}_t). \]

All variables are as above.

Abnormal accruals are measured based on the Jones (1991) model, which measures abnormal accruals as the residual of a regression of total accruals on the change in sales and plant, property and equipment (PPE). However, this model of abnormal accruals includes both current and non-current accruals. In order to extract only current accruals from total accruals, I use a modification of the Jones model of only current accruals. I estimate abnormal accruals as the residual of the cross-sectional estimation by two-digit SIC- industry and year of the following modification of the Jones model:

\[ \text{TCA}_t = \alpha_{j} \frac{1}{\text{Total Assets}}_t + \phi_1 \Delta \text{Sales}_t - \Delta \text{REC}_t + e_t \]  \hspace{1cm} (6.7)

All variables are as above.

To test for the of abnormal accruals in predicting future cash flows, conditional on accrual quality, I run annual cross-sectional regression with time-series standard errors for each decile of accrual quality of the following model:

\[ \text{CFO}_{t+1} = a_0 + \phi_1 \text{CFO}_t + \phi_2 \text{NOA}_t + \phi_3 \text{Long Term Accruals}_t + \phi_4 \text{Current Accruals excluding Abnormal Accruals}_t + \phi_5 \text{Abnormal Accruals}_t + \epsilon_t \]  \hspace{1cm} (6.8)

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58 I thank Patricia O’Brien for suggesting this model.
This estimation model allows me to truly isolate the effect of accrual quality, as proxied by my accrual quality measure, on abnormal accruals. To examine if the level of net operating assets on the balance sheet is relevant for the prediction of future cash flows, I re-estimate equation 6.2 with the level of net operating assets as an additional variable.

6.4 Results

6.4.1 Descriptive statistics

Table 6.1 provides descriptive statistics on the variables. Descriptive statistics reveal that cash flow and accruals are both more volatile than earnings. Cash flow volatility is 0.070, and accruals volatility is 0.059, while earnings volatility is 0.048. Since accruals are used to dampen the volatility in cash flows, this result should be expected. Results also show that total accruals are negative on average at -0.051, as are current accruals (-0.003), reflecting that firms on average are mean reversing in terms of growth. This result is similar to previous studies. For instance, Dechow and Dichev (2002) report mean accruals of -0.046. Long-term accruals however are positive on average (0.007). These accruals, for instance goodwill, are likely capitalized costs, and are not generally converted into cash within one year. Net income is positive on average, 0.027 with a standard deviation of 0.11. This is very similar to Dechow and Dichev (2002), who find average earnings of 0.03 with a standard deviation of 0.11. Change in NOA is on average positive and much smaller than total accruals. ΔNOA is on average 0.003, while total accruals are on average -0.051. This could reflect the higher standard deviation of ΔNOA compared to total accruals, with the lower values averaging out the higher values of ΔNOA.

The correlations in Table 6.2 illustrate the relations between the sample variables and provide comparability with previous studies. These empirical correlations are in agreement with existing findings and the predictions of the model. Specifically, there is a positive contemporaneous correlation between NOA and CFO (0.14) and a negative correlation between CFO and the change in net operating assets ΔNOA (-0.23). This negative correlation can also be seen for the decomposed accrual measures long term accruals (-0.01), current accruals (-0.40), current accruals excluding abnormal accruals (-0.11) and abnormal accruals (-0.37). Interestingly enough, it appears that the abnormal accrual element of current accruals is much more responsible for the noise reducing effect of cash flows in earnings than the normal accrual portion of current accruals. Finally, there is positive correlation between accrual quality and current CFO as well as future CFO.
Table 6.1 Descriptive statistics and correlations for the initial firm characteristics and accrual characteristics

<table>
<thead>
<tr>
<th>Firm Characteristics</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Lower Quartile</th>
<th>Median</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>4.757</td>
<td>2.083</td>
<td>3.231</td>
<td>4.546</td>
<td>6.106</td>
</tr>
<tr>
<td>Sales volatility</td>
<td>0.168</td>
<td>0.154</td>
<td>0.069</td>
<td>0.127</td>
<td>0.218</td>
</tr>
<tr>
<td>Earnings volatility</td>
<td>0.048</td>
<td>0.056</td>
<td>0.014</td>
<td>0.029</td>
<td>0.058</td>
</tr>
<tr>
<td>Cash flow volatility</td>
<td>0.070</td>
<td>0.055</td>
<td>0.033</td>
<td>0.057</td>
<td>0.091</td>
</tr>
<tr>
<td>Accruals volatility</td>
<td>0.059</td>
<td>0.041</td>
<td>0.028</td>
<td>0.049</td>
<td>0.080</td>
</tr>
<tr>
<td>Operating cycle</td>
<td>153.3</td>
<td>923.8</td>
<td>83.3</td>
<td>128.4</td>
<td>187.6</td>
</tr>
<tr>
<td>Negative Earnings</td>
<td>0.430</td>
<td>0.126</td>
<td>0.353</td>
<td>0.429</td>
<td>0.500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accrual Characteristics</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Lower Quartile</th>
<th>Median</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income</td>
<td>0.027</td>
<td>0.114</td>
<td>0.009</td>
<td>0.046</td>
<td>0.082</td>
</tr>
<tr>
<td>Cash from operations</td>
<td>0.078</td>
<td>0.121</td>
<td>0.035</td>
<td>0.090</td>
<td>0.146</td>
</tr>
<tr>
<td>NOA</td>
<td>0.953</td>
<td>0.290</td>
<td>0.784</td>
<td>0.962</td>
<td>1.136</td>
</tr>
<tr>
<td>ΔNOA</td>
<td>0.003</td>
<td>0.127</td>
<td>-0.053</td>
<td>0.006</td>
<td>0.062</td>
</tr>
<tr>
<td>Long Term Accruals</td>
<td>0.007</td>
<td>0.109</td>
<td>-0.034</td>
<td>0.007</td>
<td>0.049</td>
</tr>
<tr>
<td>Total Accruals</td>
<td>-0.051</td>
<td>0.074</td>
<td>-0.090</td>
<td>-0.049</td>
<td>-0.012</td>
</tr>
<tr>
<td>Current Accruals</td>
<td>-0.003</td>
<td>0.069</td>
<td>-0.036</td>
<td>-0.002</td>
<td>0.030</td>
</tr>
<tr>
<td>Jones Abnormal Accruals</td>
<td>-0.001</td>
<td>0.065</td>
<td>-0.032</td>
<td>0.000</td>
<td>0.031</td>
</tr>
<tr>
<td>AQ Score</td>
<td>24</td>
<td>6</td>
<td>19.0</td>
<td>24.0</td>
<td>29.0</td>
</tr>
</tbody>
</table>

The sample consists of 40,730 firm-year observations from 1972 to 2001. Variables Measurement: Size= log of Total Assets; Total Assets= Compustat data item (Compustat item #6); Sales volatility= the standard deviation of Sales (Compustat item #12), from years t-4 to t; Earnings volatility= the standard deviation of Net Earnings before Extraordinary Items (Compustat item #18), from years t-4 to t; Cash flow volatility= the standard deviation of Cash flow from operations, as defined in table1, from years t-4 to t; Accruals volatility= the standard deviation of Total Accruals, from years t-4 to t; Operating cycle= firm j’s operating cycle in days; Negative Earnings= incidence of negative earnings; Net income = Net Earnings before Extraordinary Items (Compustat item #18); CFO = Net Income; TA = Total Accruals = (CA_t - Cash_t) - (CL_t - STDebt_t) - DEPN_t; CA_t = change in current assets (Compustat data item #4); ΔCash_t = change in cash/cash (Compustat data item #1); ΔCL_t = change in current liabilities (Compustat data item #5); ΔSTDebt_t = change in debt included in current liabilities (Compustat data item #34); DEPN_t = depreciation and amortization expense (Compustat data item #14); NOA_t = AR_t + INV_t + OTHERCA_t + PPE_t + INTANG_t + OTHERLTLA_t - AP_t - OTHERCL_t - OTHERLTL_t; AR_t = accounts receivable (Compustat item #2); INV_t = inventories (Compustat item #3); OTHERCA_t = other current assets (Compustat item #68); PPE_t = property, plant, and equipment (Compustat item #7); INTANG_t = intangibles (Compustat item #33); OTHERLTLA_t = other long-term assets (Compustat item #69); AP_t = accounts payable (Compustat item #70); OTHERCL_t = other current liabilities (Compustat item #72); OTHERLTL_t = other long-term liabilities (Compustat item #75); ΔNOA = change in NOA; Long Term Accruals_t = ΔNOA_t - TCA_t; TCA_t = total current accruals = (CA_t - ΔCash_t) - (CL_t - ΔSTDebt_t); CA_t = change in current assets (Compustat data item #4); ΔCash_t = change in cash/cash (Compustat data item #1); ΔCL_t = change in current liabilities (Compustat data item #5); ΔSTDebt_t = change in debt included in current liabilities (Compustat data item #34); PPE_t = property, plant, and equipment (Compustat item #7); ΔSales_t = change in sales (Compustat item #12); Abnormal accruals are the residual of the two-digit SIC- industry and year cross-sectional Jones (1991) model: TCA_t = α_0 + 1 Total Asset_t + β_1 ΔSales_t + β_2 PPE_t + e_t; AQ Score = composite score of accrual quality score on firm characteristics. All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.
<table>
<thead>
<tr>
<th></th>
<th>Cash Flow from Operations (CFO)</th>
<th>Future Cash Flow from Operations</th>
<th>NOA</th>
<th>ΔNOA</th>
<th>LTAccr</th>
<th>Current Accruals</th>
<th>Current Accruals ex Abnormal accruals</th>
<th>Abnormal Accruals</th>
<th>Accrual Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Flow from Operations (CFO)</td>
<td>-</td>
<td>0.3675</td>
<td>0.0227</td>
<td>-0.3131</td>
<td>-0.0146</td>
<td>-0.5211</td>
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<td>(0.0000)</td>
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<td>-</td>
<td>0.1440</td>
<td>0.0692</td>
<td>-0.0233</td>
<td>0.1259</td>
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<td>(0.0000)</td>
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<td>NOA</td>
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<td>0.2274</td>
<td>-</td>
<td>0.2222</td>
<td>0.1669</td>
<td>0.1373</td>
<td>0.0587</td>
<td>0.1229</td>
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<td>(0.0000)</td>
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</tr>
<tr>
<td>ΔNOA</td>
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<td>0.0582</td>
<td>0.2335</td>
<td>-</td>
<td>0.7578</td>
<td>0.5612</td>
<td>0.1738</td>
<td>0.5184</td>
<td>-0.0312</td>
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<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td></td>
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<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
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<tr>
<td>LTAccr</td>
<td>-0.0097</td>
<td>-0.0134</td>
<td>0.1917</td>
<td>0.8530</td>
<td>-</td>
<td>-0.0042</td>
<td>0.0313</td>
<td>-0.0138</td>
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<td></td>
<td>(0.0269)</td>
<td>(0.0050)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
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<td>(0.0000)</td>
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<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Current Accruals</td>
<td>-0.4046</td>
<td>0.1320</td>
<td>0.1377</td>
<td>0.5081</td>
<td>-0.0165</td>
<td>-</td>
<td>0.2680</td>
<td>0.9224</td>
<td>-0.0283</td>
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<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0002)</td>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
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<tr>
<td>Current Accruals ex Abnormal accruals</td>
<td>-0.1082</td>
<td>0.0498</td>
<td>0.0441</td>
<td>0.1982</td>
<td>0.0156</td>
<td>0.3325</td>
<td>-</td>
<td>-0.0417</td>
<td>0.0305</td>
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<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0013)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
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<td>Abnormal Accruals</td>
<td>-0.3705</td>
<td>0.1183</td>
<td>0.1419</td>
<td>0.4840</td>
<td>-0.0251</td>
<td>0.9389</td>
<td>-0.0124</td>
<td>-</td>
<td>-0.0346</td>
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<td>(0.0000)</td>
<td>(0.0000)</td>
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<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0040)</td>
<td>(0.0000)</td>
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<tr>
<td>AQ_Score</td>
<td>0.2787</td>
<td>0.2166</td>
<td>0.2819</td>
<td>-0.0175</td>
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<td>-0.0164</td>
<td>0.0339</td>
<td>-0.0151</td>
<td>-</td>
</tr>
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<td>(0.0000)</td>
<td>(0.0012)</td>
<td>(0.0004)</td>
<td>(0.0007)</td>
<td>(0.0000)</td>
<td>(0.0053)</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.1 provides definitions for all variables.
6.4.2 Test of H6.1: There is a positive association between accrual quality and the persistence of cash flows and the incremental relevance of cash flow to accruals

The first hypothesis concerns the effect of the accrual accounting process on the relevance of cash flows and accruals in predicting future cash flows. Barth et al. (2001) show that cash flows are assisted in the prediction of future cash flows by accruals, or the change in NOA. Hypothesis 6.1 examines whether accruals are informative of predicting future cash flows dependent on accrual quality. High accrual quality indicates a steady state, and as accruals are expected to be a function of firm’s real business activity (Guay, 2006), high accrual quality suggest a business environment where there is thus a high likelihood that operating assets will be converted into operating cash flows. In the case of high accrual quality, current cash flows are very informative of future cash flows, and NOA are less necessary for mitigating timing and matching problems when predicting future cash flows. In other words, since the accrual process represents net operating assets that are converted into cash, cash from operations is adequate for the prediction of future cash flows. For low accrual quality, the business environment is too volatile to depend on just current cash flows to predict future cash flows. Therefore, for the prediction of future cash flows, the change in net operating assets is incremental to current cash flows for the prediction of future cash flows.

Tests of H6.1 are provided in table 6.3. Table 6.3 reports results of Fama-Macbeth (1973) regressions with time-series standard errors of equation (6.2). Panel A of table 6.3 shows the results of equation (6.2) for the entire sample. The results show that the change in net operating assets (NOA) is incremental to current cash flows in predicting future cash flows. The coefficient on $\Delta$NOA is 0.157 (t-stat = 26.77), and the explanatory power of the model improves from 18% to 21%, indicating that net operating assets are incremental to current cash flows in predicting future cash flows. This is consistent with Barth et al. (2001), who show that decomposing earnings in cash flows and accruals enhances the ability of earnings to predict future cash flows.
Equation 6.2: $CFO_{t+1} = \alpha_0 + \delta_1 CFO_t + \delta_2 \Delta NOA_t + \nu_t$

### Panel A: Estimation results for entire sample

<table>
<thead>
<tr>
<th>Intercept, $t$-stat</th>
<th>CFO, $t$-stat</th>
<th>$\Delta NOA$, $t$-stat</th>
<th>Adj. $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coeff</td>
<td>0.051</td>
<td>0.381</td>
<td>0.178</td>
</tr>
<tr>
<td>t-stat</td>
<td>(12.99)</td>
<td>(17.38)</td>
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<tr>
<td>Mean Coeff</td>
<td>0.046</td>
<td>0.433</td>
<td>0.157</td>
</tr>
<tr>
<td>t-stat</td>
<td>(12.29)</td>
<td>(22.32)</td>
<td>0.205</td>
</tr>
</tbody>
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### Panel B: Estimation results for deciles of AQ_score

<table>
<thead>
<tr>
<th>Intercept, $t$-stat</th>
<th>CFO, $t$-stat</th>
<th>$\Delta NOA$, $t$-stat</th>
<th>Adj. $R^2$</th>
<th>AQ_score decile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coeff</td>
<td>0.026</td>
<td>0.378</td>
<td>0.224</td>
<td>1</td>
</tr>
<tr>
<td>t-stat</td>
<td>(5.03)</td>
<td>(11.62)</td>
<td>(12.77)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.040</td>
<td>0.328</td>
<td>0.174</td>
<td>2</td>
</tr>
<tr>
<td>t-stat</td>
<td>(9.79)</td>
<td>(10.63)</td>
<td>(6.97)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.045</td>
<td>0.345</td>
<td>0.184</td>
<td>3</td>
</tr>
<tr>
<td>t-stat</td>
<td>(9.90)</td>
<td>(10.04)</td>
<td>(9.39)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.05</td>
<td>0.370</td>
<td>0.150</td>
<td>4</td>
</tr>
<tr>
<td>t-stat</td>
<td>(11.44)</td>
<td>(11.36)</td>
<td>(7.18)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
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<td>0.395</td>
<td>0.147</td>
<td>5</td>
</tr>
<tr>
<td>t-stat</td>
<td>(17.38)</td>
<td>(17.57)</td>
<td>(8.29)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.050</td>
<td>0.469</td>
<td>0.144</td>
<td>6</td>
</tr>
<tr>
<td>t-stat</td>
<td>(10.44)</td>
<td>(15.18)</td>
<td>(4.57)</td>
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<tr>
<td>Mean Coeff</td>
<td>0.056</td>
<td>0.433</td>
<td>0.099</td>
<td>7</td>
</tr>
<tr>
<td>t-stat</td>
<td>(16.02)</td>
<td>(14.02)</td>
<td>(6.22)</td>
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</tr>
<tr>
<td>Mean Coeff</td>
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<td>0.585</td>
<td>0.096</td>
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<tr>
<td>t-stat</td>
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<td>(19.56)</td>
<td>(3.82)</td>
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</tr>
<tr>
<td>Mean Coeff</td>
<td>0.032</td>
<td>0.666</td>
<td>0.061</td>
<td>9</td>
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<tr>
<td>t-stat</td>
<td>(13.78)</td>
<td>(34.30)</td>
<td>(2.39)</td>
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</tr>
<tr>
<td>Mean Coeff</td>
<td>0.022</td>
<td>0.759</td>
<td>0.067</td>
<td>10</td>
</tr>
<tr>
<td>t-stat</td>
<td>(8.70)</td>
<td>(37.96)</td>
<td>(4.17)</td>
<td></td>
</tr>
</tbody>
</table>

### Panel C: Parameter tests by Year

<table>
<thead>
<tr>
<th>No. Years</th>
<th>All firms</th>
<th>No. Years</th>
<th>Firms with AQ_Score=1</th>
<th>No. Years</th>
<th>Firms with AQ_Score=10</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>26</td>
<td>7</td>
<td>26</td>
<td>25</td>
<td>25</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Tests based on significance level of p-value < 0.01

The sample consists of 46423 firm-year observations from 1972 to 2001. Table 6.1 provides the definitions for all variables.

Table 6.3 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year’s cash flow from operations on this year’s cash flow from operations and net operating assets
Panel B of table 6.3 shows the results for different levels of accrual quality. For the first decile of accrual quality, i.e. the decile with the lowest accrual quality, the coefficient on ∆NOA is 0.224 (with a t-stat of 12.77), and is incremental to cash flow from operations, which has a coefficient of 0.378 (with a t-stat of 11.62) and the explanatory power of the model is 18%. The coefficient on ∆NOA declines in an almost monotonic fashion from 0.224 for the first decile to 0.067 (t-stat is 4.17) for the tenth decile of accrual quality, i.e. the decile with the highest accrual quality. However, while the relevance of ∆NOA in the highest decile of accrual quality is less than a third of the relevance of the decile with the lowest accrual quality, the coefficient on cash from operations for the decile with the highest accrual quality (0.759 with a t-stat of 37.96) is almost twice the value compared to the decile with the lowest accrual quality (0.378 with a t-stat of 11.62), while the explanatory power of the model improves to 44%, which is more than double the explanatory power of decile 1. The higher explanatory power of the model highlights how accrual quality improves the predictive power of current cash flows and accruals for future cash flows. The coefficient on cash from operations does not change in a monotonic nature from the first decile to the tenth decile, however, the results move in the predicted direction.

Panel C of table 6.3 shows results for annual F-tests of equality of the coefficients. The results indicate that for the entire sample of firms, cash flow from operations is significantly more relevant in predicting future cash flow from operations relative to accruals (∆NOA) in all 26 years. However, when partitioning on the level of accrual quality, the results show how accrual quality affects the relevance of accruals on the prediction of future cash flows. For the lowest decile of accrual quality, the coefficient on cash flow from operations is significantly higher than accruals in only 7 years. In 19 years, the coefficient on accruals does not differ significantly from current cash flow from operations in determining future cash flow from operations, indicating that when accrual quality is low, accruals are relevant in predicting future cash flows. However, for the decile with the highest accrual quality, this finding is reversed. Cash flow from operations is significantly higher in predicting future cash flows in 25 of the 26 years. Overall, the parameter tests by year show that accrual quality is an important factor in the relevance of cash flows and accruals in predicting future cash flows. Note that only 26 years yielded results in the 30 year period, because the measurement of accrual quality required 5 years of data to be determined.

The results for H6.1 show the somewhat remarkable result that low accrual quality leads to accruals being more relevant in predicting future cash flows from operations than high accrual quality. These results indicate that accruals, i.e. ∆NOA, assist in predicting
future cash flows dependent on the quality of accruals. The incremental power of accruals declines as accrual quality increases. This result may seem counterintuitive, but can be explained by the increase in cash flow persistence for higher levels of accrual quality. My results show that high accrual quality leads to higher cash flow persistence. Given that accrual quality represents the state of the firm, this results highlights how business activity, as represented by accrual accounting, can determine the ability to predict future cash flows. The results also highlight how business activity determines how accruals can assist in mitigating timing and matching problems of cash flows. When accrual quality is low, accruals are needed to ameliorate the lower persistence in cash flows. As a results, earnings are produced which are less noisy. However, when accrual quality is high, cash flows are more persistent, and accruals are less relevant in predicting future cash flows. Accruals are less necessary for ameliorating cash flows to produce earnings.

My results also provide an explanation for, and are consistent with Francis et al. (2005), who show that investors price accrual quality. Higher accrual quality is associated with more persistent cash flows, which is reflected in the stock returns by investors. The results also highlight the effect of the business activity on earnings quality. Earnings that are a good indicator of prospective earnings (cash flows) are considered to be of high quality (Penman and Zhang, 2002). However, my results indicate that the higher predictive ability of earnings does not necessarily reflect a higher quality accounting process. Rather, it may reflect that accrual accounting for business in a steady state lead to more persistent cash flows.

6.4.3 Test of H6.2: The incremental relevance of abnormal accruals for the prediction of future cash flows incremental to current cash flow is not related to accrual quality

The second hypothesis concerns the effect of abnormal accruals on the accrual accounting process in predicting future cash flows. Results for Hypothesis 6.1 show that the contribution of accruals on predicting future cash flows is dependent on accrual accounting quality. If abnormal accruals are used for earnings management, the abnormal accruals should not be relevant for predicting future cash flows when accrual quality is high, only when accrual quality is low. However, if abnormal accruals are relevant for the prediction of future cash flows from operations, this would suggest that abnormal accruals reflect managers inside information, and management uses abnormal accruals to give a better indication of firm performance. The relevance of abnormal accruals should not change with accrual quality, since abnormal accrual accruals are used by managers to convey information on the change in business activity and its effect on future cash flows. Table 6.4 reports results of Fama-Macbeth (1973) regression with time-series standard errors of equation (6.4).
Table 6.4 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year’s cash flow from operations on this year’s cash flow from operations and net operating assets

Equation 6.4: \( \text{CFO}_{t+1} = \alpha_0 + \delta_1 \text{CFO}_t + \delta_2 \Delta \text{NOA}_{t} + \delta_2, \text{AbnAccr}_t + \epsilon_t \)

<table>
<thead>
<tr>
<th>Panel A: Estimation results for entire sample</th>
<th>( \Delta \text{NOA}_{t} )</th>
<th>Abnormal Accruals,</th>
<th>( \text{Adj. } R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept, CFO, Abnormal Accruals,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.051</td>
<td>0.381</td>
<td>0.007</td>
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<td>t-stat</td>
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<td>(16.92)</td>
<td>(1.05)</td>
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<td>Mean Coeff</td>
<td>0.049</td>
<td>0.381</td>
<td>0.589</td>
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<tr>
<td>t-stat</td>
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<td>(16.44)</td>
<td>(29.21)</td>
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<tr>
<td>Mean Coeff</td>
<td>0.033</td>
<td>0.569</td>
<td>0.024</td>
</tr>
<tr>
<td>t-stat</td>
<td>(11.54)</td>
<td>(36.43)</td>
<td>(27.98)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Estimation results for deciles of ( \text{AQ} ) score</th>
<th>( \Delta \text{NOA}_{t} )</th>
<th>Abnormal Accruals,</th>
<th>( \text{Adj. } R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept, CFO, Abnormal Accruals,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff way</td>
<td>0.019</td>
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<td>-0.047</td>
</tr>
<tr>
<td>t-stat</td>
<td>(2.00)</td>
<td>(9.96)</td>
<td>(-0.43)</td>
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<tr>
<td>Mean Coeff way</td>
<td>0.027</td>
<td>0.492</td>
<td>0.023</td>
</tr>
<tr>
<td>t-stat</td>
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<td>(11.15)</td>
<td>(0.90)</td>
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<tr>
<td>Mean Coeff way</td>
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<td>0.042</td>
</tr>
<tr>
<td>t-stat</td>
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<td>(10.11)</td>
<td>(1.73)</td>
</tr>
<tr>
<td>Mean Coeff way</td>
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<td>0.519</td>
<td>0.017</td>
</tr>
<tr>
<td>t-stat</td>
<td>(3.00)</td>
<td>(11.08)</td>
<td>(0.67)</td>
</tr>
<tr>
<td>Mean Coeff way</td>
<td>0.050</td>
<td>0.507</td>
<td>0.015</td>
</tr>
<tr>
<td>t-stat</td>
<td>(6.02)</td>
<td>(9.20)</td>
<td>(0.54)</td>
</tr>
<tr>
<td>Mean Coeff way</td>
<td>0.032</td>
<td>0.627</td>
<td>0.034</td>
</tr>
<tr>
<td>t-stat</td>
<td>(5.23)</td>
<td>(12.06)</td>
<td>(1.33)</td>
</tr>
<tr>
<td>Mean Coeff way</td>
<td>0.015</td>
<td>0.737</td>
<td>0.012</td>
</tr>
<tr>
<td>t-stat</td>
<td>(0.94)</td>
<td>(5.05)</td>
<td>(0.73)</td>
</tr>
<tr>
<td>Mean Coeff way</td>
<td>0.028</td>
<td>0.708</td>
<td>0.029</td>
</tr>
<tr>
<td>t-stat</td>
<td>(3.34)</td>
<td>(13.22)</td>
<td>(1.05)</td>
</tr>
<tr>
<td>Mean Coeff way</td>
<td>0.015</td>
<td>0.806</td>
<td>0.003</td>
</tr>
<tr>
<td>t-stat</td>
<td>(5.04)</td>
<td>(31.76)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Mean Coeff way</td>
<td>-0.071</td>
<td>0.743</td>
<td>0.638</td>
</tr>
<tr>
<td>t-stat</td>
<td>(-0.80)</td>
<td>(10.93)</td>
<td>(1.13)</td>
</tr>
</tbody>
</table>
Panel C: Parameter tests by Year

<table>
<thead>
<tr>
<th>All firms</th>
<th>AQ_Score=1</th>
<th>AQ_Score=10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Yrs</td>
<td>Implied by Result</td>
<td>No. Yrs</td>
</tr>
<tr>
<td>7</td>
<td>Abn_Accruals &gt; CFO</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>Abn_Accruals = CFO</td>
<td>25</td>
</tr>
<tr>
<td>0</td>
<td>Abn_Accruals &lt; CFO</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All firms</th>
<th>AQ_Score=1</th>
<th>AQ_Score=10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Yrs</td>
<td>Implied by Result</td>
<td>No. Yrs</td>
</tr>
<tr>
<td>23</td>
<td>Abn_Accruals &gt; ∆NOA_ex_Abn_Accruals</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Abn_Accruals = ∆NOA_ex_Abn_Accruals</td>
<td>15</td>
</tr>
<tr>
<td>0</td>
<td>Abn_Accruals &lt; ∆NOA</td>
<td>0</td>
</tr>
</tbody>
</table>

Tests based on significance level of p-value < 0.01

The sample consists of 36095 firm-year observations from 1972 to 2001. Table 6.1 provides the definitions for all variables.

Panel A of table 6.4 show the results of equation (6.4) for the entire sample. The results indicate that the abnormal part of total accruals are not only relevant for predicting future cash flows, it seems that abnormal accruals are more relevant for predicting future cash flows than the non-abnormal component of total accruals. The coefficient on total accruals excluding abnormal accruals is 0.007 with a t-stat of 1.05, while the coefficient on abnormal accruals is 0.589 with a t-stat of 29.21. This result suggests that abnormal accruals reflect the signaling of (private) information of managers about future cash flows rather than earnings management. This indicates that the estimation procedure of abnormal accruals does not necessarily extract the earnings management component of management discretion. Rather, it extracts the private information of the effect of business activity on future cash flows. This is consistent with Subramanyam (1996), who shows that abnormal accruals improve the earnings-return relation.

Abnormal accruals are the residual of a model that attempts to reflect changes in the business, where the residual should encompass changes in accruals which are not the result of changes in business, i.e., earnings management. However, the results of panel A of table 6.4 indicate that abnormal accruals pick up more than just earnings management. In Panel B of table 6.4, the effect of the business activity on the relevance of abnormal accruals is examined. The results in panel B indicate that while the coefficient on cash flow increases from the decile with the lowest accruals quality to the decile with the highest accrual quality, the
coefficient on abnormal accruals remains somewhat unchanged. However, the coefficient on abnormal accruals is highly significant for all deciles. If abnormal accruals were used exclusively for earnings management, the coefficient should decrease with an increase in accrual quality. The coefficient on total accruals excluding abnormal accruals is not significant for all deciles. This result indicates that abnormal accruals can be used by managers to reflect changes in business activity rather than earnings management. This is consistent with the result that the normal part of accruals is not significant for the prediction of future cash flows when accrual quality is high, as shown for hypothesis 6.1. Normal accruals does not pick up the change in business activity, this is done by abnormal accruals. The private information on future cash flows is therefore conveyed through abnormal accruals.

Panel C of table 6.4 shows results for annual F-tests of equality of the coefficients. When comparing the coefficient on abnormal accruals with the coefficient on cash flows, the results indicate that for the entire sample of firms, abnormal accruals are significantly higher than cash flow in 7 of the 26 years. In 19 of the 26 years, the coefficient on cash flow does not differ significantly from abnormal accruals in determining future cash flow, indicating that abnormal accruals reflect information on future cash flows, rather than earnings management. When partitioning on the level of accrual quality, the results show that for the lowest decile of accrual quality, the coefficient on abnormal accruals does not differ significantly from cash flow in 25 of the 26 years, indicating that when accrual quality is low, abnormal accruals are relevant in predicting future cash flows. However, for the decile with the highest accrual quality, this finding is less obvious. Cash flow is significantly higher in predicting future cash flows in 11 of the 26 years, consistent with the findings in hypothesis 6.1. This can be explained by the fact that when the firm is in a steady state, managers do not need abnormal accruals to reflect private information, as cash flow is more persistent in the steady state.

When comparing the coefficient on abnormal accruals with the coefficient on non-abnormal accruals, the results show that for the entire sample, abnormal accruals are more relevant than non-abnormal accruals. Abnormal accruals are significantly higher than non-abnormal accruals in 23 of the 26 years. When deciles of accrual quality are formed, the results indicate that accrual quality does not affect the relevance of abnormal accruals. The results are similar for the low accrual quality decile and the high accrual quality decile.

These results can be interpreted as follows. First, as the model examines the prediction of next year's cash flows, the results indicate that abnormal accruals are used to reflect information on next period's cash flows in favor of the non-abnormal component of accruals. This is consistent for all deciles of accrual quality. Second, since the coefficient on abnormal accruals does not change with accrual quality, the results also indicate that abnormal accruals remain significant in reflecting information on the business activity of the
firm. The results from table 6.4 suggest that when accrual quality is high, and the firm is in a steady state, abnormal accruals are still relevant for predicting future cash flows similar to when accrual quality is low, and the firm operates in a volatile environment. This would especially be the case for abnormal accruals, if they are used to reflect (private) information about future cash flows. However, since the test does not examine earnings management specifically, one cannot conclude that abnormal accruals are not used for earnings management.

An alternative explanation for the result in table 6.4 is that the accrual quality is only reflecting the short-term consequences of accruals, while abnormal accruals also consist of long term accruals. For instance, abnormal accruals may also contain long term effects on future cash flows, which are not picked up by the short term accrual quality measure. Therefore, I further decompose total accruals in long term accruals, current accruals excluding abnormal accruals and abnormal accruals, where abnormal accrual are estimated by a modification of the Jones model to reflect only current abnormal accruals. In order to isolate only the short term effect of accrual quality on abnormal accruals, table 6.5 reports results of annual Fama-Macbeth (1973) regressions with time-series standard errors of equation (6.8).

**Table 6.5** Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year’s cash flow from operations on this year’s cash flow from operations and net operating assets and accruals

*Equation 6.8: \( \text{CFO}_{t+1} = \alpha_0 + \varphi_1 \text{CFO}_t + \varphi_2 \text{Long Term Accruals}_t + \varphi_3 \text{Current Accruals excluding Abnormal Accruals}_t + \varphi_4 \text{Abnormal Accruals}_t + \epsilon_t \)*

<table>
<thead>
<tr>
<th>Panel A: Estimation results for entire sample</th>
<th>Intercept, ( \text{CFO} )</th>
<th>Long Term Accruals, ( \epsilon )</th>
<th>Current Accruals Excluding Abnormal Accruals, ( \epsilon )</th>
<th>Abnormal Accruals, ( \epsilon )</th>
<th>Adj. ( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coeff</td>
<td>0.052</td>
<td>-0.011</td>
<td></td>
<td></td>
<td>0.172</td>
</tr>
<tr>
<td>t-stat</td>
<td>(13.51)</td>
<td>(1.68)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.031</td>
<td>0.718</td>
<td></td>
<td></td>
<td>0.326</td>
</tr>
<tr>
<td>t-stat</td>
<td>(14.40)</td>
<td>(48.49)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.032</td>
<td>-0.007</td>
<td>0.720</td>
<td></td>
<td>0.309</td>
</tr>
<tr>
<td>t-stat</td>
<td>(15.12)</td>
<td>(46.02)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.049</td>
<td>0.537</td>
<td></td>
<td></td>
<td>0.187</td>
</tr>
<tr>
<td>t-stat</td>
<td>(10.96)</td>
<td>(8.13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.031</td>
<td>0.594</td>
<td></td>
<td>0.680</td>
<td>0.305</td>
</tr>
<tr>
<td>t-stat</td>
<td>(10.93)</td>
<td>(36.74)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.029</td>
<td>-0.010</td>
<td>0.779</td>
<td>0.717</td>
<td>0.306</td>
</tr>
<tr>
<td>t-stat</td>
<td>(10.34)</td>
<td>(10.82)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(Table 6.5 continued)

Panel B: Estimation results for deciles of AQ_score

<table>
<thead>
<tr>
<th>AQ-score decile</th>
<th>Intercept, Mean Coeff</th>
<th>CFO</th>
<th>Long Term Abnormal Accruals, Mean Coeff</th>
<th>Ex-Current Accruals, Mean Coeff</th>
<th>Abnormal Accruals, Mean Coeff</th>
<th>Adj. R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.016</td>
<td>0.511</td>
<td>-0.068</td>
<td>0.535</td>
<td>0.556</td>
<td>0.258</td>
</tr>
<tr>
<td></td>
<td>t-stat (1.59)</td>
<td>(10.27)</td>
<td>(-0.74)</td>
<td>(8.71)</td>
<td>(11.89)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.027</td>
<td>0.520</td>
<td>-0.031</td>
<td>0.644</td>
<td>0.605</td>
<td>0.209</td>
</tr>
<tr>
<td></td>
<td>t-stat (4.03)</td>
<td>(11.33)</td>
<td>(-1.40)</td>
<td>(3.70)</td>
<td>(11.81)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.031</td>
<td>0.547</td>
<td>0.007</td>
<td>0.815</td>
<td>0.713</td>
<td>0.243</td>
</tr>
<tr>
<td></td>
<td>t-stat (6.85)</td>
<td>(11.49)</td>
<td>(0.28)</td>
<td>(5.35)</td>
<td>(14.87)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.026</td>
<td>0.551</td>
<td>0.000</td>
<td>0.592</td>
<td>0.633</td>
<td>0.218</td>
</tr>
<tr>
<td></td>
<td>t-stat (2.96)</td>
<td>(10.67)</td>
<td>(-0.01)</td>
<td>(3.96)</td>
<td>(10.04)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.059</td>
<td>0.431</td>
<td>0.002</td>
<td>0.224</td>
<td>0.329</td>
<td>0.235</td>
</tr>
<tr>
<td></td>
<td>t-stat (2.87)</td>
<td>(2.39)</td>
<td>(0.10)</td>
<td>(0.55)</td>
<td>(1.17)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.031</td>
<td>0.671</td>
<td>-0.019</td>
<td>0.958</td>
<td>0.813</td>
<td>0.299</td>
</tr>
<tr>
<td></td>
<td>t-stat (4.68)</td>
<td>(11.61)</td>
<td>(-0.73)</td>
<td>(4.28)</td>
<td>(10.81)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.036</td>
<td>0.642</td>
<td>-0.013</td>
<td>0.490</td>
<td>1.468</td>
<td>0.215</td>
</tr>
<tr>
<td></td>
<td>t-stat (7.32)</td>
<td>(17.06)</td>
<td>(-0.57)</td>
<td>(2.89)</td>
<td>(2.74)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.004</td>
<td>0.908</td>
<td>0.067</td>
<td>0.273</td>
<td>1.138</td>
<td>0.381</td>
</tr>
<tr>
<td></td>
<td>t-stat (0.28)</td>
<td>(15.84)</td>
<td>(0.41)</td>
<td>(3.79)</td>
<td>(4.65)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>-0.003</td>
<td>0.987</td>
<td>-0.096</td>
<td>0.530</td>
<td>0.888</td>
<td>0.441</td>
</tr>
<tr>
<td></td>
<td>t-stat (-0.20)</td>
<td>(7.44)</td>
<td>(-1.61)</td>
<td>(1.38)</td>
<td>(9.59)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>-0.060</td>
<td>0.812</td>
<td>0.483</td>
<td>0.813</td>
<td>0.899</td>
<td>0.247</td>
</tr>
<tr>
<td></td>
<td>t-stat (-0.84)</td>
<td>(11.50)</td>
<td>(0.97)</td>
<td>(4.22)</td>
<td>(10.16)</td>
<td></td>
</tr>
</tbody>
</table>

The sample consists of 36,095 firm-year observations from 1972 to 2001. Variables Measurement: CFO = NI/TA; NI = Net Income Before Extraordinary Items (Compustat data item 18); TA = (ΔCA – ΔCash) – (ΔCL – ΔSTDebt) – DEPN; ΔCA = change in current assets (Compustat data item # 4); ΔCash = change in cash/cash assets (Compustat data item # 1); ΔCL = change in current liabilities (Compustat data item # 5); ΔSTDebt = change in debt included in current liabilities (Compustat data item # 34); DEPN = depreciation and amortization expense (Compustat data item # 14); NOA = AR + INV + OTHERCA + PPE + INTANG + OTHERLT; ΔAR = accounts receivable (Compustat item #2); ΔINV = inventories (Compustat item #3); ΔOTHERCA = other current assets (Compustat item #68); ΔPPE = property, plant, and equipment (Compustat item #7); ΔINTANG = intangibles (Compustat item #33); ΔOTHERLT = other long-term liabilities (Compustat item #72); ΔPPE = other property, plant, and equipment (Compustat item #7); ΔSales = change in sales (Compustat item #12); Abnormal accruals are the residual of a modification of the two-digit SIC industry and year cross-sectional Jones (1991) model: TCA = a0 + 1/Total Assett + 1/1 + ΔSales – ΔRec) + εt

AQ Score = composite score of accrual quality score on firm characteristics. All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

The results in panel A of table 6.5 show results similar to table 6.4. Abnormal accruals are incremental to current cash flows and long term and current accruals in predicting future cash flows. For the complete model, the coefficient on abnormal accruals is 0.717 with a t-stat of 31.95. This result suggests that not all abnormal accruals are used for earnings management. Rather, on average, abnormal accruals improve the ability to predict future cash flows. Long
term accruals have a negative effect on future cash flows (-0.010 with t-stat of -1.70), presumably because these type of net operating assets (e.g. goodwill) consist of investments that will not be converted into cash within one accounting period. Also, current accounting accruals are also highly significant in predicting future cash flows. The explanatory power of the decomposed accruals model improves from 21% for the net operating assets model in table 3 to 31% for the decomposed model, indicating that decomposing in accruals helps in predicting future cash flows. This is consistent with Barth et al. (2001).

Panel B show the results for the deciles of accrual quality. For the first decile of accrual quality, i.e. the decile with the lowest accrual quality, abnormal accruals are relevant, with a coefficient of 0.556 with t-stat of 11.89. For the tenth decile of accrual quality, i.e. the decile with the highest accrual quality, abnormal accruals are even more relevant for predicting future cash flows, with a coefficient of 0.899 with t-stat of 10.16.

If abnormal accruals were used to reflect (private) information about business activity, abnormal accruals would relevant for explaining future cash flows independent of the accrual quality, since abnormal accruals are a way of reflecting information about future cash flows. The results confirm this. Current accruals (ex-abnormal accruals) are also highly relevant for all deciles, which is expected since current accruals are expected to be converted into cash in the short term. Cash from operations for the decile with the highest accrual quality (0.812 with t-stat of 11.50) is again higher than the decile with the lowest accrual quality (0.511 with t-stat of 10.27), as expected. The deciles do not change in a monotonic nature, however, the results move in the predicted direction.

These results indicate that on average, the abnormal component of current accruals is as relevant for predicting future cash flows as the non-abnormal component of current accruals. This result is consistent with Dechow (1994), who concludes that:”manipulation of accruals is of second-order importance and the first-order effect of the accrual process is to produce a summery measure that more closely reflects firm performance (p. 28)”. Overall, the results from hypothesis 6.2 suggest that abnormal accruals do not reflect earnings management. However, one cannot conclude that abnormal accruals are not used for earnings management.

6.4.4 Test of H6.3: The level of net operating assets (NOA) is informative for the prediction of future cash flow dependent on the level of accrual quality

Hirshleifer et al. (2004) consider the level of NOA balance sheet bloat. Table 6.6 examines the relation between accrual quality and relevance of the level of net operating assets for predicting future cash flows. More specifically, table 6.6 examines if the quality of accruals affects the extent that accruals on the balance sheet, i.e. the level of NOA, are relevant in
predicting future cash flows. Panel A of table 6.6 shows that NOA is incremental to current cash flows in predicting cash flows. The coefficient is 0.063 with a t-stat of 24.20. This result suggests that the amount of accruals on the balance sheet is informative in predicting future cash flows. Combining the level of NOA with the change in NOA in equation 6.2 yields a higher explanatory power, and shows that the level of NOA is incremental to the change in NOA in predicting future cash flows. This is inconsistent with Hirshleifer et al. (2004), who argue that the level of NOA is a predictor of lower future stock returns.

Table 6.6 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year’s cash flow from operations on this year’s cash flow from operations and net operating assets

Equation 6.2: \( CFO_{t+1} = \alpha_0 + \delta_1 CFO_t + \delta_2 NOA_t + \delta_3 \Delta NOA_t + \epsilon_t \)

Panel A: Estimation results for entire sample

<table>
<thead>
<tr>
<th>Intercept, t</th>
<th>CFO_t</th>
<th>NOA_t</th>
<th>( \Delta NOA_t )</th>
<th>Adj. ( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coeff</td>
<td>0.051</td>
<td>0.381</td>
<td></td>
<td>0.178</td>
</tr>
<tr>
<td>t-stat</td>
<td>(12.99)</td>
<td>(17.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>-0.009</td>
<td>0.365</td>
<td>0.063</td>
<td>0.207</td>
</tr>
<tr>
<td>t-stat</td>
<td>(-1.95)</td>
<td>(17.46)</td>
<td></td>
<td>(24.20)</td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.046</td>
<td>0.433</td>
<td>0.157</td>
<td>0.205</td>
</tr>
<tr>
<td>t-stat</td>
<td>(12.29)</td>
<td>(22.32)</td>
<td></td>
<td>(26.77)</td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.000</td>
<td>0.411</td>
<td>0.050</td>
<td>0.223</td>
</tr>
<tr>
<td>t-stat</td>
<td>(0.03)</td>
<td>(21.46)</td>
<td></td>
<td>(20.56)</td>
</tr>
</tbody>
</table>

Panel B: Estimation results for deciles of AQ_score

<table>
<thead>
<tr>
<th>Intercept, t</th>
<th>CFO_t</th>
<th>NOA_t</th>
<th>( \Delta NOA_t )</th>
<th>Adj. ( R^2 )</th>
<th>AQ_score decile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coeff</td>
<td>-0.039</td>
<td>0.364</td>
<td>0.073</td>
<td>0.182</td>
<td>2</td>
</tr>
<tr>
<td>t-stat</td>
<td>(-5.83)</td>
<td>(11.29)</td>
<td>(8.82)</td>
<td>(9.29)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.002</td>
<td>0.320</td>
<td>0.044</td>
<td>0.145</td>
<td>1</td>
</tr>
<tr>
<td>t-stat</td>
<td>(0.14)</td>
<td>(9.45)</td>
<td>(3.74)</td>
<td>(5.09)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>-0.004</td>
<td>0.336</td>
<td>0.055</td>
<td>0.147</td>
<td>3</td>
</tr>
<tr>
<td>t-stat</td>
<td>(-0.46)</td>
<td>(9.89)</td>
<td>(5.56)</td>
<td>(6.96)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.02</td>
<td>0.36</td>
<td>0.03</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(4.33)</td>
<td>(10.92)</td>
<td>(3.85)</td>
<td>(6.62)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.030</td>
<td>0.389</td>
<td>0.028</td>
<td>0.128</td>
<td>4</td>
</tr>
<tr>
<td>t-stat</td>
<td>(5.34)</td>
<td>(17.13)</td>
<td>(4.55)</td>
<td>(7.56)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.031</td>
<td>0.459</td>
<td>0.021</td>
<td>0.130</td>
<td>5</td>
</tr>
<tr>
<td>t-stat</td>
<td>(3.83)</td>
<td>(14.75)</td>
<td>(2.62)</td>
<td>(4.12)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.030</td>
<td>0.427</td>
<td>0.027</td>
<td>0.086</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(3.74)</td>
<td>(13.95)</td>
<td>(3.75)</td>
<td>(5.38)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.037</td>
<td>0.588</td>
<td>0.004</td>
<td>0.094</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(5.41)</td>
<td>(19.83)</td>
<td>(0.759)</td>
<td>(3.75)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.018</td>
<td>0.664</td>
<td>0.014</td>
<td>0.049</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(2.78)</td>
<td>(33.03)</td>
<td>(2.23)</td>
<td>(1.89)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.008</td>
<td>0.763</td>
<td>0.012</td>
<td>0.057</td>
<td>7</td>
</tr>
<tr>
<td>t-stat</td>
<td>(0.91)</td>
<td>(37.98)</td>
<td>(1.60)</td>
<td>(3.87)</td>
<td></td>
</tr>
</tbody>
</table>

101
Table 6.6 continued

### Panel C: Parameter tests by Year

<table>
<thead>
<tr>
<th></th>
<th>All firms</th>
<th>AQ_Score=1</th>
<th>AQ_Score=10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Yrs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implied by Result</td>
<td>NOA &gt; CFO</td>
<td>NOA &gt; CFO</td>
<td>NOA &gt; CFO</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OR NOA = CFO</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OR NOA &lt; CFO</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
</tbody>
</table>

Tests based on significance level of p-value < 0.01

The sample consists of 46423 firm-year observations from 1972 to 2001. Table 6.1 provides the definitions for all variables.

Panel B of table 6.6 shows the results for different levels of accrual quality. For the first decile of accrual quality, i.e. the decile with the lowest accrual quality, the coefficient on NOA is 0.073 (with a t-stat of 8.82) and the coefficient on ΔNOA is 0.182 (with a t-stat of 9.29). Both variables are incremental to cash flow from operations (0.364 with t-stat of 11.29) with the explanatory power of the model of 20%. For the tenth decile of accrual quality, i.e. the decile with the highest accrual quality, the coefficient on NOA is 0.012 (with a t-stat of 1.60) and is not significant in explaining future cash flows. The change in net operating assets, ΔNOA (0.057 with t-stat of 3.87), is still incremental to cash flow from operations (0.763 with t-stat of 37.98) to current cash flow, but less than a third of the relevance of decile 1 with the lowest accrual quality. Cash flow from operations for the decile with the highest accrual quality (0.763 with t-stat of 37.98) is twice the value compared to the decile with the lowest accrual quality (0.364 with t-stat of 11.29) with the explanatory power of the model of 44%, which is more than double the explanatory power of decile 1. The deciles do not change in a monotonic nature, however, the results move in the predicted direction. This is consistent with the results of table 6.3.

Panel C of table 6.6 shows results for annual F-tests of equality of the coefficients. When comparing the coefficient on NOA with the coefficient on cash flows, the results indicate that for the entire sample of firms, cash flow is significantly higher than NOA in all 26 years. However, when partitioning on the level of accrual quality, the results show that for the lowest decile of accrual quality, the coefficient on NOA does not differ significantly from cash flow in 14 of the 26 years, indicating that when accrual quality is low, NOA is as
relevant in predicting future cash flows as current cash flow. This result suggests that NOA is not to be ‘considered balance sheet bloat’ perse. For the decile with the highest accrual quality, this finding is reversed. Cash flow is again significantly higher in predicting future cash flows in all 26 years, consistent with the findings in hypothesis 6.1. Combining this result with the low significance of NOA for decile 10, this result can be explained by the fact that when the firm is in a steady state, the information on the balance sheet is not needed for the prediction of future cash flows. However, when accrual quality is low, the level of NOA can be informative.

When comparing the coefficient on NOA with the coefficient on the change in NOA, i.e. total accruals, it appears that the change in NOA is more informative than the level of NOA in predicting future cash flows. When deciles of accrual quality are formed, the results indicate that accrual quality does not affect the relevance of accruals on the balance sheet compared to accruals in the income statement. The results are similar for the low accrual quality decile and the high accrual quality decile.

The results for Hypothesis 6.3 show that NOA does not necessarily reflect balance sheet bloat. NOA can assist in predicting future cash flows dependent on the quality of accruals. The incremental power of NOA declines as accrual quality increases. This result may seem counter intuitive, but can be explained by the increase in cash flow persistence for higher levels of accrual quality. Accrual quality is the extent in which accruals are converted into cash. Since NOA are anticipated cash flows, when accrual quality is low, current cash flow is less a function of accruals being converted into realized cash flows than when accrual quality is high. When accruals are not converted into cash flows, they remain on the balance sheet. Current cash flow is not indicative of assets being converted in cash, and is assumed to be less likely to persist. That is, current cash flow does not fully reflect the cash generating ability of accruals. NOA are then informative incremental to cash flows in predicting future cash flows when accrual quality is low, because the level of NOA is indicative of the amount of unrealized cash flows that potentially will be converted in cash. However, when accrual quality is high, accruals are expected to be converted into cash with higher certainty. Accruals that are not converted in to cash when accrual quality is high are put on the balance sheet as balance sheet bloat. Thus, accrual quality determines in part the extent that net operating assets can be considered balance sheet bloat. Unreported results show that the results are similar when the level of NOA is further decomposed in long term accruals, current accruals and abnormal accruals.
6.5 Robustness Tests

The results reported in the previous section indicate that the ability of earnings, decomposed in cash flows and accruals, to predict future cash flows is dependent on the quality of accruals. In this subsection, I show that this result is robust with respect to different definitions of accrual quality, cash flow and accruals.

6.5.1 The Dechow and Dichev (2002) measure of Accrual Quality

In the previous section, I examined the effect of accrual quality on the predictive ability of future cash flows. The accrual quality measure used in the tests is based on a composite score of firm characteristics that Dechow and Dichev (2002) show to be related to accrual quality. In this section I check if the accrual measure is robust to the regression based method of Dechow and Dichev (2002) that is examined in previous research (e.g. Dechow and Dichev, 2002; Francis et al., 2005; Francis et al., 2006). In the Dechow and Dichev model, accrual quality is measured by the extent to which working capital accruals map into operating cash flow realizations, where a poor match signifies low accrual quality. This model is predicated on the idea that, regardless of management intent, accruals quality is affected by the measurement error in accruals. Intentional estimation error arises from incentives to manage earnings, and unintentional error arises from management lapses and environmental uncertainty; however, the source of the error is irrelevant in this approach (Francis et al., 2005). The empirical measure of accrual quality is the residual from a regression of changes in working capital on past, present, and future operating cash flows. The residual from this regression is a measure of accrual estimation errors. These residuals are unrelated to cash flow realizations, and include the estimation errors and their reversals. The standard deviation of these residuals is the firm-specific measure of quality of accruals (Accrual_Quality), where a higher standard deviation signifies lower quality. Following Francis et al. (2005, 2006), I estimate the following model:

\[ TCA_{jt} = \beta_{0,j} + \beta_{1,j} CFO_{jt-1} + \beta_{2,j} CFO_{jt} + \beta_{3,j} CFO_{jt+1} + \beta_{4,j} \Delta Sales_{jt} + \beta_{5,j} PPE_{jt} + \nu_{jt} \]  
(6.9)

Where: \( TCA_{jt} \) is total current accruals, \( CFO_{jt} \) is cash from operations, \( \Delta Sales_{jt} \) = change in sales and \( PPE_{jt} \) is property, plant, and equipment. Variables are defined as follows:
$TCA_{jt} = \text{total current accruals. Accruals are calculated from the balance sheet as follows: } \left( \Delta CA_{jt} - \Delta Cash_{jt} \right) - \left( \Delta CL_{jt} - \Delta STDebt_{jt} \right)$;

$\Delta CA_{jt} = \text{change in current assets (Compustat data item # 4 );}$

$\Delta Cash_{jt} = \text{change in cash/cash (Compustat data item # 1 );}$

$\Delta CL_{jt} = \text{change in current liabilities(Compustat data item # 5 );}$

$\Delta STDebt_{jt} = \text{change in debt included in current liabilities (Compustat data item # 34 );}$

$CFO_{jt} = \text{cash flow from operations, calculated as: } \text{NI}_{jt} - TA_{jt};$

$NI_{jt} = \text{net income before extraordinary items (Compustat #18);}$

$TA_{jt} = \text{total accruals, are calculated from the balance sheet as calculated as: } \left( \Delta CA_{jt} - \Delta Cash_{jt} \right) - \left( \Delta CL_{jt} - \Delta STDebt_{jt} \right) - \text{DEPN}_{jt}$

$\text{DEPN}_{jt} = \text{depreciation and amortization expense (Compustat data item # 14);}$

$PPE_{jt} = \text{property, plant, and equipment (Compustat item #7);}$

$\Delta Sales_{jt} = \text{change in sales (Compustat item #12);}$

I estimate equation (6.9) annually for each industry based on the 2 digit SIC-industry code. Annual cross-sectional estimations of equation (6.9) yield firm- and year-specific residuals, which form the basis for the accrual quality metric: $Accrual\_Quality_{jt} = \sigma(v)$. That is, Accrual\_Quality is the negative of the standard deviation of firm j’s residuals, $\sigma (v)$, calculated over years $t - 4$ through $t$. Larger standard deviations of residuals indicate poorer accruals quality.

The results in table 6.7 only partly show that the accrual quality score used in the tests in the previous section is related to the Dechow and Dichev (2002) accrual quality measure. Table 6.7 reports results for the cash flow prediction model using the Dechow and Dichev (2002) regression-based method to measure accrual quality. For the persistence of cash flows, results are qualitatively similar to results in table 6.3. That is, there is a rise in cash flow persistence from the decile with the lowest accrual quality to the decile with the highest accrual quality. However, for the coefficient on total accruals, i.e. $\Delta NOA_t$, the results in table 6.7 are not robust to the prior results. That is, table 6.7 reports that the incremental relevance of remains constant for all levels of accrual quality. This is inconsistent with the results in table 6.3, which show a decrease in the incremental relevance of accruals from decile 1 to decile 10.

The difference in results can be explained by the fact that Dechow and Dichev (2002) define accrual quality in terms of the relation between accruals and cash flows. Their definition does not distinguish among the various factors that influence this relation, such as the uncertainty in the firm’s environment, the ability of management, the extent to which accruals are manipulated, factors that may be correlated to the residual in their accrual model.
For instance, as stated by Dechow and Dichev (2002), their accrual quality measure may not only be related to business activity, but “is also likely to be related to variables capturing managerial skill and managerial opportunism (p. 46)”. These factors potentially explain the differences in results. The accrual quality score potentially mitigates this problem, examining the state of the firm in relation to the prediction of future cash flows. Second, their accrual measure is based on the relation between current accruals and cash flows in the three adjacent periods. It does not take into account long term accruals and long series of cash flows. However, I examine the effect of all total accruals on cash flows, so using the Dechow and Dichev (2002) may not fully reflect the effect of accrual quality on the prediction of future cash flows.

Table 6.7 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year’s cash flow from operations on this year’s cash flow from operations and net operating assets

\[ \text{Equation 6.2: } CFO_{t+1} = \alpha_0 + \delta_1 CFO_{t} + \delta_2 \Delta NOA_t + \nu_t \]

<table>
<thead>
<tr>
<th>Decile</th>
<th>Intercept ( \nu_t )</th>
<th>CFO_t</th>
<th>( \Delta NOA_t )</th>
<th>Adj. R²</th>
<th>Accrual Quality Decile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coeff</td>
<td>0.026</td>
<td>0.346</td>
<td>0.125</td>
<td>0.155</td>
<td>1</td>
</tr>
<tr>
<td>t-stat</td>
<td>(6.82)</td>
<td>(10.16)</td>
<td>(6.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.040</td>
<td>0.410</td>
<td>0.185</td>
<td>0.165</td>
<td>2</td>
</tr>
<tr>
<td>t-stat</td>
<td>(12.97)</td>
<td>(18.38)</td>
<td>(8.36)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.051</td>
<td>0.377</td>
<td>0.140</td>
<td>0.135</td>
<td>3</td>
</tr>
<tr>
<td>t-stat</td>
<td>(13.62)</td>
<td>(12.37)</td>
<td>(8.20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.051</td>
<td>0.418</td>
<td>0.167</td>
<td>0.159</td>
<td>4</td>
</tr>
<tr>
<td>t-stat</td>
<td>(13.38)</td>
<td>(15.55)</td>
<td>(8.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.051</td>
<td>0.438</td>
<td>0.181</td>
<td>0.148</td>
<td>5</td>
</tr>
<tr>
<td>t-stat</td>
<td>(12.01)</td>
<td>(12.05)</td>
<td>(9.29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.053</td>
<td>0.463</td>
<td>0.197</td>
<td>0.180</td>
<td>6</td>
</tr>
<tr>
<td>t-stat</td>
<td>(13.36)</td>
<td>(14.93)</td>
<td>(8.53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.051</td>
<td>0.473</td>
<td>0.184</td>
<td>0.178</td>
<td>7</td>
</tr>
<tr>
<td>t-stat</td>
<td>(11.17)</td>
<td>(15.40)</td>
<td>(7.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.056</td>
<td>0.435</td>
<td>0.142</td>
<td>0.193</td>
<td>8</td>
</tr>
<tr>
<td>t-stat</td>
<td>(12.42)</td>
<td>(12.16)</td>
<td>(7.94)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.043</td>
<td>0.571</td>
<td>0.130</td>
<td>0.223</td>
<td>9</td>
</tr>
<tr>
<td>t-stat</td>
<td>(7.07)</td>
<td>(11.88)</td>
<td>(5.78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>0.045</td>
<td>0.507</td>
<td>0.129</td>
<td>0.214</td>
<td>10</td>
</tr>
<tr>
<td>t-stat</td>
<td>(8.69)</td>
<td>(10.34)</td>
<td>(4.14)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The sample consists of 46423 firm-year observations from 1972 to 2001. Table 6.1 provides the definitions for all variables. Accrual Quality is determined as the negative of standard deviation of the residual of annual regressions by 2-digit SIC code industry of the following model:

\[ TCA_t = \beta_{0j} + \beta_{1j} CFO_{j,t-1} + \beta_{2j} CFO_{j,t} + \beta_{3j} CFO_{j,t+1} + \beta_{4j} \Delta Sales_{j,t} + \beta_{5j} PPE_{j,t} + \nu_h \]
6.5.2 Tests of different accrual quality measures

The composite score is based on a simple summation of the firm characteristic score. However, it is possible that certain firm characteristics have a somewhat similar effect on the accrual quality. For instance, firms with a high sales volatility may also have high cash flow volatility, following the sales process. Therefore, I perform a factor analysis of the firm characteristics to generate an accrual quality factor score, FactorAQ. The factor score is based on the principal components estimation of the firm characteristics under each factor. The factor analysis technique maximizes commonalities within a group (i.e., a factor) and minimizes commonalities among groups. Hence, I implicitly assume that scores for a firm characteristic that fall under one factor tend to occur more often with scores for other firm characteristics that load on that factor but are less likely to occur with scores on firm characteristics that fall under another factor.

The results in table 6.8 show that the factor analysis yields two factors with eigenvalues greater than one, which I call Factor 1 and Factor 2. Of the 7 firm characteristics that determine accrual quality, 5 exhibit strong loadings on Factor 1. These characteristics are sales volatility, earnings volatility, cash flow volatility, accrual volatility and firm size. Only one firm characteristic loads on Factor 2. This is the operating cycle, and it should be noted that this characteristic does not load on Factor 1. Negative earnings does not load on either factor, but is included for comparability with Dechow and Dichev (2002). Together, these two factors account for 54.68% of the variance in my sample.

To compare the factor score to the other accrual quality scores, I also perform a principal components estimation of the firm characteristics constrained to one factor. Constraining the analysis to one factor yields FactorAQ, with an eigenvalue of 2.782. Operating cycle does not load on FactorAQ, however, combining these characteristics yield the highest correlation with the other accrual quality scores.
Table 6.8 Factor Loadings using Principal Components Method with Varimax Rotations

**Panel A: Factor loadings**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor Loadings</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales volatility</td>
<td>0.5998</td>
<td>-0.4038</td>
<td></td>
</tr>
<tr>
<td>Earnings volatility</td>
<td>0.7726</td>
<td>0.0453</td>
<td></td>
</tr>
<tr>
<td>Cash flow volatility</td>
<td>0.8785</td>
<td>0.1002</td>
<td></td>
</tr>
<tr>
<td>Total Accruals volatility</td>
<td>0.7852</td>
<td>0.1286</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>-0.6323</td>
<td>-0.1303</td>
<td></td>
</tr>
<tr>
<td>Log Operating cycle</td>
<td>0.1165</td>
<td>0.9242</td>
<td></td>
</tr>
<tr>
<td>Negative Earnings</td>
<td>-0.0802</td>
<td>-0.0018</td>
<td></td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>2.765</td>
<td>1.063</td>
<td></td>
</tr>
<tr>
<td>Cumulative percentage of variation explained (%)</td>
<td>0.3950</td>
<td>0.5468</td>
<td></td>
</tr>
<tr>
<td>Incremental percentage of variation explained (%)</td>
<td>0.3950</td>
<td>0.1518</td>
<td></td>
</tr>
</tbody>
</table>

**Panel B: Factor loadings**

<table>
<thead>
<tr>
<th>Factor AQ</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales volatility</td>
<td>0.5566</td>
</tr>
<tr>
<td>Earnings volatility</td>
<td>0.7733</td>
</tr>
<tr>
<td>Cash flow volatility</td>
<td>0.8842</td>
</tr>
<tr>
<td>Total Accruals volatility</td>
<td>0.7941</td>
</tr>
<tr>
<td>Size</td>
<td>-0.6422</td>
</tr>
<tr>
<td>Log Operating cycle</td>
<td>0.2080</td>
</tr>
<tr>
<td>Negative Earnings</td>
<td>-0.0799</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>2.782</td>
</tr>
</tbody>
</table>

Factor loadings exceeding .5 are identified in bold.

The sample consists of 42,756 firm-year observations from 1972 to 2001. Variables Measurement: Total Assets= Compustat data item (Compustat item # 6); Size= log of Total Assets; Sales volatility= the standard deviation of Sales (Compustat item # 12), from years t-4 to t; Earnings volatility= the standard deviation of Net Earnings before Extraordinary Items (Compustat item #18), from years t-4 to t; Cash flow volatility= the standard deviation of Cash flow from operations, as defined in table 1, from years t-4 to t; Accruals volatility= the standard deviation of Total Accruals, as defined in table 1, from years t-4 to t; Operating cycle= firm j’s operating cycle in days; Negative Earnings= incidence of negative earnings; Net income = Net Earnings before Extraordinary Items (Compustat item #18); CFO = Net Income / TA; TA = Total Accruals = (ΔCA_t - ΔCash_t) - (ΔCL_t - ΔSTDebt_t) + DEPN_t; ΔCA_t = change in current assets (Compustat data item # 4); ΔCash_t = change in cash/cash (Compustat data item # 1); ΔCL_t = change in current liabilities (Compustat data item # 5); ΔSTDebt = change in debt included in current liabilities (Compustat data item # 13); DEPN = depreciation and amortization expense (Compustat data item # 14).

The correlations in table 6.9 show that the composite accrual quality measure AQ_score is related to the accrual quality measure used in previous research. The Pearson (Spearman) correlation between Accrual_Quality and AQ_Score is 0.53 (0.58) and highly significant. The correlation between Accrual_Quality and FactorAQ is even higher at 0.64 (0.62), with Factor...
1 and Factor 2 also having statistically significant correlation. Overall, the results indicate that my accrual quality measure is comparable to the accrual measure used in previous research.

Table 6.9 Correlation matrix of Accrual Quality measures- Pearson (Spearman) Correlation Coefficients in the Lower (Upper) Diagonal (p-values shown in parentheses below correlations)

<table>
<thead>
<tr>
<th></th>
<th>Accrual Quality</th>
<th>AQ_score</th>
<th>FactorAQ</th>
<th>Factor1</th>
<th>Factor2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accrual_Quality</td>
<td>- 0.5761</td>
<td>0.6247</td>
<td>0.6171</td>
<td>0.2010</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>AQ_score</td>
<td>0.5333</td>
<td>- 0.8975</td>
<td>0.8836</td>
<td>0.3088</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>FactorAQ</td>
<td>0.6408</td>
<td>0.8092</td>
<td>- 0.9968</td>
<td>0.1742</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Factor1</td>
<td>0.6336</td>
<td>0.7950</td>
<td>0.9950</td>
<td>- 0.1073</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Factor2</td>
<td>0.1364</td>
<td>0.1827</td>
<td>0.0996</td>
<td>0.0000</td>
<td>- (0.0000)</td>
</tr>
</tbody>
</table>

Variable Measurement: Accrual Quality= the standard deviation of firm j’s residuals, from years t-4 to t from firm-specific estimations of the modified Dechow- Dichev (2002) model; AQ Score= composite score of accrual quality score on firm characteristics. FactorAQ= Factor loadings using Principal Components Method constrained to one factor; Factor 1 and 2 are factor loadings using Principal Components Method.

6.5.3 Definition of Total Accruals

For the tests, I use the change in net operating assets as the measure of total accruals, as suggested by Richardson et al. (2005). For comparability with previous research, I also run equation 6.2 with the conventional definition of total accruals (e.g. Sloan (1996), where total accruals is defined as: \( TA_{jt} = \) total accruals, calculated from the balance sheet as calculated as

\[
(\Delta CA_{j,t} - \Delta Cash_{j,t}) - (\Delta CL_{j,t} - \Delta STDebt_{j,t}) - DEPN_{jt}
\]

where:

\( \Delta CA_{j,t} \) = change in current assets (Compustat data item # 4);
\( \Delta Cash_{j,t} \) = change in cash/cash (Compustat data item # 1);
\( \Delta CL_{j,t} \) = change in current liabilities (Compustat data item # 5);
\( \Delta STDebt_{j,t} \) = change in debt included in current liabilities (Compustat data item # 34);
\( DEPN_{j,t} \) = depreciation and amortization expense (Compustat data item # 14).

The results in table 6.10 show that my results are not affected by using different definitions of total accruals.
Table 6.10 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year’s cash flow from operations on this year’s cash flow from operations and net operating assets

Equation 6.2: \( \text{CFO}_{t+1} = \alpha_0 + \delta_1 \text{CFO}_t + \delta_2 \text{Total Accruals}_t + \nu_t \)

Panel A: Estimation results for entire sample

| Intercept, CFO, Total Accruals, Adj. \( R^2 \) |
|------------------|------------------|------------------|------------------|
| **Mean Coeff**   | 0.059            | 0.599            | 0.565            |
| **t-stat**       | (31.41)          | (53.64)          | (34.33)          |

Panel B: Estimation results for deciles of AQ-score

| Intercept, CFO, Total Accruals, Adj. \( R^2 \), AQ-score |
|------------------|------------------|------------------|------------------|------------------|
| **Mean Coeff**   | 0.040            | 0.512            | 0.553            | 0.261            |
| **t-stat**       | (11.10)          | (19.95)          | (19.07)          | (13.07)          |
| **Mean Coeff**   | 0.056            | 0.500            | 0.579            | 0.250            |
| **t-stat**       | (19.02)          | (16.61)          | (17.27)          | (15.33)          |
| **Mean Coeff**   | 0.060            | 0.522            | 0.577            | 0.238            |
| **t-stat**       | (22.04)          | (15.33)          | (16.72)          | (12.80)          |
| **Mean Coeff**   | 0.06             | 0.53             | 0.54             | 0.196            |
| **t-stat**       | (19.76)          | (13.91)          | (13.07)          | (11.22)          |
| **Mean Coeff**   | 0.066            | 0.548            | 0.480            | 0.196            |
| **t-stat**       | (26.94)          | (16.67)          | (8.77)           | (8.13)           |
| **Mean Coeff**   | 0.062            | 0.674            | 0.641            | 0.235            |
| **t-stat**       | (14.73)          | (15.22)          | (11.08)          | (12.80)          |
| **Mean Coeff**   | 0.063            | 0.636            | 0.528            | 0.214            |
| **t-stat**       | (22.80)          | (21.85)          | (12.78)          | (12.80)          |
| **Mean Coeff**   | 0.050            | 0.807            | 0.593            | 0.325            |
| **t-stat**       | (14.79)          | (23.14)          | (13.81)          | (13.81)          |
| **Mean Coeff**   | 0.035            | 0.892            | 0.517            | 0.378            |
| **t-stat**       | (17.62)          | (25.31)          | (8.13)           | (8.13)           |
| **Mean Coeff**   | 0.025            | 0.893            | 0.307            | 0.463            |
| **t-stat**       | (12.70)          | (40.98)          | (7.27)           | (7.27)           |

The sample consists of 46423 firm-year observations from 1972 to 2001. Variables Measurement: \( \text{CFO} \equiv \text{NI}_t - \text{TA}_t \); \( \text{NI}_t \), Net Income Before Extraordinary Items (Compustat data item 18); \( \text{TA}_t \equiv (\Delta \text{CA}_t - \Delta \text{Cash}_t) - (\Delta \text{CL}_t - \Delta \text{STDebt}) - \text{DEPN}_t \); \( \Delta \text{CA}_t = \text{change in current assets (Compustat data item # 4)} \); \( \Delta \text{Cash}_t = \text{change in cash/cash (Compustat data item # 1)} \); \( \Delta \text{CL}_t = \text{change in current liabilities (Compustat data item # 5) \}; \( \Delta \text{STDebt} = \text{change in debt included in current liabilities (Compustat data item # 34) \}; \( \Delta \text{DEPN} = \text{depreciation and amortization expense (Compustat data item # 14)} \); \( \text{AQ Score} = \text{composite score of accrual quality score on firm characteristics. All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.} \)
6.5.4 Definition of net operating assets

In my test for the predictive ability of NOA for future cash flows, I used the definition of NOA used by Fairfield et al. (2003). Fairfield et al. (2003) calculate NOA by summarizing all assets and liabilities on the balance sheet. This differs from the definition used by Hirschleifer et al. (2004), who calculate NOA by subtracting financial assets and financial liabilities and equity from total assets. For comparability with Hirschleifer et al. (2004), I re-estimate the regressions with the Hirschleifer et al. (2004) definition of NOA. The results in table 6.11 show that the difference in definitions does not affect my results.

Table 6.11 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year’s cash flow from operations on this year’s cash flow from operations and net operating assets

| Equation 6.2: $CFO_{t+1} = \alpha_0 + \delta_1 CFO_t + \delta_2 NOA_t + \delta_3 \Delta NOA_t + \nu_t$ |
|-----------------|----------------|---------|----------|-----------|-------------|
| Intercept       | CFO           | NOA     | ANOA     | Adj. $R^2$ | AQ Score Decile |
| Mean Coef       | 0.014         | 0.427   | 0.049    | 0.167     | 0.221         | All firms |
| t-stat          | (3.04)        | (28.00) | (8.57)   | (15.18)   |              |
| Mean Coef       | -0.045        | 0.352   | 0.109    | 0.195     | 0.190         | 1         |
| t-stat          | (-4.62)       | (13.11) | (7.46)   | (7.07)    |              |
| Mean Coef       | 0.028         | 0.745   | -0.005   | 0.076     | 0.442         | 10        |
| t-stat          | (3.69)        | (46.88) | (-0.49)  | (4.19)    |              |

The sample consists of 46423 firm-year observations from 1972 to 2001. Variable Measurement: NOA= Net Operating Assets = (TAj,t - Cashj,t) - (TAj,t - STDebtj,t - LTDj,t - PSj,t - CEj,t); TAj,t= Total Assets (Compustat data item # 6); ΔCashj,t= change in cash/cash (Compustat data item # 1); ΔSTDebtj,t= change in debt included in current liabilities (Compustat data item # 34); LTDj,t= Long Term Debt (Compustat data item # 9); PSj,t= Preferred Stock (Compustat data item # 130); CEj,t= Common Equity (Compustat data item # 60); CFOj,t= Net Incomej,t - TAj,t; TA= Total Accruals= (ΔCAj,t - ΔCashj,t) - (ΔCLj,t - ΔSTDebtj,t) - DEPNj,t; ΔCAj,t= change in current assets (Compustat data item # 4); ΔCashj,t= change in cash/cash (Compustat data item # 1); ΔCLj,t= change in current liabilities (Compustat data item # 5); ΔSTDebtj,t= change in debt included in current liabilities (Compustat data item # 34); DEPNj,t= depreciation and amortization expense (Compustat data item # 14); AQ Score= composite score of accrual quality score on firm characteristics. All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

6.5.5 Is accrual quality related to future cash flows?

The first hypothesis is based on the premise that high accrual quality indicates persistent cash flows, which results in accruals being less relevant in predicting future cash flows. However, it remains an empirical question whether higher accrual quality leads to higher cash flow persistence. In this section I examine if accrual quality is indeed related to higher cash flow persistence. Dechow et al. (2005) investigate whether the persistence of the cash component of earnings is influenced by management’s decision to retain or distribute cash flows. They find that when firms retain the cash flows, the cash component has low persistence almost
identical to that of accruals component of earnings. Only when the cash flows are distributed to equity holders does the cash component of earnings have high persistence.

Dechow et al. (2005) show that the higher persistence of the cash component of earnings is attributable to net cash distributions to equity holders. Therefore, I expect that accrual quality is most attributable to the net cash distributions to equityholders part of free cash flow, indicating that accrual quality is important in determining the cash flow implications of net operating assets.

For testing if accrual quality is related to cash distributions, I use the definitions of free cash flow, cash on the balance sheet and cash distributions to debt holders and equity holders of Dechow et al. (2005). To test for the relation between accrual quality and cash, I run annual cross-sectional regression with time-series standard errors of the following model:

\[
\text{Accrual Quality}_t = \lambda_{0,j} + \lambda_{1,j} \Delta \text{CASH}_j, t + \lambda_{2,j} \text{DIST}_\text{Debt}, t + \lambda_{3,j} \text{DIST}_\text{Equity}, t + \omega_t
\]  \hspace{1cm} (6.10)

Variables are defined as follows:

\[
\Delta \text{CASH}_t = \text{change in the annual cash balance, where cash is defined as cash and short-term investments (Compustat data item #1);}
\]

\[
\text{DIST}_t = \text{annual net distributions to capital providers, defined as DIST}_\text{Equity} + \text{DIST}_\text{Debt};
\]

\[
\text{DIST}_\text{Equity}_t = \text{annual net distributions to equityholders, defined as the reduction in equity plus net income (Compustat data item #18). Equity is calculated as total assets (Compustat data item #6) less total liabilities (Compustat data item #181);}
\]

\[
\text{DIST}_\text{Debt}_t = \text{annual net distributions to debtholders, defined as the reduction in debt. Debt is calculated as long-term debt (Compustat data item #9) plus short term debt (Compustat data item #34).}
\]

Test results are provided in table 6.12, which reports results of Fama-Macbeth (1973) regression with time-series standard errors of equation (6.10). Panel A shows results for regressions of cash components on the AQ_Score. Results of regression 1 indicate that accrual quality is related to cash, with a coefficient of 15.57 (t-stat 26.81). This indicates that the higher the accrual quality, the more cash is generated. Regression 2 shows that the cash that is distributed to debt and equity holders has a higher association with accrual quality than cash on the balance sheet. The results of regression 6.10 indicate that the distribution of cash to equity holders has the highest association with accrual quality of all three cash distributions.
Panel B shows the results for regression 6.10 with the negative of the Dechow and Dichev (2002) accrual quality measure. The dependent variable is the negative of this measure, since high measures of this variable indicate low accrual quality. Results are identical for this measure of accrual quality. The results of hypothesis 6.1 show that high accrual quality is associated with high cash flows.

Table 6.12 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of Accrual Quality and the AQ_score on (different components of) free cash flow

<table>
<thead>
<tr>
<th>Panel A:</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation 6.10:</td>
<td>$AQ_{Score_t} = \lambda_0 + \lambda_1 \Delta CASH_j + \lambda_2 DIST_{Debt} + \lambda_3 DIST_{Equity,t} + \omega_t$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>Cash</td>
<td>Dist_cash</td>
<td>Dist_Debt</td>
<td>Dist_Equity</td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>22.609</td>
<td>15.574</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(210.25)</td>
<td>(26.81)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>23.629</td>
<td>4.333</td>
<td>10.037</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(269.49)</td>
<td>(6.71)</td>
<td>(18.76)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>23.516</td>
<td>5.591</td>
<td>6.403</td>
<td>13.102</td>
</tr>
<tr>
<td>t-stat</td>
<td>(246.69)</td>
<td>(8.91)</td>
<td>(10.40)</td>
<td>(20.98)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B:</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation 6.10:</td>
<td>$Accrual\ Quality_t = \lambda_0 + \lambda_1 \Delta CASH_{t-j} + \lambda_2 DIST_{Debt,t} + \lambda_3 DIST_{Equity,t} + \omega_t$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>Cash</td>
<td>Dist_cash</td>
<td>Dist_Debt</td>
<td>Dist_Equity</td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>-0.034</td>
<td>0.055</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(-27.92)</td>
<td>(16.84)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>-0.031</td>
<td>0.010</td>
<td>0.046</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>(-29.50)</td>
<td>(2.99)</td>
<td>(18.90)</td>
<td></td>
</tr>
<tr>
<td>Mean Coeff</td>
<td>-0.032</td>
<td>0.019</td>
<td>0.024</td>
<td>0.069</td>
</tr>
<tr>
<td>t-stat</td>
<td>(-31.25)</td>
<td>(5.70)</td>
<td>(11.64)</td>
<td>(20.65)</td>
</tr>
</tbody>
</table>

The sample consists of 40730 firm-year observations from 1972 to 2001. Variables Measurement: AQ Score= composite score of accrual quality score on firm characteristics; Accrual Quality= the standard deviation of firm j’s residuals, from years t-4 to t from firm-specific estimations of the modified Dechow- Dichev (2002) model; $\Delta CASH = \text{change in the annual cash balance, where cash is defined as cash and short-term investments (Compustat data item 1)}$; DIST = annual net distributions to capital providers, defined as DIST_EQ + DIST_D; DIST_Debt = annual net distributions to debtholders, defined as the reduction in debt; Debt is calculated as long-term debt (Compustat data item 9) plus short term debt (Compustat data item 34); DIST_Equity = annual net distributions to equityholders, defined as the reduction in equity plus Income NI (Compustat data item 18); Equity is calculated as total assets (Compustat data item 6) less total liabilities (Compustat data item 181); All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

**6.6 Summary and Conclusion**

In this chapter, it is hypothesized that level of accrual quality affects the relative impact of current cash flows and several measures of accruals to predict future cash flows. The results are consistent with this prediction. Earnings are the best predictor for future cash flows. However, when earnings are decomposed into current cash flows and accruals, the predictive
power improves. My results show that when accrual quality is low, cash flow persistence is low, and accruals have high incremental relevance in predicting future cash flows. However, when accrual quality is high, the persistence of cash flows improves, and the relative relevance of accruals is lower than current cash flows in predicting future cash flows.

In this chapter, it is also shown that abnormal accruals are more relevant in predicting future cash flows than non-abnormal accruals. This result suggests that abnormal accruals do not necessarily reflect earnings management. Rather, abnormal accruals could reflect the private information of managers about future cash flows. The results in this chapter also indicate that relevance of abnormal accruals in predicting future cash flow is not related to the accrual quality. This result suggests two things. First, abnormal accruals do not necessarily reflect earnings management. Second, abnormal accruals reflect private information about future cash flows, since higher accrual quality does not diminish the relevance of abnormal accruals in predicting future cash flows like the normal part of accruals, as predicted in hypothesis 6.1. Alternative roles of abnormal accruals could be the transitory estimation error in accruals or earnings management.

Finally, it is shown that the level of net operating assets (NOA) can be relevant in predicting future cash flows. When accrual quality is high, the level of operating assets is not relevant, and current cash flows dominate balance sheet information in the prediction of future cash flows. However, when accrual quality is low, the level of net operating assets can be incrementally relevant to cash flows. Furthermore, it is shown that the level of net operating assets is as relevant in the prediction of future cash flows as the change in net operating assets, irrelevant of accrual quality.

The contribution to the accounting literature made in this chapter is to show how the state of the firm impacts the relevance of financial accounting. In particular, it is shown that when firms are not in a steady state, accruals can be relevant for the prediction of future cash flows. This is consistent with the accounting literature (e.g. Dechow, 1994). However, I also show that the state of the firm affects the cash flow persistence. This finding has, to my knowledge, not been shown empirically until now.

My results also contribute to the earnings management literature. I show that abnormal accruals measure more than just earnings management. My results indicate that abnormal accruals reflect the private information of managers about future cash flows. This is consistent with Subramanyam (1996) and Demski (1998). However, due to the nature of the tests, one cannot conclude that earnings management is not a factor in abnormal accruals. Future research can use my results to examine the role of abnormal accruals in financial accounting and the relation between abnormal accruals and earnings quality.
Chapter 7 Growth and the role of Accounting Accruals

7.1 Introduction

In this chapter I examine the effect of growth on accounting accruals. Accounting is fundamentally linked to underlying economics. Growth of a firm seems to affect the accrual accounting process. Growing firms are typically firms with large positive accruals relative to their asset base, while firms with large negative accruals (value firms) are typically firms that are exiting businesses and are in a state of decline. Accruals for growing firms have an income statement perspective, focusing on revenue recognition and the matching of costs with revenues. Value firms however, use accruals from a balance sheet perspective, where the focus is on changes in the value of assets, as reflected in earnings. The difference in accounting perspective is presumably driven by differences in the historical emphasis on reliability and conservatism in accounting (Dechow and Ge, 2006).

I examine the systematic differences in the relation between accruals and cash flows for high growth firms and low growth firms (value firms) (Skinner and Sloan, 2002). I argue that the role of accruals in reducing the noise in cash flows to produce earnings is different for growth firms and value firms. Furthermore, accruals have a prominent place in earnings management research. I predict that the effect of growth on accruals causes a systematic difference in accrual based measures for earning management research. My results confirm that the relation between accruals and cash flows is affected by growth, and that this causes a bias in accrual based measures for earnings management. Thus, my results enhance the understanding of accruals and the role accruals can play in the financial reporting process.

Accruals are used to smooth temporary fluctuations of cash flows in earnings, i.e. the noise reducing role of accruals. There is a difference in accounting perspective for accruals that is likely to be dependent on the life cycle the company is in. The role of accruals is therefore hypothesized to be different for growth firms and value firms. I show that there are systematic differences in accrual accounting between growth firms and value firms. Using a standard cash flow model (Ball and Shivakumar, 2006) to examine the relation between accruals and cash flows for growth firms and value firms, I show that the noise reducing role of accruals is less prevalent for growth firms, and more prevalent for value firms on average. This is consistent with business activity effecting accruals.

I then examine the effect of growth on accrual based measures for earnings management. Accruals have attracted substantial attention from researchers studying earnings

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59 The difference in perspective is the result of the demand for reporting quality. Following Ball and Shivakumar (2005), I interpret reporting quality in abstract terms as the usefulness of financial statements to investors, creditors, managers and all other parties contracting with the firm.
management and earnings quality. While accruals are used to adjust cash flow from operations to present the earnings of a company over a specific time frame, accruals can also be used by management to manage earnings in a certain direction. For instance, management can show higher revenues by generating additional sales on bad credit or creating questionable receivables as an accrual to show higher earnings.

In the symmetric Dechow (1994) view of accruals, high-quality accrual accounting reduces the variance of earnings, conditional on the variance of cash flows. However, since growth causes adjustments in the accruals process, growth actually increases the variance in earnings without partitioning on earnings management, as the noise reducing role of accruals is significantly lower for growth firms. This would suggest that accrual-based measures, which are for instance used in earnings management research, would behave differently for growth firms and value firms in a systematic fashion, causing a bias in accrual based earnings management measures.

I examine the effect of growth on earnings management measures that examine the relation between cash flow and aggregate accruals (e.g. Leuz et al., 2003). I argue that these measures are also systematically affected by growth. However, this effect is not expected to be isolated to aggregate accrual models. As McNichols (2000) shows, specific accruals are also often examined in earnings management research. Therefore, I also examine the effect of growth on specific accrual measures of earnings management. My results indicate that measures which examine the relation between earnings, cash flow and aggregate accruals are also related to growth. The contemporaneous correlation between changes in accounting accruals and changes in operating cash flows is significantly lower for high growth firms compared to value firms, as is the magnitude of accruals relative to cash flows (Leuz et al., 2003). This is consistent with the results in the first hypothesis, which show that accruals are used to a lesser extent to ameliorate transitory cash flows for growth firms than for value firms. Growth also affects measures of unexpected specific accruals, which furthers shows that growth can be an omitted correlated variable in earnings management research.

My analysis makes the following contributions. First, the research adds to the insights of the function of accounting accruals, which occupy a central position in financial reporting. I show that the noise reducing role of accruals demonstrated by Dechow (1994) is less prevalent for growth firms than for value firms. As a result, earnings will be more volatile for growth firms, than for value firms.

Second, my results add to the earnings management literature. Accruals are of great interest for researchers of earnings management and earnings quality. The first hypothesis shows that growth can cause earnings to be more volatile, which could be interpreted as lower quality earnings, even though an incentive for earnings management is absent. I then show
that this effect is also reflected in accrual based earnings management measures. Also, incorrect inferences about earnings management and earnings quality can be drawn from incomplete accruals models. Different models of accruals have been used to examine earnings management. The two most popular research designs are models based on aggregate accruals respectively based on specific accruals models. The most used aggregate accrual model is the Jones (1991) abnormal accrual model (McNichols, 2000; Guay, 2006). Since accruals are related to growth, growing firms are also likely to show discretionary accruals using the Jones accrual models, in spite of the absence of managerial influence. McNichols (2000) for instance shows that growth is related to Jones-model discretionary accruals. Thus, researchers may conclude that earnings management has taken place, where in fact the accrual process is altered as a result of the firm growing, causing discretionary accruals. These results are consistent with assertions that accruals models that are used to show earnings management that do not control for growth may lead to inappropriate conclusions about earnings management (McNichols, 2000). My results caution users of financial statements not to interpret the effect of growth on accruals as earnings management.

The remainder of the chapter is as follows. Paragraph 7.2 develops the hypotheses in this chapter. Paragraph 7.3 describes the data and methodology employed in this research. Paragraph 7.4 discusses the results of my analysis. Paragraph 7.5 discusses the robustness checks of the empirical examination. Paragraph 7.6 Concludes.

7.2 Hypothesis Development

The primary product of financial reporting is net income or earnings as a measure of performance. Earnings are the summary measure of firm performance produced under the accrual basis of accounting. Earnings are important since they are used as a summary measure of firm performance by a wide range of users, for instance for executive compensation plans or in debt covenants. The primary role of accruals is to overcome problems with measuring firm performance when firms are in continuous operation. Information asymmetries between management and other contracting parties create a demand for an internally generated measure of firm performance over finite intervals. Reporting realized cash flows is not

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60 Beaver (2002) states that some of the earnings management literature could in fact be the “glamour phenomenon” in disguise. The glamour phenomenon refers to the fact that high growth stocks, i.e. stocks with low fundamentals-to-price ratios (for instance a low book-to-market ratio), show lower stock performance than value stock, i.e. stock with high fundamentals-to-price ratios (for instance high book-to-market ratio). Lakonishok et al. (1994) explain this phenomenon in terms of investors’ expectations. They argue that investors are overoptimistic about glamour stocks and have high expectations of future growth due to their strong past performance. As growth mean-reverses in the future, investors are negatively surprised by the performance of glamour stocks. This causes lower returns on the stock. Similarly, growth can cause a firm to have too high expectations, and as a result may have too much accruals, for instance too much inventory based on too high expectations for sales.
necessarily informative, because realized cash flows have timing and matching problems that cause them to be a ‘noisy’ measure of firm performance. To mitigate these problems, generally accepted accounting principles have evolved to enhance performance measurement by using accruals to alter the timing of cash flows recognition into earnings. This results in a negative correlation between accruals and cash flow from operations. Accruals offset negative serial correlation in cash flow changes to produce first differences in earnings that are approximately serially uncorrelated. If accruals are used to smooth temporary fluctuations in cash flows, then changes in cash flows and accruals will be negatively correlated (Dechow, 1994). This effect is called the noise reducing role of accruals (Ball and Shivakumar, 2006).

The life cycle of a firm is an important determinant of the properties of accruals. For instance, Desai et al. (2004) show that high growth firms are likely to have large positive accruals, while low sales growth firms (value firms) are likely to have smaller positive or negative accruals. Marquandt and Wiedman (2004) show that different accruals are used to manage earnings, depending on whether the firm is a young growing company or a stagnant company.

Accrual adjustments made by firms are fundamentally linked to underlying economics. Dechow and Ge (2006) argue that accounting rules applicable to growing and declining firms have very different perspectives and that this difference in perspective leads to predictable implications for earnings persistence. A firm that is raising capital and growing will also be a firm that is recording large positive accruals relative to assets. Young, growing firms that are typically reporting large positive accruals are firms that are purchasing assets, generating sales, and expanding their businesses. Accrual accounting generally does not attempt to fair-value these growth opportunities on the balance sheet. For instance, under US GAAP, R&D investments cannot be capitalized, but have to be expensed immediately, while young, high growth firms typically invest a lot in R&D (Joos and Plesko, 2005). Growing firms only record assets that meet certain criteria and these assets are generally recorded at capitalized costs. Accrual accounting for high accrual firms tends to have an income statement perspective, focusing on revenue recognition and matching costs that generate the revenues.

In contrast a firm that is declining or downsizing will be recording large negative accruals relative to assets. When firms are downsizing, the accounting rules have a strong balance sheet perspective. As a firm exits lines of businesses, assets such as inventory, goodwill, property, plant, and equipment are likely to have market values less than their book values. In such circumstances, assets are typically written down to their fair value. The marking of assets and liabilities to their fair value results – in general - in changes in value being reflected in earnings. These accrual adjustments result in impairment charges,
restructuring charges, and other special items being recorded in the income statement via accruals.

If growth firms are more likely to have an income-statement perspective, it is likely that the noise reducing role of accruals is less prevalent than in value firms. However, if value firms have a balance sheet perspective, it is likely that the noise reducing role of accruals is more prevalent in value firms than in growth firms. Therefore, the first hypothesis is:

**H7.1: The noise reducing role of accruals is less prevalent for growth firms, and more prevalent for value firms**

Accruals have attracted substantial attention from researchers studying earnings management. If accrual accounting is linked to the underlying economics, researchers could find differences in accrual properties that are associated with earnings management caused by the effect of growth on accruals, rather than by a partitioning incentive for earnings management. Recall from equation 5.1 in chapter 5 that researchers typically partition their sample on PART, a dummy variable partitioning the data set into two groups for which earnings management predictions are specified by the researcher. If however differences in (discretionary) accruals or other accrual based measures for earnings management are found without partitioning on PART, one has to conclude that the (discretionary) accrual or accrual measure could be driven by another variable. In this chapter, growth is hypothesized to be (one of) the variable(s). If growth drives differences in accruals, growth is an important omitted correlated variable in earnings management research. Growth could lead researchers to make spurious conclusions, i.e. to conclude to earnings management when there is no earnings management. I examine the properties of accruals based on the underlying economics of the company. I examine the different properties of accruals, to get a better understanding of the role accruals may play for different type of firms. Accruals may be used to reduce the noise in accounting or to recognize a loss or to manage earnings. It is imperative to understand the role accruals play to avoid making wrong conclusions on the observation of the behavior of accruals. This includes concluding earnings management when in fact another factor, such as growth, caused accruals to behave differently. Therefore, the second hypothesis in this chapter is:

**H7.2: The difference in accounting perspective for growth firms versus value firms causes a bias in accrual based measures for earnings management**

The earnings management measures I examine are measures based on the relation between cash flows, earnings and accruals (Leuz et al., 2003) and specific accruals (Marquandt and Wiedman, 2004).
7.3 Research Methodology

The empirical tests employ data obtained from the Compustat annual industrial and research files over 1972 to 2001. Consistent with prior literature, the extreme 1% of the observations are deleted on either side of the distribution for all variables. All variables are deflated by average total assets. Excluded from the sample are financial firms (SIC codes 6000-6999) and firms without complete data. Also excluded are firms with a negative book value. After these reductions, the sample yields 79,823 firm-year observations.

To test the first hypothesis, I use a piecewise linear model of accruals and cash flows. Evidence of a nonlinear relation between accruals and cash flows is shown by Ball and Shivakumar (2005, 2006), who report an asymmetric relation between accruals and cash flows for firm with economic losses. I employ a model that allows a non-linear relation between cash flows and accruals for growth firms and value firms. Using a piecewise model allows for an incremental coefficient on cash flows for growth firms and value firms that can be distinguished from the rest of the sample. This specification allows for examining if accrual accounting for growth firms differs significantly from value firms. I run annual cross-sectional regressions with time-series adjusted standard errors of the following model:

$$Acc_t = \beta_0 + \beta_1 CFO_t + \beta_2 D\_Growth_t + \beta_3 D\_Growth_t * CFO_t + \beta_4 D\_Value_t + \beta_5 D\_Value_t * CFO_t + \epsilon_t$$

(7.1)

Where $Acc_t =$ total accruals = $(\Delta CA_t - \Delta Cash_t) - (\Delta CL_t - \Delta STDebt_t) - DEPN_t$ and $CFO_t$ is cash flow from operations, and is calculated as $CFO_t = NI_t - TA_t$. $NI_t$ is firm j’s net income before extraordinary items (Compustat #18) in year t, and $TA_t$ is total accruals, where total accruals is $(\Delta CA_t - \Delta Cash_t) - (\Delta CL_t - \Delta STDebt_t) - DEPN_t$.

The variables are defined as:

$Acc_t =$ total accruals. Accruals are calculated from the balance sheet as follows: $(\Delta CA_t - \Delta Cash_t) - (\Delta CL_t - \Delta STDebt_t) - DEPN_t$;

$\Delta CA_t =$ change in current assets (Compustat data item # 4);

$\Delta Cash_t =$ change in cash/cash (Compustat data item # 1);

$\Delta CL_t =$ change in current liabilities (Compustat data item # 5);

$\Delta STDebt_t =$ change in debt included in current liabilities (Compustat data item # 34);

$DEPN_t =$ depreciation and amortization expense (Compustat data item # 14);
\[ D_{Growth}, = \text{Dummy variable that takes the value of 1 if the firm-year observation is a growth firm;} \]
\[ D_{Value}, = \text{Dummy variable that takes the value of 1 if the firm-year observation is a value firm.} \]

Growth firms and value firms are classified by the method used by Skinner and Sloan (2002). Firms are ranked on the book-to-market ratio, where firms with a low book-to-market ratio are growth firms, and firms with a high book-to-market ratio are value firms. Growth firms are the top 25% of the sample, and value firms are the bottom 25% of the sample (Skinner and Sloan, 2002). Book value of equity is Compustat data item #60, and market value is the amount of shares outstanding (Compustat data item #25) times the closing price (Compustat data item #199).

The second hypothesis examines if the difference in accrual accounting affects accrual based measures used in earnings management research. First, I examine the relation between growth and the descriptive variables of the firm. I examine firm characteristics and accrual characteristics and test to see if there is a difference in descriptive variables between growth firms and value firms. By showing that there is a difference in firm characteristics between growth firms and value firms, I show that one can expect different properties for accruals based on the business environment the company is in, regardless of any managerial discretion. The firm characteristics I examine are size, sales volatility, earnings volatility, cash flow volatility, accruals volatility, the firm’s operating cycle and the propensity to have negative earnings.

To further examine earnings management, I then examine measures related to accruals that have been employed in the accounting literature to measure earnings management (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. Given hypothesis 1, I expect that value firms have more smoothing of reported earnings, and therefore I expect the value of this measure to rise for value firms. I expect growing firms to have more volatile cash flows from operations. However, there is little demand for the reporting of growth opportunities via accrual accounting, as stakeholders focus on the realization of the growth opportunities. As a result, the noise reducing role of accruals is lower for growth firms than for value firms. Value firms have a relatively stable business, and are expected to show stable results. I therefore expect relatively more smoothing for value firms than growth firms.
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.\(^{61}\)

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). All variables are defined as above.

I also examine unexpected accruals at the specific accrual level. The use of aggregate accrual measures to show earnings management is subject to interpretation as to what exactly the role of accruals is. Specific accruals suffer less from this problem, and are therefore expected to be more indicative of earnings management (McNichols, 2000). I use a method based on Marquandt and Wiedman (2004) to identify unexpected specific accruals. Marquandt and Wiedman (2004) relate the specific accrual to the underlying business activity in determining the expected level of specific accruals. For instance, accounts receivable is related to sales revenue. The expected level of accounts receivable (AR) is obtained by multiplying the prior year’s closing account balance by the growth in sales. The unexpected component is the difference between the actual account balance and this expected value.

Unexpected accounts receivable (UAR) for period \(t\) is thus defined as:

\[
UAR_{jt} = (AR_{jt} - (AR_{jt-1} \times \frac{SALES_{jt}}{SALES_{jt-1}}))
\]  

(7.2)

For the test on earnings management, unexpected accounts receivable (UAR) is controlled for the median industry unexpected accounts receivable (Median_IndUAR) at the three-digit SIC code level. Thus, unexpected industry-controlled accounts receivable are:

\[
UnAR_{jt} = UAR_{jt} - Median_\text{IndUAR}_{jt}
\]  

(7.3)

In similar fashion, inventory (INV) and accounts payable (AP) are related to cost of goods sold. Unexpected inventory \((UINV)\) for period \(t\) and firm \(j\) is defined as:

\[\text{UnINV}_{jt} = UINV_{jt} - Median_\text{IndUAR}_{jt}\]

\(^{61}\) However, as Ball and Shivakumar (2006) point out, this not necessarily considered a negative effect. Dechow and Dichev (2002) interpret greater negative correlation as an indicator of higher earnings quality, due to noise reduction.
\[ UINV_{jt} = (INV_{jt} - (INV_{jt-1} \times COGS_{jt} / COGS_{jt-1}) ) \]  

(7.4)

Unexpected accounts payable \((UAP)\) for period \(t\) is defined as:

\[ UAP_{jt} = (AP_{jt} - (AP_{jt-1} \times COGS_{jt} / COGS_{jt-1}) ) \]  

(7.5)

Depreciation expense \((DEP)\) is assumed to remain a constant proportion of gross property, plant, and equipment. Thus, the unexpected component of depreciation expense \((UDEP)\) for period \(t\) is defined as:

\[ UDEP_{jt} = (DEP_{jt} - (DEP_{jt-1} \times Gross PPE_{jt} / Gross PPE_{jt-1}) ) \]  

(7.6)

All unexpected values of these specific accruals are subsequently controlled for by the median industry unexpected value of the accrual at the three-digit SIC level.

Special items \((SI)\) are by their nature non-recurring, and therefore it is expected that special items to equal zero. The unexpected component of special items \((USI)\) for period \(t\) is therefore simply defined as the level of special items itself:

\[ USI_{jt} = SI_{jt} \]  

(7.7)

I expect both growth firms and value firms to have different levels of unexpected specific accruals, given their difference in accrual accounting. I expect to find these differences without partitioning on an earnings management incentive. This would indicate that growth in itself could lead to differences in unexpected accruals, and therefore to spurious conclusions on earnings management.

7.4 Results

7.4.1 Descriptive Statistics

Table 7.1 provides descriptive statistics on the variables. Results show that total accruals are negative on average at -0.051, reflecting that firms on average are mean reversing in terms of growth. This result is similar to previous studies. For instance, Dechow and Dichev (2002) report mean accruals of -0.046. The average book-to-market ratio is 0.922, with the lower quartile (growth firms) of 0.440 and the upper quartile (value firms) of 1.191.
Table 7.1 Descriptive Statistics for Firm-Year Observations

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Lower Quartile</th>
<th>Median</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets</td>
<td>1.407</td>
<td>5.911</td>
<td>32.3</td>
<td>122.2</td>
<td>595.9</td>
</tr>
<tr>
<td>Book Value of Equity</td>
<td>0.518</td>
<td>0.208</td>
<td>0.361</td>
<td>0.501</td>
<td>0.662</td>
</tr>
<tr>
<td>Market Value of equity</td>
<td>1.012</td>
<td>1.215</td>
<td>0.359</td>
<td>0.639</td>
<td>1.197</td>
</tr>
<tr>
<td>Book to Market ratio</td>
<td>0.922</td>
<td>0.697</td>
<td>0.440</td>
<td>0.733</td>
<td>1.191</td>
</tr>
<tr>
<td>Cash from operations</td>
<td>0.083</td>
<td>0.114</td>
<td>0.041</td>
<td>0.093</td>
<td>0.146</td>
</tr>
<tr>
<td>Total Accruals</td>
<td>-0.051</td>
<td>0.071</td>
<td>-0.089</td>
<td>-0.049</td>
<td>-0.014</td>
</tr>
</tbody>
</table>

N= 79,823. Total Assets = Compustat data item (Compustat item # 6); CFO$_{jt}$ = NI$_{jt}$ - TA$_{jt}$; Net income = Net Earnings before Extraordinary Items (Compustat item #18); CFO$_{jt}$ = Net Income$_{jt}$ - TA$_{jt}$; TA= Total Accruals = (ΔCA$_{jt}$ - ΔCash$_{jt}$) - (ΔCL$_{jt}$ - ΔSTDebt$_{jt}$) - DEPN$_{jt}$; ΔCA$_{jt}$ = change in current assets (Compustat data item # 4); ΔCash$_{jt}$ = change in cash/cash short-term (Compustat data item # 1); ΔCL$_{jt}$ = change in current liabilities (Compustat data item # 5); ΔSTDebt$_{jt}$ = change in debt included in current liabilities (Compustat data item # 34); DEPN$_{jt}$: depreciation and amortization expense (Compustat data item # 14); All variables are scaled by average total assets (Compustat item 6). For each variable, the extreme 1% is deleted on either side of the distribution.

Table 7.2 Descriptive statistics for the underlying business process that determine the accrual characteristics of a firm. The accrual characteristics reflect the ability of accruals to be converted into cash, and therefore determine the quality of accruals, an important determinant of earnings quality (Dechow and Dichev, 2002). The descriptive statistics reveal the primary role of accruals in financial reporting. The cash flow volatility is 0.070. However, earnings volatility is lower, at 0.048. This is the result of the role of accruals to reduce the noise of transitory cash flow changes in earnings.

Table 7.2 Descriptive statistics of the accrual characteristics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Lower Quartile</th>
<th>Median</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Firm Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>4.849</td>
<td>2.095</td>
<td>3.305</td>
<td>4.659</td>
<td>6.224</td>
</tr>
<tr>
<td>Sales volatility</td>
<td>0.168</td>
<td>0.154</td>
<td>0.069</td>
<td>0.127</td>
<td>0.218</td>
</tr>
<tr>
<td>Earnings volatility</td>
<td>0.048</td>
<td>0.056</td>
<td>0.014</td>
<td>0.029</td>
<td>0.058</td>
</tr>
<tr>
<td>Operating income volatility</td>
<td>0.050</td>
<td>0.049</td>
<td>0.018</td>
<td>0.036</td>
<td>0.065</td>
</tr>
<tr>
<td>Cash flow volatility</td>
<td>0.070</td>
<td>0.055</td>
<td>0.033</td>
<td>0.057</td>
<td>0.091</td>
</tr>
<tr>
<td>Accruals volatility</td>
<td>0.059</td>
<td>0.041</td>
<td>0.028</td>
<td>0.049</td>
<td>0.080</td>
</tr>
<tr>
<td>Operating cycle</td>
<td>146</td>
<td>140</td>
<td>84</td>
<td>129</td>
<td>185</td>
</tr>
<tr>
<td>Negative Earnings</td>
<td>0.430</td>
<td>0.126</td>
<td>0.353</td>
<td>0.429</td>
<td>0.500</td>
</tr>
</tbody>
</table>

N= 79,823. Variables Measurement: Size= log of Total Assets; Total Assets= Compustat data item (Compustat item # 6); Sales volatility= the standard deviation of Sales (Compustat item # 12), from years t-4 to t; Earnings volatility= the standard deviation of Net Earnings before Extraordinary Items (Compustat item #18), from years t-4 to t; Cash flow volatility= the standard deviation of Cash flow from operations, as defined in table 1, from years t-4 to t; Accruals volatility = the standard deviation of Total Accruals, as defined in table 1, from years t-4 to t; Operating cycle= firm j’s operating cycle in days; Negative Earnings= incidence of negative earnings; All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.
In order to examine the effects of growth on accrual accounting, table 7.3 summarizes the difference in accrual and firm characteristics between high-growth and low-growth firms. Table 7.3 shows that the effect of growth on the firm characteristics is to increase the volatility of the firm characteristics. For five of the eight firm characteristics, the underlying process is significantly more volatile for growth firms than value firms at the 1% level. For high-growth firms, the sales process and the underlying cash flows are more volatile. The accruals process for high growth firms is less prevalent, as reflected in the higher earnings volatility. Overall, the results in table 7.3 show that growth causes higher volatility of the business environment of the firm, and this is reflected in different accrual characteristics between growth firms and value firms.

Table 7.3 Differences in means of firm and accrual characteristics between Growth firms and Value firms

<table>
<thead>
<tr>
<th></th>
<th>Growth firms</th>
<th>Value firms</th>
<th>Difference in Means</th>
<th>t-stat</th>
<th>Difference p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>5.100</td>
<td>4.323</td>
<td>0.777</td>
<td>28.03</td>
<td>0.0000</td>
</tr>
<tr>
<td>Sales volatility</td>
<td>0.181</td>
<td>0.177</td>
<td>0.004</td>
<td>1.89</td>
<td>0.0591</td>
</tr>
<tr>
<td>Earnings volatility</td>
<td>0.064</td>
<td>0.045</td>
<td>0.019</td>
<td>23.68</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cash flow volatility</td>
<td>0.082</td>
<td>0.070</td>
<td>0.011</td>
<td>14.57</td>
<td>0.0000</td>
</tr>
<tr>
<td>Total Accruals volatility</td>
<td>0.063</td>
<td>0.060</td>
<td>0.003</td>
<td>4.60</td>
<td>0.0000</td>
</tr>
<tr>
<td>Operating cycle</td>
<td>152</td>
<td>150</td>
<td>1.55</td>
<td>0.60</td>
<td>0.5480</td>
</tr>
<tr>
<td>Negative Earnings</td>
<td>0.418</td>
<td>0.430</td>
<td>-0.012</td>
<td>-9.04</td>
<td>0.0000</td>
</tr>
<tr>
<td>Total Accruals</td>
<td>-0.051</td>
<td>-0.049</td>
<td>-0.002</td>
<td>-2.61</td>
<td>0.0089</td>
</tr>
</tbody>
</table>

Tables 1 and 2 provide the definitions for all variables. P-Values for difference are based on two-tailed test.

The correlations in Table 7.4 illustrate the relations between the sample variables. These empirical correlations are in agreement with previous research and the predictions of the model. Specifically, there is a negative correlation between CFO and total accruals (-0.44). Growth, as measured by the Book-to-Market (B-to-M) ratio is negatively related to cash flow, but positively related to total accruals.
Table 7.4 Correlations between variables. Pearson (Spearman) Correlation Coefficients in the Lower (Upper) Diagonal (significance in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>CFO</th>
<th>Total Accruals</th>
<th>B-to-M</th>
<th>Book value of Equity</th>
<th>Market value of Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO</td>
<td>-</td>
<td>-0.5572</td>
<td>-0.1854</td>
<td>0.2294</td>
<td>0.2767</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Total Accruals</td>
<td>-0.4401</td>
<td>-</td>
<td>0.0217</td>
<td>0.0612</td>
<td>0.0109</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0051)</td>
</tr>
<tr>
<td>B-to-M</td>
<td>-0.0998</td>
<td>0.0161</td>
<td>-</td>
<td>-0.1131</td>
<td>-0.8425</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td></td>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Book value of Equity</td>
<td>0.1552</td>
<td>0.0710</td>
<td>-0.0879</td>
<td>-</td>
<td>0.5814</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td></td>
<td>(0.0000)</td>
<td></td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Market value of Equity</td>
<td>0.0458</td>
<td>0.0254</td>
<td>-0.4897</td>
<td>0.4609</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td></td>
<td>(0.0000)</td>
<td></td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Table 1 provides the definitions for all variables.

7.4.2 Test of H7.1: The noise reducing role of accruals is less prevalent for growth firms, and more prevalent for value firms

The first hypothesis states that there is a difference in the noise reducing role of accruals for growth firms and value firms. Growth affects accrual accounting. Also, the accounting rules have a different perspective for growth firms than for value firms, and I expect that this is reflected in the difference in noise reduction of cash flows by accruals. More specifically, I expect that the noise reduction role of accruals is less prevalent for growth firms, and more prevalent for value firms. Tests of hypothesis 7.1 are provided in table 7.5. Table 7.5 reports results of Fama-Macbeth (1973) regression with time-series standard errors of equation (7.1). The results presented in table 7.5 indicate the there is indeed a difference in the noise reduction role of accruals.
### Table 7.5: Time-series means and t-statistics for coefficients from annual cross-sectional regressions of total accruals on cash flow from operations

*Equation 7.1: Acc = \beta_0 + \beta_1 CFO_i + \beta_2 D_{growth} + \beta_3 D_{growth} * CFO_i + \beta_4 D_{value} + \beta_5 D_{value} * CFO_i + \epsilon_i*

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Regression I</th>
<th>Regression II</th>
</tr>
</thead>
<tbody>
<tr>
<td>sign</td>
<td>Coefficient</td>
<td>t-stat</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.018</td>
<td>-3.54</td>
</tr>
<tr>
<td>CFO_i</td>
<td>-0.365</td>
<td>-11.10</td>
</tr>
<tr>
<td>D_growth</td>
<td>?</td>
<td>-</td>
</tr>
<tr>
<td>D_growth * CFO_i</td>
<td>+</td>
<td>0.205</td>
</tr>
<tr>
<td>D_value</td>
<td>?</td>
<td>-</td>
</tr>
<tr>
<td>D_value * CFO_i</td>
<td>-</td>
<td>-0.045</td>
</tr>
</tbody>
</table>

Adj R^2 0.19 0.22  
No of obs 79823 79823

*D_growth, is a dummy variable that takes the value of 1 if the firm-year observation is a growth firm; D_value, is a dummy variable that takes the value of 1 if the firm-year observation is a value firm. Table 1 provides the definitions for all variables.

Regression I show results for traditional linear cash flow model. The coefficient on current cash flow CFO_i is -0.365 with a t-stat of -11.10. This is consistent with previous research (e.g. Dechow, 1994; Dechow and Dichev, 2002), and shows that accruals are negatively correlated to cash flows, i.e. accruals reduce the noise in cash flows. Regression II shows the results for the piecewise linear model with the adjustments for growth. This model offers an improvement in specification, as the explanatory power improves from 0.19 to 0.22. The coefficient on current cash flow CFO_i is somewhat similar to regression I at -0.440 (with a t-stat of -14.32). However, for firms with high growth, the incremental coefficient on Growth* CFO_i is +0.205, with a t-stat of 13.71. This indicates that the noise reduction role of accruals for cash flows is less prevalent for firms with high growth. The total coefficient on cash flow CFO_i for high growth firms is -0.235 (-0.440 + 0.205). This means that the noise reducing role of accruals for high growth firms is 53% lower than non-growth-non value firms. For value firms, the incremental coefficient on Value* CFO_i is -0.045, with a t-stat of -4.27. This indicates that the noise reduction role of accruals for cash flows is more prevalent for value firms than for growth firm. The total coefficient on cash flow CFO_i for value firms is -0.485 (-0.440 - 0.045). This means that the noise reducing role of accruals for high growth firms is 10% higher than non-growth-non value firms.

My results show that high growth affect the accrual process to the extent that it significantly reduces the noise reducing role of accruals. This is consistent with Richardson et al. (2006), who show that growth is associated with the lower persistence of accruals. However, as a result of the lower noise reducing role of accruals, earnings are more noisy for growth firms. This could be interpreted as lower earnings quality, or even earnings
management. The interpretation of this result is dependent on the reader’s priors. If the reader’s prior is that smoothed earnings do not reflect a firm’s underlying economic performance, and is therefore considered an indicator of earnings management (e.g. Leuz et al., 2003) this is considered a positive effect. Earnings reflect the underlying business as reflected in operating cash flows. However, if the reader’s prior is that greater noise reduction is an indicator of higher earnings quality (e.g. Dechow and Dichev, 2002), this would be considered less positive, since management is less able to use its discretion over accruals to show the firm true performance. In this case, matching and timing problems are considered to be accentuated for high growth firms. The effect of growth on earnings management measures is further examined with hypothesis 7.2.

7.4.3 Test of H7.2: The difference in accounting perspective for growth firms versus value firms causes a bias in accrual based measures for earnings management

The second hypothesis examines the effect of growth on accrual based measures for earnings management. The results for hypothesis 7.1 show that the noise reducing role of accrual is less prevalent for growth firms compared to value firms. This result potentially has implications for earnings management research. For instance, McNichols (2000) shows that abnormal accruals are related to growth. The Jones model requires for abnormal accruals the estimation of the sensitivity of accruals to sales growth. If the noise reducing role of accruals is less prevalent for high-growth firms, it seems likely that accruals are less reactive to the sales process if growth is high. This could be picked-up by the residual in the Jones model, i.e. abnormal accruals.

For hypothesis 7.3, I examine the effect of growth on two research designs used in earnings management research. The first type of earnings management measures are based on the relation between cash flows and accruals, the second type of earnings management measures are based on specific accruals. Notice that the aim of hypothesis 7.3 is not to show that growth increases the likelihood of earnings management. Rather, table 7.7 shows that there is a difference in the examined earnings management measures resulting from a systematic differences in accruals caused by the level of firm-growth. Table 7.6 shows the effect of growth on the ratio of the firm-level standard deviation of earnings to the firm-level standard deviation of cash flow from operations, the contemporaneous correlation between changes in accounting accruals and changes in operating cash flows and the magnitude of accruals relative to cash flows (Leuz et al., 2003).
Table 7.6 Accrual properties and earnings management proxies for Growth firms versus Value firms

Panel A: Ratio of the firm-level standard deviation of earnings to the firm-level standard deviation of cash flow from operations

<table>
<thead>
<tr>
<th></th>
<th>StDev Earn / StDev CFO</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>p-value of differencea)</td>
<td></td>
</tr>
<tr>
<td>All firms</td>
<td>1.149</td>
<td></td>
</tr>
<tr>
<td>Growth firms</td>
<td>0.966</td>
<td></td>
</tr>
<tr>
<td>Value firms</td>
<td>1.157</td>
<td>0.3961</td>
</tr>
</tbody>
</table>

Panel B: Correlation of change in accruals to change in cash flows from operations

<table>
<thead>
<tr>
<th></th>
<th>Corr ΔAccr/ΔCFO</th>
<th>p-value of differenceb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All firms</td>
<td>-0.674</td>
<td></td>
</tr>
<tr>
<td>Growth firms</td>
<td>-0.540</td>
<td></td>
</tr>
<tr>
<td>Value firms</td>
<td>-0.761</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Panel C: Magnitude of accruals

<table>
<thead>
<tr>
<th></th>
<th>Accr/ CFO</th>
<th>p-value of differencec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All firms</td>
<td>2.031</td>
<td></td>
</tr>
<tr>
<td>Growth firms</td>
<td>1.525</td>
<td></td>
</tr>
<tr>
<td>Value firms</td>
<td>2.352</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

a) P-Values for differences in means are based on two-tailed tests
b) P-Values for differences in means are based on two-tailed tests after Fisher Z- transformation of the correlation coefficients

text continues

Panel A of table 7.6 shows results for the ratio of the firm-level standard deviation of earnings to the firm-level standard deviation of cash flow from operations, which, according to Leuz et al. (2003) represents the smoothing of earnings by management. A low ratio indicates that earnings are less volatile than underlying cash flows, meaning that accruals are used to produce earnings that reflect the volatility of the underlying economics to a lesser extent than cash flows. The subsample of high growth firms shows a lower ratio of 0.966 compared to the ratio of the entire sample of 1.149. This is contrary to what is expected based on the offsetting influence of high growth on the noise reduction role of accruals. The difference between growth firms and value firms in the ratio of firm-level standard deviation of earnings...
to the firm-level standard deviation of cash flow from operations is not significant, indicating that the difference in the level of growth does not affect this measure.  

Panel B of table 7.6 examines another measure of earnings smoothing, the contemporaneous correlation between changes in accounting accruals and changes in operating cash flows. The subsample of high growth firms shows a correlation of -0.540 compared to the correlation of the entire sample of -0.674. This is consistent with the offsetting influence of high growth on the noise reduction role of accruals. For high growth firms, accruals are used to a lesser extent to ameliorate cash flow shocks than for value firms. The correlation for the value firm subsample of -0.761 is higher than the entire sample. The difference between growth firms and value firms in the contemporaneous correlation between changes in accounting accruals and changes in operating cash flows is significant, indicating that the difference in the level of growth affects this measure.

Panel C of table 7.6 examines the absolute value of firms’ accruals scaled by the absolute value of firms’ cash flow from operations. 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. The subsample of high growth firms shows a value of scaled accruals of 1.525 compared to the 2.031 for the entire sample. Again, this is consistent with the offsetting influence of high growth on the noise reduction role of accruals. For high growth firms, accruals are used to a lesser extent to ameliorate cash flow shocks than for value firms. The value of scaled accruals for the value firms subsample of 2.352 is higher than the entire sample. The difference between growth firms and value firms in the absolute value of firms’ accruals scaled by the

---

62 For this test, earnings are defined as operating income, similar to Leuz et al. (2003). However, untabulated results show that using net income before operations (Compustat data item # 18) as the measure of earnings does not affect this result.

63 The difference between the correlations is determined by performing Fisher’s Z transformation of the sample correlation. The r to z transformation is as follows:

$$Z_{xy} = \frac{1}{2} \log_e \left( \frac{1 + r_{xy}}{1 - r_{xy}} \right)$$

The Fisher Z transformation normalizes the correlation coefficient, enabling to use the properties of the student's t-distribution in determining the significance. The significance of the difference is determined by the following formula, where a Z of 2.56 determines significance at the 1% level:

$$Z = \frac{z_{n1} - z_{n2}}{\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}}$$
absolute value of firms’ cash flow from operations is significant, indicating that the difference in the level of growth affects this measure.

The results in table 7.6 show that growth is a potential correlated omitted variable in aggregate accrual based measures of earnings management. To further examine the effect of growth on earnings management measures, table 7.7 shows the effect of growth on specific accrual measures. More specifically, I expect that unexpected accruals are negative for high-growth firms, and positive for value firms. Negative unexpected accruals would indicate that the actual level of accruals is lower than the expected level of accruals. Positive unexpected accruals suggest that the actual level of accruals is higher than the expected level of accruals.

Table 7.7 Logistic Regressions of Life Cycle on Unexpected Specific Accruals

<table>
<thead>
<tr>
<th>Panel A: Logistic regression of Growth on Unexpected Accruals</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Growth_{firm} = \gamma_0 + \gamma_1 \text{UnAR} + \gamma_2 \text{UnINV} + \gamma_3 \text{UnAP} + \gamma_4 \text{UnDEPN} + \gamma_5 \text{UnSPEC} + \nu_t$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regression Coefficient</th>
<th>$\gamma_0$</th>
<th>$\gamma_1$</th>
<th>$\gamma_2$</th>
<th>$\gamma_3$</th>
<th>$\gamma_4$</th>
<th>$\gamma_5$</th>
<th>Model Chi-Square</th>
<th>(P-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated value</td>
<td>-1.332</td>
<td>0.137</td>
<td>-0.024</td>
<td>-0.377</td>
<td>-4.224</td>
<td>-2.917</td>
<td>207.41</td>
<td>(0.000)</td>
</tr>
<tr>
<td>(p-value)</td>
<td>(0.000)</td>
<td>(0.402)</td>
<td>(0.817)</td>
<td>(0.006)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Logistic regression of Value on Unexpected Accruals</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Value_{firm} = \gamma_0 + \gamma_1 \text{UnAR} + \gamma_2 \text{UnINV} + \gamma_3 \text{UnAP} + \gamma_4 \text{UnDEPN} + \gamma_5 \text{UnSPEC} + \nu_t$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regression Coefficient</th>
<th>$\gamma_0$</th>
<th>$\gamma_1$</th>
<th>$\gamma_2$</th>
<th>$\gamma_3$</th>
<th>$\gamma_4$</th>
<th>$\gamma_5$</th>
<th>Model Chi-Square</th>
<th>(P-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated value</td>
<td>-1.002</td>
<td>-0.400</td>
<td>-0.254</td>
<td>0.430</td>
<td>1.280</td>
<td>1.412</td>
<td>44.68</td>
<td>(0.000)</td>
</tr>
<tr>
<td>(p-value)</td>
<td>(0.000)</td>
<td>(0.010)</td>
<td>(0.030)</td>
<td>(0.019)</td>
<td>(0.082)</td>
<td>(0.000)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sample consists of 69444 observations. Variable measurement: Growth_firm is an indicator variable equal to one if the firm-year observation is a growth firm; Value_firm is an indicator variable equal to one if the firm-year observation is a value firm; Sales = Compustat data item # 12; AR = Accounts Receivable (Compustat data item # 2); INV = Inventory (Compustat data item # 3); AP = Accounts Payable (Compustat data item # 70); DEPN = Depreciation and Amortization (Compustat data item # 14); SPEC = Special Items (Compustat data item #17); The unexpected specific accrual measures are calculated as unexpected accrual - median unexpected industry accrual at the three-digit SIC level:

- $\text{UnAR}_{jt} = (\text{AR}_{jt} - (\text{AR}_{jt} \times \text{SALES}_{jt} / \text{SALES}_{jt-1}))$
- $\text{UnINV}_{jt} = (\text{INV}_{jt} - (\text{INV}_{jt} \times \text{COGS}_{jt} / \text{COGS}_{jt-1}))$
- $\text{UnAP}_{jt} = (\text{AP}_{jt} - (\text{AP}_{jt} \times \text{COGS}_{jt} / \text{COGS}_{jt-1}))$
- $\text{UnDEPN}_{jt} = (\text{DEPN}_{jt} - (\text{DEPN}_{jt} \times \text{Gross PPE}_{jt} / \text{Gross PPE}_{jt-1}))$
- $\text{USPEC}_{jt} = \text{SPEC}_{jt} - \text{medium Industry}$
- $\text{UnAR}_{jt} = \text{medium Industry} \times \text{AR}_{jt}$
- $\text{UnINV}_{jt} = \text{medium Industry} \times \text{INV}_{jt}$
- $\text{UnAP}_{jt} = \text{medium Industry} \times \text{AP}_{jt}$
- $\text{UnDEPN}_{jt} = \text{medium Industry} \times \text{DEPN}_{jt}$
- $\text{USPEC}_{jt} = \text{SPEC}_{jt} - \text{median Industry}$
- $\text{USME}_{jt} = \text{USME}_{jt} - \text{median Industry}$

For each variable, the extreme 1% is deleted on either side of the distribution.

The results in table 7.7 partly confirm that growth affects the level of unexpected specific accruals. The model is significant for both firms and value firms, with a chi-square of
207.41 and 44.68 respectively. Unexpected accounts payables, depreciation and special items are more likely to be negative for growth firms, and more likely to be positive for value firms. However, accounts receivables and inventory are not significant, or not significant in the expected direction. Note that the aim of the examination of unexpected accruals is not to show that firms manage earnings in a certain direction using accounts payables, depreciation or special items. Rather, the results in table 7.7 indicate that growth affects the likelihood that an unexpected specific accruals is likely to significantly behave in a specific direction. That is, panel A shows that unexpected specific accruals like accounts payable are likely to be significantly positive for growth firms, suggesting that growth firms manage their earnings upward. Negative unexpected accounts payable means that the actual accounts payable are lower than the expected accounts payable. Since accounts payable has a negative effect on earnings, this would suggest higher earnings. Panel B shows that unexpected accruals are likely to be significantly negative for value firms, suggesting that value firms manage their earnings downward, even though there is no incentive for earnings management that can be used as a partitioning variable. These results indicate that growth affects specific accruals used to examine earnings management. However, even though the models lack an incentive for earnings management, one cannot conclude that earnings management has not taken place. Table 7.7 just shows that growth potentially affects the level of unexpected accruals.

7.5 Robustness tests

7.5.1. Specification of robustness tests

The results reported in the previous section indicate that growth offsets the noise reduction role of accruals. In this subsection, I show that this result is robust with respect to different definitions of accruals and controls for size, fiscal year-end and industry.

7.5.2. Different definitions of accruals

Francis and Smith (2005) observe that traditional measures of accruals are functions of current- and non-current-period transactions. This causes the contemporary relation between accruals and performance to be biased downwards. They develop “time-specific” measures of accruals and cash that capture current-period transactions only. Using the “time-specific” accrual measures should improve the specification of the model, as it better captures the true relation between accruals and cash flows. Their measure of accruals uses the ending balance of asset accruals and the beginning balance of asset deferrals as the construct for the accrual component of income. In their measure of accruals, different types of accruals are treated
differently depending on whether their recognition in current-period income precedes cash (an accrual account (A) e.g. accounts receivables, or follows, their cash consequences (a deferral account (D), e.g. unearned revenue). The time-specific definition of accruals is:

\[
\text{Accrual}_{t, \text{Time}} = (CA^h_t - CA^h_{t-1}) - (CL^h_t - CL^h_{t-1}) - \text{InvEffect}_t - \text{DEPN}_t
\]  

(7.8)

where

\[
\text{InvEffect} = \min (AP_t, \text{COGS}_t) \quad \text{if } \text{INV}_t \geq \text{INV}_{t-1}
\]

(7.9)

\[
\min (\text{COGS}_t, AP_t - (\text{INV}_t - \text{INV}_{t-1})) \quad \text{if } \text{INV}_t < \text{INV}_{t-1}
\]

and

\[
CA^h_t = \text{current assets of type } h = \{A, D\} \text{ as of the end of year } t \text{ (excluding inventory)}
\]

\[
CL^h_t = \text{current liabilities of type } h = \{A, D\} \text{ as of the end of year } t \text{ (excluding accounts payable)}
\]

The empirical definition of the time specific accrual measure is:

\[
\text{Accruals}_t = \text{AR}_t - \text{OtherCA}_{t-1} - \text{OtherCL}_t - \text{InvEffect}_t - \text{DEPN}_t
\]

(7.10)

where

\[
\text{AR}_t = \text{ending balance of accounts receivable for year } t \text{ (Compustat data item # 2)};
\]

\[
\text{INV}_t = \text{change in inventories for year } t \text{ (data item # 3)};
\]

\[
\text{OTHERCA}_{t-1} = \text{beginning balance of other current assets for year } t \text{ (data item # 68)};
\]

\[
\text{AP}_t = \text{accounts payable for year } t \text{ (data item # 70)};
\]

\[
\text{OTHERCL}_t = \text{ending balance for other current liabilities for year } t \text{ (data item # 72)};
\]

\[
\text{DEPN}_t = \text{depreciation and amortization expense for year } t \text{ (data item # 14)};
\]

\[
\text{COGS}_t = \text{Cost of Goods Sold for year } t \text{ (data item # 41)}.
\]

This definition of accruals essentially uses balance sheet accounts to reconstruct income summary journal entries. The current asset (CA) and current liability (CL) accounts exclude inventory and accounts payable, respectively, because the balances of these accounts do not map neatly into cost of goods sold (Francis and Smith, 2005). Regression I of table 7.8 shows the results for time-specific accruals. The contemporaneous relation between accruals and cash flow is -0.657, with a t-stat of -47.33. This is consistent with the notion by Francis and Smith (2005), that time accruals better captures the true relation between accruals and cash flows. This is also captured in the higher Adj. R² of the model of 0.51, compared to 0.22 in table 7.5. The results for hypothesis 7.1 using the time accruals specification are similar to the specification in table 7.5. For firms with high growth, the incremental coefficient on \(Growth^* CFO_t\) is +0.207, with a t-stat of 14.26. For value firms, the incremental coefficient on \(Value^*

CFO, is significant, with a coefficient of -0.046 and a t-stat of -4.67, as predicted in hypothesis 7.1. If time accruals better capture the true relation between accruals and cash flows as suggested, this results provide strong support for the hypothesis that growth offsets the noise reducing role of accruals.

Another potential shortcoming of the accrual measurement procedures is that hypothesis 7.1 is tested using balance sheet data to construct accruals. Hribar and Collins (2002) point out that the use of balance sheet data can introduce errors into the measurement of accruals. Therefore, I also run the model using accruals and cash flow data obtained from cash flow statements and not estimated indirectly from balance sheet data. This restricts the sample to the 1987–2001 period. Accruals are defined as Net Income Before Extraordinary Items (Compustat data item #123) minus Cash From Operations (Compustat data item #308); Net Income and Cash From Operations are from the SFAS No. 95, Statement of Cash Flows. Regression II of table 7.8 shows the results for accruals taken from the cash flow statement. Even though the Adj. R² of the model of is lower at 0.12, compared to 0.22 in table 7.5, the results for hypothesis 7.1 using the cash flow statement accruals specification are also robust to the specification in table 7.5. For firms with high growth, the incremental coefficient on Growth* CFO, is +0.295, with a t-stat of 12.74, similar to table 7.5. Similarly, for firms value firms, the incremental coefficient on Value* CFO, is significant, with a coefficient of -0.104 and a t-stat of -4.44, as predicted in hypothesis 7.1. If cash flow statement accruals better capture the true relation between accruals and cash flows as suggested, this results again provides strong support for the hypothesis that growth offsets the noise reducing role of accruals.
Table 7.8: Time-series means and t-statistics for coefficients from annual cross-sectional regressions of Current accruals on cash flow from operations

Equation 7.1: \( Acc_t = \beta_0 + \beta_{1} \text{CFO}_t + \beta_{2} \text{D\_Growth}_t + \beta_{3} \text{D\_Growth*}_t * \text{CFO}_t + \beta_{4} \text{D\_Value}_t + \beta_{5} \text{D\_Value*}_t * \text{CFO}_t + \epsilon_t \)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression I</th>
<th>Regression II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Predicted sign</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Intercept</td>
<td>?</td>
<td>0.022</td>
</tr>
<tr>
<td>CFO</td>
<td>-</td>
<td>-0.657</td>
</tr>
<tr>
<td>D_Growth</td>
<td>?</td>
<td>-0.040</td>
</tr>
<tr>
<td>D_Growth* CFO</td>
<td>+</td>
<td>0.207</td>
</tr>
<tr>
<td>D_Value</td>
<td>?</td>
<td>-0.029</td>
</tr>
<tr>
<td>D_Value* CFO</td>
<td>-</td>
<td>-0.046</td>
</tr>
</tbody>
</table>

Adj R² 0.51 0.12
No of obs 79823 41382

Variable measurement:

Regression I:

\[
\text{Accruals}_t = \text{AR}_t - \text{OtherCA}_t - \text{OtherCL}_t - \text{InvEffect}_t - \text{DEPN}_t;
\]

\[
\text{InvEffect} = \min (\text{AP}_t, \text{COGS}_t) \quad \text{if } \text{INV}_t \geq \text{INV}_{t-1};
\]

\[
\min (\text{COGS}_t, \text{AP}_t - (\text{INV}_t - \text{INV}_{t-1})) \quad \text{if } \text{INV}_t < \text{INV}_{t-1};
\]

\[
\text{AR}_t = \text{ending balance of accounts receivable for year } t \text{ (Compustat data item # 2); INVE}_t = \text{change in inventories for year } t \text{ (data item # 3); OTHERCA}_t = \text{beginning balance of other current assets for year } t \text{ (data item # 68); AP}_t = \text{accounts payable for year } t \text{ (data item # 70); OTHERCL}_t = \text{ending balance for other current liabilities for year } t \text{ (data item # 72); DEPN}_t = \text{depreciation and amortization expense for year } t \text{ (data item # 14); COGS}_t = \text{Cost of Goods Sold for year } t \text{ (data item # 41); CFO}_t = \text{Net Income before extraordinary items (data item # 18) – Accruals.}
\]

Regression II:

\[
\text{Accruals} = \text{Net Income Before Extraordinary Items (Compustat data item # 123) minus Cash From Operations (Compustat data item # 308).}
\]

7.5.3. Size

Firm-size can proxy for exogenous volatility in economic income. I check this possibility by adding the rank of year-end total assets (\( SIZE_t \)) as an interactive variable. Table 7.9 reports results from versions of regression (7.1) with controls for size. The results in table 7.9 show that the results remain qualitatively unaltered when size is included as an additional interactive variable.
Table 7.9 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of Current accruals on cash flow from operations with controls for growth

\[
\text{Acc}_i = \beta_0 + \beta_1 \text{CFO}_i + \beta_2 \text{D\_Growth}_i + \beta_3 \text{D\_Growth}_i \times \text{CFO}_i + \beta_4 \text{SIZE}_i + \beta_5 \text{SIZE}_i \times \text{CFO}_i \\
+ \beta_6 \text{SIZE}_i \times \text{D\_Growth}_i + \beta_7 \text{SIZE}_i \times \text{D\_Growth}_i \times \text{CFO}_i + \beta_8 \text{SIZE}_i \times \text{D\_Value}_i \\
+ \beta_9 \text{SIZE}_i \times \text{D\_Value}_i \times \text{CFO}_i + \epsilon_i
\]

<table>
<thead>
<tr>
<th>Predicted sign</th>
<th>Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.007</td>
<td>-1.28</td>
</tr>
<tr>
<td>CFO</td>
<td>-0.436</td>
<td>-14.01</td>
</tr>
<tr>
<td>D_Growth</td>
<td>-0.018</td>
<td>-7.25</td>
</tr>
<tr>
<td>D_Growth * CFO</td>
<td>0.206</td>
<td>13.84</td>
</tr>
<tr>
<td>D_Value * CFO</td>
<td>-0.017</td>
<td>-10.91</td>
</tr>
<tr>
<td>D_Value * CFO</td>
<td>-0.046</td>
<td>-4.11</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.226</td>
<td>4.67</td>
</tr>
<tr>
<td>SIZE * CFO</td>
<td>-2.354</td>
<td>-6.23</td>
</tr>
<tr>
<td>SIZE * D_Growth</td>
<td>2.450</td>
<td>2.77</td>
</tr>
<tr>
<td>SIZE * D_Growth * CFO</td>
<td>-9.793</td>
<td>-2.84</td>
</tr>
<tr>
<td>SIZE * D_Value</td>
<td>0.535</td>
<td>2.73</td>
</tr>
<tr>
<td>SIZE * D_Value * CFO</td>
<td>-5.642</td>
<td>-2.10</td>
</tr>
</tbody>
</table>

\[
\text{Adj } R^2 = 0.19
\]

| No of obs | 79823 |

Table 7.1 provides the definitions for the variables; SIZE, rank of total assets at end of year \( t \), standardized to the interval \((0,1)\).

### 7.5.4 Fiscal year-end

The model is based on the relation between accruals and cash flows in a specific book year. Results may be affected by the fact that different companies have different fiscal year-ends, and therefore have differences in the relation between accruals and cash flows in a calendar year. In table 7.10, the model is re-estimated using only firms with a December fiscal year end. The results show that the results are not affected by differences in fiscal year-end.
Table 7.10 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of Current accruals on cash flow from operations with December fiscal year-end

\[ \text{Equation 7.1: } \text{Acc}_t = \beta_0 + \beta_1 \text{CFO}_t + \beta_2 \text{D}_{-\text{Growth}}_t + \beta_3 \text{D}_{-\text{Growth}}_t \times \text{CFO}_t + \beta_4 \text{D}_{-\text{Value}}_t + \beta_5 \text{D}_{-\text{Value}}_t \times \text{CFO}_t + \varepsilon_t \]

<table>
<thead>
<tr>
<th>Predicted sign</th>
<th>Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.006</td>
<td>-1.00</td>
</tr>
<tr>
<td>CFO</td>
<td>-0.445</td>
<td>-13.56</td>
</tr>
<tr>
<td>D_Growth</td>
<td>-0.013</td>
<td>-4.52</td>
</tr>
<tr>
<td>D_Growth*CFO</td>
<td>0.195</td>
<td>9.67</td>
</tr>
<tr>
<td>D_Value</td>
<td>-0.016</td>
<td>-10.03</td>
</tr>
<tr>
<td>D_Value*CFO</td>
<td>-0.035</td>
<td>-2.24</td>
</tr>
</tbody>
</table>

\[ \text{Adj R}^2 = 0.20 \]

No of obs = 44073

\text{D_Growth} is a dummy variable that takes the value of 1 if the firm-year observation is a growth firm; \text{D_Value} is a dummy variable that takes the value of 1 if the firm-year observation is a value firm. Table 7.1 provides the definitions for all variables. All firms have December fiscal year end.

7.5.5 Controls for industry

Different industries typically differ in growth rates. For instance, technology firms are usually high growth firms, while utilities are traditionally low growth industries. To control for industry effects, I partition the sample into 13 industries using the primary SIC code (Barth et al. 1998; Easton and Pae, 2004) and run annual regressions with time-series adjusted t-statistics for each major industry. Table 7.11 reports the industry composition of the sample.
Table 7.11 Industry subsample

<table>
<thead>
<tr>
<th>Industry</th>
<th>Primary SIC codes</th>
<th># firm-years</th>
<th>% of obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1 - 999</td>
<td>347</td>
<td>0.47</td>
</tr>
<tr>
<td>Mining and Construction</td>
<td>1000–1999, excluding 1300–1399</td>
<td>1950</td>
<td>2.62</td>
</tr>
<tr>
<td>Food</td>
<td>2000–2111</td>
<td>2940</td>
<td>3.96</td>
</tr>
<tr>
<td>Textiles and Printing</td>
<td>2200–2790</td>
<td>7143</td>
<td>9.61</td>
</tr>
<tr>
<td>Chemicals</td>
<td>2800–2824, 2840–2899</td>
<td>2857</td>
<td>3.84</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>2830–2836</td>
<td>2284</td>
<td>3.07</td>
</tr>
<tr>
<td>Extractive Industries</td>
<td>2900–2999, 1300–1399</td>
<td>3888</td>
<td>5.23</td>
</tr>
<tr>
<td>Durable Manufacturers</td>
<td>3000–3999, excluding 3570–3579 and 3670–3679</td>
<td>24789</td>
<td>33.35</td>
</tr>
<tr>
<td>Computers</td>
<td>7370–7379, 3570–3579, 3670–3679</td>
<td>7752</td>
<td>10.43</td>
</tr>
<tr>
<td>Transportation</td>
<td>4000–4899</td>
<td>4215</td>
<td>5.67</td>
</tr>
<tr>
<td>Retail</td>
<td>5000–5999</td>
<td>9630</td>
<td>12.96</td>
</tr>
<tr>
<td>Services</td>
<td>7000–8999, excluding 7370–7379</td>
<td>5997</td>
<td>8.07</td>
</tr>
<tr>
<td>Others</td>
<td>9000 and above</td>
<td>527</td>
<td>0.71</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>74319</td>
<td>100.00</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>5717</td>
<td>7.69</td>
</tr>
</tbody>
</table>

Table 7.12 shows the results for the annual regressions for the 13 major industries. The results indicate that there is variation in the contemporaneous relation between accruals and cash flows on an industry level, and as a result, one can expect variation in the effect of growth on the noise reducing role of accruals over different industries. The results indicate that for most industries, accruals for high growth firms are less prevalent in noise reduction of cash flows. The incremental coefficient on cash flow for growth firms, $Growth \times CFO_{it}$, is significant for firms for ten of the thirteen industries. However, for only one of these industries the incremental coefficient on cash flow for value firms, $Value \times CFO_{it}$, is significant. This is only partly consistent with the results in table 7.5. The results in table 7.12 show that only Retail has a significant negative incremental coefficient on cash flow for value firms, $Value \times CFO_{it}$. Overall, the results in table 7.12 show that growth has industry specific effects on accrual accounting, especially for firms with high growth.
Table 7.12 Time-series means and t-statistics for coefficients from annual cross-sectional regressions of Total accruals on cash flow form operations

<table>
<thead>
<tr>
<th>Industry</th>
<th>Intercept</th>
<th>CFOt</th>
<th>D_Growtht</th>
<th>CFOt*</th>
<th>D_Value</th>
<th>CFOt</th>
<th>Adj-R²</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.045</td>
<td>-0.598</td>
<td>-0.014</td>
<td>0.069</td>
<td>-0.055</td>
<td>0.116</td>
<td>0.14</td>
<td>347</td>
</tr>
<tr>
<td>(1.71)</td>
<td>(-4.33)</td>
<td>(-0.35)</td>
<td>(0.28)</td>
<td>(-2.18)</td>
<td>(0.82)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mining and Construction</td>
<td>-0.016</td>
<td>-0.427</td>
<td>-0.007</td>
<td><strong>0.126</strong></td>
<td>-0.006</td>
<td>-0.063</td>
<td>0.24</td>
<td>1950</td>
</tr>
<tr>
<td>(-2.55)</td>
<td>(-10.77)</td>
<td>(-0.94)</td>
<td>(2.30)</td>
<td>(-1.29)</td>
<td>(-1.46)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>0.011</td>
<td>-0.576</td>
<td>-0.024</td>
<td><strong>0.258</strong></td>
<td>-0.013</td>
<td>-0.073</td>
<td>0.50</td>
<td>2940</td>
</tr>
<tr>
<td>(1.84)</td>
<td>(-16.92)</td>
<td>(-1.21)</td>
<td>(2.52)</td>
<td>(-2.16)</td>
<td>(-1.38)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textiles and Printing</td>
<td>0.011</td>
<td>-0.527</td>
<td>-0.014</td>
<td>0.104</td>
<td>-0.024</td>
<td>-0.034</td>
<td>0.40</td>
<td>7143</td>
</tr>
<tr>
<td>(2.38)</td>
<td>(-21.64)</td>
<td>(-1.21)</td>
<td>(0.70)</td>
<td>(-6.06)</td>
<td>(-0.95)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemicals</td>
<td>0.005</td>
<td>-0.475</td>
<td>-0.011</td>
<td><strong>0.202</strong></td>
<td>-0.022</td>
<td>-0.084</td>
<td>0.26</td>
<td>2857</td>
</tr>
<tr>
<td>(0.83)</td>
<td>(-17.07)</td>
<td>(-0.92)</td>
<td>(3.17)</td>
<td>(-4.02)</td>
<td>(-1.18)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>-0.010</td>
<td>-0.346</td>
<td>-0.011</td>
<td><strong>0.207</strong></td>
<td>-0.016</td>
<td>0.219</td>
<td>0.04</td>
<td>2284</td>
</tr>
<tr>
<td>(-1.18)</td>
<td>(-6.73)</td>
<td>(-1.79)</td>
<td>(5.13)</td>
<td>(-1.75)</td>
<td>(1.22)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extractive Industries</td>
<td>-0.026</td>
<td>-0.410</td>
<td>-0.015</td>
<td><strong>0.085</strong></td>
<td>-0.016</td>
<td>0.021</td>
<td>0.24</td>
<td>3888</td>
</tr>
<tr>
<td>(-3.28)</td>
<td>(-9.69)</td>
<td>(-2.32)</td>
<td>(2.10)</td>
<td>(-3.40)</td>
<td>(0.53)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durable Manufacturers</td>
<td>0.002</td>
<td>-0.493</td>
<td>-0.019</td>
<td><strong>0.230</strong></td>
<td>-0.023</td>
<td>-0.015</td>
<td>0.28</td>
<td>24789</td>
</tr>
<tr>
<td>(0.40)</td>
<td>(-15.97)</td>
<td>(-4.54)</td>
<td>(9.92)</td>
<td>(-8.82)</td>
<td>(-0.78)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers</td>
<td>-0.029</td>
<td>-0.358</td>
<td>0.003</td>
<td><strong>0.093</strong></td>
<td>-0.014</td>
<td>-0.004</td>
<td>0.06</td>
<td>7752</td>
</tr>
<tr>
<td>(-4.24)</td>
<td>(-9.66)</td>
<td>(0.41)</td>
<td>(2.32)</td>
<td>(-3.10)</td>
<td>(-0.12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>-0.016</td>
<td>-0.458</td>
<td>-0.008</td>
<td>0.137</td>
<td>-0.007</td>
<td>-0.103</td>
<td>0.30</td>
<td>4215</td>
</tr>
<tr>
<td>(-3.38)</td>
<td>(-17.88)</td>
<td>(-0.52)</td>
<td>(1.81)</td>
<td>(-1.51)</td>
<td>(-1.75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail</td>
<td>0.004</td>
<td>-0.517</td>
<td>-0.011</td>
<td><strong>0.203</strong></td>
<td>-0.018</td>
<td><strong>-0.074</strong></td>
<td>0.33</td>
<td>9630</td>
</tr>
<tr>
<td>(0.76)</td>
<td>(-18.16)</td>
<td>(-2.15)</td>
<td>(5.49)</td>
<td>(-5.20)</td>
<td>(-2.23)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>-0.007</td>
<td>-0.493</td>
<td>-0.016</td>
<td><strong>0.212</strong></td>
<td>-0.020</td>
<td>0.000</td>
<td>0.24</td>
<td>5997</td>
</tr>
<tr>
<td>(-1.34)</td>
<td>(-19.55)</td>
<td>(-2.86)</td>
<td>(4.68)</td>
<td>(-5.00)</td>
<td>(-0.01)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>-0.018</td>
<td>-0.361</td>
<td>-0.022</td>
<td>0.183</td>
<td>-0.015</td>
<td>-0.189</td>
<td>0.15</td>
<td>527</td>
</tr>
<tr>
<td>(-1.89)</td>
<td>(-5.57)</td>
<td>(-1.49)</td>
<td>(1.77)</td>
<td>(-1.20)</td>
<td>(-1.49)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7.1 provides the definitions for the variables.
7.6 Summary and Conclusion

In this chapter, it is hypothesized that growth affects accounting accruals. The results are consistent with this prediction. Accounting is fundamentally linked to underlying economics. There is a difference in accounting perspective for accruals, that is likely to be dependent on the life cycle the company is in. My results confirm that the noise reducing role of accruals is less prevalent for high growth firms than for non-high growth and value firms. My results also show a higher prevalence of the noise reduction role of accruals for value firms. This result indicates that for firms with high growth, accruals are used to a lesser extent to dampen the effects of transitory cash flows, causing more volatile earnings. This could be interpreted as lower earnings quality. My results also show that for firms with low growth, accruals are used to a higher extent to dampen the effects of transitory cash flows, causing less volatile earnings, which could be interpreted as earnings of high quality.

In this chapter, it is also shown that the effect of growth on accounting accruals is also reflected in accrual based measures for earnings management. I show that measures that examine the relation between earnings, cash flow and aggregate accruals are also related to growth. This is consistent with the results in the first hypothesis, which show that accruals are used to a lesser extent to ameliorate transitory cash flows when growth is high. A further examination of specific accruals is also consistent with this result.

The contribution to the accounting literature made in this chapter is to show the effects of growth on accounting accruals. In particular, it is shown that when growth is high, earnings can be more volatile, since accruals will be less prevalent in reducing transitory cash flows. This finding adds to the literature on the role of accruals in financial accounting (e.g. Dechow, 1994).

My results also contribute to the earnings management literature. I show that growth also affects accrual based measures for earnings management. This is consistent with McNichols (2000), who shows that growth affects Jones model abnormal accruals. Future research should examine other effects of growth on accruals, for instance whether high growth firms have lower accrual quality because of the difference in accruals for high growth firms or because of earnings management motives.
Chapter 8 Differences in the Role of Accruals for Conditional Conservatism between Profit firms and Loss firms

8.1 Introduction

This chapter examines the role of accruals in conditional accounting conservatism. Accounting conservatism can be divided into two types, unconditional conservatism and conditional conservatism (Beaver and Ryan, 2005). Conditional conservatism reflects the reduction of accounting income due to a contemporaneous economic loss, e.g. more timely earnings recognition of bad news than of good news, and is also called timely loss recognition. I examine the timely recognition (incorporation in earnings) of economic losses for firms with an accounting profit and for firms with an accounting loss.64

The timely recognition of unrealized gains and losses is an important attribute of earnings quality (Ball and Shivakumar, 2005). An economic gain or loss represents an alteration in the expectation of future cash flows. Hence, economic gains or losses are often called unrealized gains or losses. This is different from an accounting profit or loss, which represents the realization of all (economic) gains or losses in the income statement. Unrealized gains and losses can be recognized through accruals in the income statement. In this chapter, the difference in the recognition of unrealized economic losses through accruals between firms with an accounting profit respectively an accounting loss is examined.

Firms reporting accounting losses experience higher levels of information asymmetry among investors relative to firms reporting accounting profits (Ertimur, 2004). From a contracting perspective, one of the manners in which financial reporting deals with asymmetric information is by instituting accounting conservatism. For instance, financial reporting standards require a lower verification standard for information about decreases in expected future cash flows (i.e., economic losses) than for increases (i.e., economic gains) (Basu, 1997). Ball and Shivakumar (2005) state that the governance effect of timely loss incorporation is due to it mitigating agency problems associated with managers’ investment decisions. Timely loss recognition increases managers’ incentives to act quickly to limit economic losses, and thereby increases the efficiency of contracting between firms and managers.

64 Accounting loss firms refer to firms that report an accounting loss, i.e., negative earnings before extraordinary items (Compustat data item #123) in their annual income statement. Timely loss recognition refers to the recognition of economic losses, i.e., a downward revision of expected future cash flows.
Timeliness of loss recognition is a summary indicator of the speed with which adverse economic events are reflected in both the income statement and the balance sheet. Ball and Shivakumar (2006) demonstrate the role of accruals in the asymmetry between gain and loss recognition timeliness. They argue that a major role of accruals is to recognize gains and losses in a timely fashion, particularly losses. That is, economic losses are more likely to be recognized on a timely basis, as accrued charges against income, whereas the recognition of economic gains is more likely to be deferred until realized in cash.

Prior research documents a discontinuity at zero in the distribution of earnings, showing an unusually high frequency of firm-year observations with small profits and an unusually low frequency of firm-year observations with small losses (Hayn, 1995; Burgstahler and Dichev, 1997; DeGeorge et al., 1999). Ball and Shivakumar (2005) argue that the 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). 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. Timely recognition incorporates unrealized losses in income on an accrued basis, for example as inventory write-downs or as restructuring or asset impairment charges. These accruals are often reflected in the income statement as special items.

Beaver et al. (2005) findings suggest that the discontinuity is at least partly explained by the asymmetric effects of special items for profit firms and loss firms. They show that the magnitude and frequency of negative special items are higher for loss firms than for profit firms. As a result, the earnings distribution only begins to display a striking discontinuity at zero after the inclusion of special items. Special items enhance the discontinuity in net income, causing the discontinuity in the distribution of income before special items to be substantially smaller than that in pretax income after special items.

If the asymmetric relation between accruals and cash flows for timely loss recognition explains the asymmetric shape of the earnings discontinuity, since special items occur more frequently and are more negative for loss firms than profit firms, it can be argued that there is a difference in the timely loss recognition role of accruals between loss firms and profit firms. In this chapter, I hypothesize that accruals are used for timely loss recognition, or

Ball and Shivakumar (2005) argue that the 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 argue 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.
conditional conservatism, for firms that incur an accounting loss. Information asymmetry causes management to use accruals to signal the transitory nature of losses. In contrast, for firms that earn an accounting profit, accruals are not used for conditional conservatism. My results confirm this. More specifically, results show that profit firms do not use accruals to reflect an economic loss, as predicted by Ball and Shivakumar (2006). In contrast, loss firms do in fact use accruals to reflect a downward revision in expected future cash flows, consistent with previous literature.

The timely loss recognition role of accrual accounting is especially important for accounting loss firms. For example, Ball and Shivakumar (2005) argue that timely gain and loss recognition increases the usefulness of financial reporting. Ertimur (2004) shows that, on average, loss firms have higher levels of information asymmetry. She shows that, on average, loss firms have higher bid-ask spreads than profit firms. Furthermore, the documented positive association between losses and bid-ask spreads is not driven by firms in financial distress. These results suggest that losses may affect the efficient functioning of capital markets through higher levels of information asymmetry. The use of accruals for timely loss recognition for loss firms mitigates this problem, by incorporating losses in a timely fashion, thereby reducing uncertainty about the prospects of the firm. Ball and Shivakumar (2005) argue that timely gain recognition is less of a concern than timely loss recognition. The focus in this chapter will therefore be on timely recognition of losses.

Beaver et al. (2005) provide evidence on accounting conservatism by examining the distribution on net income, and show that the asymmetric effect of special items for profit firms and loss firms partly explains the discontinuity at zero in the distribution of earnings. Callen et al. (2006) state that accounting conservatism is mainly facilitated by the special item accruals. Riedl and Srinivasan (2006) show that the use of special items reflects management intent to provide more transparent information via income statement presentation. Therefore, it seems that special items play a major role in timeliness of earnings for losses. Beaver et al. (2005) show that loss firms on average report more special items than profit firms, and that the special items for loss firms are more negative on average. Dechow and Ge (2006) state that “large negative accruals are less likely to be the consequence of the firm recording large positive transitory cash flows as liabilities (i.e., accruals playing a matching role). Instead,

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66 Ball and Shivakumar (2005; 2006) show that conditional conservatism introduces an asymmetry in the relation between accruals and cash flows. Economic losses are more likely to be recognized on a timely basis, as accrued (i.e., non-cash) charges against income, whereas economic gains are more likely to await recognition until realized in cash. This asymmetry holds for both working capital accruals (e.g., the lower-of-cost-or-market rule for inventories requires income-decreasing but not income-increasing accruals) and long term accruals (e.g., impairing but not revaluing goodwill). It implies that the positive correlation between cash flows and accruals arising from the timely recognition role of accruals is greater in periods with economic losses than in periods with economic gains. See also chapter 3, page 36.
they are more likely to reflect transitory “special items” adjustments that reduce earnings persistence”. Burgstahler et al. (2002) show that the average effect of special items on expected future earnings is much different from the average effect of aggregate earnings. In contrast to the persistent elements of aggregate earnings, special items are more transitory than the remaining components of earnings. However, their results also reveal significant differences between the effects of positive special items and negative special items on future earnings. Positive special items are less than completely transitory in the sense that positive special items are followed on average by a smaller but nonzero amount of earnings of the same sign in subsequent quarters. Negative special items, on the other hand, are followed by earnings of the opposite sign in subsequent quarters. This suggests that special items, at least in part, cause the difference in conditional conservatism between loss firms and profit firms. The results in this chapter indicate that the difference in conditional conservatism between profit firms and loss firms is done largely through special items. Special items have a positive relation with cash flows. Special items are also more negative for loss firms than for profit firms. Loss firms use special items for conditional conservatism, resulting in an even more positive relation between cash flows and special items. Profit firms in contrast use special items to reduce the noise of transitory cash flows caused by an economic loss.

My analysis makes several contributions. First, the research furthers the knowledge of the function of accounting accruals, which occupy a central position in financial reporting. Dechow (1994) shows that accruals mitigate transitory variation in cash flows, while Ball and Shivakumar (2006) state that accruals are also used for timely loss recognition. My results indicate that there is a difference in the manner in which profit firms and loss firms use accruals to reflect an economic loss. Profit firms use accruals to ameliorate the transitory variation, or noise, in cash flow caused by an economic loss, while loss firms use accruals to reflect the downward revision in future cash flows in current earnings. Also, it is essential to have a better understanding of loss firms, since loss firms constitute a growing number of firm-year observations, growing from about 15 percent of the U.S. firm-year observations during the 1970s to about 35 percent of the U.S. firm-year observations by the 1990s (Joos and Plesko, 2005).

Second, my results further the insights in the use of special items accruals. Callen et al. (2006) state that accounting conservatism is mainly facilitated by the special item accruals. I show that there is a difference between profit firms and loss firms in the use of special items to facilitate conditional conservatism. Differences in information asymmetry result in special items being used for conditional conservatism primarily by loss firms, and not by profit firms.

Finally, my research extends the earnings management literature. I present evidence against the earnings management hypothesis that is presented in prior research. I argue that accrual choices that previously may have been considered earnings management in fact
represent the application of conditional conservatism, or timely loss recognition. For instance, McVay (2006) argues that managers opportunistically shift expenses from core expenses (cost of goods sold and selling, general, and administrative expenses) to special items, since this vertical movement of expenses does not change bottom-line earnings, but overstates “core” earnings. I show that the shifting to special items could in fact reflect timely loss recognition, where special items are used to effect conditional conservatism, rather than earnings management. Also, some studies use measures of accrual volatility and earnings volatility to measure earnings management (e.g. Leuz et al, 2003). However, the results in this chapter show that higher accrual volatility and higher earnings volatility can also reflect managers’ information on the revision of future expected cash flows, as the use of accruals for timely loss recognition increase the positive relation between cash flows and accruals, and thus increase earnings volatility.

The remainder of the chapter is as follows. Paragraph 8.2 develops the hypotheses in this chapter. Paragraph 8.3 describes the data and methodology employed in this research. Paragraph 8.4 discusses the results of my analysis. Paragraph 8.5 discusses the robustness checks of the empirical examination. Paragraph 8.6 concludes.

### 8.2 Hypothesis development

Timeliness of loss recognition is a summary indicator of the speed with which adverse economic events are reflected in both the income statement and the balance sheet.

Assuming “clean surplus” accounting and ignoring offsetting changes such as reclassifications, all changes in the balance sheet flow through the income statement. Therefore, accounting income is the main indicator of financial reporting.

Accounting income consists of the cash flow generated by the operations of a firm, and accruals adjustments on cash flow from operations based on expectations of future cash flows. Accrual adjustments are made to mitigate timing and matching problems with cash flows, and are based on the revenue recognition principle and the matching principle.

Accounting income differs from economic income, which can broadly be defined as the change of the market value of equity, adjusted for dividends and capital contributions (Ball and Shivakumar, 2005). Economic income incorporates both current period cash flows and any revision in the present value of expected future cash flows. The economic gain or loss during a period can be thought of as the current-period cash flow plus or minus any upward or downward revision in the present value of expected future cash flows.
Accounting recognizes (economic) income under two broad models: deferred and timely recognition. Deferred recognition largely ignores revisions in expectations and awaits the realization of the revised cash flows themselves (realization principle).

Timely recognition incorporates unrealized losses in income (and hence the balance sheet) on an accrued basis, for example as inventory write-downs or as restructuring charges or asset impairment charges. By definition, timely loss recognition must occur around the time of revisions in expectations of future cash flows. This normally will be prior to the actual realization of those losses in cash, so timely recognition generally requires accounting accruals.

The economic gain or loss during a period can be thought of as the current-period cash flow plus or minus any upward or downward revision in the present value of expected future cash flows. Timely recognition of gains and losses must be accomplished at least in part through accounting accruals, because it is based in part on revisions of cash flow expectations made prior to their actual realization. Examples of timely recognition involving working capital assets and liabilities include gains and losses on trading securities, inventory write-downs due to factors such as spoilage, obsolescence or declines in market value, receivables revaluations, and provisions for operating costs arising from adverse events in the current period. Examples of timely recognition of losses involving long term assets and liabilities include restructuring charges arising from attending to failed strategies or excessive headcounts, goodwill impairment charges arising from negative-NPV acquisitions, and asset impairment charges arising from negative-NPV investments in long term assets (Ball and Shivakumar, 2006).

This role of accrual accounting has important implications for the interpretation of accruals. For example, Ball and Shivakumar (2005) argue that timely loss recognition increases the usefulness of financial reporting, but that it also increases the volatility of accruals (and of earnings as well as analysts’ earnings forecast errors), which the literature generally has taken to indicate lower reporting quality.

Timely loss recognition has the opposite effect of the noise mitigating role discussed by Dechow (1994). It increases the variance of earnings conditional on the variance of periodic cash flows, by including capitalized losses in earnings. By increasing the volatility of accruals, and of earnings relative to cash flows, timely loss recognition could be mistaken for poor earnings quality (e.g., Leuz et al., 2003; Graham et al., 2005), whereas it could be argued that timely recognition of losses through accounting accruals actually improves reporting quality (see Basu, 1997, Ball et al., 2000 and Ball and Shivakumar, 2005).

A primary reason for asymmetric accounting recognition is that managers have an asymmetric incentive to reveal their private information. Ball and Shivakumar (2005, 2006) focus on timely loss recognition, because financial reporting normally modifies the revenue
recognition rules by adopting a lower verification standard for information about decreases in expected future cash flows (i.e., economic losses) than for increases (i.e., economic gains). Timeliness of economic loss incorporation is an important attribute of earnings quality because it makes financial statements more useful in several contexts, for example in corporate governance and loan agreements. Other reasons for focusing on losses, provided by Ball and Shivakumar (2005), are lower demand for timely gain recognition, and empirical evidence that timely gain recognition is not a high priority in accounting (Basu, 1997; Ball et al., 2000).

Beaver et al. (2005) provide evidence on the role of conservatism on the income distribution for profit firms and for loss firms. They report that the magnitude and frequency of negative special items are higher for loss firms than for profit firms. Beaver et al. (2005) conclude that the distribution of net income is not a single continuous distribution, but rather a mixture of two underlying distributions for profit firms and loss firms. This finding suggests that the timely loss recognition role of accruals may differ for profit firms and loss firms.

Prior research highlights the incentive for managers to recognize economic losses when firms have accounting losses, but not when firms have accounting profits. Hayn (1995) shows that investors value reported losses differently than reported profits. Hayn (1995) posits that reported losses are perceived by investors as temporary. They are thus more weakly associated with returns than profits. Losses are likely to be considered temporary since shareholders can always liquidate the firm rather than suffer from indefinite losses. As a result, investors do not price losses into the stock price. Recognizing an economic loss when a firm has an accounting loss therefore highlights the transitory nature of the economic loss. In contrast, for firms with an accounting profit, recognizing an economic loss is considered permanent, and is reflected in lower returns for the stock.

Hypothesis 8.1 concerns the use of accruals to reflect economic losses for firms with actual accounting losses. Since managers want to accentuate the transitory nature of losses, knowing that investors price economic losses only for firms with an accounting profit (Hayn, 1995), it can be expected that firms that have an actual accounting loss are more likely to use accounting accruals for conditional conservatism. Ball and Shivakumar (2005; 2006) did not examine this specification. Therefore, in this study, I examine differences in timely loss recognition using accruals for profit firms versus loss firms. I expect on average, that loss firms use accruals to reflect a loss more than profit firms. The first hypothesis is:

67 Hayn (1995) shows that for a loss, the earnings response coefficient (ERC) is not different from zero. In contrast, for a profit firms, the predicted value of the ERC is expected to be $1 + 1/r$ where $r$ is the discount rate used by investors.
H8.1: Accruals are used by loss firms for conditional conservatism. In contrast, profit firms do not use accruals for conditional conservatism

Callen and Segal (2004) examine the manner in which accruals news relative to other factors, such as cash flow news and expected return news explain the total variance in current unexpected equity return changes. They show that accrual earnings news is as value relevant as cash flow earnings news in driving stock returns. Callen et al. (2006) argue that special items are one of the main accrual items through which conservatism is facilitated. They show that the asymmetric properties of conservative accounting generate a nonlinear relation between the unexpected revision in equity returns and earnings news. More specifically, their analysis implies that the GAAP treatment of special items generates a nonlinear and discontinuous relation between unexpected revisions in equity returns and special items.

In prior research, Elliott and Hanna (1996) investigate the information content of earnings in the presence of large nonrecurring or unusual charges. They find that the valuation weight, i.e. the earnings response coefficient (ERC), on earnings, before special items declines significantly in quarters following the recognition of large special items. ERCs decline even further if subsequent special items are reported. They also document that the ERC on special items is lower than the ERC on earnings before special items, consistent with the notion that special items are more transitory than other components of earnings, and that the ERC on special items declines with the frequency of reported special items.

68 Their analysis is based on the Feltham-Ohlson (1995; 1996) framework. Accruals in the Feltham-Ohlson framework are defined as the change in the firm’s operating assets. In addition to direct (dis)investment in operating assets, operating assets in the Feltham-Ohlson framework increase (decrease) whenever operating earnings are greater (less) than the firm’s free cash flows. Defining accruals in this fashion, Feltham and Ohlson (1995) show that an incremental dollar of accruals should theoretically have a more favorable impact on future earnings than an incremental dollar of cash flows since operating assets generate (ex ante) returns above the risk-free rate whereas invested cash flows yield the risk-free rate only (Callen and Segal, 2004).

69 Traditionally, for research using US data, special items comprise non-recurring items identified by Compustat from the income statement and the accompanying footnotes. The composition of the Compustat data item ”special items” is not determined by a formal definition specified in GAAP, but rather by Compustat's own definition. Professional standards influence, but do not completely determine, the composition of special items because (1) components of earnings reported separately on the income statement are frequently, but not always, included in the Compustat data item "Special Items" and (2) the Compustat data item "Special Items" sometimes includes items reported in the footnotes but not shown separately on the income statement. Similarly, management discretion with respect to which items are reported separately in the financial statements and what information is reported in the footnotes influences the composition of special items. Compustat special items (data item #17) includes significant nonrecurring items, such as current year results of discontinued operations, natural disaster losses, and nonrecurring profit or loss on the sale of assets, investments and securities. Note that the definition of special items excludes the three major classes of transactions reported separately from income from continuing operations and shown net of tax under GAAP: (1) disposals of a segment of a business that meet the criteria specified in APB 30, (2) extraordinary items and (3) cumulative effects of changes in accounting principles (see also Burgstahler, et al. (2002).
Francis et al. (1996) examine whether managerial manipulation or economic impairment drives write-off decisions and whether the market reacts differently in the two cases. They find that proxies for both manipulation and impairment are significantly related to the write-off decision, and on average, investors react negatively to write-offs. However, they document significant positive reactions to restructuring charges.

Fairfield et al. (1996) document that disaggregating earnings into operating earnings, non-operating earnings, and special items improves forecasts of return-on-equity. Their results suggest that, although special items can result either from proper application of GAAP (e.g., a write-down of impaired assets) or from earnings management (e.g., big bath accounting that artificially improves future reported profitability), separate disclosure of special items may improve the usefulness of financial reports (also see Callen et al., 2006).

Burgstahler et al. (2002) examine if investors price the information in earnings components, including special items. They document that, consistent with previous research, special items are more transitory than other earnings components. They find that equity prices do reflect relatively more of the effects of special items compared to other earnings components, consistent with special items being largely transitory in nature. However, they also find that equity prices do not fully impound the implications of special items for future earnings.

They also find significant differences between positive special items and negative special items. Positive special items are less than completely transitory in that they are followed by a smaller but nonzero amount of earnings of the same sign in subsequent quarters. Negative special items, on the other hand, are followed by earnings of the opposite sign in subsequent quarters. This is consistent with the conjecture that negative special items sometimes represent a shift of expenses from future periods into the current period (through, for example, restructuring charges) that reduce current income but increase future income.

Burgstahler et al. (2002) differentiate special items between transitory prototypes and inter-period transfer prototypes. The transitory prototype represents a temporary effect where none of the earnings innovation carries over to subsequent quarters. For the inter-period transfer prototype, the earnings innovation has no effect on cumulative earnings but rather represents a reallocation of income among quarters so that the earnings innovation in period $t$ is exactly matched by offsetting earnings innovations in subsequent periods. An example of a prototypical inter-period transfer is a restructuring charge recognized in period $t$ that represents immediate recognition of costs more properly expensed in periods $t+1$, $t+2$, and subsequent periods. They show that the characteristics of special items are empirically related to their sign: positive special items on average are best described by the transitory prototype while negative special items are best described by the inter-period transfer prototype.
The second hypothesis deals with the role of special items in explaining the difference in conditional conservatism using accruals between profit firms and loss firms. Beaver et al. (2005) findings suggest that the discontinuity at zero in the distribution of earnings is at least partly explained by the asymmetric effects of special items for profit firms and loss firms. They show that the magnitude and frequency of negative special items are higher for loss firms than for profit firms. Therefore, I hypothesize that the difference in conditional conservatism is caused by special items. The second hypothesis is:

**H8.2: The difference in the role of accruals for conditional conservatism between profit firms and loss firms is caused by the use of special items**

### 8.3 Research Methodology

Figure 8.1 illustrates the classification of firms with timely loss recognition into profit firms and loss firms.

<table>
<thead>
<tr>
<th>Group AP: Profit firms</th>
<th>Group AL: Loss firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Income Before Extraordinary items ≥ 0</td>
<td>Net Income Before Extraordinary items &lt; 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔCFO &lt;0, ABNRET &lt;0 or CFO&lt;0</td>
<td>ΔCFO &lt;0, ABNRET &lt;0 or CFO&lt;0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 8.1 Grouping of firms with accounting profits and accounting losses**

Group AP: firms with an accounting profit; Group AL: firms with an accounting loss; Group APEG: firms with an accounting profit and an economic gain; Group APEL: firms with an accounting profit and an economic loss; Group ALEG: firms with an accounting profit and an economic gain; Group ALEL: firms with an accounting profit and an economic loss; CFO: cash flow from operations; ABNRET: stock return in fiscal year minus market return in fiscal year;
The research question in this chapter is whether the role of accruals differs for the APEL group and the ALEL group. Ball and Shivakumar (2006) suggest that there is no difference in the role of accruals for APEL and APEG, however, I hypothesize that there is a difference, and this difference is caused by the difference in special items for APEL and APEG.

The empirical tests employ data obtained from the Center for Research in Security prices (CRSP) and Compustat annual industrial and research files. Accruals are estimated from cash flow statement, as Hribar and Collins (2002) point out that the use of balance sheet data can introduce errors into the measurement of accruals. This restricts the sample to the 1987–2001 period. Consistent with the prior literature, the 1% of extreme values of the distribution are excluded for all variables. All variables are deflated by average total assets. Excluded from the sample are financial firms (SIC codes 6000-6999) and firms without complete data. Also excluded are firms with negative book value.

I use the method of Ball and Shivakumar (2005; 2006) to examine the difference in timely loss recognition, or conditional conservatism, for profit firms and loss firms. In this model, accruals are a piecewise linear model of cash flows, where the change in cash flows is a proxy for profits or losses. The economic loss during a period can be thought of as the current-period cash flow minus a downward revision in the present value of expected future cash flows. The proxy for an economic loss is either non-market (book) based or market based. The non-market based proxy for an economic loss is a negative change in cash from operations (ΔCFO). The change specification is the correct specification for the tests of the difference in timely loss recognition between firms with an accounting profit and firms with an accounting loss, as the tests are less likely to be affected by a selection bias. The market based proxy for an economic loss is a negative change in market value, i.e. a negative abnormal return (ABNRET). The negative change in these proxies indicates that future cash flows are likely to be lower than previous anticipated, i.e. a downward revision in the present value of expected future cash flows. Profit firms and loss firms are determined by net income before extraordinary items (Compustat data item #123).

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70 More specifically, for accounting profit firms, firms with negative cash flow from operations have positive accruals by default. Conversely, for loss firms with a positive cash flow from operations, accruals are negative by default. When using the level of cash flow for as a proxy for economic losses, selecting on the dependent variable in the model may cause biased test statistics. I am grateful to Peter Easton for bringing this to my attention.
Profit firms are firms with net income before extraordinary items $\geq 0$, loss firms are firms with net income before extraordinary items $< 0$. I run pooled regressions with White (1980) adjusted standard errors of the following models:\footnote{The use of interaction dummy variables may cause concerns of collinearity, since the independent variable $\Delta CFO$ is highly correlated to the interaction terms $D_{\text{Loss}}$ and $D_{\Delta CFO}$. However, this is not an issue that affects the tenure of the results on this model, as the addition of the interaction terms increases the standard error of the coefficient on $\Delta CFO$. This does not affect the interpretation of the interaction terms, which are examined in this model.}

\begin{align}
\text{Acc}_i &= \beta_0 + \beta_1 * CFO_i + \beta_2 * \Delta CFO_i + \beta_3 * D_{\Delta CFO_i} + \beta_4 * D_{\Delta CFO_i} * \Delta CFO_i + \beta_5 * D_{\text{Loss}_i} \\
&+ \beta_6 * D_{\text{Loss}_i} * D_{\Delta CFO_i} + \beta_7 * D_{\text{Loss}_i} * \Delta CFO_i + \beta_8 * D_{\text{Loss}_i} * D_{\Delta CFO_i} * \Delta CFO_i + \epsilon_i \\
\end{align}

(8.1)

\begin{align}
\text{Acc}_i &= \beta_0 + \beta_1 * CFO_i + \beta_2 * \text{ABNRET}_i + \beta_3 * D_{\text{ABNRET}_i} + \beta_4 * D_{\text{ABNRET}_i} * \text{ABNRET}_i + \beta_5 * D_{\text{Loss}_i} \\
&+ \beta_6 * D_{\text{Loss}_i} * \text{ABNRET}_i + \beta_7 * D_{\text{ABNRET}_i} + \beta_8 * D_{\text{Loss}_i} * \text{ABNRET}_i + \epsilon_i \\
\end{align}

(8.2)

where:

- $\text{Acc}_i = \text{total accruals}$. Accruals are defined as net income before extraordinary items, taken from the cash flow statement (Compustat item #123) minus cash flow from operations, also taken from the cash flow statement (Compustat item #308);
- $\text{CFO}_i = \text{cash from operations}$, taken from the cash flow statement (Compustat #308) in year $t$;
- $D_{\text{Loss}_i} = \text{Dummy variable that takes the value of 1 if net income } < 0$, indicating an accounting loss, where net income is defined as net income before extraordinary items, taken from the cash flow statement (Compustat item #123), 0 otherwise;
- $D_{\Delta CFO_i} = \text{Dummy variable that takes the value of 1 if } \Delta CFO < 0$, indicating an economic loss, 0 otherwise;
- $\text{ABNRET}_i = \text{abnormal return}$, where the abnormal return is the stock return in fiscal year $t$ minus the market return in year $t$. The market return is the CRSP equally weighted market return in year $t$;
- $D_{\text{ABNRET}_i} = \text{Dummy variable that takes the value of 1 if } \text{ABNRET}_i < 0$, indicating an economic loss, 0 otherwise.

To examine hypothesis 2, which states that the difference in the role of accruals for conditional conservatism between profit firms and loss firms is caused by the use of special...
items, I examine the relation between special items and cash flow. Special items represent a class of accruals. Accruals are generally used to reduce noise in cash flow, resulting in a negative relation between contemporaneous cash flow and accruals. However, accruals can also be used for conditional conservatism, causing a positive relation between contemporaneous cash flow and accruals. To test the relation between cash flows and special items, I run the accrual model specifically for special items. In this examination, I investigate if there is a difference in timely loss recognition using special items for profit firms and loss firms. I run pooled regressions with White (1980) adjusted standard errors of the following model:

\[
Special\_Items_t = \beta_0 + \beta_1 \times CFO_t + \beta_2 \times D\_CFO_t + \beta_3 \times D\_Loss_t + \beta_4 \times D\_Loss_t \times CFO_t + \beta_5 \times D\_CFO_t \times CFO_t + \epsilon_t
\]

(8.3)

Where:

- \(Special\_Items_t\) = Compustat data item # 17, and all other variables as above.

In this specification, I examine if special items have a negative relation with cash flows, which suggest that special items are used to reduce the noise in transitory cash flows (e.g. Dechow, 1994) or if special items have a positive relation with cash flow, which suggest that special items are used to reflect unrealized gains or losses in the income statement (e.g. Ball and Shivakumar, 2006). Furthermore, I examine the timely recognition of economic losses via special items, and more specifically the difference between profit firms and loss firms in timely loss recognition using special items.

### 8.4 Results

#### 8.4.1 Descriptive Statistics

Table 1 provides descriptive statistics on the variables. Total accruals are negative on average (-0.053), as are special items (-0.011). The median value of special items is zero. This reflects the “special” nature of special items, that is, special items are on average not part of normal operations. It should be noted that on average, total accruals are more volatile than special items. The correlations in Table 2 illustrate the relations between the sample variables. As expected, there is a negative contemporaneous relation between cash flows and total accruals, with a Pearson correlation coefficient of -0.29. However, there is a positive relation between contemporaneous cash flow and special items, with a Pearson correlation coefficient of 0.11. This indicates that special items do not reduce the noise in cash flows to produce earnings, but rather make earnings more noisy estimates of firm performance. The positive relation between cash flow and special items suggest that special items could play a major role in
timely loss recognition, as Ball and Shivakumar (2006) show that timely loss recognition induces a positive relation between cash flows and accruals. This is further investigated in the next section of this chapter.

Table 8.1 Descriptive Statistics for Firm-Year Observations

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Lower Quartile</th>
<th>Median</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Accruals</td>
<td>-0.053</td>
<td>0.099</td>
<td>-0.091</td>
<td>-0.047</td>
<td>-0.006</td>
</tr>
<tr>
<td>Special Items</td>
<td>-0.011</td>
<td>0.055</td>
<td>-0.006</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Cash from operations</td>
<td>0.068</td>
<td>0.110</td>
<td>0.024</td>
<td>0.079</td>
<td>0.130</td>
</tr>
</tbody>
</table>

N= 41,382; Variables Measurement: Total Accruals= net income before extraordinary items, taken from the cash flow statement (Compustat item #123) minus cash flow from operations, also taken from the cash flow statement (Compustat item #308); Special Items,= Compustat item #17; All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

Table 8.2 Correlations of variables
Pearson (Spearman) Correlation Coefficients in the Lower (Upper) Diagonal (p- values shown in parentheses below correlations)

<table>
<thead>
<tr>
<th></th>
<th>Total Accruals</th>
<th>CFO</th>
<th>Special Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Accruals</td>
<td>-</td>
<td>-0.4486</td>
<td>0.2731</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>CFO</td>
<td>-0.2901</td>
<td>-</td>
<td>0.0768</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td></td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Special Items</td>
<td>0.5278</td>
<td>0.1056</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td></td>
</tr>
</tbody>
</table>

Table 8.1 provides the definitions for all variables.

8.4.2 Test of H8.1: Accruals are used by accounting loss firms for conditional conservatism. In contrast, profit firms do not use accruals for conditional conservatism

The first hypothesis concerns the difference in the use of accruals for conditional conservatism between firms with an accounting profit and firms with an accounting loss. First, in table 8.3, I replicate the results of Ball and Shivakumar (2006) regarding the role of accruals for the timely recognition of unrealized losses. Table 8.3 reports results of pooled regressions with White (1980) standard errors of equation (8.1). Regression I is the standard accrual model without the piece-wise linear specification for timely loss recognition. The coefficient on current cash flow $CFO_t$ is -0.186 with a t-stat of -19.36, while the coefficient on $ΔCFO_t$ is -0.244, with a t-stat of -27.33. Regression II features the addition of the
piecewise specification for the timely recognition of unrealized losses by accruals, consistent with Ball and Shivakumar (2006). The coefficient on $\Delta CFO_t$ is -0.309 with a t-stat of -22.73. The incremental coefficient on the change in current cash flow $D_{\Delta CFO_t} * \Delta CFO_t$ for firms with an economic loss, as indicated by a negative change in cash flow, is positive, as predicted by Ball and Shivakumar (2006), with a value of 0.203 and a t-stat of 8.27. The total coefficient on $\Delta CFO_t$ for economic loss firms is -0.106 (-0.309 + 0.203), indicating that firms with an economic loss offset 11% of negative cash flows with accruals. This model offers a marginal improvement in specification, as the explanatory power improves from 0.14 to 0.15 from the regression of hypothesis I. This improvement can be explained by the addition of the piecewise specification for the timely recognition of unrealized losses by accruals, consistent with Ball and Shivakumar (2006).

In regression III, the incremental loss function is examined separately for loss firms and profit firms. Hypothesis 8.1 predicts that only firms with an accounting loss use accruals for asymmetric loss recognition. As a result, in regression III the incremental loss coefficient $D_{\Delta CFO_t} * \Delta CFO_t$ for firms with an accounting profit is predicted to be negative, while the incremental loss coefficient $D_{Loss} * D_{\Delta CFO_t} * \Delta CFO_t$ for firms with an accounting loss is predicted to be positive. The results of regression III in table 8.3 are consistent with hypothesis 8.1. The coefficient on $\Delta CFO_t$ for firms with an accounting profit without economic losses is -0.106 with a t-stat of -12.55. For firms with an accounting loss, the coefficient $D_{Loss} * D_{\Delta CFO_t}$ is also negative, with a value of -0.158 and a t-stat of -5.50, indicating that there is no difference in direction of the noise reducing role of accruals between firms with an accounting profit and firms with an accounting loss. However, when examining the asymmetric loss function of accruals, there is a difference between firms with an accounting profit and firms with an accounting loss. The incremental coefficient on the change in current cash flow $D_{\Delta CFO_t} * \Delta CFO_t$ for firms with an accounting profit and an economic loss is negative, with a value of -0.241 and a t-stat of -18.88. This is inconsistent with Ball and Shivakumar (2006), and shows that accounting profit firms do not use accruals for asymmetric loss recognition. In fact, the results suggest that for firms with an accounting profit, accounting accruals play an even bigger role in reducing the noise in cash flows when there is an economic loss. The total coefficient on $\Delta CFO_t$ for economic loss firms with an accounting profit is -0.347 (-0.106 - 0.241). In contrast, for firms with an accounting loss, the results indicate that accruals are used for the timely recognition of economic losses. The incremental loss coefficient $D_{Loss} * D_{\Delta CFO_t} * \Delta CFO_t$ for firms with an accounting loss is positive as predicted, with a value of 0.699 and a t-stat of 15.24, consistent with Ball and Shivakumar (2006). The total coefficient on $\Delta CFO_t$ for economic loss firms with an accounting loss is positive, at 0.194 (-0.106 - 0.241-0.158 + 0.699) suggesting that there is
positive relation between changes in cash flow for operations and accruals for accounting loss firms with an economic loss. This model offers a large improvement in specification, as the explanatory power improves from 0.15 to 0.45 from the regression II. Thus, the results indicate that the role of accruals for the timely recognition of economic losses seems to be restricted to firms with an accounting loss. This could be the result of loss firms having bigger information asymmetries which are resolved by more efficient contracting, or because profit firms do not have an incentive to recognize economic losses on a timely basis.

**Table 8.3** Coefficients and t-statistics for coefficients from regressions of Total Accruals on Cash Flow from Operations. The proxy for an economic loss is \( \Delta CFO < 0 \)

<table>
<thead>
<tr>
<th></th>
<th>Pred</th>
<th>Sign</th>
<th>Regression I</th>
<th>Coefficient</th>
<th>t-stat</th>
<th>Regression II</th>
<th>Coefficient</th>
<th>t-stat</th>
<th>Regression III</th>
<th>Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>?</td>
<td>-0.04</td>
<td>-38.53</td>
<td>-0.036</td>
<td>-26.8</td>
<td>0.008</td>
<td>7.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFO</td>
<td>-</td>
<td>-0.186</td>
<td>-19.36</td>
<td>-0.204</td>
<td>-21.68</td>
<td>-0.489</td>
<td>-51.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \Delta CFO )</td>
<td>-</td>
<td>-0.244</td>
<td>-27.33</td>
<td>-0.309</td>
<td>-22.73</td>
<td>-0.106</td>
<td>-12.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( D_{\Delta CFO} )</td>
<td>?</td>
<td>0.008</td>
<td>4.96</td>
<td>-0.001</td>
<td>-0.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( D_{\Delta CFO} \ast \Delta CFO )</td>
<td>-</td>
<td>0.203</td>
<td>8.27</td>
<td>-0.241</td>
<td>-18.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( D_{\Delta CFO} \ast \Delta CFO )</td>
<td>?</td>
<td>-0.117</td>
<td>-41.09</td>
<td>-0.241</td>
<td>-18.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( D_{Loss} \ast \Delta CFO )</td>
<td>?</td>
<td>-0.158</td>
<td>-5.50</td>
<td>-0.241</td>
<td>-18.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( D_{Loss} \ast \Delta CFO )</td>
<td>?</td>
<td>0.016</td>
<td>3.66</td>
<td>-0.241</td>
<td>-18.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variables Measurement: \( CFO \) = Cash Flow from Operations (Compustat item #308); \( Acc \) = Total Accruals = Net income before Extraordinary Items (Compustat data #123) - Cash Flow from Operations (Compustat item #308); \( D_{\Delta CFO} \) = Dummy variable that takes the value of 1 if \( \Delta CFO < 0 \), indicating an economic loss for regression II; \( D_{Loss} \) = Dummy variable that takes the value of 1 if Net income before Extraordinary Items < 0 (Compustat data #123), indicating an accounting loss in regression III. All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

Table 8.4 examines the difference in timely economic loss recognition between firms with an accounting profit and firms with an accounting loss using market-adjusted return \( ABNRET \); as a proxy for economic losses, as in Basu (1997) and Ball and Shivakumar (2006). The results in table 8.4 using a market based proxy for economic losses are consistent with the inferences in table 8.3 using a non-market based proxy for economic losses. Regression I and regression II in table 8.4 show that, consistent with the results in Ball and Shivakumar (2006), only the firm-years with negative abnormal market returns contain significant information about accruals. For positive abnormal returns, the coefficient on \( ABNRET \) is economically small at \(-0.010\). The coefficient on economic loss \( D_{ABNRET} \ast ABNRET \) is positive and significant at 0.043, consistent with Ball and Shivakumar (2006). However, the results in regression III show that for only firms with an accounting loss negative abnormal market returns contain
significant information about accruals. The coefficient $D_{-Loss} * D_{-ABNRET} * ABNRET$ for firms with an accounting loss is positive and significant at 0.080, while the coefficient $D_{ABNRET} * ABNRET$ for firms with an accounting profit is -0.018 is economically small. The market-based proxy confirms the conclusion reached from using the book-based proxy, that the asymmetric loss recognition role of accruals is restricted to firms with an accounting loss.

Table 8.4 Coefficients and t-statistics for coefficients from regressions of Total Accruals on Cash Flow from Operations. The proxy for an economic loss is $ABNRET_t < 0$.

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Regression I</th>
<th>Coefficient</th>
<th>t-stat</th>
<th>Coefficient</th>
<th>t-stat</th>
<th>Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.028</td>
<td>-30.24</td>
<td>-0.022</td>
<td>-16.87</td>
<td>0.021</td>
<td>-20.35</td>
<td></td>
</tr>
<tr>
<td>CFO_t</td>
<td>-0.294</td>
<td>-34.81</td>
<td>-0.308</td>
<td>-36.02</td>
<td>-0.552</td>
<td>-64.85</td>
<td></td>
</tr>
<tr>
<td>ABNRET_t</td>
<td>-0.005</td>
<td>-5.67</td>
<td>-0.010</td>
<td>-7.79</td>
<td>0.000</td>
<td>-0.69</td>
<td></td>
</tr>
<tr>
<td>$D_{ABNRET}$</td>
<td></td>
<td></td>
<td>0.006</td>
<td>4.55</td>
<td>-0.002</td>
<td>-3.05</td>
<td></td>
</tr>
<tr>
<td>$D_{ABNRET} * ABNRET$</td>
<td></td>
<td></td>
<td>0.043</td>
<td>12.89</td>
<td>-0.018</td>
<td>-9.87</td>
<td></td>
</tr>
<tr>
<td>$D_{Loss}$</td>
<td></td>
<td></td>
<td>-0.130</td>
<td>-50.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{Loss} * ABNRET$</td>
<td></td>
<td></td>
<td>-0.008</td>
<td>-4.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{Loss} * D_{ABNRET}$</td>
<td></td>
<td></td>
<td>0.016</td>
<td>3.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{Loss} * D_{ABNRET} * ABNRET$</td>
<td></td>
<td></td>
<td>0.080</td>
<td>10.46</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adj $R^2$ | 0.114 | 0.121 | 0.43 |
No of obs | 35865 | 35865 | 35865 |

Equation 8.2: $Acc_t = \beta_0 + \beta_1 \cdot CFO_t + \beta_2 \cdot ABNRET_t + \beta_3 \cdot D_{ABNRET} + \beta_4 \cdot ABNRET_t + \beta_5 \cdot D_{-Loss} + \beta_6 \cdot D_{-Loss} * ABNRET_t + \beta_7 \cdot ABNRET_t + \beta_8 \cdot D_{-Loss} * ABNRET_t + \beta_9 \cdot ABNRET_t + \epsilon_t$.

The results show that there is a difference in the way accruals are used for the recognition of unrealized losses for profit firms and loss firms. For profit firms, timely loss recognition actually improves the noise reduction role of accruals, contrary to the results of Ball and Shivakumar (2006). For firms with an accounting loss however, the noise reduction role of accruals is less prevalent, consistent with previous research. My results also suggest that for loss firms, measures of earnings quality that examine the volatility of accruals and earnings relative to cash flows could mistake timely loss recognition for poor earnings quality (e.g., Leuz et al., 2003; Graham et al., 2005), since it could be argued that timely recognition of losses through accounting accruals actually improves reporting quality (see Basu, 1997; Ball et al., 2000; Ball and Shivakumar, 2005).
8.4.3 Test of H8.2: The difference in the role of accruals for timely loss recognition between profit firms and loss firms is caused by the use of special items

The results of hypothesis 1 indicate that there is a difference in the timely loss recognition role of accruals for profit firms and loss firms. The second hypothesis states that this difference is caused by the difference in special items for profit firms and loss firms. To examine hypothesis 8.2, I examine the relation between special items and cash flow. Special items is a class of accruals, and one of the major functions of accruals is to ameliorate transitory shocks in cash flow. As a result, there is a negative relation between accruals and cash flow. However, accruals are also used for the timely recognition of unrealized losses. This role of accruals results in a positive relation between accruals and cash flow. In this test, I examine the relation between special items and cash flow. First, table 5 provides descriptive statistics on the special items, conditional on an accounting profit or accounting loss and conditional on an economic profit or economic loss.

| Table 8.5 Descriptive Statistics of Special Items, conditional on accounting and economic profits or losses |
|---------------------------------------------------|----------------|----------------|----------------|
| Special Items                                      | n  | Mean  | Median | Standard Deviation |
| Special Items for firms with an Accounting Profit | 31482 | 0.000 | 0.000 | 0.027 |
| Special Items for firms with an Accounting Loss  | 10674 | -0.043 | -0.006 | 0.092 |
| Special Items for firms with an Economic Loss     | 16158 | -0.012 | 0.000 | 0.056 |
| Special Items if Economic Loss & Accounting Profit| 11892 | -0.001 | 0.000 | 0.028 |
| Special Items if Economic Loss & Accounting Loss | 4264 | -0.045 | -0.010 | 0.091 |

Variables Measurement: Special Items, = Compustat item #17; Accounting profit firms are all firms with Net income before Extraordinary Items ≥ 0 (Compustat data #123); Accounting loss firms are all firms with Net income before Extraordinary Items < 0 (Compustat data #123). Economic loss is all firms with ΔCFO <0 (Compustat data#308). All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

As presented in table 8.5, special items are negative on average for all firms, with a value of -0.011. However, when partitioning the sample on accounting profit firms and accounting loss firms, the descriptive statistics reveal that special items are zero (0.000) on average for accounting profit firms, in contrast to firms with an accounting loss, which have more negative special items than average, with a mean value of -0.043. Also note that the volatility of special times is almost twice as large for the accounting loss firms sample than for the entire sample of firms, and only half the volatility for the profit firm sample compared to the entire sample for firms. This indicates that loss firms use special items differently than profit firms.
The descriptive statistics also reveal that firms with an economic loss have on average negative special items with the same magnitude as the total sample of firms (-0.012). However, when partitioning economic loss firms on accounting profits and losses, the descriptive statistics reveal that accounting profit firms still have zero special items on average, while accounting loss firms have negative special items (-0.045). It appears that the special items accrual is used to reflect an economic loss, when the firm has an accounting loss. However, for profit firms, special items are not used to reflect an economic loss. Table 8.6 shows the results of pooled regressions with White (1980) standard errors of the accrual model for one specific set of accruals, the special items. Regression I shows the basic model, regressions II and III show the basic model adjusted for the timely loss recognition role of accruals for firms with an accounting profit and firms with an accounting loss.

**Table 8.6** Coefficients and t-statistics from regressions of Special items on Cash Flow from Operations. The proxy for an economic loss is $CFO_{t} < 0$

<table>
<thead>
<tr>
<th>Pred Sign</th>
<th>Regression I</th>
<th>Regression II</th>
<th>Regression III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>? -0.016 -30.88 -0.013 -24.51 -0.000 -1.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$CFO_{t}$</td>
<td>+ 0.053 11.62 0.033 7.97 -0.013 -4.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{CFO_{t}}$</td>
<td>- -0.003 -1.86 -0.035 -0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{CFO_{t}} \times CFO_{t}$</td>
<td>+ 0.029 2.04 -0.192 -2.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{Loss_{t}}$</td>
<td>+ 0.000 -17.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{Loss_{t}} \times CFO_{t}$</td>
<td>+ -0.121 -7.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{Loss_{t}} \times D_{CFO_{t}}$</td>
<td>? -0.001 -0.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{Loss_{t}} \times D_{CFO_{t}} \times CFO_{t}$</td>
<td>+ 0.347 5.98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Equation 8.3:**

\[
\text{Special Items}_{i} = \beta_{0} + \beta_{1} \times CFO_{i} + \beta_{2} \times D_{CFO_{i}} + \beta_{3} \times D_{CFO_{i}} \times CFO_{i} + \beta_{4} \times D_{Loss_{i}} + \beta_{5} \times D_{Loss_{i}} \times CFO_{i} + \beta_{6} \times D_{Loss_{i}} \times D_{CFO_{i}} + \beta_{7} \times D_{Loss_{i}} \times D_{CFO_{i}} \times CFO_{i} + \epsilon_{i}
\]

| Variables Measurement: Special Items = Compustat item #17; $CFO_{t} =$ Cash Flow from Operations (Compustat item #308); $D_{CFO_{t}} =$ Dummy variable that takes the value of 1 if CFO < 0, indicating a loss; $D_{Loss_{t}} =$ Dummy variable that takes the value of 1 if Net income before Extraordinary Items < 0 (Compustat data #123), indicating an accounting loss. All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

The results in table 8.6 indicate that special items are used in a different manner than the total accruals measure used in hypothesis 8.1. If special items are used for timely loss recognition, the relation of special items and accruals should be opposite of the relation between total accruals and special items. The positive relation between special items and contemporaneous cash flows in table 8.6 confirms this. The value of the coefficient $CFO_{t}$ is 0.053, with a t-value of 11.62. When this result is related to the coefficient for current cash flow $CFO_{t}$ on total accruals of -0.186 in table 8.3, the different role of special items becomes apparent. Special items amplify the transitory shocks of cash flow in earnings, while total accruals...
reduce the shocks of cash flow in earnings. The results for regression II show that this role of special items is accentuated when partitioning firms on the presence an economic loss. The coefficient on current cash flow \( CFO \), for firms without an economic loss is significantly positive at 0.033, while the incremental coefficient on current cash flow \( D_{CFO} \times CFO \), for firms with an economic loss, as indicated by a negative cash flow, is 0.029 with a t-stat of 2.04, indicating that special items are especially relevant for firms with an economic loss.

The results in regression III of table 8.6 highlight the difference in the way profit firms and loss firms use special items. For regression III in table 8.6, the coefficient on \( CFO \), for firms with an accounting profit without economic losses is -0.013 with a t-stat of -4.54, suggesting that special items are generally used to reduce the noise in cash flows. For firms with an accounting loss, the coefficient \( D_{Loss} \times D_{\Delta CFO} \) is also negative, with a value of -0.121 and a t-stat of -7.52, indicating that there is no difference in direction of the noise reducing role of special items between firms with an accounting profit and firms with an accounting loss. However, when examining the asymmetric loss function of accruals, there is a difference between firms with an accounting profit and firms with an accounting loss. The incremental coefficient on current cash flow \( D_{CFO} \times CFO \), for firms with an accounting profit and an economic loss is negative, with a value of -0.192 and a t-stat of -2.42, suggesting that accounting profit firms do not use special items for asymmetric loss recognition. The total coefficient on \( CFO \), for economic loss firms with an accounting profit is -0.205 (-0.013 - 0.192). In contrast, for firms with an accounting loss, the results indicate that special items are used for the timely recognition of economic losses. The incremental loss coefficient \( D_{Loss} \times D_{CFO} \times CFO \), for firms with an accounting loss is positive as predicted, with a value of 0.347 and a t-stat of 5.98. The total coefficient on \( CFO \), for economic loss firms with an accounting loss is positive, at 0.021 (-0.013 - 0.192 - 0.121 + 0.347) suggesting that there is positive relation between cash flow for operations and special items for accounting loss firms with an economic loss. Overall, the results in table 8.6, combined with the descriptive statistics in table 8.5 indicate that there is a difference in the manner in which profit firms and loss firms employ special items for the timely recognition of economic losses.

8.5 Robustness tests

8.5.1 Differential mean reversion in earnings changes

Accruals that are used for timely recognition of economic losses introduce a transitory element in income. As a result, changes in income that are the result of timely loss recognition have the tendency to reverse (Basu, 1997). If there is a difference in timely loss recognition of economic losses between firms with an accounting profit and firms with an accounting loss, the tendency of reversal of income changes as a result of timely loss
recognition of economic losses should also differ between firms with an accounting profit and firms with an accounting loss. I therefore test Basu’s (1997) time-series measure of timely loss recognition for accounting loss and accounting profit firms to examine if my results are robust to this specification:

\[
\Delta N_{t+1} = \alpha_0 + \alpha_1 \Delta N_t + \alpha_2 D_{-\Delta N_t} + \alpha_3 \Delta N_t * \Delta N_t \* \Delta N_t + \alpha_4 D_{-Loss} + \alpha_5 D_{-Loss} * \Delta N_t + \alpha_6 D_{-\Delta N_t} \* D_{-Loss} + \alpha_7 D_{-\Delta N_t} \* D_{-Loss} * \Delta N_t + \epsilon,
\]

(8.4)

where \(\Delta N_{t+1}\) is the change in income (defined as net income before extraordinary items) from fiscal year \(t\) to \(t+1\). \(D_{-\Delta NI}\) is a dummy variable taking the value 1 if the prior-year change \(\Delta NI\) is negative and \(D_{Loss}\) is a dummy variable that takes the value 1 for firms with the level of net income before extraordinary items < 0.

Table 8.6 shows the results of pooled regressions with White (1980) standard errors of regression 8.4. Regressions I and II shows the Basu (1997) model, regressions III shows the model adjusted for timely loss recognition for firms with an accounting profit and firms with an accounting loss.

<table>
<thead>
<tr>
<th></th>
<th>Regression I</th>
<th>Regression II</th>
<th>Regression II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pred Sign</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>?</td>
<td>-0.005</td>
<td>-0.006</td>
</tr>
<tr>
<td>(\Delta NI)</td>
<td>+</td>
<td>-0.355</td>
<td>-0.169</td>
</tr>
<tr>
<td>(D_{-\Delta NI})</td>
<td>?</td>
<td>-0.017</td>
<td>-0.192</td>
</tr>
<tr>
<td>(D_{-\Delta NI} * \Delta NI)</td>
<td>+</td>
<td>-0.461</td>
<td>-0.184</td>
</tr>
<tr>
<td>(D_{Loss})</td>
<td>?</td>
<td>0.020</td>
<td>0.101</td>
</tr>
<tr>
<td>(D_{Loss} * \Delta NI)</td>
<td>+</td>
<td>0.028</td>
<td>-6.06</td>
</tr>
<tr>
<td>(D_{Loss} * D_{-\Delta NI} * \Delta NI)</td>
<td>-</td>
<td>-0.900</td>
<td>-16.24</td>
</tr>
<tr>
<td>Adj R²</td>
<td>0.12</td>
<td>0.16</td>
<td>0.19</td>
</tr>
<tr>
<td>No of obs</td>
<td>58819</td>
<td>58819</td>
<td>58819</td>
</tr>
</tbody>
</table>

Variables Measurement: \(\Delta NI\) = Net income before Extraordinary Items (Compustat data #123); \(D_{-\Delta NI}\) = Dummy variable that takes the value of 1 if \(\Delta NI\) < 0, indicating an economic loss; \(D_{Loss}\) = Dummy variable that takes the value of 1 if Net income before Extraordinary Items < 0 (Compustat data #123), indicating an accounting loss. All variables are deflated by average total assets. For each variable, the extreme 1% is deleted on either side of the distribution.

The results of regression I in table 8.7 indicate that there is a reversal of income increases for all firms, with a value of the coefficient \(\Delta NI\) of -0.355, and a t-stat of -29.72. However, in
regression II, the results show that, when partitioning on firms with an economic loss as proxied by a negative change in net income, the income increase reversal is smaller for firms without an economic loss, with a value of the coefficient $\Delta NI_t$ of -0.169 and a t-stat of -9.66, and more pronounced for firms with an economic loss, with a value of the coefficient $D_\Delta NI_t \times \Delta NI_t$ of -0.461 and a t-stat of -18.86. This evidence of timely recognition of economic losses as non-repeating transitory components of income is consistent with Basu (1997). In regression III of table 8.7, firms with an economic loss are partitioned in firms with an accounting profit and firms with an accounting loss. The results indicate that the timely recognition of economic losses is restricted to firms with an accounting loss. The value of the coefficient $\Delta NI_t$ for accounting profit firms without an economic loss is -0.220 and a t-stat of -10.82. However, for accounting profit firms with an economic loss, the incremental timely loss coefficient $D_\Delta NI_t \times \Delta NI_t$ is positive at 0.337, with a t-stat of 10.63, indicating that profit firms are less likely to incorporate transitory losses in income. In contrast, the incremental timely loss coefficient for firms with an accounting loss, $D_{Loss} \times D_\Delta NI_t \times \Delta NI_t$, is negative as predicted, with a value of the coefficient $\Delta NI_t$ of -0.900, and a t-stat of -16.24. Overall, the results in table 8.7 show that the results of the difference in timely loss recognition between firms with an accounting profit and firms with an accounting loss are robust to the earnings changes specification.

8.5.2 Accruals estimated from the balance sheet

Another issue of the study is the accrual measurement. Accruals are estimated from the cash flow statement, as Hribar and Collins (2002) point out that the use of balance sheet data can introduce errors into the measurement of accruals. This restricts the sample to the 1987–2001 period. Therefore, as a robustness test, I also run equation 8.1 using accruals and cash flow data estimated indirectly from balance sheet data, which extends the sample to the 1971-2001 period. Accruals are defined as follows:

$$Acc_t = \text{total accruals. Accruals are calculated from the balance sheet as follows: } (\Delta CA_{j,t} - \Delta Cash_{j,t}) - (\Delta CL_{j,t} - \Delta STDebt_{j,t}) - DEPN_{j,t};$$

$$\Delta CA_t = \text{change in current assets (Compustat data item # 4);}$$

$$\Delta Cash_t = \text{change in cash/cash (Compustat data item # 1);}$$

$$\Delta CL_t = \text{change in current liabilities(Compustat data item # 5);}$$

$$\Delta STDebt_t = \text{change in debt included in current liabilities (Compustat data item # 3);}$$

$$DEPN_t = \text{depreciation and amortization expense (Compustat data item # 14);}$$

$$CFO_t = \text{cash from operations, and is calculated as } CFO_{j,t} = NI_{j,t} - TA_{j,t} \times NI_{j,t} \text{ is firm j’s net income before extraordinary items (Compustat #18) in year t;}$$
Table 8.8 reports the result of hypothesis 8.1 using cash flow statement data. The results in table 8.8 show that the results of hypothesis 8.1 are not affected by a different specification of accruals. In regression II of table 8.8, for all firms, the incremental coefficient on \( D_{CFO} \cdot CFO \) is positive at 0.192, with a t-stat of 18.41, similar to table 8.3. However, in regression III, for profit firms, the incremental coefficient on \( D_{LOSS} \cdot D_{CFO} \cdot CFO \) is negative, with a coefficient of -0.121 and a t-stat of -19.87, similar to results in table 8.3. Finally, for loss firms, the incremental coefficient on \( D_{LOSS} \cdot D_{CFO} \cdot CFO \) is positive, with a coefficient of 0.473 and a t-stat of 24.96, again similar to results in table 8.3. Finally, the explanatory power of the model is much higher for the profit and loss firm specification, consistent with previous results.

Table 8.8 Coefficients and t-statistics for coefficients from regressions of Total Accruals from the balance sheet on Cash Flow from Operations. The proxy for an economic loss is \( \Delta CFO < 0 \)

Equation 8.1: \( Acc = \beta_0 + \beta_1 \cdot CFO + \beta_2 \cdot \Delta CFO + \beta_3 \cdot D_\Delta CFO + \beta_4 \cdot D_\Delta CFO \cdot \Delta CFO + \beta_5 \cdot D_{Loss} + \beta_6 \cdot D_{Loss} \cdot \Delta CFO + \beta_7 \cdot D_{Loss} \cdot \Delta CFO \cdot \Delta CFO + \epsilon \)

<table>
<thead>
<tr>
<th>Pred</th>
<th>Regression I</th>
<th>Regression II</th>
<th>Regression III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>t-stat</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Intercept</td>
<td>?</td>
<td>-0.037</td>
<td>-63.1</td>
</tr>
<tr>
<td>CFO</td>
<td>+</td>
<td>-0.176</td>
<td>-32.94</td>
</tr>
<tr>
<td>( \Delta CFO )</td>
<td>-</td>
<td>-0.202</td>
<td>-53</td>
</tr>
<tr>
<td>( D_{\Delta CFO} )</td>
<td>+</td>
<td>0.015</td>
<td>18.56</td>
</tr>
<tr>
<td>( D_{\Delta CFO} \cdot \Delta CFO )</td>
<td>+</td>
<td>0.192</td>
<td>18.41</td>
</tr>
<tr>
<td>( D_{Loss} )</td>
<td>+</td>
<td>-0.079</td>
<td>-56.17</td>
</tr>
<tr>
<td>( D_{Loss} \cdot \Delta CFO )</td>
<td>?</td>
<td>0.009</td>
<td>0.73</td>
</tr>
<tr>
<td>( D_{Loss} \cdot \Delta CFO \cdot \Delta CFO )</td>
<td>+</td>
<td>0.021</td>
<td>9.79</td>
</tr>
<tr>
<td>( D_{Loss} \cdot \Delta CFO \cdot \Delta CFO )</td>
<td>+</td>
<td>0.473</td>
<td>24.96</td>
</tr>
</tbody>
</table>

Table 8.3 provides the definitions for all variables.

8.5.3 Fama-Macbeth statistics

One concern is cross-sectional correlation among firms in the pooled sample. To address this, table 8.9 reports average coefficients, adjusted \( R^2 \) values, and Fama-Macbeth (1973) t-statistics from annual cross-sectional regressions of equation 8.1. Results reported are for the book loss proxy \( \Delta CFO < 0 \). Previous results are qualitatively unchanged. Earlier conclusions, therefore, do not appear to be due to cross-sectional correlation overstating statistical significance.
Equation 8.1: \( \text{Acc}_t = \beta_0 + \beta_1 \cdot \text{CFO}_t + \beta_2 \cdot \Delta \text{CFO}_t + \beta_3 \cdot D_\Delta \text{CFO}_t \cdot \Delta \text{CFO}_t + \beta_4 \cdot \Delta \text{Loss}_t \\
+ \beta_5 \cdot D_\Delta \text{Loss}_t \cdot \Delta \text{CFO}_t + \beta_6 \cdot D_\Delta \text{Loss}_t \cdot \Delta \text{CFO}_t + \beta_7 \cdot \Delta \text{CFO}_t \cdot \Delta \text{CFO}_t + \epsilon_t \)

<table>
<thead>
<tr>
<th>Pred</th>
<th>Regression I</th>
<th>Coefficient</th>
<th>t-stat</th>
<th>Coefficient</th>
<th>t-stat</th>
<th>Coefficient</th>
<th>t-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>-0.036</td>
<td>-7.86</td>
<td>-0.032</td>
<td>-7.68</td>
<td>0.011</td>
<td>3.94</td>
</tr>
<tr>
<td>CFO</td>
<td>+</td>
<td>-0.216</td>
<td>-8.27</td>
<td>-0.233</td>
<td>-9.25</td>
<td>-0.509</td>
<td>-26.02</td>
</tr>
<tr>
<td>ΔCFO</td>
<td></td>
<td>-0.234</td>
<td>-22.18</td>
<td>-0.296</td>
<td>-16.35</td>
<td>-0.101</td>
<td>-10.60</td>
</tr>
<tr>
<td>D_ΔCFO</td>
<td>+</td>
<td>0.007</td>
<td>3.98</td>
<td>0.222</td>
<td>-9.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D_ΔLoss</td>
<td>?</td>
<td>-0.113</td>
<td>-26.28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D_ΔLoss*ΔCFO</td>
<td></td>
<td>-0.190</td>
<td>-4.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D_ΔLoss*D_ΔCFO</td>
<td>+</td>
<td>0.012</td>
<td>2.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D_ΔLoss<em>D_ΔCFO</em>ΔCFO</td>
<td>0.677</td>
<td>14.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( \text{Adj R}^2 \)

<table>
<thead>
<tr>
<th></th>
<th>Regression I</th>
<th></th>
<th>Regression II</th>
<th></th>
<th>Regression III</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.143</td>
<td></td>
<td>0.149</td>
<td></td>
<td>0.450</td>
<td></td>
</tr>
<tr>
<td>No of obs</td>
<td>33584</td>
<td></td>
<td>33584</td>
<td></td>
<td>33584</td>
<td></td>
</tr>
</tbody>
</table>

Table 8.3 provides the definitions for all variables.

8.5.4 Controls for Industry

To control for industry effects on economic losses, I partition the sample into 16 industries using the primary SIC code (Barth et al., 1998; Easton and Pae, 2004) and run pooled regressions with White (1980) adjusted standard errors of equation 8.1 for each major industry. Table 8.10 reports the industry composition of the sample.
### Table 8.10 Industry subsample

<table>
<thead>
<tr>
<th>Industry</th>
<th>Primary SIC codes</th>
<th># firm-years</th>
<th>% of obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1 - 999</td>
<td>105</td>
<td>0.34</td>
</tr>
<tr>
<td>Mining and Construction</td>
<td>1000–1999, excluding 1300–1399</td>
<td>705</td>
<td>2.26</td>
</tr>
<tr>
<td>Food</td>
<td>2000–2111</td>
<td>1120</td>
<td>3.59</td>
</tr>
<tr>
<td>Textiles and Printing</td>
<td>2200–2790</td>
<td>2486</td>
<td>7.96</td>
</tr>
<tr>
<td>Chemicals</td>
<td>2800–2824, 2840–2899</td>
<td>1201</td>
<td>3.85</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>2830–2836</td>
<td>1231</td>
<td>3.94</td>
</tr>
<tr>
<td>Extractive Industries</td>
<td>2900–2999, 1300–1399</td>
<td>1479</td>
<td>4.74</td>
</tr>
<tr>
<td>Durable Manufacturers</td>
<td>3000–3999, excluding 3570–3579 and 3670–3679</td>
<td>10201</td>
<td>32.67</td>
</tr>
<tr>
<td>Computers</td>
<td>7370–7379, 3570–3579, 3670–3679</td>
<td>3979</td>
<td>12.74</td>
</tr>
<tr>
<td>Transportation</td>
<td>4000–4899</td>
<td>1765</td>
<td>5.65</td>
</tr>
<tr>
<td>Retail</td>
<td>5000–5999</td>
<td>4041</td>
<td>12.94</td>
</tr>
<tr>
<td>Services</td>
<td>7000–8999, excluding 7370–7379</td>
<td>2758</td>
<td>8.83</td>
</tr>
<tr>
<td>Others</td>
<td>9000 and above</td>
<td>158</td>
<td>0.51</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>31229</td>
<td>100.00</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>2402</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Table 8.11 shows the results for the pooled regressions for the 16 major industries. The results indicate that there is variation in the contemporaneous relation between accruals and cash flows on an industry level. The incremental loss coefficient for firms with an accounting profit, $D_{CFO} \times CFO_t$, is positive for only one of the industry groups, Food, but not significantly so. For the other 15 industry groups, the incremental loss coefficient $D_{CFO} \times CFO_t$ is negative, and significant for 8 industry groups. For loss firms, the incremental coefficient on $D_{LOSS} \times D_{CFO} \times CFO_t$ is positive for 15 of the 16 industry groups, and significant for 9 of the 16 industry groups. For the majority of the industries (88% of the firm years), results are similar to results in table 8.3. Finally, the explanatory power of the model is much higher for the profit and loss firm specification, consistent with previous results, indicating that the results are on average robust to industry specification.
Table 8.11 Coefficients and t-statistics from pooled regressions of Total accruals on cash flow form operations by industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>Intercept</th>
<th>CFO</th>
<th>ΔCFO</th>
<th>ΔCFO*</th>
<th>D_{ΔCFO}</th>
<th>D_{ΔCFO}*</th>
<th>ΔCFO</th>
<th>D_{ΔCFO}*</th>
<th>Adj-R^2</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.015</td>
<td>-0.345</td>
<td>-0.227</td>
<td>-0.014</td>
<td>-0.28</td>
<td>-0.13</td>
<td>0.261</td>
<td>0.085</td>
<td>0.716</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>(1.34)</td>
<td>(-3.47)</td>
<td>(-2.33)</td>
<td>(-1.38)</td>
<td>(-1.75)</td>
<td>(-3.39)</td>
<td>(0.83)</td>
<td>(1.79)</td>
<td>(1.21)</td>
<td></td>
</tr>
<tr>
<td>Mining and Construction</td>
<td>0.019</td>
<td>-0.701</td>
<td>-0.032</td>
<td>0.002</td>
<td>-0.233</td>
<td>-0.145</td>
<td>-0.167</td>
<td>0.046</td>
<td>0.932</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>(2.85)</td>
<td>(-12.90)</td>
<td>(-0.52)</td>
<td>(0.34)</td>
<td>(-2.52)</td>
<td>(-9.48)</td>
<td>(-1.51)</td>
<td>(1.74)</td>
<td>(3.08)</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>0.018</td>
<td>-0.516</td>
<td>-0.234</td>
<td>-0.002</td>
<td>0.002</td>
<td>-0.099</td>
<td>0.211</td>
<td>0.011</td>
<td>-0.214</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>(4.17)</td>
<td>(-16.15)</td>
<td>(-8.36)</td>
<td>(-0.69)</td>
<td>(0.05)</td>
<td>(-9.82)</td>
<td>(3.29)</td>
<td>(0.67)</td>
<td>(-1.58)</td>
<td></td>
</tr>
<tr>
<td>Textiles and Printing</td>
<td>0.021</td>
<td>-0.594</td>
<td>-0.112</td>
<td>-0.005</td>
<td><strong>0.171</strong></td>
<td>-0.096</td>
<td>-0.217</td>
<td>0.023</td>
<td><strong>0.727</strong></td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>(5.93)</td>
<td>(-20.67)</td>
<td>(-3.76)</td>
<td>(-2.10)</td>
<td>(-4.12)</td>
<td>(-13.80)</td>
<td>(-2.88)</td>
<td>(2.03)</td>
<td>(5.32)</td>
<td></td>
</tr>
<tr>
<td>Chemicals</td>
<td>0.012</td>
<td>-0.493</td>
<td>-0.116</td>
<td>0.000</td>
<td><strong>0.203</strong></td>
<td>-0.083</td>
<td>-0.602</td>
<td>-0.002</td>
<td><strong>0.951</strong></td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>(2.26)</td>
<td>(-10.40)</td>
<td>(-1.74)</td>
<td>(0.04)</td>
<td>(-2.75)</td>
<td>(-5.92)</td>
<td>(-3.13)</td>
<td>(-0.09)</td>
<td>(4.21)</td>
<td></td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>-0.003</td>
<td>-0.208</td>
<td>-0.107</td>
<td>0.002</td>
<td><strong>0.311</strong></td>
<td>-0.115</td>
<td>0.015</td>
<td>0.009</td>
<td><strong>0.441</strong></td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>(-0.41)</td>
<td>(-5.73)</td>
<td>(-2.37)</td>
<td>(0.38)</td>
<td>(-3.87)</td>
<td>(6.79)</td>
<td>(0.15)</td>
<td>(0.41)</td>
<td>(2.78)</td>
<td></td>
</tr>
<tr>
<td>Extractive Industries</td>
<td>0.003</td>
<td>-0.617</td>
<td>0.01</td>
<td>-0.004</td>
<td><strong>0.159</strong></td>
<td>-0.103</td>
<td>-0.262</td>
<td>0.012</td>
<td><strong>0.513</strong></td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>(0.59)</td>
<td>(-13.82)</td>
<td>(-1.19)</td>
<td>(2.99)</td>
<td>(-9.39)</td>
<td>(-2.30)</td>
<td>(0.81)</td>
<td>(2.92)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durable Manufacturers</td>
<td>0.02</td>
<td>-0.512</td>
<td>-0.121</td>
<td>-0.001</td>
<td><strong>0.202</strong></td>
<td>-0.121</td>
<td>-0.108</td>
<td>0.016</td>
<td><strong>0.531</strong></td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>(10.10)</td>
<td>(-28.99)</td>
<td>(-7.70)</td>
<td>(-0.78)</td>
<td>(-9.28)</td>
<td>(-25.94)</td>
<td>(-2.37)</td>
<td>(2.31)</td>
<td>(7.65)</td>
<td></td>
</tr>
<tr>
<td>Computers</td>
<td>0.004</td>
<td>-0.431</td>
<td>-0.125</td>
<td>0.002</td>
<td><strong>0.207</strong></td>
<td>-0.155</td>
<td>-0.139</td>
<td>0.009</td>
<td><strong>0.646</strong></td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>(1.14)</td>
<td>(-17.93)</td>
<td>(-5.51)</td>
<td>(0.69)</td>
<td>(-4.37)</td>
<td>(-16.51)</td>
<td>(-1.62)</td>
<td>(0.69)</td>
<td>(5.38)</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>0.012</td>
<td>-0.643</td>
<td>-0.057</td>
<td>0.001</td>
<td>-0.077</td>
<td>-0.083</td>
<td>-0.223</td>
<td>0.003</td>
<td>0.393</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>(3.63)</td>
<td>(-28.34)</td>
<td>(-1.36)</td>
<td>(0.38)</td>
<td>(-1.37)</td>
<td>(-9.18)</td>
<td>(-1.90)</td>
<td>(0.28)</td>
<td>(2.17)</td>
<td></td>
</tr>
<tr>
<td>Retail</td>
<td>0.026</td>
<td>-0.658</td>
<td>-0.087</td>
<td>0.002</td>
<td><strong>0.142</strong></td>
<td>-0.12</td>
<td>-0.084</td>
<td>0.007</td>
<td><strong>0.397</strong></td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>(11.44)</td>
<td>(-35.06)</td>
<td>(-5.11)</td>
<td>(1.28)</td>
<td>(-5.41)</td>
<td>(-15.13)</td>
<td>(-0.94)</td>
<td>(0.61)</td>
<td>(2.76)</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>0.01</td>
<td>-0.517</td>
<td>-0.137</td>
<td>0.001</td>
<td><strong>0.182</strong></td>
<td>-0.108</td>
<td>-0.136</td>
<td>0.006</td>
<td><strong>0.626</strong></td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>(2.86)</td>
<td>(-18.68)</td>
<td>(-4.41)</td>
<td>(0.23)</td>
<td>(-4.09)</td>
<td>(-11.96)</td>
<td>(-1.78)</td>
<td>(0.45)</td>
<td>(4.85)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>0.027</td>
<td>-0.389</td>
<td>-0.207</td>
<td>-0.025</td>
<td>-0.162</td>
<td>-0.151</td>
<td>0.237</td>
<td>0.038</td>
<td>0.585</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>(1.29)</td>
<td>(-1.97)</td>
<td>(-1.36)</td>
<td>(-1.67)</td>
<td>(-1.04)</td>
<td>(-4.68)</td>
<td>(0.72)</td>
<td>(0.98)</td>
<td>(1.45)</td>
<td></td>
</tr>
</tbody>
</table>

Table 8.3 provides the definitions for all variables.
8.5.5 Different proxy for economic loss

The non-market based test for hypothesis 8.1 in equation 8.1 employs a negative change in cash flow as a proxy for economic losses. Ball and Shivakumar (2006) also employ a negative level of cash flow as a non-market based proxy for an economic loss. However, given that equation 8.1 partitions the sample on firms based on the level of net income, which is the sum of the level of cash flow and the level of accruals, using the level of cash flow as a proxy for economic losses to test hypothesis 8.1 induces a potential bias in the test statistics. For the purpose of comparison to Ball and Shivakumar (2006), in table 8.12, I also run equation 8.1 with a negative level of cash flow as a proxy for an economic loss. The results in table 8.12 show that using this specification does not affect the tenure of the results of hypothesis 8.1.

**Table 8.12 Coefficients and t-statistics for coefficients from regressions of Total Accruals on Cash Flow from Operations. The proxy for an economic loss is \( CFO_t < 0 \)**

\[
Acc_t = \beta_0 + \beta_1 \cdot CFO_t + \beta_2 \cdot D_{-CFO} + \beta_3 \cdot D_{-CFO} \cdot CFO_t + \beta_4 \cdot D_{-Loss} + \beta_5 \cdot D_{-Loss} \cdot CFO_t + \beta_6 \cdot D_{-Loss} \cdot CFO_t \cdot CFO_t + \varepsilon_t
\]

<table>
<thead>
<tr>
<th>Pred Sign</th>
<th>Regression I</th>
<th>Regression II</th>
<th>Regression III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>( -0.035 )</td>
<td>( -0.011 )</td>
<td>( 0.026 )</td>
</tr>
<tr>
<td>CFO_t</td>
<td>+</td>
<td>-0.260</td>
<td>-0.488</td>
</tr>
<tr>
<td>D_{-CFO}</td>
<td>-</td>
<td>0.009</td>
<td>3.98</td>
</tr>
<tr>
<td>D_{-CFO} \cdot CFO_t</td>
<td>+</td>
<td>0.570</td>
<td>25.26</td>
</tr>
<tr>
<td>D_{-Loss}</td>
<td>+</td>
<td>-0.105</td>
<td>-46.92</td>
</tr>
<tr>
<td>D_{-Loss} \cdot CFO_t</td>
<td>+</td>
<td>-0.339</td>
<td>-13.81</td>
</tr>
<tr>
<td>D_{-Loss} \cdot D_{-CFO}</td>
<td>+</td>
<td>-0.021</td>
<td>-5.64</td>
</tr>
<tr>
<td>D_{-Loss} \cdot D_{-CFO} \cdot CFO_t</td>
<td>+</td>
<td>1.375</td>
<td>36.26</td>
</tr>
</tbody>
</table>

**Adj R^2** | 0.08 | 0.13 | 0.49 |
| **No of obs** | 41382 | 41382 | 41382 |

Table 8.3 provides the definitions for all variables.

8.6 Summary and Conclusion

In this chapter, it is hypothesized that there is a difference between accounting profit firms and accounting loss firms in one of the major roles of accruals, the timely recognition of unrealized (economic) losses in earnings. The results are consistent with this prediction. First, for accounting profit firms, accruals do not perform the role of timely loss recognition. Rather, for accounting profit firms with an economic loss, accruals enhance the other major role of accruals, the reduction of noise in transitory cash flows in earnings. As a result of accruals ameliorating the noise in cash flow, accruals have a negative relation with cash flow. For
profit firms with an economic loss, this relation is even more negative. However, for accounting loss firms with an economic loss, accruals are less prevalent in reducing the noise in cash flow. The recognition of unrealized losses results in a positive relation between accruals and cash flow, and as a result, the relation between accruals and cash flow is less negative for loss firms with an economic loss.

In this chapter, it is also shown that the difference in conditional conservatism using accruals is caused in part by a major class of accruals, the special items. Evidence is presented that special items are on average negative for loss firms, and zero for profit firms. The negative nature of special items for loss firms is elevated by an economic loss. Furthermore, special items have a positive relation with cash flow, indicating that special items increase the noise of transitory cash flows in earnings, as predicted by the role of timely loss recognition. For firms with an accounting loss, the positive relation between special items and cash flow is even more prevalent for firms with an economic loss. As a result, the relation between special items and cash flow is even more positive for accounting loss firms with an economic loss. However, for accounting profit firms with an economic loss, special items reduce the positive relation between special items and cash flow. That is, the noise in transitory cash flow in earnings is reduced by special items for profit firms, with an economic loss. These results indicate that special items are, at least partly, responsible for the difference in timely loss recognition using accruals between profit firms and loss firms.

The contribution to the accounting literature made in this chapter is to show how accrual adjustments may differ between firms. In particular, it is shown that accounting profit firms make different accrual adjustments to reflect an economic loss than accounting loss firms. Accounting profit firms are more likely to use accruals to ameliorate the transitory cash flows in earnings, while accounting loss firms are more likely to accentuate the transitory cash flow in earnings. This finding is important for financial statement analysis purposes. The results demonstrate how users of financial statements should differentiate between accounting loss firms and accounting profit firms. Accounting loss firms are likely to show more volatile earnings as the result of an economic loss than accounting profit firms. This could be interpreted as lower earnings quality when in fact the timely recognition of unrealized losses reflects higher earnings quality.

My results also contribute to the earnings management literature. Some studies use measures of accrual volatility and earnings volatility to measure earnings management (e.g. Leuz et al, 2003). However, the results in this chapter show that higher accrual volatility and higher earnings volatility can also reflect managers’ information on the revision of future expected cash flows rather than earnings management. Also, some studies document a discontinuity at zero in the distribution of earnings as evidence of earnings management (Burgstahler and Dichev 1997, DeGeorge et al. 1999). Beaver et al. (2005) suggest that the
discontinuity is the result of the different treatment of special items between profit firms and loss firms. My results confirm that special items are used differently for conditional conservatism by profit firms and loss firms, potentially causing the discontinuity. However, one cannot conclude that earnings management is not a factor in the differences in accounting between accounting profit firms and accounting loss firms. For instance, accounting loss firms may have an incentive to take a big bath, since results are already negative, while accounting profit firms may have an incentive to postpone the realization of an economic loss for earnings management purposes. Future research can incorporate my results in the examination of earnings management in accounting profit and accounting loss firms.
Chapter 9 Summary and Discussion

9.1 Introduction

The purpose of financial reporting is to provide information that is useful for business decisions. Financial reports are of interest to users for a multiple of purposes, ranging from investment decisions to contracting purposes. At the heart of the financial reporting system is accrual accounting. Accruals shift or adjust the recognition of cash flows over time, so that the adjusted number, i.e. earnings, better measures firm performance. Managers of the firm are responsible for generating financial statements, and through the exercise of their discretion over accounting accruals, managers can improve or impair the usefulness and the quality of financial statements. Knowing more about the role of accruals in financial accounting in general, and more specifically about the role of accruals for the quality of earnings and earnings management is therefore essential to increase the usefulness of financial statements.

In this dissertation, the use of accruals in financial reporting is described and explained. In particular, this dissertation addresses the following three research questions that examine the role of accounting accruals for earnings quality and earnings management.

RQ1: What is the effect of accrual quality on the prediction of future cash flows?
RQ2: How does growth affect the role of accounting accruals in financial reporting?
RQ3: Is there a difference in the manner in which accruals are used for conditional conservatism, i.e. the timely recognition of unrealized economic losses, between firms with an accounting profit and firms with an accounting loss?

9.2 The theoretical foundation of the dissertation

The dissertation starts with the presentation of the main theoretical arguments and empirical evidence on the role of accounting accruals in financial reporting. A model is discussed which shows how generally accepted accounting principles employ accruals to alter the timing of cash flows recognition in earnings. Two important accounting principles that guide the production of earnings are the revenue recognition principle and the matching principle. Accrual accounting consists of all the techniques developed by accountants to apply the matching rule. Accrual accounting is the basis under which the effects of transactions and other events are recognized when they occur (and not as cash or its equivalent is received or
paid) and they are recorded in the accounting records and reported in the financial statements of the periods to which they relate.

Then, the role of accruals for reducing the noise of transitory cash flows is discussed. Generally speaking, accruals perform two functions in financial accounting. The primary function of accruals is to reduce the noise in transitory cash flows to produce earnings. The other major function of accruals is the timely recognition of unrealized gains and losses. Empirical evidence is presented of the noise reduction role of accruals. It is shown that the noise reduction role of accruals induces a negative relation between cash flow and accruals.

The information content of accruals is examined by establishing that accrual based earnings are a better measure of performance than reported realized cash flows. This is because realized cash flows have timing and matching problems that cause them to be a ‘noisy’ measure of firm performance. To evaluate the effectiveness of the accounting summary of events, empirical research requires a benchmark against which the financial report can be evaluated. Since the events that have affected the firm are reflected in firm value, the market value of the firm, as reflected in the stock price, is used as the benchmark. The stock price reflects all the future pay-outs to the holder of the stock, i.e. all future cash flows generated by the firm that will be distributed to shareholders. Therefore, changes in the stock price reflect changes in the expectations of future cash flows, or future pay-outs to the holders of the stock. Information is considered to be relevant if it is associated with (changes in) the value of the firm. Empirical evidence is discussed that shows that the association between security returns and earnings is higher than the association between security returns and operating cash flows, suggesting that accruals have information content. However, it is also shown that transitory components of earnings do not have an association with stock returns. This suggests that not all accruals are related to future cash flows generated by the firm.

Chapter 3 provides a discussion of the other major role of accruals, the timely recognition of unrealized gains and losses. The focus in this dissertation is on the timely recognition of unrealized losses. Timeliness of loss recognition is a summary indicator of the speed with which adverse economic events are reflected in both income statements and balance sheets. It is considered to be an important attribute of financial reporting quality.

Accounting recognizes (economic) income under two broad models: deferred and timely recognition. Deferred recognition largely ignores revisions in expectations and awaits the realization of the revised cash flows themselves. Timely recognition incorporates unrealized gains or losses in income (and hence the balance sheet) on an accrued basis. The economic gain or loss during a period can be thought of as the current-period cash flow plus or minus any upward or downward revision in the present value of expected future cash flows. By definition, timely gains and loss recognition must occur around the time of revisions in
expectations of future cash flows. The revision in cash flow expectations normally will be
made prior to the actual realization of those losses in cash, so timely recognition of an
economic loss in accounting income generally requires accounting accruals. In contrast to
noise-reducing operating accruals, gain and loss accruals are a source of positive correlation
between accruals and current-period operating cash flow.

There is a difference in accounting practice in the timely recognition of losses and
the timely recognition of gains. Financial reporting normally modifies the revenue recognition
rules by adopting a lower verification standard for information about decreases in expected
future cash flows (i.e. economic losses) than for increases (i.e. economic gains). Thus, the
accounting treatment of gains and losses is asymmetric when concerning the verification
requirement. This difference is induced by the conservatism principle of accounting. Using
accruals for timely loss recognition is also called ex post conservatism, news-dependent
conservatism or conditional conservatism. Empirical evidence is discussed that shows that
accruals play a major role in the timely recognition of unrealized losses.

Chapter 4 discusses earnings quality. Given the focus on decision usefulness of
financial reporting, the quality of financial reporting is of interest to those who use financial
reports for contracting purposes and for investment decision making. A major interest in
financial reporting is the earnings quality, which is part of the overall financial reporting
quality.

It is shown that the time series properties of earnings are typically used in financial
accounting research to examine earnings quality. Persistent earnings are often referred to as
sustainable or core earnings, where sustainable earnings are considered high quality earnings.
Empirical evidence is discussed that shows that the accrual portion of earnings is less
persistent than the cash portion of earnings. Furthermore, it is shown that the differential
 persistence of accruals is possibly caused by earnings management. Finally, the difference
between cash flow persistence and accrual persistence is highly variable across firms.
Empirical evidence is discussed that confirms that firm-specific information is an important
determinant for the persistence of earnings.

The earnings management literature is discussed in depth in chapter 5. Earnings
management deals with accrual accounting. It is defined as 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.

Earnings management concerns managers using their discretion over accounting
accruals and accounting choices, presumably for a private purpose. 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. 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. Three dominant research designs are used to test for earnings management: aggregate accruals tests, specific accruals tests and distribution of earnings tests. The most popular test for earnings management is based on aggregate Jones-abnormal accruals. However, as discussed in chapter 5, there are many reasons to suspect that the estimated discretionary accruals from the Jones model reflect nondiscretionary forces rather than pure discretion. While aggregate accruals tests receive the most criticism, they remain the most used test for earnings management. Specific accrual tests mitigate some of the problems associated with aggregate accrual tests. Together, chapters 2 through 5 provide the motivation and foundation for the empirical research of this dissertation.

9.3 Empirical Research

The first empirical examination in chapter 6 examines the effect of accrual quality on the prediction of future cash flows. One of the primary objectives of financial reporting is to provide information to help investors, creditors, and others assess the amount and timing of prospective cash flows. For instance, stock prices reflect the current value of future cash flows. Therefore, the ability to predict future cash flows is essential for the valuation of securities.

Earnings are the best predictor of future cash flows. However, decomposing earnings in cash flow from operations and accruals enhances the ability of earnings to predict future cash flows. Chapter 6 examines how accruals assist cash flows in predicting future cash flows. Since the persistence of earnings is firm specific, a measure of accrual quality is used that reflects the firm- specific effect accrual accounting has on financial reporting, based on the firm’s real business activity. This measure can be interpreted as a reflection of the accounting state of the firm. This accrual quality measure is employed to examine the effect of accrual quality on the predictive ability of accruals on future cash flows. Thus, this empirical examination answers the first research question of this dissertation: What is the effect of accrual quality on the prediction of future cash flows?

Three different types of accruals are examined. First, the effect on the prediction of future cash flows of total accruals is examined. Total accruals represent the change in the net
operating assets of a firm. The results indicate that when accrual quality is low, that is, the firm is in a volatile (accounting) state, accruals assist current cash flow in the prediction of future cash flows. This result can be explained by the fact that when a firm is in a volatile state, cash flow persistence is low, and accruals are used to mitigate the shocks in transitory cash flow. When accrual quality is high, that is, the firm is in a stable state, accruals are less relevant in predicting cash flows. The persistence of cash flows is high when accrual quality is high, and as a result, the noise reducing role of accruals is less relevant. The relation between accrual quality, which is a measure of earnings quality, and the persistence of cash flows, which is also a measure of earnings quality, is the major contribution of the first hypothesis of chapter 6.

The second type of accruals examined in chapter 6 is the Jones model abnormal accruals. Abnormal accruals are the most used proxy for earnings management in the literature. The effect of accrual quality is examined. It is hypothesized that if abnormal accruals represent earnings management, they can be considered a transitory shock, and therefore will not have any relevance in the prediction of future cash flows. The results however indicate that the abnormal part of accruals has the highest relevance in predicting future cash flows, casting doubt on the use of abnormal accruals for earnings management research. This result suggests that abnormal accruals are used by managers to convey private information about future cash flow rather than to manage earnings. Also, accrual quality does not seem to affect the relevance of abnormal accruals for the prediction of future cash flows. The stable coefficient of abnormal accruals for conveying private information about future cash flows shows the relevance of abnormal accruals for the prediction of future cash flows. This result suggests that the change in business activity is reflected in abnormal accruals, and not in the normal part of total accruals, which decreases with the increase in accrual quality and cash flow persistence. Therefore, abnormal accruals are used exclusively to convey private information about future cash flows. However, this test allows not for the conclusion that abnormal accruals are never used for earnings management.

Finally, the third measure of accruals examined is the level of accruals on the balance sheet. It is shown that the level of accruals on the balance sheet can be relevant for the prediction of future cash flows, dependent on the accrual quality.

The second empirical examination in chapter 7 examines the effect of growth on the role of accruals in financial accounting. Accounting is fundamentally linked to underlying economics. Growth seems to affect the accrual accounting process. Firms with large positive accruals relative to their asset base are typically growing firms, while firms with large negative accruals are typically firms that are exiting businesses and are in a state of decline. Accruals for growing firms have an income statement perspective, focusing on revenue recognition and the matching of costs with revenues. As a result, there is a lower demand for
the reporting of growth opportunities via accrual accounting for high growth firms, as stakeholders focus on the realization of the growth opportunities. Value firms however, use accruals from a balance sheet perspective, where the focus is on changes in the value of assets, as reflected in earnings. As such, there is a larger demand for the reporting of changes in asset values in earnings. In chapter 7, I answer the second research question in this dissertation: How does growth affect the role of accounting accruals in financial reporting?

I show empirically that there are systematic differences in accrual accounting between growth firms and value firms. I show that the noise reducing role of accruals is less prevalent for growth firms, and more prevalent for value firms on average. As a result of this accrual effect, earnings for growth firms are more volatile, and earnings for value firms are less volatile. This is consistent with business activity effecting accruals. It is also consistent with lower demand for the reporting of growth opportunities via accrual accounting for high growth firms, as stakeholders focus on the realization of the growth opportunities.

I then show that the difference in the use of accruals for growth firms and value firms potentially affect accrual-based measures of earnings management. My results indicate that that measures that examine the relation between earnings, cash flow and aggregate accruals are also related to growth. The contemporaneous correlation between changes in accounting accruals and changes in operating cash flows is significantly lower for firms with high growth compared to firms with low growth, as is the magnitude of accruals relative to cash flows. Growth also affects measures of unexpected specific accruals. Based on these results, I show that growth can be an omitted correlated variable in earnings management research.

The final empirical examination in chapter 8 more closely examines the state of the firm and accounting accruals. I examine the use of accounting accruals for firms with an accounting profit and firms with an accounting loss, and investigate if there is a difference in conditional conservatism using accruals between these two types of firms.

Firms reporting accounting losses experience higher levels of information asymmetry among investors relative to firms reporting accounting profits. This information asymmetry is typically dealt with by instituting accounting conservatism. Accounting conservatism implies the exercise of caution in the recognition and measurement of income and assets. Two forms of accounting conservatism have emerged in the literature. One is an accounting bias toward reporting low book values of stockholder equity. This kind of conservatism is called unconditional conservatism. The second form of conservatism is the asymmetric timeliness of loss recognition. Timeliness of loss recognition is a summary indicator of the speed with which adverse economic events are reflected in both income statements and balance sheets. This second kind of earnings conservatism is also called conditional conservatism. In chapter 8, I examine if the role of accruals in conditional conservatism is different for profit firms and for loss firms. In this chapter I answer research question 3: Is there a difference in the manner
in which accruals are used for conditional conservatism, i.e. the timely recognition of unrealized economic losses, between firms with an accounting profit and firms with an accounting loss?

The results in chapter 8 indicate that accruals are used for conditional conservatism for firms than incur an accounting loss. Information asymmetry causes management to use accruals to signal the transitory nature of losses. In contrast, firms that earn an accounting profit do not use accruals for conditional conservatism. For profit firms, revisions in future cash flows are expected to persist, and therefore managers do not use accruals to reflect a change in expectations of future cash flows in earnings. Partitioning on profit firms and loss firms also dramatically improves the explanatory power of the model, illustrating that there are major differences in accounting between profit firms and loss firms. My results indicate that pooling profit firms and loss firms may result in misspecification of accrual-based models.

The results in this chapter indicate that the difference in conditional conservatism between profit and loss firms is caused largely by special items. Loss firms use special items in a different manner than loss firms. Special items are more negative for loss firms than for profit firms. Special items are also shown to have a positive relation with cash flow. Loss firms use special items for conditional conservatism, resulting in an even more positive relation between cash flow and special items. Profit firms in contrast use special items to reduce the noise of transitory cash flows caused by an economic loss resulting in a more negative relation between cash flows and accruals.

### 9.4 Limitations, suggestions for future research and implications

The results in this dissertation imply that the state of the firm, as represented in the accrual quality of the firm, the level of growth of the firms, and the sign of accounting earnings, affect earnings quality. However, there are some limitations to the study that should be considered when drawing conclusions based on the evidence provided. A general limitation concerns the data used in this study. The data used in this study is data from the US, which potentially limits the generalizability of the results to countries using other GAAP. For instance, the examination of conservatism and accruals could be affected by the fact that in some instances IFRS allows for fair value accounting where US GAAP does not. Even though this is a general concern for all research in financial accounting, an extra heed of cautions seems in place. Other limitations are directly related to the methods of empirical research.

First off, the prediction of future cash flows is related to accrual quality. The measurement of accrual quality is not easily done, and is subject to interpretation what accrual quality is. Accrual quality is defined as the extent to which accruals are converted into cash
flows. However, the model of the prediction of future cash flows is confined to the prediction of next period’s cash flows. The model fails to pick up the extent that accruals are converted into cash at a later period. Thus, the results on the relation between accrual quality and the prediction of future cash flows can be considered incomplete to the extent that the model fails to incorporate all future cash flows. Future research should develop a measure of the long term accrual quality, and examine the effect of accrual quality on all future cash flows.

Second, the influence of growth on the role of accruals in financial accounting is examined. Growth is determined by the book-to-market ratio, and therefore reflects the stock market’s expectations of growth. However, future research should also examine the effect of other proxies for growth on the role of accruals in financial accounting. Suggestions of other proxies for growth are sales growth, earnings growth and analysts’ expectations of long term growth. Also, the results seem to be affected by industry specification. The results also do not seem to be stable for different industry specifications. Although this is expected, since industries can differ widely in growth conditions, the reader should take these limitations into account when drawing conclusion on the results presented in chapter 7. Growth also seems to affect measures of earnings management. However, in this study, only two types of earnings management measures are examined. Future research should further examine the effect of growth on proxies for earnings management, using other definitions of growth and other earnings management measures.

Finally, the difference in conditional conservatism between firms with an accounting loss and an accounting profit is examined. The proxy for conditional conservatism is based on accounting measures, i.e. the change in cash flows, or stock-market based measures, i.e. abnormal returns. My results are contingent on these proxies actually measuring conditional conservatism. Also, the results seem to be affected by industry specification, which could be explained by differences in conservatism between industries, or by the fact that my results are not generalizable over all industries.

This study extends research in financial accounting by showing how accrual adjustments are affected by the state of the firm. The evidence in this study suggests that the level of accrual accounting quality affects the persistence of cash flows, and as a result, accrual quality affect the prediction of future cash flows. Also, abnormal accruals appear not to be affected by the accrual quality, suggesting that abnormal accruals are used by managers to reflect private information about future cash flows. Second, growth affects the earnings of a firm by adjusting the accrual process. Finally, there is a difference in the manner in which accrual accounting is used to generate earnings for profit firms and loss firms. For users of financial statements who use financial statements to make economic decisions like the investment of shares in a firm, this information can improve the usefulness of financial statements. Since share prices reflect the expectations of future cash flows, a measure of
accrual quality can be used to predict share prices. A firm with a high level of accruals and high accrual quality should have higher returns than a firm with a high level of accruals and a low level of accrual quality. Also, earnings as a measure of firm performance have a higher association with returns than cash flows. However, for high growth firms, the earnings number may be less useful to predict returns, as the accrual adjustment of cash flows that produces earnings is less prevalent for high growth firms. Investors could therefore use other information in financial statements like cash flow information to predict returns. Finally, investors should also differ between earnings for loss firms and earnings for profit firms as a measure of firm performance. The association between earnings and stock returns should be higher for profit firms than for loss firms, as the accrual adjustment to cash flows to produce earnings are more prevalent for profit firms than the accrual adjustments for loss firms.
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Appendix A

As mentioned in chapter 6, Hirshleifer et al. (2004) argue that a high level of NOA indicates a lack of sustainability of recent earnings performance. The reasoning behind this result can be explained by examining the relation between net operating assets and cash on the balance sheet. The balance sheet of a firm can be summed up by the following identity (Dechow et al., 2005):

\[
\text{Total Assets} = \text{Total Liabilities} + \text{Owners Equity} \quad (A.11)
\]

Operating assets and operating liabilities can be distinguished from financial assets and financial liabilities. The most common financial asset is the balance of cash and short-term investments (Cash), while the most common financial liability is debt (Debt):

\[
\text{Cash} + \text{Operating Assets} = \text{Debt} + \text{Operating Liabilities} + \text{Owners Equity} \quad (A.12)
\]

The difference between operating assets and operating liabilities are the net operating assets (NOA) of a firm, denoting owner’s equity as EQUITY and rearranging yields:

\[
\text{NOA} = \text{Debt} + \text{Equity} - \text{Cash} \quad (A.13)
\]

Operating accounts are grouped on the left and the financial accounts on the right. The NOA expression on the left is the accounting estimate of the net value of the firms operations. Taking the first difference of this equation gives:

\[
\Delta \text{NOA} = \Delta \text{Debt} + \Delta \text{Equity} - \Delta \text{Cash} \quad (A.14)
\]

Dechow et al. (2005) rearrange the equation, assuming standard clean surplus assumptions for changes in equity and changes in debt:

\[
\Delta \text{Equity} = \text{Income} - \text{DIST_Equity} \quad (A.15)
\]

and so

\[
\text{Debt} = \text{Interest Expense} - \text{Interest Paid} - \text{DIST_Debt} \quad (A.16)
\]
Where:
Income = net income
DIST_Equity = net cash distributions to equity holders
DIST_Debt = net non-interest cash distributions to debt holders

Substitution, under the assumption that all interest expense is paid in cash and some final rearrangement yields:

Income = Accruals + ∆Cash + DIST_Equity + DIST_Debt \hspace{1cm} (A.17)

The final three terms on the right hand side of this equation sum to what is frequently termed ‘free cash flow’ (FCF):

FCF = ∆Cash + DIST_Equity + DIST_Debt \hspace{1cm} (A.18)

and so

Income = Accruals + FCF \hspace{1cm} (A.19)

Dechow et al. (2005) argue that accruals, representing the difference between income and free cash flow, provides a comprehensive measure of the component of income that is attributable to the application of accrual accounting. Hirschleifer et al. (2004) state that the accumulation over time of the difference between income and free cash flow are the net operating assets:

Net Operating Assets_T = \sum_0^T \text{Operating Income}_t - \sum_0^T \text{Free cash Flow}_t \hspace{1cm} (A.20)

Hirschleifer et al. (2004) argue that net operating assets are a cumulative measure of the deviation between accounting value added and cash value added, and term this ‘balance sheet bloat’. They state that accumulation of accounting earnings without a commensurate accumulation of free cash flows raises doubts about future profitability. Net operating assets can be further decomposed as:

Net Operating Assets_T = \sum_0^T \text{Operating Income}_t - \sum_0^T (\text{Operating cash Flow}_t - \text{Investment}_t) \hspace{1cm} (A.21)
Net Operating Assets\( T = \sum_{0}^{T} \text{Operating Income Before Depreciation}_t - \text{Operating Cash Flow}_t \)
\[ + \sum_{0}^{T} (\text{Investment}_t - \text{Depreciation}_t) \quad \text{(A.22)} \]

Eq. (6.22) indicates that the value of net operating assets is the sum of the cumulative differences between accounting and cash value added: (Operating Income Before Depreciation - Operating Cash Flow), and (Investment - Depreciation). Thus, firms with high net operating assets have high cumulative deviation between accounting and cash profitability derived from both operating and investing activities. Simplifying (6.23) yields

\[
\text{Net Operating Assets}_T = \sum_{0}^{T} \text{Operating Accruals}_t + \sum_{0}^{T} \text{Investment}_t \quad \text{(A.23)}
\]

which expresses net operating assets as the sum of cumulative operating accruals and cumulative investment. An example of an operating accrual is accounts receivables, for instance, when a firm books a sale as a receivable before it has received the actual cash inflow, its net operating assets increase. Second, when a firm records an expenditure as an investment rather than an expense, its net operating assets increase.
Summary in Dutch (Nederlandstalige samenvatting)

Dit proefschrift behandelt de rol van overlopende posten in de boekhouding, de zogenaamde accounting accruals, in het vaststellen van de kwaliteit van de gerapporteerde winst en de rol van accounting accruals in de beïnvloeding van de gerapporteerde winst. Accruals staan aan de basis van het financieel verslaggevingssysteem, en worden toegepast om de erkenning van kasstromen over tijd aan te passen of te verschuiven, om zo de nettowinst van een onderneming over een bepaalde periode te bepalen. Het netto winst-cijfer geeft hierbij een beter beeld van de prestaties van het bedrijf dan de kasstromen die in de boekingsperiode zijn gerealiseerd. Echter, de verantwoordelijkheid voor de boekhoudkundige aanpassingen ligt bij de managers van een onderneming. Daar de managers van een onderneming tevens beoordeeld worden op het winstcijfer welke zij kunnen beïnvloeden met hun discreetie over de boekhoudkundige aanpassingen, is het de vraag op welke wijze de kwaliteit van de gerapporteerde wins onderhevig is aan sturing door managers. In deze dissertatie is derhalve onderzocht op welke wijze accruals de kwaliteit van de gerapporteerde winst beïnvloedt.

Daartoe wordt eerst de literatuur over de rol van accruals in de financiële verslaggeving besproken. Vervolgens zijn er drie empirische onderzoeken uitgevoerd met data van Amerikaanse ondernemingen met betrekking tot (1) het voorspellen van toekomstige kasstromen, (2) het effect van groei op accruals, en (3) het gebruik van accruals bij het tijdig erkennen van economische verliezen.

Accrual accounting behelst alle boekhoudkundige technieken welke opstellers kunnen gebruiken om de nettowinst in een bepaalde boekingsperiode vast te stellen. Bij accrual accounting worden the gevolgen van transacties en andere gebeurtenissen erkend in de winst/ en verliesrekening wanneer ze plaatshebben, en niet wanneer de kasstromen die betrekking hebben op de desbetreffende transacties en andere gebeurtenissen ontvangen of uitgegeven worden. Uit de literatuur, zoals weergegeven in hoofdstuk 2, blijkt dat accruals een belangrijke rol vervullen in de financiële verslaggeving, namelijk het verminderen van de ruimte in kasstromen als prestatiemaatstaf van een onderneming. Kasstromen zijn onderhevig aan negatieve autocorrelatie, als gevolg waarvan kasstromen grote fluctuaties over de tijd vertonen. Accruals zijn negatief gecorreleerd aan kasstromen, en het erkennen van accruals in het resultaat zorgt ervoor dat fluctuaties in kasstromen afgevlakt worden in een bepaalde boekingsperiode. Kenmerk van accruals is dat dit effect in een volgende boekingsperiode teruggedraaid wordt. Dat de boekhoudkundige aanpassingen van accruals een beter beeld van de prestaties van een onderneming bieden, wordt in de literatuur empirisch vastgesteld door de bevinding dat de nettowinst van een onderneming een hogere associatie heeft met de beurskoers van een onderneming dan de operationele kasstroom van een bedrijf, waarbij de
beurskoers wordt gezien als maatstaf voor de prestaties van een onderneming. Tevens blijkt dat accruals op zichzelf ook informatie over de prestaties van een onderneming bevatten, waardoor de rol van accruals in het verbeteren van de financiële verslaggeving bevestigd wordt.

In hoofdstuk drie blijkt uit de literatuur dat accruals niet alleen gebruikt worden om de ruis in kasstromen als prestatie maatstaf af te vlakken. Accruals hebben ook als doel het voorzichtigheidsbeginsel in de financiële verslaggeving tot uiting te brengen. Het voorzichtigheidsbeginsel komt onder andere tot uiting in het principe dat verliezen bij constatering in de winst- en verliesrekening verwerkt moeten worden, en dat winsten pas verwerkt worden op het moment dat deze gerealiseerd zijn. Een verlies kan hierbij een afname van de waarde van de activa zijn, of een neerwaartse bijstelling van de verwachting van toekomstige kasstromen. Eén van dewijzen waarop opstellers een verlies in de winst- en verliesrekening kunnen verwerken is middels het boeken van een accrual welke het verlies weerspiegelt. Deze rol van accruals heeft tot gevolg dat er grotere fluctuaties in de nettowinst optreden, waar de boekhoudkundige aanpassing voor het erkennen van een verlies positief gecorreleerd is met de kasstromen van een onderneming. Het tijdig erkennen van verliezen lijdt tot een hogere kwaliteit van de financiële verslaggeving, daar het een getrouw beeld geeft van de onderliggende economische realiteit van een onderneming.

De kwaliteit van de winst wordt nader besproken in hoofdstuk 4. Uit de literatuur blijkt dat accruals niet alleen nuttig zijn om de huidige prestaties van een onderneming weer te geven, maar dat accruals er ook voor zorgen dat de voorspelbaarheid van toekomstige kasstromen wordt verhoogd. De boekhoudkundige aanpassingen van de operationele kasstroom die worden gedaan om de netto winst te bepalen blijken bij te dragen aan de voorspelbaarheid van toekomstige kasstromen, daar de netto winst een betere voorspeller is van toekomstige kasstromen dan huidige kasstromen. Een hogere voorspelbaarheid van toekomstige kasstromen wordt wenselijk geacht, omdat toekomstige kasstromen gebruikt kunnen worden in bijvoorbeeld waarderingsmodellen en investeringsbeslissingen. Een hoge mate van persistentie van de winst wordt hierbij gezien als een hoge mate van kwaliteit van de winst. Empirisch onderzoek wijst uit dat de persistentie van de kasstroom component van de winst hoger is dan de accrual component van de winst. De persistentie van verschillende accruals kan hierbij een grote diversiteit laten zien.

In hoofdstuk 5 wordt de huidige stand van het onderzoek naar winstbeïnvloeding onderzocht. Er blijken meerdere onderzoeksmethoden naar winstbeïnvloeding te zijn met elk sterke en zwakke punten. Uit de literatuur blijkt dat het moeilijk blijft om te bewijzen of er daadwerkelijk winstbeïnvloeding heeft plaatsgevonden, omdat de boekhoudkundige aanpassingen onder de discreetie van opstellers vallen, en het niet eenvoudig is winstbeïnvloeding te onderscheiden van het reguliere verslaggevingsproces.
In het eerste empirisch onderzoek (hoofdstuk 6) wordt de rol van accruals in het voorspellen van toekomstige kasstromen nader onderzocht. In dit onderzoek wordt voor Amerikaanse data onderzocht of de mate waarin accruals in kasstromen worden omgezet van invloed is op de wijze waarop de huidige operationele kasstroom de operationele kasstroom van de volgende boekingsperiode voorspelt. De mate waarin accruals in operationele kasstromen worden omgezet wordt in de literatuur de accrual kwaliteit genoemd, waarbij hoge kwaliteit van accruals aangeeft dat de accruals op korte termijn omgezet worden in kasstromen. Accrual kwaliteit geeft aan op welke wijze het financiële verslaggevingssysteem de onderliggende economische kenmerken van een onderneming weergeeft. Uit de resultaten van het onderzoek blijkt dat wanneer de accrual kwaliteit hoog is, de huidige kasstromen erg persistent zijn, en derhalve een goede voorspeller van toekomstige kasstromen zijn. Dit komt omdat bij hoge accrual kwaliteit de onderliggende economische bedrijfsvoering stabiel is, en weinig overlopende posten nodig zijn om de ruis in kasstromen af te vlakken. Echter, huidige kasstromen zijn minder persistent wanneer de accrual kwaliteit laag is, en leveren accruals een belangrijke bijdrage in het voorspellen van toekomstige kasstromen.

In het tweede empirisch onderzoek (hoofdstuk 7) wordt onderzocht of groei op een systematische wijze de boekhoudkundige aanpassingen van accounting accruals beïnvloedt. Uit de literatuur blijkt dat financiële verslaggeving op fundamentele wijze beïnvloed wordt door het onderliggend economisch proces. In dit hoofdstuk wordt aangetoond dat de mate van groei waaraan een onderneming onderhevig is de wijze waarop de netto winst wordt bepaald met behulp van accruals beïnvloedt. Ondernemingen die een hoge groei laten zien gebruiken veel minder accruals om de fluctuaties in operationel kasstromen af te vlakken dan bedrijven met een gemiddelde groei of lage groei. Ondernemingen die een daarentegen een lage groei laten zien gebruiken veel meer accruals om de fluctuaties in operationel kasstromen af te vlakken dan bedrijven met een gemiddelde groei of hoge groei. De resultaten geven ook aan dat meetinstrumenten van winstbeïnvloeding hier rekening mee dienen te houden om te voorkomen dat er onjuiste conclusies worden getrokken ten aanzien van aanwezigheid van winstbeïnvloeding bij ondernemingen.

In het derde empirisch onderzoek (hoofdstuk 8) wordt onderzocht of er een verschil is in de wijze waarop ondernemingen met een nettowinst en ondernemingen met een netto verlies accruals gebruiken om op een tijdige manier verliezen te verwerken in de winst- en verliesrekening. Voorgaand onderzoek suggereert dat alleen ondernemingen met een netto verlies er baat bij hebben om op een tijdige wijze verliezen in de winst- en verliesrekening te verwerken, terwijl bedrijven met een netto winst er baat bij hebben te wachten met de erkenning van een verlies in de winst- en verliesrekening totdat de economische verliezen daadwerkelijk gerealiseerd zijn. De resultaten in hoofdstuk 8 bevestigen dat enkel ondernemingen met een netto verlies accruals gebruiken om verliezen op een tijdige wijze te
verwerken in de winst- en verliesrekening. Ondernemingen met een nettowinst daarentegen gebruiken accruals niet om op een tijdige wijze verliezen te verwerken in de winst- en verliesrekening.

De bevindingen van dit proefschrift zijn relevant voor gebruikers van financiële verslaggeving en onderzoekers op dit gebied. Wel moet er rekening gehouden worden met de methodologische beperkingen van de onderzoeken alvorens conclusies te trekken op basis van de onderzoeksbevindingen. Vervolgonderzoek naar de rol van accounting accruals is gewenst om deze beperkingen weg te nemen en beter inzicht te krijgen van de rol van accruals in de financiële verslaggeving.
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