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Stock Returns, Earnings Management, and Discretionary Accruals: An Examination of the Accrual Anomaly

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STOCK RETURNS, EARNINGS MANAGEMENT, AND DISCRETIONARY ACCRUALS: AN EXAMINATION OF THE ACCRUAL ANOMALY

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# TABLE OF CONTENTS

List of Tables .......................................................................................................................... vi
List of Figures ............................................................................................................................ vii
Abstract ....................................................................................................................................... viii

1. INTRODUCTION AND MOTIVATION ............................................................................. 1
   Introduction ......................................................................................................................... 1
   Motivation ......................................................................................................................... 2
   Summary of Chapter 1 ..................................................................................................... 13

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT .................................. 14
   Overview ......................................................................................................................... 14
   Earnings Management Incentives .................................................................................... 16
   Corporate Governance and the Ability to Manage Earnings ....................................... 27
   Identifying Firms with the Incentive and Ability to Manage Earnings ....................... 28
   Hypothesis Development ............................................................................................... 30
   Summary of Chapter 2 ..................................................................................................... 35

3. MEASURING DISCRETIONARY ACCRUALS ......................................................... 36
   Introduction ....................................................................................................................... 36
   Background ....................................................................................................................... 36
   Competing Models ........................................................................................................... 39
   Measuring Total Accruals ............................................................................................... 49

4. RESEARCH DESIGN ...................................................................................................... 51
   Overview ........................................................................................................................... 51
   Discretionary Accruals and Earnings Management ......................................................... 51
   The Accrual Anomaly and Earnings Management Incentives ..................................... 63
   The Accrual Anomaly and Earnings Management Behavior ....................................... 68
   The Accrual Anomaly and Overreaction to Earnings ..................................................... 71
   Summary of Chapter 4 ..................................................................................................... 73

5. RESULTS .......................................................................................................................... 75
Overview .......................................................... 75
Accrual Decomposition Models and Earnings Management Firms ....... 75
Selecting a Model .................................................. 86
The Accrual Anomaly and Earnings Management Incentives .......... 88
The Accrual Anomaly and Earnings Management Behavior .......... 98
The Reversal of Announcement Date Overreaction ..................... 109

6. CONCLUSIONS AND AREAS FOR FURTHER RESEARCH .......... 116
   Introduction ..................................................... 116
   Do Accrual Decomposition Models Identify Earnings Management
   Firms? ........................................................... 117
   Do Earnings Management Firms Drive the Accrual Anomaly? ....... 118
   Does the Anomaly Represent a Reversal of Announcement Date
   Overreaction? ................................................ 119
   Contributions and Areas for Further Research ......................... 120

REFERENCES ..................................................... 122

BIOGRAPHICAL SKETCH ........................................ 131
LIST OF TABLES

Table 1: Comparisons of the Proportions of Earnings Management Firms Across Discretionary Accrual Deciles .......................................................... 77
Table 2: Proportions of EM Firms by the Direction of Accruals .................. 84
Table 3: Model Comparisons ........................................................................... 87
Table 4: The Accrual Anomaly, Cross-Sectional Regression Analysis .......... 89
Table 5: Earnings Management and Earnings Management-Discretionary Accrual Interaction, Cross-Sectional Regression Analysis .................. 92
Table 6: The Accrual Anomaly - Abnormal Returns to Hedge Portfolios ...... 94
Table 7: Comparisons of Hedge Portfolio Returns by Firm Type, EM versus NonEM Firms ....................................................................................... 97
Table 8: The Impact of Earnings Management Behaviors on the Accrual Anomaly, Cross-Sectional Regression Analysis ................................. 100
Table 9: Abnormal Returns to Hedge Portfolios - Behavior Analysis Period.... 104
Table 10: Comparisons of Hedge Portfolio Returns by Earnings Management Behavior, Rare versus Regular Earnings Management ................. 106
Table 11: Comparisons of Hedge Portfolio Returns by Earnings Management Behavior, Smoothers versus Regular Earnings Management .......... 107
Table 12: Comparisons of Hedge Portfolio Returns by Earnings Management Behavior, Smoothers versus Non-Smoothers ................................. 108
Table 13: Announcement Date Overreaction and Long Run Reversal .............. 112
LIST OF FIGURES

Figure 1: Approximation of Skinner and Sloan (2002) Figure 4 .................. 19

Figure 2: 21 Day CAR Plot, Abnormal Returns Around Earnings Announcement Dates, High Accrual Firms v. Low Accrual Firms ............... 111

Figure 3: 61 Day CAR Plot, Abnormal Returns Around Earnings Announcement Dates, High Accrual Firms v. Low Accrual Firms ............... 114

Figure 4: 121 Day CAR Plot, Abnormal Returns Around Earnings Announcement Dates, High Accrual Firms v. Low Accrual Firms ............... 115
ABSTRACT

The purpose of this dissertation is to examine earnings management as it relates to the accrual anomaly. In this examination, three primary research questions arise. First, I address the question as to whether or not accrual decomposition models can, in actuality, be used to identify earnings management firms in the general population of firms. Second, I address the question as to whether or not earnings management firms drive the accrual anomaly. Third, I address the question as to whether or not the accrual anomaly results from a reversal of an overreaction to the earnings announcements of earnings management firms. With respect to the first question, although I am unable to conclude that extreme decile firms, in general, manage earnings, I find that the firms in the highest and lowest discretionary accrual deciles are more likely to contain firms with incentives to manage earnings upwards and downwards, respectively. Results relating to the second question are mixed. While regression analysis does not support the contention that earnings management firms drive the anomaly, hedge portfolio analysis reveals that earnings management firms produce significantly higher returns. With regards to the final question, although I find some evidence of positive abnormal returns accruing to high accrual firms and negative abnormal returns to low accrual firms around their announcement dates, the magnitudes of these returns are far too small to explain the long-run returns that have been documented. Additional contributions of this research include 1.) evidence that the KLW Jones model is most effective at identifying earnings management firms when analyzing the general population of firms and 2.) evidence that the abnormal returns of the accrual anomaly should be measured from firms’ actual earnings announcement dates, rather than from four months following fiscal year-ends.
CHAPTER 1
INTRODUCTION AND MOTIVATION

Introduction

The purpose of this dissertation is to examine the market impact of earnings management in the context of the accrual anomaly first documented by Sloan (1996). The accrual anomaly is simply Sloan’s (1996) finding that the accrual component of earnings can predict future stock returns.¹ My analysis examines the relationships between both high and low accrual firms and various earnings management incentives to provide evidence as to whether or not the unexpected (discretionary) accruals identified by accrual decomposition models truly are discretionary and thus represent earnings management. In addition, I analyze the effects of the various earnings management incentives on the abnormal stock returns arising from the accrual anomaly. This analysis sheds light on what factors drive this anomaly, on investors’ potential to exploit it, and on managers’ ability to influence stock prices via earnings management. Finally, I examine whether long-run abnormal returns associated with this anomaly are negatively related to abnormal returns around the initial earnings announcement date, suggesting the anomaly results from investors overreaction to earnings. Other contributions of this study include a new model for estimating discretionary accruals that incorporates many of the suggested extensions of the Jones (1991) model, and an analysis of this model's ability to identify earnings management relative to that of the Kang and Sivaramakrishnan (1995)

¹ The accrual anomaly and potential explanations for this anomaly are discussed more thoroughly later in this chapter.

Motivation

My research is motivated by three primary areas of capital markets research: market efficiency, the accrual anomaly, and earnings management. As the accrual anomaly is unexplained, an examination of earnings management as a potential cause contributes to the market efficiency debate. In addition, this research contributes to the earnings management literature in two ways. First, Chan, Chan, Jegadeesh, and Lakonishok (2001) note that while it has been documented that certain firms suspected of earnings management, specifically those subject to SEC enforcement actions, tend to have high accruals, there is no documented evidence that the managers of high accrual firms, in general, use accruals to manipulate earnings. To fill this gap, I examine whether or not segmenting firms on the basis of their discretionary accruals actually identifies firms likely to manage earnings in the market as a whole. Finally, within the earnings management stream of research, a portion of my dissertation is motivated by the need for a better model to estimate discretionary accruals. Each of these motivations is discussed in the sections that follow.

Market Efficiency and Stock Market Anomalies

The theory of market efficiency and the efficient markets hypothesis has long been a focal point of financial research. Put simply, the efficient markets hypothesis is that markets are efficient, that is, market prices fully-reflect available information. Fama (1970) provides an excellent review of the theory of market efficiency and of the empirical findings to that point in time. Of particular interest, Fama (1970) discusses the implications of market efficiency, and the joint hypothesis problem inherent in testing the efficient markets hypothesis.

Addressing the implications of market efficiency, Fama (1970) points out that a major empirical implication of efficient markets theory is that profitable trading strategies
based on available information are not possible.\(^2\) At the time of Fama’s (1970) review, there was little evidence contrary to the hypothesis that markets are efficient. By the 1990s, however, this had begun to change. In his second review of efficient markets literature, Fama (1991) notes that new research suggests that returns may be predicted using past returns (Debondt and Thaler, 1985 & 1987), size (Banz, 1981), dividend yields (Fama and French, 1988), and other variables. As profitable trading strategies could be derived from these findings, these results seem to be directly contrary to the implication of market efficiency discussed in Fama (1970). This brings me to the second topic of interest from Fama’s (1970) article: the joint hypothesis problem.

Fama (1970) notes that while the theory of efficient markets is simply concerned with whether or not market prices fully-reflect all available information, the theory only has empirical content within the context of a specific model for determining what returns should be. Thus, research documenting anomalies, predictable returns not explained by the model used to estimate expected returns, may represent a market inefficiency or they may indicate a flaw in the returns model. With respect to the early anomalies discussed above, Fama (1991) suggests that return predictability could reflect rational variation through time in expected returns. Thus, the market is not inefficient, merely the model typically used for determining expected returns, the capital asset pricing model (CAPM), does not allow for changing conditions.

During the 1990s, long-run event studies took center stage in the market efficiency debate, producing further evidence of return predictability, and further challenging market efficiency. These studies provide evidence of both stock price underreaction and overreaction.\(^3\) In addition, researchers began to develop new behavioral theories contrary to the efficient markets hypothesis.\(^4\) Among these, Schleifer and Summers (1990) suggest an alternative to efficient markets theory in which some traders are not fully rational (i.e., may be subject to systematic biases) and limits to arbitrage prevent rational investors from completely countering irrational demand. Barberis, Schleifer, and Vishney (1998) and Daniel, Hirshleifer, and Subrahmanyam

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\(^2\) By profitable strategy, I mean one that is expected to earn excess returns.

(1998) offer more detailed models that have the ability to explain much of the overreaction and underreaction documented in the empirical studies.

In the face of these new theories and empirical findings, the efficient market debate continues. Fama (1998) argues that the new behavioral models work well for the anomalies they are designed to explain, but typically cannot be applied to other anomalies. In addition, he counters the empirical findings with both the tried and true bad models problem and new criticisms regarding the methods used in calculating long-run abnormal returns. He then demonstrates that the vast majority of anomalies disappear with “reasonable” methodological changes: the use of the three-factor model (Fama and French, 1993) to generate expected returns and the use of alternative return metrics.5

Loughran and Ritter (2000) counter Fama’s (1998) arguments on several fronts. First, they note that in tests of market efficiency, a normative equilibrium model must be used to generate benchmark returns. They suggest that the use of the three-factor model merely tests whether or not an anomaly is distinct from already documented patterns (potentially anomalies themselves). Second, they argue that the “reasonable” methods suggested by Fama (1998) not only suffer from an extreme lack of power but also are biased against finding anomalies by benchmark contamination.6 Then, using the new issues puzzle as a test case, Loughran and Ritter (2000) show that when new issue firms are excluded from factor construction, even the three-factor model produces evidence of long-run underperformance. This dissertation adds to the debate on market efficiency by further examining the accrual anomaly and its potential causes.

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4 For an extensive review, see Hirshleifer (2001).
5 Of the anomalies examined by Fama (1998), only the post earnings announcement drift anomaly, first documented by Ball and Brown (1968), survives Fama's methodological changes.
6 The small-minus-big (SMB) and high-minus-low (HML) factors in the three-factor model are constructed using the returns of all available stocks, including the returns of the issuing firms to be studied. Thus the benchmark returns produced by the three-factor model are contaminated. Any abnormal returns attributable to the sample firms will have been included in the average, making it more difficult for the model to later detect these abnormal returns.
The Accrual Anomaly

**Overview of the accrual anomaly.** Net income is comprised of two components. The cash flow component is the portion of net income represented by cash, while the accrual component represents income that has been recorded in the absence of underlying cash flow. Sloan (1996) finds that the accrual component of income can predict future stock returns. Further, he finds that a trading strategy based on this predictability produces abnormal returns in each of the first three years following the release of accrual information. The trading strategy involves segmenting firms into deciles based on their level of accruals and then purchasing the stock of firms in the lowest decile while selling short the stock of firms in the highest decile. Sloan (1996) finds that this strategy produces significant average abnormal returns of 10.4% over the year following portfolio formation and that the returns to this strategy are positive in 28 of the 30 years analyzed. Sloan’s (1996) findings have come to be known as the accrual anomaly.

Potential explanations for the accrual anomaly can be classified into three groups. The first group consists of behavioral explanations, the second consists of rational explanations, and the third group consists of explanations that suggest the anomaly is merely an alternative manifestation of a previously documented anomaly. As the research in the third area has demonstrated that the accrual anomaly is largely distinct from other anomalies, I will focus on the behavioral and rational explanations.  

**Behavioral explanations and evidence.** Sloan (1996) notes that it appears as if investors fixate on net income, ignoring information contained in the accrual component of this figure. This has become generally known as the naïve investor or investor fixation hypothesis. However, finer distinctions are required if the underlying cause of the anomaly is to be determined, as multiple explanations could fall under these headings. Sloan (1996) suggests this anomaly could be related to earnings management— that is,

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7 Collins and Hribar (2000) suggest that as there are instances in which the accrual anomaly and post-earnings announcement drift offer the same predictions, the accrual anomaly could simply be another manifestation of this previously documented anomaly. They find, however, that the two anomalies are distinct. Zach (2002) investigates whether the accrual anomaly is related to other corporate event anomalies documented in the finance literature. He finds that while removing mergers and divestitures lowers returns to the accrual strategy slightly, these events do not drive the anomaly. Research suggesting the anomaly is related to the book-to-market (BTM) anomaly, the finding that high BTM (value) stocks outperform low BTM (growth) stocks, is discussed with the behavioral explanations.
investors may be fooled and fail to see through discretionary actions of management. I will call this the earnings management hypothesis to distinguish it from the more general investor fixation hypothesis. Chan, Chan, Jegadeesh, and Lakonishok (2001) also offer a potential explanation that could fall into the investor fixation category. They suggest that the anomaly may be due to the market’s underreaction to business conditions or slow response to fundamental information. A final alternative is offered by Fairfield, Whisenant, and Yohn (2003a&b). While their explanation does not fall into the investor fixation category, it does fall into the naïve investor category. They suggest naïve investors fail to correctly interpret the implications of past growth and make cognitive errors extrapolating this growth into the future. Thus the behavioral theories can be summarized as the earnings management theory, business fundamentals theory, and the growth extrapolation theory. Evidence relating to each is discussed below.

Ali, Hwang, and Trombley (2000) investigate the general earnings fixation hypothesis that encompasses both the earnings management and underreaction to fundamentals hypotheses. They suggest that sophisticated investors would be less likely to make the mistake of earnings fixation, and examine the anomaly across levels of investor sophistication. They find that the effect is stronger in the stocks of firms held by more sophisticated investors and interpret this as “strong” evidence against the naïve investor/investor fixation hypothesis. Xie (2001), on the other hand, provides support for the earnings management hypothesis by showing that abnormal accruals drive the anomaly. He notes this is consistent with the market mispricing accruals arising from managerial discretion.

Chan, Chan, Jegadeesh, and Lakonishok (2001) also examine the earnings management hypothesis along with the underreaction to business conditions and growth extrapolation hypotheses. Contrary to Ali, Hwang, and Trombley’s (2000) findings against fixation, they find evidence supporting both the earnings manipulation and the underreaction to business conditions hypotheses. First, they note that the time series behavior of accruals is consistent with earnings management. The pattern suggests that high accrual firms are already experiencing problems, but use accruals to delay the reflection of the poor performance in the financial statements. Second, they find that change in inventories contributes the most to the effect of accruals, and that increases in
payables predict poor future returns. They interpret these findings as being consistent with a delayed response to fundamentals and inconsistent with earnings management.\(^8\) Chan, Chan, Jegadeesh, and Lakonishok (2001) also provide evidence against the extrapolative biases regarding future growth. They argue that if investors fail to accurately account for growth, then the nondiscretionary component of accruals, which would incorporate accruals related to growth, should be mispriced along with the discretionary component. They find that this is not the case.

Fairfield, Whisenant, and Yohn (2003a\&b), however, provide evidence supporting the growth extrapolation hypothesis. They show that investors misprice growth in both the current and long-term portions of net operating assets and conclude that the accrual anomaly is the result of a more general growth anomaly. Desai, Rajgopal, and Venkatachalam (2003) also provide evidence consistent with the growth extrapolation hypothesis. They question whether or not the accrual anomaly is simply capturing the well-documented behavior of value and glamour stocks and they show that while accruals have explanatory power beyond that of traditional value/glamour measures, a cash flow to price ratio, where cash flow is defined as earnings adjusted for depreciation and working capital accruals, subsumes the power of accruals and the traditional variables.\(^9\) As Lakonishok, Shleifer, and Vishney (1994) suggest that the superior returns to value strategies may be due to extrapolating past growth far into the future, the findings of Desai, Rajgopal, and Venkatachalam (2003) are consistent with those of Fairfield, Whisenant, and Yohn (2003a\&b) and the growth extrapolation hypothesis.

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\(^8\) Chan, Chan, Jegadeesh, and Lakonishok (2001) suggest that it is relatively easy to manipulate earnings by recording revenues early, so, if earnings management is the explanation, receivables should have a larger impact than inventories. With respect to accounts payable, they note that it is one of the few accounts for which the earnings management hypothesis and the business conditions hypothesis produce different expectations. Under the earnings management hypothesis, an increase in accounts payable would indicate that the firm was recording expenses now to allow for higher future profits. Thus, returns should be higher in the future. On the other hand, fundamental analysis would suggest that an increase in payables may indicate difficulty in paying suppliers due to deteriorating performance. Based on this, future returns should be lower.

\(^9\) The traditional variables for glamour/value classification discussed in Desai, Rajgopal, and Venkatachalam (2003) are past sales growth, book-to-market, earnings-price, and cash flow-price where cash flow is defined as earnings adjusted for depreciation.
Richardson, Sloan, Soliman, and Tuna (2003a), however, argue against the growth extrapolation hypothesis. They provide evidence that the Fairfield, Whisenant, and Yohn (2003a&b) results are not consistent with conservative accounting or diminishing returns to scale (their offered explanations), and Richardson, Sloan, Soliman, and Tuna (2003b) provide another interpretation of these results. They point out that long-term operating assets are long-term accruals, and show that the impact of these accruals on the accrual anomaly is related to their reliability. Thus, they conclude that the Fairfield, Whisenant, and Yohn (2003a&b) results represent a natural extension of the accrual anomaly, rather than a more general growth anomaly.

Thus, the evidence regarding the various behavioral explanations of the accrual anomaly is mixed, and there is no consensus as to whether investors naively misinterpret earnings or growth or as to why investors may misinterpret either.

**Rational explanations and evidence.** Kothari (2001) presents the rational view of the accrual anomaly. Along the lines of Fama (1998), he argues that the anomaly is likely due to omitted risk factors, statistical and survival biases in research design, biases in long-horizon performance assessment, or chance. Several researchers have attempted to address these potential problems. Zach (2002) uses multiple return metrics (size-adjusted returns, size and book-to-market adjusted returns, and size, book-to-market, and momentum adjusted returns), and adopts the portfolio buy-and-hold abnormal return (BHAR) techniques of Lyon, Barber, and Tsai (1999). Lyon, Barber, and Tsai (1999) showed that these techniques eliminate the survival bias and the rebalancing bias, but not the skewness bias documented by Barber and Lyon (1997). Zach finds that the inclusion of the book-to-market ratio (BTM) in the portfolio matching criteria lowers returns by about 150 basis points to 7.9% in the year following portfolio formation, but does not drive the anomaly. Cotten (2003) also controls for BTM in his examination of the accrual anomaly. Cotten (2003) adopts the firm matching approach, shown by Lyon, Barber and Tsai (1999) to also control for the skewness bias, and finds mean and median abnormal returns of 13.9% and 10.8%, respectively in the year following portfolio formation. Finally, Xie (2001) and Hogue and Loughran (2002) each document that the accrual anomaly is robust to the three-factor model. These results do not support the rational explanations for this anomaly.
**Resolving the conflict.** While much of the newer research has addressed methodological and statistical issues raised by Fama (1998) and Kothari (2001), the efficient markets camp can always cite the bad models problem and claim that risk has not been adequately controlled. In addition, they can point to the lack of agreement as to the cause of the accrual anomaly on the behavioral side as further support for efficiency. As this is the case, the identification of the underlying cause of the accrual anomaly would strengthen the argument for market inefficiency. Thus, I investigate the hypothesis that naïve investors fail to extract important information from the accrual component of net income and that their inability to do so results from managers’ attempts to manipulate earnings. If earnings management is found not to be the cause of this anomaly, future research can focus on the cognitive biases in extrapolating growth and delayed response to fundamental information. On the other hand, if strong evidence for the earnings manipulation hypothesis is found, this research will provide further evidence against the efficient markets hypothesis. While this research will most certainly not resolve the debate on market efficiency, it provides additional evidence, which is always beneficial. As Fama notes:

> Still, even if we disagree on the market efficiency implications of the new results on return predictability, I think we can agree that the tests enrich our knowledge of the behavior of returns, across securities and through time. (Fama, 1991)

**Earnings Management**

The third area of research motivating this dissertation is the area of earnings management. Healy and Wahlen (1998) provide a thorough review of the earnings management literature. In this review they identify several motivations for earnings management, classifying them into three categories: contracting motivations, regulatory motivations, and capital market motivations. This dissertation contributes to the literature relating to the third motivation, influencing capital markets. This motivation is inherently related to market efficiency. While Fama (1972) notes that one implication of the efficient markets hypothesis is that investors should be unable to profit from trading
strategies based on publicly available information, another implication is that managers should be unable to induce mispricing.

Healy and Wahlen (1998) note that while much of the research in this area focuses on examining whether earnings management occurs in situations where managers have a strong capital markets incentive to manipulate earnings (e.g., prior to management buyouts or stock issues), there is relatively little evidence on the frequency of earnings management market-wide or on its overall impact on resource allocation. These, however, are important questions. If the use of earnings management to influence stock prices is wide spread, then investors must be especially careful when analyzing financial statements, and if investors do not see through earnings management, securities mispricing could be substantial.

The possibility of management’s inducing mispricing has been investigated in limited settings by a number of researchers.¹⁰ Among these, Teoh, Welsh, and Wong (1998a&b) suggest that the long-run underperformance of IPO firms documented by Ritter (1991) and the long-run underperformance of SEO firms documented by both Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) may be attributable to earnings management in the pre-issue period. In each case, Teoh, Welch, and Wong (1998 a&b) provide evidence that investors naively extrapolate pre-issue earnings without properly adjusting these earnings for potential manipulation.

Evidence on the extent of earnings management market-wide is provided by Xie (2001). As discussed earlier, Xie (2001) finds that the accrual anomaly is driven by discretionary accruals. As discretionary accruals are frequently used as a proxy for earnings management, this suggests that earnings management is reasonably widespread and results in significant mispricing. However, the ability of discretionary accrual models to identify earnings management is not without question. Dechow, Sloan, and Sweeney (1995) find that all of the common models for decomposing accruals have low power. Healy (1996) suggests that these models are likely to be powerful enough in situations where earnings management is expected, but says nothing about their ability to detect earnings management in a more general setting. Thus, while Xie’s (2001) findings

¹⁰ These include Teoh, Welsh, and Wong (1998a&b), discussed here, as well as Erickson and Wang (1999), DeAngelo (1986), and Perry and Williams (1994). The latter studies are discussed in Chapter 2.
have been interpreted to represent earnings management, no one has examined whether or not this is likely the case. This dissertation fills this gap by examining whether or not extreme accrual firms have characteristics consistent with having the ability and incentives to manage earnings. In addition, it sheds further light on the capital markets impact of earnings management by examining how the market effect varies with different earnings management incentives and by investigating whether the market is more or less likely to anticipate earnings management given different management incentives and motivations.

The Need for Better Discretionary Accrual Models

Finally, a portion of this dissertation is motivated by the need for better discretionary accruals models. The majority of studies investigating earnings management, including those discussed above, use discretionary accruals, estimated by one model or another, as a proxy for earnings management. Thus, it is vitally important that these models accurately decompose accruals into discretionary and nondiscretionary components. If the models used do not accurately identify accruals that are truly due to managerial discretion then discretionary accruals estimated may be poor proxies for earnings management, and inferences drawn from them may be incorrect.

Many researchers have questioned the ability of existing models to decompose accruals into discretionary and nondiscretionary components. Dechow, Sloan, and Sweeney (1995) analyzed the power and specification of five discretionary accruals models. They found that the Jones (1991) model and their modified Jones model have the most power in detecting earnings management. Based on this finding versions of these two models have become the most widely used by researchers.

These models, however, are not without problems. While Dechow, Sloan, and Sweeney (1995) also find that the Jones and modified Jones models are more powerful than the other models they examined, they note that the power of these model is still quite low. In addition, the models tend to be misspecified in samples of firms with extreme
financial performance. This second issue is worth emphasizing as the highest accrual firms tend to be firms that have had very strong performance in prior years.

Guay, Kothari, and Watts (1996) also examine the models evaluated by Dechow, Sloan, and Sweeney (1995). They examine whether the relationship between stock returns and the components of earnings (non-discretionary earnings and discretionary accruals) are consistent with an opportunistic earnings management hypothesis. They find that all five models estimate discretionary accruals with much imprecision, and only the Jones and modified Jones model produce results roughly consistent with the earnings management hypothesis. Healy (1996) questions the strength of the conclusions drawn by Guay, Kothari, and Watts (1996), noting that their model makes many strong assumptions. He suggests their tests are thus joint hypotheses of the discretionary accrual models and the assumptions made. However, he goes on to conclude that the accrual models are indeed crude and need improving.

Although the findings of Dechow, Sloan, and Sweeney (1995) and Guay, Kothari, and Watts (1996) suggest that the Jones and modified Jones models may have some merit, at least relative to the other models analyzed, Kang and Sivaramakrishnan (1995) point out several econometric problems with the Jones models. Kang and Sivaramakrishnan (1995) suggest an instrumental variables model (the original KS model) to correct these problems, and show that their model is more powerful and better specified than the Jones models. Kang (1999) makes minor adjustments to the original model to improve its comparability to the Jones model. I refer to this latter model as the KS model and the original specification as the original KS model.

Despite the findings of Kang and Sivaramakrishnan (1995) the Jones and modified Jones models gained popularity and continue to be widely used in the literature. In addition, many researchers have suggested further improvements to the Jones models, giving rise to a whole family of models based on Jones’ original 1991 specification. At this point, however, no one has incorporated all of the proposed improvements into one model. Thus, in this dissertation, I propose an extended Jones model (the E-J model),

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incorporating additional variables that have been suggested in the literature and provide evidence of its performance relative to the KS model and the KLW Jones model.

**Summary of Chapter 1**

In summary, this dissertation is motivated by three primary areas of research: market efficiency, the accrual anomaly, and earnings management. As the accrual anomaly implies a profitable trading strategy based on publicly available information, it represents a challenge to market efficiency. However, for this challenge to be taken seriously a plausible explanation must be presented. Therefore, I examine the possibility that managers manage earnings to influence stock prices and that this activity can explain the anomaly. First, I investigate whether or not extreme accrual firms have characteristics of firms that would have strong incentives to manage earnings. Second, I investigate whether and how the behavior of the stock of these companies varies with their earnings management incentives and behaviors. Third, I investigate whether the anomaly represents overreaction to earnings. Finally, as discretionary accruals are to be used as a proxy for earnings management, it is important that estimated discretionary accruals accurately reflect the component of earnings subject to managerial discretion. I therefore propose a new model for estimating discretionary accruals and provide evidence of its effectiveness, relative to other models.

The rest of this dissertation is organized as follows. Chapter 2 contains the literature review and the development of the hypotheses I test in this dissertation. Chapter 3 contains an extensive discussion of existing discretionary accrual models and development of the E-J model. Chapter 4 contains the methods for testing the hypotheses set out in Chapter 2. Chapter 5 presents the results of the analyses, and Chapter 6 concludes, summarizing the findings and providing suggestions for future research.
The primary objective of this dissertation is to examine the earnings management hypothesis as a possible explanation for the accrual anomaly, first documented by Sloan (1996). Using annual data from 1962 to 1991, Sloan (1996) finds that the accrual component of net income can be used to predict future stock returns, and demonstrates that a trading strategy based on this predictability produces significant abnormal returns. The strategy, which involves short selling the stocks of high accrual firms while purchasing the stocks low accrual firms, produces average one-year size-adjusted returns of 10.4%. In addition, the abnormal return to the long position alone is 4.9%, and the strategy as a whole produces positive returns in 28 of the 30 years examined. The accrual-based return predictability documented by Sloan (1996) is known as the accrual anomaly.

The earnings management hypothesis is the suggestion that the accrual anomaly results from investors’ inability to see through earnings management. Under this hypothesis, investors fixate on earnings and fail to disentangle relevant information contained in its accrual and cash flow components. Prior research examining the earnings management hypothesis includes Ali, Hwang, and Trombley (2000), Chan,
Chan, Jegadeesh, and Lakonishok (2001) and Xie (2001). Ali, Hwang, and Trombley (2000) investigate the general earnings fixation hypothesis that encompasses the earnings management hypothesis. They suggest that sophisticated investors would be less likely to make the mistake of earnings fixation, and examine the anomaly across levels of investor sophistication. They find that the effect is stronger in the stocks of firms held by more sophisticated investors and interpret this as “strong” evidence against the naïve investor/investor fixation hypothesis.

On the other hand, Chan, Chan, Jegadeesh, and Lakonishok (2001) find that the time-series behavior of accruals is consistent with earnings management. The pattern suggests that high accrual firms are already experiencing problems, but use accruals to delay the reflection of the poor performance in the financial statements. Xie (2001) also provides support for the earnings management hypothesis by showing that abnormal accruals drive the anomaly. He notes this is consistent with the market mispricing accruals arising from managerial discretion.

Considering the competing hypotheses (discussed in the previous chapter) and mixed results produced by the studies discussed above, the evidence supporting the earnings management hypothesis is far from compelling. Consider Xie’s (2001) results. While Xie’s (2001) results are suggestive of earnings management, the argument that earnings management is responsible for the accrual anomaly relies on the assumption that, in general, firms with high discretionary accruals are firms that manage earnings. This assumption has not been tested.

The majority of earnings management studies use outside criteria (e.g., SEC enforcement actions) to identify firms that are suspected of earnings management and then investigate whether these firms have unusually high abnormal accruals. Here, the general finding is that firms suspected of earnings management do have significantly higher abnormal accruals than the average firm, leading to the conclusion that these firms do in fact manage earnings via accruals. However, if there are situations, other than earnings management, that can produce extreme abnormal accruals, it is possible that a large number of firms that do not manage earnings are also contained in the extreme

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12 Sloan also calculates abnormal returns as Jensen’s alpha. Using this methodology, one-year abnormal returns to the strategy are an identical 10.4%; however, the abnormal returns to the long position are
In this case, the assumption that firms with extreme abnormal accruals, in general, manage earnings does not hold. No one, however, has examined whether or not this is likely to be the case. Thus, I begin my analysis by looking at firms in the extreme deciles to determine whether or not these firms would likely manage earnings based on both their incentives and abilities to do so.

To complete this analysis, I must identify firms with both an incentive and the ability to manage earnings (EM firms). The following sections discuss these issues. I first address several potential incentives identified in the earnings management literature. I then discuss the relationship between corporate governance and a manager’s ability to manage earnings. Finally, I discuss how I identify EM firms for this analysis.

**Earnings Management Incentives**

To identify earnings management incentives, I turn to prior research. Healy and Wahlen (1998) discuss many incentives to manage earnings, classifying them into three categories: capital markets motivations, contracting motivations, and regulatory motivations. Each of these motivations is discussed below.

**Capital Markets Motivations**

Under the heading of capital markets motivations fall several distinct incentives. These include the incentive to beat various benchmarks, the incentive to affect firm value prior to certain corporate events (e.g., stock issues, stock-for-stock mergers, management buyouts, and share repurchases associated with a planned change in capital structure), and the incentive to protect shareholders by maintaining firm value.

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13 One example of this type of occurrence is identified by Hribar and Collins (2002). They find that measurement errors resulting from the use of the balance sheet approach for accrual estimation may result in the inappropriate inclusion of some firms in the extreme deciles.

14 Throughout this dissertation I use the abbreviation ‘EM firms’ to refer specifically to those firms identified as having both the incentive and ability to manage firms. I do not use it to refer to earnings management firms in general or to extreme decile firms in general in the analysis based on earnings management behaviors.
Benchmark beating. Burgstahler and Dichev (1997) contend that managers have strong incentives to manage earnings to avoid losses and decreases in earnings. They discuss two theories as to why this would be the case. The first of these is the transaction cost theory.\textsuperscript{15} This theory is based on two assumptions. First, it assumes that information about earnings will affect a firm’s terms of trade with customers, suppliers, lenders, and employees. Second, it assumes that at least some stakeholders, to avoid costs of gathering and processing information, will rely on heuristic benchmarks (e.g., zero earnings or prior year earnings) when determining acceptable terms. Given these two conditions, managers will manage earnings upwards to surpass the zero profit and prior performance benchmarks, as missing them will result in higher costs from poorer terms of trade.

The second theory offered by Burgstahler and Dichev (1997) is based on prospect theory. Prospect theory, developed by Kahneman and Tversky (1979), suggests that value is determined by gains or losses relative to some reference point (benchmark), and that value functions are concave in gains and convex in losses (i.e., S-shaped). The S-shaped value function implies the greatest value increases will be obtained when moving from a loss to a gain across a reference point, where the value function is steepest. Thus, it is around these points that management’s incentives to manage earnings will be greatest.

Degeorge, Patel, and Zeckhauser (1999) develop this theory further. They present a model that predicts effort to exceed thresholds or beat benchmarks will induce certain patterns of earnings management. Specifically, earnings falling just short of thresholds will be managed upwards, while earnings either well above or well below thresholds will be managed downwards to make thresholds more easily attainable in the future. Abarbanell and Lehavy (2003) echo this prediction, suggesting that while earnings management may be used to meet or beat relative targets, if the combination of pre-managed earnings and available accounting reserves is less than relevant earnings targets,\textsuperscript{17}

\textsuperscript{15} This is actually a contracting incentive, rather than a market incentive. However, as it explicitly incorporates benchmarks, I include it in this section. In addition, this theory is very similar to Trueman and Titman’s (1988) explanation for income smoothing, which I discuss in the upcoming section on contracting motivations.
then firms are expected to take a big bath, that is, manage earnings downwards to replenish accounting reserves.

Much empirical evidence supports the idea that firms manage earnings to beat benchmarks. Burgstahler and Dichev (1997) examine the distribution of reported earnings and, consistent with earnings management, find unusually low frequencies of small losses and small earnings declines and unusually high frequencies of small positive earnings and small earnings increases. Degeorge, Patel, and Zeckhauser (1999) perform a similar analysis, and find evidence of earnings management to beat analyst expectations as well as to report profits and sustain earnings.

While Burgstahler and Dichev (1997) and Degeorge, Patel, and Zeckhauser (1999) examine the distribution of reported earnings, other studies provide more direct evidence of earning management. Peasnell, Pope, and Young (2000) find evidence that firms whose pre-managed earnings are below zero or the prior years earnings use discretionary accruals to manage earnings upwards, while firms whose pre-managed income is well above these benchmarks adopt income decreasing discretionary accruals. Abarbanell and Lehavy (2003) analyze the discretionary accruals of management and find that firms whose stock price is more sensitive to earnings news (proxied by its analyst recommendation) are more likely to manage earnings across thresholds.

Similarly, Payne and Robb (2000) provide further evidence that firms manage earnings to meet analyst forecasts, and Kasnick (1999) considers a fourth benchmark, management earnings forecasts, and finds that managers who underestimate earnings in their forecasts use discretionary accruals to manage earnings upwards.

A final study, Skinner and Sloan (2002), provides evidence supporting the prospect theory incentive for earnings management and illustrates incentives to manage earnings. Skinner and Sloan (2002, Figure 4) plot the quarterly average abnormal returns to growth stocks and value stocks against their earnings surprises.\footnote{Abnormal returns are calculated by subtracting the returns of a size-matched portfolio from the returns of the sample firms. Results are robust to alternative methods of calculating abnormal returns, including market and market model adjustments.} This figure is approximated below as Figure 1. Consistent with prospect theory, both growth stocks and value stocks produce an S-shaped earnings surprise response function. As these
functions are steepest around the reference point (consensus analyst forecast), managers can greatly affect firm value by managing earnings to exceed forecasts.

While both the growth stocks and value stocks produce the S-shape, there are some striking differences between the two groups. First, the graph for the growth stocks is much steeper than that of the value stocks and the magnitude of the response is much greater for growth stocks than for value stocks. The abnormal return for growth firms missing the forecast by 1 cent is approximately –15%, while the abnormal return for exceeding expectations by 1 cent is about +10%. For value firms, these same returns are –4% and 5%, respectively. Second, growth firms have an asymmetric response to earnings surprises. For an equal dollar amount, they are penalized more heavily for missing the forecast than they are rewarded for exceeding it. The greater sensitivity of growth stocks to earnings surprises, along with the asymmetric response, provide managers of growth firms with even greater incentives to manage earnings.

Figure 1: Approximation of Skinner and Sloan (2002) Figure 4.
Finally, this plot illustrates the interesting implication of prospect theory. That is, there are diminishing marginal returns to beating a benchmark. A growth firm exceeding the forecast by 1 cent receives a 10% abnormal return. However, this return does not change appreciably for beating the forecast by two or three cents. As managers will not be rewarded for beating benchmarks by a larger margin, they have an incentive to manage earnings downwards if their pre-managed earnings are well above the forecast. Similarly, there are diminishing marginal costs to missing a forecast. A growth firm missing the forecast by five cents suffers a –20% return, however, this is only 5 percentage points lower than the return for missing by one cent. This indicates that a big bath strategy may benefit the firm, as reporting earnings well below forecast will likely have a less negative impact than narrowly missing the forecast in multiple years.

In summary, if outsiders rely on simple heuristics (e.g. positive earnings, sustained performance, and market expectations) when evaluating firm performance, managers will have an incentive to manage earnings to exceed these benchmarks. Additionally, if pre-managed earnings exceed the benchmark, firms may have an incentive to manage earnings downwards. Managing earnings downwards allows management to set aside reserves for the future and reduces the likelihood that earnings targets will be raised substantially in the future. Finally, if pre-managed earnings are so far below all relevant targets that earnings may not be reasonably managed upwards to attain them, then managers may have an incentive to take an earnings bath (e.g., manage earnings downwards while replenishing reserves), so future targets will be more easily attained. There is substantial empirical evidence that firms manage earnings both upwards and downwards towards various benchmarks; however, evidence supporting the big bath hypothesis has proved more elusive.

**Corporate events.** Many corporate events can provide managers with incentives to manage earnings. These include stock issues, stock-for-stock mergers, management buyouts, and share repurchases associated with a planned change in capital structure. The incentives arising from each of these events are discussed below.

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17 The SEC has suggested that firms may manage earnings downwards to exploit diminishing marginal returns to reported earnings (Goel and Thakor, 2003).
Stock issues. One potential explanation of the new issues puzzle, discussed by Ritter (1991), Lerner (1994), Loughran and Ritter (1995 and 2000), and Baker and Wurgler (2000), is that managers take advantage of asymmetric information by issuing stock when their firms’ stock specifically or equities in general are overvalued.\(^{18}\) As the true value of the firm is revealed through time, the stock price corrects, resulting in underperformance. Rangan (1998), Teoh, Welch, and Wong (1998a&b), and Teoh, Wong, and Rao (1998) extend this idea. They suggest that some firms not only take advantage of mispricing by issuing stock when it is overvalued, but also contribute to or induce mispricing by manipulating earnings prior to issuing stock. The incentive for doing so is quite clear. Higher earnings produce higher stock prices, and higher stock prices produce greater proceeds from the stock issue with less dilution of earnings and control.\(^{19}\) Each of these studies finds evidence consistent with this hypothesis, suggesting that earnings are managed upwards prior to issuing stock. While Hribar and Collins (2002) question these findings, further evidence supporting the earnings management explanation is presented by DuCharme, Malatesta, and Sefcik (2004). They find that the negative abnormal returns following stock issues are significantly greater for firms that are later sued for misrepresenting the stock issue and that the size of the settlement is positively related to the firm’s abnormal accruals prior to the stock issue.

Stock-for-stock mergers. The rationale for acquiring firms to manage earnings upwards prior to a stock-for-stock merger is discussed by Erickson and Wang (1999). They note that often in stock-for-stock mergers, the acquiring firm and target firm first agree on a purchase price. The number of shares exchanged is then determined by the price of the acquiring firm’s stock when the merger agreement is reached. They suggest that this provides the management of the acquiring firm with several incentives to increase the pre-merger stock price. First, a higher price results in the issuance of fewer shares, which lessens earnings dilution. Second, the issuance of fewer shares lessens the dilution of voting rights. And third, a higher stock price for the acquiring firm lessens the

\(^{18}\) An alternative explanation to the new issues puzzle, based on omitted risk factors, is offered by Eckbo, Masulis, and Norli (2000).

\(^{19}\) Harris and Raviv (1988) and Stulz (1988) suggest that managers’ financing choices are related to their ability to maintain control over their corporations. Amihud, Lev, and Travlos (1990) test this theory, hypothesizing that managers holding a large percentage of outstanding stock will be reluctant to dilute their
cost of acquiring the target firm. This would be especially true if the shares of the acquiring firm are overvalued. Consistent with this reasoning, Erickson and Wang (1999) find that acquiring firms manage earnings upwards prior to stock-for-stock mergers and that the extent of earnings management is related to the size of the merger.

Management buyouts. The incentives to manage earnings prior to management buyouts (MBOs) are discussed by DeAngelo (1986) and Perry and Williams (1994). A summary of DeAngelo’s (1986) discussion follows. In a management buyout transaction, insider managers purchase all of the shares held by outsider stockholders and take the company private. Although managers have a fiduciary responsibility to provide outside shareholders with a fair price, a conflict of interest clearly exists. The managers, who are themselves purchasing the company, want to pay as low a price as is possible, and their superior information regarding the company’s prospects provides managers with the opportunity to take advantage of the less informed outsider stockholders. The outsider stockholders, however, are not without some protections. First, going private transactions are regulated by the SEC, and the SEC requires firms to disclose what they are doing to mitigate the potential for managerial self-dealing. Second, as a result of the disclosure requirement, managers virtually always hire an investment bank to assess the fairness of the proposed price. Finally, shareholders often challenge the fairness of their compensation in the courts.

Somewhat ironically, it is from the protections above that the incentives to manage earnings arise. The incentives arise from the fact that earnings-based valuation techniques are frequently used by investment bankers and the courts in their determinations of a company’s fair value. If managers can lower earnings in the periods prior to a management buyout (MBO) proposal, valuations based on earnings will be lower. Further, income decreasing accruals also tend to lower a firm’s book value, and asset values, resulting in lower valuations by non-earnings-based valuation methods. Finally, the incentive to manage earnings is increased by the fact that once private, the firm will not have to disclose financial information, making the probability of being caught lower.
The evidence on earnings management prior to MBOs is mixed. DeAngelo (1986) found no evidence of earnings management and suggested that the scrutiny accompanying the MBO transaction may prevent systematic earnings management. Perry and Williams (1994), noting methodological problems with the DeAngelo (1986) study, re-examine the issue and provide strong evidence of downwards earnings management by firms in the year prior to the announcement of management’s intentions to take firms private. These more recent results suggest that managers are likely to manage earnings prior to a management buyout.

Stock repurchases associated with a planned change in capital structure. Jiraporn (2002) suggests that stock repurchases may provide incentives for earnings management. Specifically, he argues that management may manage earnings downwards so the stock price falls and more shares can be repurchased. Jiraporn (2002) tests this hypothesis using a sample of 199 tender offers; however, he finds no evidence that firms deflate earnings prior to repurchases. Jiraporn’s (2002) lack of results, however, may be due to a flaw in his research design. That is, he fails to consider the possible motivations for share repurchases.

Many motivations for share repurchases are inconsistent with an earnings management incentive. For instance, the signaling hypothesis, which is supported empirically by many studies, falls into this category. The signaling hypothesis suggests that managers (with superior information) will buy back stock when they believe it to be undervalued, signaling the undervaluation to the market. It seems odd to suggest that a manager would drive the stock price down so as to be able to signal the firm is undervalued. Ikenberry, Lakonishok, and Vermaelen (1995) list six possible motivations: capital structure adjustment, takeover defense, signaling, excess cash distribution, substitution for cash dividends, and wealth expropriation from bondholders. Of these, only the capital structure adjustment motive would provide management with incentives to manage earnings. In this case, incentives would be similar to those associated with stock issues. By purchasing more shares at a lower price, management could concentrate both their control and earnings per share, benefiting themselves and long-term
shareholders. A re-analysis of this issue examining only firms undergoing capital structure adjustments would provide more insight into this issue.

**Shareholder protection.** A final capital markets motivation, shareholder protection, is offered by Goel and Thakor (2003). They argue that as the volatility of a firm’s earnings increase, the expected losses for uniformed shareholders increases. Thus, shareholders will pay less for a firm with high earnings volatility, decreasing the firm’s value. To counter this phenomenon, management may smooth earnings to reduce the firm’s perceived volatility, which in turn, protects its shareholders, and boost its stock price.

**Contracting Motivations**

Contracting motivations for earnings management may arise from the fact that the terms of many contracts are explicitly or implicitly related to accounting numbers. In these instances, managers may have an incentive to manage earnings so that their firms receive the benefit from exceeding or staying below a contractually set financial ratio or level of earnings. Much of the research in this area is related to debt contracts and compensation or employment contracts.

**Debt contract motivations.** In the studies relating to debt contracts, it is argued that firms who are in danger of violating debt covenants will have an incentive to manage earnings so that these covenants are not violated. Defond and Jiambalvo (1994) and Sweeney (1998) each find evidence that firms may manage earnings as they approach lending covenants.

Trueman and Titman (1988) offer a related contracting incentive based on maximizing firm value by reducing the costs of financial distress. They show that by smoothing earnings, managers may reduce the perceived volatility of the firm’s true economic earnings. If debt holders underestimate the volatility of economic earnings and consequently underestimate the probability of bankruptcy, the firm may obtain a lower cost of debt than is warranted by the firm’s actual risk. In addition they note that debt

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holders are not the only stakeholders affected. The underestimation of the probability of bankruptcy may also allow the firm to obtain more favorable terms of trade from customers, suppliers, and workers.\textsuperscript{21} Trueman and Titman (1988) conclude that management may smooth earnings to positively impact the cost of debt, production costs, and output prices.

\textit{Compensation and employment contract motivations.} Accounting-based compensation contracts provide other contractual incentives for managers to manipulate earnings to maximize their own personal wealth. For instance, if bonus pay is based on the level of reported earnings, and the firm’s economic earnings are below the bonus threshold, managers may have an incentive to manage earnings upwards. Or, if economic earnings are so far from the levels that earnings cannot be reasonably managed upward, managers may manage earnings downwards, setting aside reserves so that they will be more likely to reach bonus targets in the future. Similarly, if there is a cap on the bonus payout, and economic earnings exceed the highest bonus threshold, managers may have an incentive to manage earnings downwards, again setting aside reserves for future years. Healy (1985) and Holthausen, Larcker, and Sloan (1995) find evidence of compensation related earnings management. They show that firms with caps on bonuses are more likely to decrease reported earnings once the cap is reached. Guidry, Leone, and Rock (1998) report similar findings, and, in addition, they show that managers are more likely to manage earnings downwards when bonus thresholds will not be met.

A second employment incentive is put forth by Fudenberg and Tirole (1995). They present a model in which managers are concerned with keeping their jobs and avoiding outside interference. They show that if more weight is placed on recent performance when managers are evaluated, managers will have an incentive to smooth earnings. Defond and Park (1997) provide evidence consistent with this argument, demonstrating that managers take both current and future earnings into account when deciding whether to manage earning upwards or downwards. Ahmed, Lobo, and Zhou (2000) provide additional evidence, showing that the extent of income smoothing is related managers’ job security concerns. While the job security incentive is not directly

\textsuperscript{25} and Ikenberry, Lakonishok, and Vermaelen (1995).
tied to explicit contractual terms, it is considered to be part of an implicit compensation
contract (Healey and Whalen, 1998). Also related to compensation, Matsunaga and Park
(2001) find that missing benchmarks reduces the bonuses received by chief executive
officers. To the extent smoothing makes it easier to meet benchmarks, managers may
have an incentive to manage earnings. Similarly, Baber, Kang and Kumar (1998) find
that incentive pay increases with earnings persistence.

Providing additional evidence on this topic, Pourciau (1993) and Murphy and
Zimmerman (1993) investigate earnings management incentives associated with CEO
turnover. They note that incoming managers in executive changes have an incentive to
manage earnings downwards in the takeover year. The earnings bath provides new
management with both a low benchmark against which future performance will be
compared and the opportunity to set aside reserves that may be used to boost earnings in
future periods. In addition, the resulting poor performance can be attributed to the
outgoing management. Pourciau (1993) examines non-routine executive changes,
finding that incoming executives manage accruals to lower earnings in the takeover year.
Murphy and Zimmerman (1993) report similar results based on a sample containing both
routine and non-routine executive changes. These findings are consistent with earlier
studies (Strong and Meyers, 1987; Elliot and Shaw, 1988) that find new managers often
make discretionary income-decreasing write-offs after taking control of a firm.

**Political or Regulatory Motivations**

The final class of incentives relates to political or regulatory motivations. Firms
in industries that are heavily regulated or under government scrutiny may have incentives
to manage earnings in order to gain favorable treatment from lawmakers or regulators.
argues that the International Trade Commission’s explicit use of industry profitability in
its import relief determinations gives the firms in these industries the incentive to manage
earnings downward. Consistent with this argument, she finds evidence that companies

\[21\] For a discussion of how financial distress may impact terms of trade with various claimants, see Titman
that would benefit from import relief do manage earnings downwards during import relief investigations. Similarly, Cahan (1992) notes the Department of Justice and the Federal Trade Commission have relied on accounting profits when prosecuting antitrust violations and argues that, as a result, firms subject to antitrust investigations would have an incentive to manage earnings downwards. Cahan (1992) provides empirical evidence supporting the theory that firms manage earnings downwards during antitrust investigations. Finally, Key (1997) finds that cable television companies managed earnings downwards while the industry was the subject of congressional scrutiny. This, again, is consistent with the hypothesis that firms have incentives to manage earnings to obtain favorable treatment from lawmakers or regulators.

**Corporate Governance and the Ability to Manage Earnings**

A manager may have strong incentives to manage earnings and yet be unable to do so. Much of this ability may be tied to corporate governance structures. Fama (1980) and Fama and Jensen (1983) discuss the key role played by the board of directors in monitoring managerial actions. Both suggest that board effectiveness may be enhanced by the inclusion of outside directors on the board. Jensen (1993) echoes this sentiment, going so far as to suggest that the CEO should be the only insider on the board.

Much empirical research supports the contention that outside directors increase board effectiveness. For instance, Weisbach (1988) finds that the probability of CEO resignation following poor performance increases when boards are dominated by outside directors. Similarly, Bird and Hickman (1992) provide evidence that outside directors reduce the likelihood of empire building, and Shivdasani (1993) finds, consistent with effective monitoring, that firms with more outside board members are less likely to face hostile takeover bids.

Weisbach (1988) suggests that the board may also exercise control over managements’ choice of accounting policy. Early studies in this area include Beasley (1996) and Dechow, Sloan, and Sweeney (1996). Beasley (1996) investigates whether outside directors are likely to reduce the likelihood of financial statement fraud and finds that firms committing financial statement fraud have lower proportions of outside
directors than no fraud firms. Similarly, Dechow, Sloan, and Sweeney (1996) find that firms subject to SEC enforcement actions have fewer outside directors and conclude that firms with weak governance structures are more likely to manipulate earnings.

While Beasley (1996) and Dechow, Sloan, and Sweeney (1996) find a relationship between board structure and the most egregious accounting violations, more recent studies focus on the relationship between corporate governance structures and less extreme earnings management. These studies include Klein (2002), and Peasnell, Pope, and Young (2000). Klein (2002) examines how board characteristics and audit committee characteristics are related to earnings. She measures board independence as the percentage of outside directors on the board and finds that firms with more independent boards have significantly lower abnormal accruals than firms with less independent boards. Peasnell, Pope, and Young (2000) provide similar results. They examine a sample of United Kingdom (UK) firms and find that firms with a lower percentage of outside board members are more likely to use income increasing abnormal accruals to avoid reporting both losses and earnings reductions.

The research discussed in this section supports both the general notion that firms with more outside board members are more effective in monitoring management and the specific notion that outside board members may exercise more control over a firm’s accounting choices. This indicates that a manager’s ability to engage in earnings management may be limited by a board dominated by outside directors.

**Identifying Firms with the Incentive and Ability to Manage Earnings**

The preceding sections have discussed several earnings management incentives, as well as corporate governance issues relating to a firm’s ability to manage earnings. In this section I provide an overview of how I identify EM firms. Again, EM firms are identified as firms having both the ability to manage earnings and an incentive to manage earnings. As prior research (Beasley, 1996; Dechow, Sloan, and Sweeney, 1996; Peasnell, Pope, and Young, 2000; and Klein, 2002) suggests firms having less
independent boards have a greater ability to manager earnings, I classify a firm as having the ability to manage earnings based on the proportion of officers who serve as board members.

The identification of firms having an incentive to manage earnings is more complicated. While I identify many incentives to manage earnings, some of these, particularly political and contracting motivations, are difficult to identify directly when examining a broad cross-section of stocks. I, however, directly identify firms having many of the incentives discussed (e.g., firms motivated by certain corporate events or missing benchmarks) and include firms motivated by other incentives based on their behavior, that is, firms are classified as having an earnings management incentive if they practice income smoothing.\(^{23}\)

While income smoothing is a behavior, rather than an incentive per se, it is likely to capture many of the incentives that may be difficult to capture independently when examining large samples of stocks.\(^{24}\) Specifically, income smoothing may capture firms seeking to afford shareholders the protection of reduced volatility (Goel and Thakor, 2003); firms who seek to lower their contracting costs, as discussed by Trueman and Titman (1988); or, as smoothing may also arise from compensation issues (Healy, 1985) or other employment issues (Fudenberg and Tirole, 1995), firms whose managers have personal incentives to manage earnings.

\(^{23}\) Eckle (1981) discusses the differences among naturally smooth earnings, smooth earnings resulting from real smoothing, and smooth earnings resulting from artificial smoothing. Naturally smooth earnings result from an income generating process that inherently produces a smooth income stream, while both real and artificial smoothing produce smooth earnings as the result of managerial actions. Distinguishing between real and artificial smoothing, Eckle (1981) defines real smoothing as actions taken to control economic events (change the income generating process) and defines artificial smoothing as accounting manipulations undertaken to smooth earnings. As I am concerned with earnings management, I use the term income smoothing to mean only artificial smoothing.

\(^{24}\) In addition, it could be argued that income smoothing, once begun, does in fact become its own incentive, as substantial penalties for breaking a pattern of sustained earnings growth have been documented by DeAngelo, DeAngelo, and Skinner (1996).
Hypotheses Development

Are The Firms in Extreme Deciles Those Likely to Managing Earnings?

Having discussed how I identify EM firms, those firms with both the incentive and ability to manage earnings, I now outline my hypotheses regarding these firms. Recall that the first phase of my analysis involves determining whether or not firms in the extreme accrual deciles manage earnings.

For this analysis, I develop five hypotheses. I begin my discussion with the first three of these hypotheses. First, I hypothesize extreme discretionary accrual deciles have a higher proportion of EM firms than the middle deciles. Second, I hypothesize that firms in the highest discretionary accrual decile are more likely to have incentives to manage earnings upwards than firms in the other deciles. Third, I hypothesize that firms in the lowest discretionary accrual decile are more likely to have incentives to manage earnings downwards. The reasoning behind these hypotheses is as follows.

First, the principal behind abnormal accruals is that they capture accruals that do not arise from normal business operations, but rather from the discretionary actions of management. If this were the case, the firms with the greatest incentives and abilities to manage earnings would be expected to manage earnings to the greatest extent. However, one could argue that discretionary accrual rankings merely sort on the need to manage earnings. That is, if firms with the same ability and incentives have different needs, then these firms may be spread equally across deciles. However, firms with a lesser ability or no incentive to manage earnings should have low levels of discretionary accruals, resulting from either lower levels of actual earnings management or measurement error. Thus, these firms should populate the middle deciles. As these firms should not have large discretionary accruals, they should not fall into the extreme deciles. Thus, as each decile contains an equal number of firms, extreme deciles should contain a greater proportion of firms identified as having the potential to manage earnings.\(^\text{25}\)

\(^{25}\) For example, consider the following. Assume we have a sample of 100 firms so that we have 10 deciles containing 10 firms each. Assume further that 50 of these firms manage their earnings freely and 50 do not manage earnings or are constrained in their earnings management. Finally, assume the degree of earnings management varies across the firms freely managing earnings such that some manage earnings only by a
If all firms or the vast majority of firms manage earnings, then the decile ranking could simply be a ranking based on need. While this is unlikely, if it were the case, the use of discretionary accruals as a measure of earnings management can still be somewhat validated by modifying the second and third hypotheses to create the fourth and fifth hypotheses below. The fourth hypothesis is that firms with negative abnormal accruals are more likely to have incentives to manage earnings downwards and the fifth hypothesis is that firms with positive abnormal accruals are more likely to have incentives to manage earnings upwards.

**Accrual Decomposition Models: The Effectiveness of Competing Models**

This first phase of my analysis, examining the frequency of potential earnings managers across discretionary accrual deciles, also provides the framework in which I examine the effectiveness of my proposed E-J model relative to the effectiveness of the KS model and a formulation of the modified Jones model suggested by Kothari, Leone, and Wasley (2002) (the KLW Jones model). I suggest the most effective model is the model that places the highest proportion of firms in the extreme deciles and the lowest proportion of small amount, while others manage by a large amount. If we examine only the 50 firms that manage earnings freely, each decile of five firms would contain an equal amount of firms who manage earnings. However, if we examine the combination of firms who manage earnings freely and firms who do not, this will not be the case, as we expect the non-managing firms to have unexpected accruals that are close to zero. Overall, we have four types of firms: those with the incentive and ability to manage earnings who need to manage earnings by a large amount (assume 25 firms, half the freely managing sample), those with the incentive and ability to manage earnings who need to manage earnings only a small amount (assume 25 firms), those that are constrained in their earnings management, and those who do not manage earnings. Firms falling into the three latter categories will all have expected accruals close to zero, making them indistinguishable from one another. However, firms in the first category will have large unexpected accruals (+/-). Thus when deciles of 10 firms are formed, the middle deciles will likely contain a mixture of firms that do not or cannot manage earnings and firms that manage freely, but have little need, while the extreme deciles should be populated almost exclusively by firms identified as potential earnings managers. Ideally, the extreme deciles would contain 20 of the 25 firms identified as large earnings managers.

26 I include the formulation of modified Jones model suggested by Kothari, Leone, and Wasley (2002) (KLW) for comparison for several reasons. First, the modified Jones model has been widely used and the KLW show that their formulation improves model specification (a problem for the Jones models in general). Thus this model is a logical base for comparison. Second, the superiority of the KS model is questionable, given the pooled estimation of the Jones model used by Kang and Sivaramakrishnan (1995) in their comparison. Finally, while the E-J model is designed to improve upon earlier Jones models,
firms in the zero decile. The zero decile is the decile that includes firms with discretionary accruals closest to zero and should contain few if any EM firms. However, as each of these models has potential problems (discussed in Chapter 3), I offer no hypotheses as to which is most effective. In doing so, the standard for determining a superior model is raised.

Stock Returns and the Incentive to Manage Earnings

While the analysis discussed above should shed light on the ability of discretionary accruals to identify firms that manage earnings, it is possible that a large portion of the firms in the extreme discretionary accrual deciles will not be identified as potential earnings managers. Although this would be a significant finding in that it could suggest that discretionary accruals should not be used to identify earnings management in the general population of firms, it would not necessarily be contrary to the earnings management hypothesis as it relates to the accrual anomaly.\(^{27}\) It would still be possible that the firms driving the anomaly would be those with both an incentive and the ability to manage earnings. Thus, the next phase of my analysis is to analyze the market response of the subsample of firms identified as potential earnings managers relative to that of the remaining firms. For this analysis, I hypothesize that the accrual anomaly will be stronger for firms identified as potential earnings managers. Further, I hypothesize that those firms that have an incentive to manage earnings downward will contribute positively to future returns while those that have incentives to manage earnings upwards will contribute negatively to future returns.

\(^{27}\) Alternatively, finding no incentive for a large proportion of the firms in the extreme deciles could indicate that important incentives are not included in my analysis. This potential problem is addressed through my analysis based on earnings management behavior discussed in the next section.
Stock Returns and Earnings Management Behavior

In my next analysis, I classify firms as earnings managers based on their behavior, rather than their incentives. This methodology allows me to examine the stock market response to different earnings management behavior and allows me to include all extreme accrual firms, including those for which incentives are not theoretically or empirically identified. For this analysis, I classify firms in the extreme deciles into five categories based on the earnings dimensions discussed by Bhattacharya, Daouk, and Welker (2002).

Bhattacharya, Daouk, and Welker (2002) discuss four dimensions of earnings management: earnings smoothing, earnings aggressiveness, earnings conservatism, and loss avoidance. As loss avoidance was included in my earlier analysis of benchmark beating, I focus on the first three categories here. However, I further break down the aggressiveness and conservatism categories to allow for the distinction between firms based on the frequency of their aggressiveness or conservatism. I suggest that if a firm adopts a regular pattern of earnings management, the market will learn from it. For example, if a firm regularly inflates earnings, the market may come to expect this and be less likely to overreact to its earnings, so negative long-run abnormal returns would be less likely or less extreme. Alternatively, a firm that rarely manages earnings would be more likely to fool the market with its earnings, leading to negative abnormal returns as the truth is revealed. Thus, for my analysis, I utilize five earnings management classifications: regular aggressiveness, rare aggressiveness, regular conservatism, rare conservatism, and earnings smoothing.

Here I suggest that the market is more likely to expect earnings management from firms that regularly engage in it. Thus, I hypothesize that the market response will be greater for firms in the two rare categories and less for the firms that smooth earnings or regularly manage earnings in one direction or the other.

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28 In addition, using behavior can avoid problems that would arise when firms have multiple incentives, or when firms with the same incentives may behave differently, due to differing firm priorities.
The Reversal of Announcement Date Overreaction to Earnings

My final analysis delves further into the question of whether or not the market may be fooled by earnings management. The question I analyze here is whether firms identified as earnings managers have abnormal returns around the date of their earnings announcements, and if they do, is the reversal of these abnormal returns the source of the long-run abnormal returns that are documented in the accrual anomaly literature.

The rationale for this possibility is straightforward. The market typically responds when firms announce their earnings. If the earnings are better than expected, the market responds favorably and may produce positive abnormal returns. However, if earnings are better than expected as a result of earnings management, the positive abnormal returns may reverse as the financial statement information is examined and earnings management is revealed. On the other hand, if a firm reports poorer than expected earnings due to downwards earnings management, negative abnormal returns may occur around the announcement date, followed by long-run positive abnormal returns as the financial statements are analyzed.29, 30

Thus two hypotheses arise. First, high accrual firms, or firms with incentives to manage earnings upwards, should, on average, have positive abnormal returns around their announcement dates, and these returns should be offset by long-run negative abnormal returns over the next year.31 Second, low accrual firms, or firms with

29 Considering the benchmark beating literature, this second scenario is less likely to be reflected in the data. While some firms may take a big bath, resulting in poorer than expected performance and negative abnormal returns, other firms that manage downwards will do so after surpassing some benchmark (e.g. analyst forecasts). Having exceeded the benchmark, these firms are more likely to have positive abnormal returns around the earnings announcement. I suggest positive abnormal returns are more likely based on Skinner and Sloan’s (2002) finding of positive abnormal returns to firms exceeding analysts’ forecasts and negative abnormal returns to firms who fail to meet the analysts’ forecasts. However, it is possible that the abnormal returns to these firms may be lower than other benchmark beaters or even negative. This would be an interesting topic for further research.

30 The reasoning behind these hypotheses is similar to that of Sloan (1996). Sloan (1996) hypothesized that the long-run abnormal returns from the accrual anomaly would be concentrated around future earnings announcement dates. Here I suggest that these returns represent a reversal of abnormal returns from an earlier announcement.

31 While some firms may exceed expectations as a result of earnings management, producing positive abnormal returns, other firms may manage earnings just to meet expectations and prevent a negative abnormal return that could arise from failing to meet expectations. On average, however, the combination of the two cases should produce positive abnormal returns. Similar, though opposite, reasoning may be applied to the second hypothesis.
incentives to manage earnings downwards, should, on average, have negative abnormal returns around their announcement dates, and these returns should be offset by long-run positive abnormal returns over the following year. Evidence supporting these hypotheses would support the earnings management hypothesis as an explanation for the accrual anomaly.

**Summary of Chapter 2**

From the discussion in this chapter, three major research questions and several hypotheses arise. To summarize, my first research question is whether or not accrual decomposition models identify earnings management in the general population of firms. To address this question, I focus on the composition of discretionary accrual deciles. Here, my primary hypothesis is that the extreme accrual deciles will contain a greater proportion of potential earnings management firms than the middle deciles.

My second research question is whether or not the accrual anomaly results from earnings management. I address this question in two ways. First, I examine the contribution of the potential earnings management firms to the anomaly. Here, I hypothesize that the accrual anomaly will be stronger in the extreme decile firms identified as potential earnings managers. Second, I classify firms into earnings management categories based on their behavior to determine how various earnings management behaviors impact the anomaly. I hypothesize that the anomaly will be weaker in firms with predictable behaviors, as the market will anticipate their accruals.

The final question I address is whether or not investors overreact to the earnings announcements of potential managers and it is the reversal of this overreaction that produces the anomaly. The primary hypotheses for this analysis are that earnings management firms will have abnormal returns around their announcement dates and that these announcement date abnormal returns will be negatively related to the long-run abnormal returns of the accrual anomaly.
CHAPTER 3
MEASURING DISCRETIONARY ACCRUALS

Introduction

As the measurement of discretionary accruals is important throughout my analysis, a thorough discussion of discretionary accrual models and the issues surrounding them is warranted. In addition, in an attempt to produce better estimates of discretionary accruals, I develop an extended Jones model, the E-J model. This chapter is devoted to that discussion of discretionary accrual models and to the development of the E-J model.

Background

The majority of earnings management studies use accrual-based models for detecting earnings management. Under these models, a firm’s total accruals are assumed to be composed of both a nondiscretionary component and a discretionary component. The nondiscretionary component represents the accruals that arise naturally during business operations, while the discretionary component is assumed to represent earnings management. Researchers use some method to estimate an expected level of nondiscretionary accruals, and simply estimate the discretionary component as the difference between the firm’s actual total accruals and the expected nondiscretionary component. The models used for estimating the nondiscretionary component, however, vary a great deal. DeAngelo (1988), for instance, simply estimates nondiscretionary

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accruals as the prior year’s total accruals, while Jones (1991) uses regression analysis, modeling nondiscretionary accruals as a function of firms’ revenue changes and gross property, plant, and equipment (the Jones model).

Dechow, Sloan, and Sweeney (1995) recognized that with the wide variety of models being used, it was necessary to evaluate the relative performance of the competing models. They analyze the specification and power of five discretionary accrual models: the DeAngelo (1988) and the Jones models, discussed above, the Healy (1985) model, the Dechow and Sloan (1991) industry model, and a modified version of the Jones model (the modified Jones model). The five models examined reflect the majority of the models in use to that point.

Dechow, Sloan, and Sweeney (1995) find that while all of the models tested are well specified in random firm years, they likewise are all mispecified when applied to firms with extreme financial performance. In addition, they find that while the Jones and modified Jones models have the most power for detecting earnings management, all of the models tested have very low power to detect earnings management of economically plausible magnitudes.

Guay, Kothari, and Watts (1996) also examine the models evaluated by Dechow, Sloan, and Sweeney (1995). They examine whether the relationship between stock returns and the components of earnings (non-discretionary earnings and discretionary accruals) are consistent with an opportunistic earnings management hypothesis. They find that all five models estimate discretionary accruals with much imprecision, and only the Jones and modified Jones models produce results roughly consistent with the earnings management hypothesis. Healy (1996) questions the strength of the conclusions drawn by Guay, Kothari, and Watts (1996), noting that their model makes many strong assumptions. He suggests their tests are thus joint hypotheses of the discretionary accrual

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32 As discussed above, the DeAngelo (1988) model estimates nondiscretionary accruals as the prior year’s total accruals, while Jones (1991) uses regression analysis, modeling nondiscretionary accruals as a function of firms’ revenue changes and gross property, plant, and equipment. The Healy (1985) model estimates nondiscretionary accruals to be the average total accruals during an estimation period in which there is assumed to be no incentive to manage earnings. Like the Jones (1991) model, the Dechow and Sloan (1991) Industry Model uses regression analysis. Nondiscretionary accruals are estimated to be a firm specific constant plus the median total accruals for the firm’s industry times a firm specific coefficient. The modified Jones model is the Jones (1991) model adjusted to allow earnings management via the revenues account. The Jones and modified Jones models will be discussed more thoroughly later in this chapter.
models and the assumptions made. However, he goes on to conclude that the accrual models are indeed crude and need improving.

Although the findings of Dechow, Sloan, and Sweeney (1995) and Guay, Kothari, and Watts (1996) suggest that the Jones and modified Jones models may have some merit, at least relative to other models, Kang and Sivaramakrishnan (1995) point out three distinct econometric issues with the Jones models. First, there is an omitted variables problem. The Jones model assumes that current accruals are related to revenues. However, the current liabilities in current accruals are likely to be more closely related to expenses than to revenues. Thus, to the extent that revenues and expenses are not perfectly correlated, an omitted variable problem exists. Second, as the independent variables may actually contain earnings management, their true values are measured with error, creating an errors-in-variables problem. Third, the dependent and independent variables are determined simultaneously through the same accounting system, creating a simultaneity problem. After discussing these problems, Kang and Sivaramakrishnan (1995) suggest an instrumental variables model to correct these problems. After proposing their model, Kang and Sivaramakrishnan (1995) test the power and specification of their model relative to that of the Jones model and conclude that their model is more powerful and better specified.33 However, also worth noting, they find that the power of the Jones model may be improved substantially by estimating its parameters using the generalized method of moments.

Despite the findings of Kang and Sivaramakrishnan (1995), the KS model has been used by relatively few researchers, while the Jones and modified Jones models have gained popularity and continue to be widely used in the literature. Perhaps one explanation for this is that researchers have trouble justifying the instruments under the KS approach. In any event, rather than adopt the KS model, many researchers have suggested further modifications to the Jones models to improve their power and specification. The result is a whole family of models based on Jones’ original 1991

33 Although Kang and Sivaramakrishnan (1995) find their model to be more powerful, their findings are open to question. This is because they estimate the Jones model parameters using a pooled cross-sectional regression. They do not estimate the Jones model parameters using firm-specific time-series regressions or industry-specific cross-sectional regressions, as is traditionally done in the literature. Estimation of the Jones model and its variations are discussed in the next section.
specification; however, none of these incorporates all or even most of the suggested extensions. Thus, in this paper, I suggest an extended Jones model, the E-J model, incorporating additional variables that have been suggested in the literature.

**Competing Models**

In this section, I discuss the Jones family of models and the KS model in more detail. I begin by discussing the Jones and modified Jones models. I follow this with a discussion of the original KS model and the modifications employed by Kang (1999). Finally, I discuss several of the variations of the Jones model that have been employed or suggested in the literature, and propose a new model based on a combination of these variations.

**The Jones Model**

Unlike the earlier Healey (1985) and DeAngelo (1988) models, the Jones model allows a firm’s expected accruals to vary with the firm’s changing economic circumstances. Jones (1991) notes that accruals arise from changes in non-cash working capital accounts and non-cash charges (e.g., depreciation and amortization). She further recognizes that non-cash charges and changes in working capital accounts are related to other items in the financial statements and suggests that expected accrual levels could be predicted based on the balances of related accounts. This is the basis for her model. The non-discretionary component of accruals is calculated using the following equation:

\[
NDA_{i,t} = \hat{\beta}_0 + \hat{\beta}_1 \left( \frac{1}{A_{i,t-1}} \right) + \hat{\beta}_1 \left( \frac{\Delta REV_{i,t}}{A_{i,t-1}} \right) + \hat{\beta}_2 \left( \frac{PPE_{i,t}}{A_{i,t-1}} \right)
\]

Here, NDA represents nondiscretionary accruals (scaled by total assets), A represents total assets, \(\Delta REV\) represents the change in revenues, and PPE represents gross property, plant, and equipment. The variables \(i\) and \(t\) are firm and time subscripts, respectively,
and \( \hat{\beta}_0 \), \( \hat{\beta}_1 \), and \( \hat{\beta}_2 \) are the parameters previously estimated using the following time-series regression equation over prior years:

\[
\frac{TA_{i,t}}{A_{i,t-1}} = \beta_0 \left[ \frac{1}{A_{i,t-1}} \right] + \beta_1 \left[ \frac{\Delta \text{REV}_{i,t}}{A_{i,t-1}} \right] + \beta_2 \left[ \frac{\text{PPE}_{i,t}}{A_{i,t-1}} \right] + \epsilon_i
\]  

eq.2

Here \( TA \) represents total accruals, and \( \epsilon \) is an error term. Total accruals are estimated as follows:

\[
TA_{i,t} = \Delta CA_{i,t} - \Delta \text{Cash}_{i,t} - \Delta CL_{i,t} - \text{DEP}_{i,t}
\]  

eq.3

where \( \Delta CA \) is the change in current assets, \( \Delta \text{Cash} \) is the change in cash, \( \Delta CL \) is the change in current liabilities, and DEP represents depreciation and amortization.\(^{34}\)

Jones (1991) includes the change in revenues in her model to control for nondiscretionary changes in working capital accounts relating to the economic performance of the firm. In addition, she includes gross property, plant, and equipment to control for the portion of total accruals related to nondiscretionary depreciation expense. Also note that each term in her model is scaled by lagged total assets in an effort to reduce heteroskedasticity. Finally, discretionary accruals (scaled by total assets), \( DA \), are calculated as the difference between each firm’s actual total accruals (scaled by assets), \( TA^* \), and its scaled nondiscretionary accruals estimated by equation 1, \( NDA \). This is equation 4.

\[
DA_{i,t} = TA^*_{i,t} - NDA_{i,t}
\]  

eq.4

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\(^{34}\) More directly, total accruals may be calculated as net income minus operating cash flow. However, operating cash flow was not reported prior to 1988, so researchers have commonly estimated total accruals.
The Modified Jones Model

In using revenues to control for the changing economic conditions of firms, Jones (1991) assumes that revenues are an objective measure of a firm’s operations that does not contain earnings management. However, she notes that this may not actually be the case as managers can manage earnings via the revenues account.35 Dechow, Sloan, and Sweeney (1995) note that to the extent that firms do manage earnings though the revenues account, the Jones model may produce inaccurate estimates of discretionary accruals. They introduce the modified Jones model as an improved model that could increase the precision of the original. The exact modification entails subtracting the change in trade receivables from the change in revenues in the equation for estimating the nondiscretionary component of accruals. Thus, in the modified Jones model, equation 1 from the Jones model is replaced by equation 5 below.

\[
\text{NDA}_{i,t} = \hat{\beta}_0 + \hat{\beta}_1 \left( \frac{\text{REV}_{i,t-1} - \text{AR}_{i,t-1}}{\text{PPE}_{i,t-1}} \right) + \hat{\beta}_2 \left( \frac{\Delta \text{REVs}_{i,t-1} - \Delta \text{ARs}_{i,t-1}}{\text{PPE}_{i,t-1}} \right)
\]

Here \( \Delta \text{AR} \) represents the change in trade receivables; other variables are as previously defined. Note that this change is not applied to the parameter estimation equation from the original model, equation 2.

The KS Model

Kang and Sivaramakrishnan (1995) note three problems common to the Jones and modified Jones models. First, they suggest these models suffer from an omitted variables problem. They point out that the revenues account is used to control for changes in both

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35 In fact, later studies show that the revenues account is commonly used to manage earnings. In 18 of the 32 SEC violations identified by Dechow, Sloan, and Sweeney (1996), firms were alleged to have manipulated revenues, and Beneish (1997) reported 43 of the 83 firms in his sample of GAAP violators.
the current asset and current liabilities accounts even though many current liabilities are likely to be more closely related to expense levels. To the extent that revenues and expenses are not perfectly correlated, there is an omitted variables problem. Second, Kang and Sivaramakrishnan (1995) note that to the extent that the revenues account contains earnings management, unmanaged revenues are measured with error. Thus there exists an errors-in variables problem. Finally, they note that the dependent variable and the independent variables are determined simultaneously through the accounting process. This produces a simultaneity problem. Each of these problems alone would induce correlation between the independent variables and the error terms, causing OLS to produce inconsistent parameter estimates and inflated standard errors.

The KS model is designed to alleviate the three methodological problems of the Jones models. First, to alleviate the omitted variables problem, Kang and Sivaramakrishnan (1995) include pretax operating expenses to control for changes in the current liabilities account. Second, to address the simultaneity and errors-in-variables problems, they use the standard instrumental variable (IV) and generalized method of moments (GMM) approaches. In general, an IV approach involves replacing the independent variables that are correlated with the error terms with instruments (other variables) that are assumed to be highly correlated with the original variables, but uncorrelated with the error terms. The GMM approach estimates model parameters to minimize the weighted sum of squared errors while imposing the constraint that $x' \hat{\varepsilon}$ as a function of $\hat{\beta}$ equals zero, where $x$ is the matrix of independent variables, $\hat{\varepsilon}$ is the vector of residuals and $\hat{\beta}$ is the matrix of estimated parameters.

The original KS model is given by equations 6 and 7. Nondiscretionary accruals are estimated using equation 6,

$$NDA_{t,1} = \phi_0 + \phi_1 \left[ \frac{AR_{t,1}}{REV_{t,1}} \right] REV_{t,1} + \phi_2 \left[ \frac{AP_{t,1}^{pl}}{EXP_{t,1}^{pl}} \right] EXP_{t,1}^{pl} + \phi_3 \left[ \frac{DEP_{t,1}^{pl}}{PPE_{t,1}^{pl}} \right] PPE_{t,1}^{pl} \text{ eq.6}$$

36 Kang and Sivaramakrishnan (1995) exclude tax-related expenses and accruals from their model, as these items might induce measurement error due to tax credits and the unknown effects of earnings management on taxes. One of Kang’s (1999) modifications is to include tax-related items in the analysis.

42 Similarly, Nelson, Elliot, and Tarpley (2002) examined 515 earnings management attempts reported by auditors and found that 114 of these affected current revenues or other gains.
after parameters are estimated in equation 7 using GMM or the standard IV approach.

\[
\frac{TA_t}{A^G_{t-1}} = \phi_0 + \phi_1 \left[ \frac{AR_{t-1}}{REV_{t-1}} \right] \frac{REV_t}{A^G_{t-1}} + \phi_2 \left[ \frac{AP^{pt}_{t-1}}{EXP^{pt}_{t-1}} \right] \frac{EXP^{pt}_t}{A^G_{t-1}} + \phi_3 \left[ \frac{DEP_{t-1}}{PPE_{t-1}} \right] \frac{PPE_t}{A^G_{t-1}} \quad \text{eq. 7}
\]

In these equations, \( A^G \) is defined as gross assets, \( EXP^{pt} \) represents pre-tax operating expenses (cost of goods sold plus selling and administrative expenses before depreciation) and \( AP^{pt} \) represents account balances believed to be associated with pre-tax operating expenses (inventory plus other current assets minus current liabilities). Also, note that the parameters and parameter estimates in these equations have no subscripts. This is because the parameters are estimated from a pooled sample, rather than from firm-specific time-series of observations.

While this model is similar to the Jones models, there are several differences worth noting. First, the KS model estimates accrual balances based on levels, rather than changes in accounts. As it is easier to suggest instruments associated with account balances than changes in those balances, this alteration is done to facilitate the instrumental variables approach. Second, expected account balances are estimated by multiplying lagged turnover ratios by current period revenues, pre-tax operating expenses, and gross property plant and equipment. Third, when the parameters are estimated using the instrumental variables approach, lagged values of the dependent and independent variables are used.\(^{37}\) And finally, as noted above, common parameters are estimated for all firms using a pooled sample. The firm specific turnover ratios are expected to account for differences across firms.

Kang (1999) makes three simplifications to the original KS model. First, the original KS model excludes tax related expenses and accruals as they might induce measurement error due to tax credits and the unknown effects of earnings management on taxes. Kang includes the tax related items for comparability to Jones model and finds that it actually improves the power of the model. Second, Kang (1999) uses only once

\(^{37}\) Kang and Sivarakrishnan (1995) use once, twice, and thrice lagged variables as instruments. They find that once lagged variables perform best.
lagged variables as instruments, as Kang and Sivaramakrishnan (1995) found that they performed better than instruments based on two or three lags. Finally, Kang and Sivaramakrishnan (1995) scale their variables by gross total assets, rather than net total assets. To make the accrual levels comparable between models, Kang (1999) scales his variables by net total assets. To enhance the power and comparability of the original KS model, I adopt Kang’s (1999) modifications. This model, the KS model is represented by equations 8 and 9. Nondiscretionary accruals are estimated with equation 8 after its parameters are estimated in 9. When using this model, I estimate the parameters using GMM, as Kang and Sivaramakrishnan (1995) show this method to be most powerful. Again, this model is estimated using pooled data.

\[
NDA_{it} = \hat{\phi}_0 + \hat{\phi}_1 \left( \frac{AR_{it-1}}{REV_{it-1}} \right) \frac{REV_{it}}{A_{it-1}} + \hat{\phi}_2 \left( \frac{AP_{it-1}}{EXP_{it-1}} \right) \frac{EXP_{it}}{A_{it-1}} + \hat{\phi}_3 \left( \frac{DEP_{it-1}}{PPE_{it-1}} \right) \frac{PPE_{it}}{A_{it-1}} \tag{eq.8}
\]

\[
\frac{TA_i}{A_{t-1}} = \phi_0 + \phi_1 \left( \frac{AR_{it-1}}{REV_{it-1}} \right) \frac{REV_{it}}{A_{it-1}} + \phi_2 \left( \frac{AP_{it-1}}{EXP_{it-1}} \right) \frac{EXP_{it}}{A_{it-1}} + \phi_3 \left( \frac{DEP_{it-1}}{PPE_{it-1}} \right) \frac{PPE_{it}}{A_{it-1}} \tag{eq.9}
\]

In these equations, EXP represents operating expenses and AP represents the balances associated with operating expenses.

**Modifications and Extensions of the Jones Model**

The modified Jones model (Dechow, Sloan, and Sweeney, 1995) was not the first or the last modification to the original Jones model. One of the first modifications was to estimate the model cross-sectionally by industry (Defond and Jiambalvo, 1994), rather than in its traditional time-series environment. The cross-sectional approach has also been applied to the modified Jones model, producing the cross-sectional modified Jones model (Subramanyam, 1996). The cross-sectional formulation may be distinguished from the original time-series formulation by the subscripts on the parameters and parameter estimates. The firm-specific subscript, i in the original time series model, is replaced by the subscripts j and t, representing the industry and the time period,
respectively. The cross-sectional modified Jones model is represented by equations 10 and 11 below. Equation 10 estimates nondiscretionary accruals using the parameter estimates from the cross-sectional estimation of equation 11.

\[
\text{NDA}_{i,t} = \hat{\beta}_{0,t} + \hat{\beta}_{1,t} \left[ \frac{1}{A_{i,t-1}} \right] + \hat{\beta}_{2,t} \left[ \frac{\Delta \text{REV}_{i,t} - \Delta \text{AR}_{i,t}}{A_{i,t-1}} \right] + \epsilon_{j,t}
\]

\[
\text{TA}_{i,t} = \hat{\beta}_{0,t} + \hat{\beta}_{1,t} \left[ \frac{\Delta \text{REV}_{i,t}}{A_{i,t-1}} \right] + \hat{\beta}_{2,t} \left[ \frac{\text{PPE}_{i,t}}{A_{i,t-1}} \right] + \epsilon_{j,t}
\]

eq. 10 \quad \text{eq.10}
\]

eq. 11 \quad \text{eq.11}

Here, industry specific parameters are estimated for each year.

The cross-sectional approaches are beneficial in that they allow changing industry-wide economic conditions to be reflected in the estimation process, and allow for larger samples, as they do not require the long data histories necessary for the time-series regressions (Teoh and Wong, 2002). Because of these benefits, the use of cross-sectional versions of the Jones models has become common.\(^{38}\)

Defond and Jiambalvo (1994) implement another early modification. In addition to utilizing both time-series and cross-sectional approaches, they also utilize both the traditional total accruals approach and a current accruals approach. The current accruals approach uses unexpected current accruals, rather than unexpected total accruals, as its measure of earnings management.\(^{39}\) In this approach, when expected (nondiscretionary) current accruals are estimated, the property, plant and equipment term, PPE, is dropped from the original Jones (1991) specification. This approach is justified by the view that working capital accruals are more subject to manipulation than non-working capital accruals. Teoh, Wong, and Rao (1998) also look at both current and non-current accruals by breaking the cross-sectional modified Jones model into current and non-current components. Contrary to the justification for the current accrual approach, they find


\(^{39}\) Current accruals are defined as the sum of changes in inventory, accounts receivable, and other current assets minus the sum of changes in accounts payable, income taxes payable, and other current liabilities.
evidence that abnormal non-current accruals can explain poor firm performance following initial public offerings.

Other modifications stem from the suggestions of Dechow (1994), Guay, Kothari, and Watts (1996), Healy (1996), and Beniesh (1997). After finding that cash flows and accruals are strongly negatively correlated and that accruals exhibit strong negative autocorrelation, Dechow (1994) suggests that discretionary accrual models could be improved by incorporating these relationships. Guay, Kothari, and Watts (1996), Healy (1996), and Beneish (1997) all make similar suggestions. Acting on these suggestions, Kasnik (1999) and Chambers (1999) extend the modified cross-sectional Jones model by respectively including the change in operating cash flows and lagged current accruals as independent variables.

Motivated by the finding of Dechow, Sloan, and Sweeney (1995) that the Jones and modified Jones models are mispecified when applied to firms with extreme financial performance, Teoh, Rao, and Wong (1998) and Kothari, Leone and Wasley (2002) propose performance-matched discretionary accrual measures. Teoh, Rao and Wong (1998) note that the matched-pair approach provides the benefit of eliminating any systematic errors in the Jones model accruals for similar performing firms. A matched-firm approach, however, is not feasible for this study, as I seek to examine accruals across the cross-section of firms.

Kothari, Leone, and Wasley (2002), however, also suggest that as an alternative to the performance matching, a performance measure may be included in the Jones and modified Jones models. They implement this formulation, using return on assets as a performance measure, for comparison to their performance-matched approach, and find that this alteration improves the specification of the Jones models. Kothari, Leone and Wasley (2002) also recommend the inclusion of an intercept in the Jones models. They note that this will provide an additional control for heteroskedasticity and mitigate problems resulting from an omitted scale variable. They test this formulation and conclude that the inclusion of an intercept improves the specification of the Jones model. This model in its cross-sectional formulation is presented as equations 12 and 13, where

---

40 Kothari, Leone and Wasley (2002) find that deflating variables by lagged total assets does not completely eliminate heteroskedasticity in the cross-sectional Jones model.
NI is net income and $\alpha$ is the intercept parameter. As with the other models, parameters estimated in equation 13 are used in equation 12 to estimate nondiscretionary accruals.

$$\text{NDA}_{i,t} = \hat{\alpha} + \hat{\beta}_{0,i} \left[ \frac{1}{A_{i,t-1}} \right] + \hat{\beta}_{1,i} \left[ \frac{\Delta \text{REV}_{i,t} - \Delta \text{AR}_{i,t}}{A_{i,t-1}} \right] + \hat{\beta}_{2,i} \left[ \frac{\text{PPE}_{i,t}}{A_{i,t-1}} \right] + \hat{\beta}_{3,i} \left[ \frac{\text{NI}_{i,t-1}}{A_{i,t-1}} \right]$$ \text{eq.12}

$$\frac{\text{TA}_{i,t}}{A_{i,t-1}} = \alpha + \beta_{0,i} \left[ \frac{1}{A_{i,t-1}} \right] + \beta_{1,i} \left[ \frac{\Delta \text{REV}_{i,t}}{A_{i,t-1}} \right] + \beta_{2,i} \left[ \frac{\text{PPE}_{i,t}}{A_{i,t-1}} \right] + \beta_{3,i} \left[ \frac{\text{NI}_{i,t-1}}{A_{i,t-1}} \right] + \varepsilon_{j,t} \text{ eq.13}$$

A final extension to the Jones model arises from the omitted variables problem (the exclusion of expenses) identified by Kang and Sivaramakrishnan (1995). Rangan (1998) addresses this problem by adding the change in cost of goods sold to his model. 41 Rangan (1998) uses cost of goods sold rather than pre-tax operating expenses less depreciation and amortization, used by Kang and Sivaramakrishnan (1995), because it was more often available in the quarterly Compustat files.

The E-J Model

Drawing from the discussion above, I propose the following more thoroughly extended Jones model, the E-J Model, represented by equations 14 and 15. Nondiscretionary accruals are estimated using equation 14,

$$\text{NDA}_{i,t} = \hat{\alpha}_i \left[ \frac{1}{A_{i,t-1}} \right] + \hat{\beta}_{1,i} \left[ \frac{\Delta \text{REV}_{i,t} - \Delta \text{AR}_{i,t}}{A_{i,t-1}} \right] + \hat{\beta}_{2,i} \left[ \frac{\Delta \text{EXP}_{i,t}}{A_{i,t-1}} \right]$$

$$+ \hat{\beta}_{3,i} \left[ \frac{\text{PPE}_{i,t}}{A_{i,t-1}} \right] + \hat{\beta}_{4,i} \left[ \frac{\text{CACC}_{i,t-1}}{A_{i,t-1}} \right] + \hat{\beta}_{5,i} \left[ \frac{\Delta \text{OCF}_{i,t}}{A_{i,t-1}} \right] + \hat{\beta}_{6,i} \left[ \frac{\text{NI}_{i,t-1}}{A_{i,t-1}} \right]$$ \text{eq.14}

41 Rangan (1998) adopts the current accruals as his measure of earnings management. Thus, property plant and equipment is not included in his model.
after model parameters are obtained by estimating equation 15 using GMM.

\[
\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_{0,j} \left[ \frac{1}{A_{i,t-1}} \right] + \beta_{1,j} \left[ \frac{\Delta REV_{i,t}}{A_{i,t-1}} \right] + \beta_{2,j} \left[ \frac{\Delta EXP_{i,t}}{A_{i,t-1}} \right] \\
+ \beta_{3,j} \left[ \frac{PPE_{i,t}}{A_{i,t-1}} \right] + \beta_{4,j} \left[ \frac{CACC_{i,t-1}}{A_{i,t-1}} \right] + \beta_{5,j} \left[ \frac{\Delta OCF_{i,t}}{A_{i,t-1}} \right] + \beta_{6,j} \left[ \frac{NI_{i,t-1}}{A_{i,t-1}} \right] + \varepsilon_{i,t},
\]

eq. 15

Note the parameters for this model include an industry subscript, \(j\) and a time subscript, \(t\), as I estimate this model using annual cross-sectional regressions by industry. \(^{42}\) In these equations, CACC represents current accruals, OCF represents operating cash flow, and NI represents net income.

This model incorporates most of the changes from prior literature into one model, and in doing so, it addresses the problems documented with the Jones model. To address the specification problems in samples with extreme financial performance, this model includes lagged ROA as an independent variable. In addition, based on the findings of Kothari, Leone and Wasley (2002), an intercept term is included to reduce heteroskedasticity and further improve model specification.

The power of the model should also be improved. First, this model includes the original Dechow, Sloan, and Sweeney (1995) modification of subtracting out the change in receivables to allow for earnings management through credit sales. Second, the expense related omitted variables problem documented by Kang and Sivaramakrishnan (1995) is addressed by including an expense control variable. In addition, other omitted variable problems are addressed by including both the change in operating cash flow and prior period current accrual variables. Their inclusion allows for the interaction of these terms and captures the relationships documented by Dechow (1994). Finally, to address the simultaneity issue and further improve power, I estimate this extended Jones model using GMM. \(^{43}\)

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\(^{42}\) I estimate this model cross-sectionally to allow for the inclusion of IPO firms. However, this model, like the original Jones model may also be estimated using firm-specific time-series regressions.

\(^{43}\) As noted previously, Kang and Sivaramakrishnan (1995) find that estimation GMM improves the power of the Jones model. Specifically, in simulations, the Jones model (OLS) detected induced earnings
The modifications included in this model should improve both the power and specification of the model and possibly surpass the power of the KS model. Testing (via simulations or other means) is needed to conclusively determine how much these changes improve on the original Jones model and whether or not its power surpasses that of the KS model. While I leave simulation analysis for later research, my analysis of firms’ incentives and abilities across extreme accrual deciles sheds light on this issue. If one model detects a greater proportion of EM firms in extreme discretionary accrual deciles and a smaller proportion in the middle deciles, it is likely more effective. The methodology and results of this analysis are discussed in Chapters 4 and 5.

**Measuring Total Accruals**

A final issue in the estimation of discretionary accruals is the measurement of total accruals. Recall Jones (1991) used equation 3 to estimate total accruals.

\[
TA_{i,t} = \Delta CA_{i,t} - \Delta Cash_{i,t} - \Delta CL_{i,t} - DEP_{i,t}
\]

Equation 3 represents the balance sheet method of estimating accruals and has been widely used in the literature. For analyzing data prior to 1988, this method is necessary, as cash flow information from this period is not directly available. However, beginning in 1988, firms were required to report cash flow from operations, so total accruals may now be calculated directly, as the difference between earnings and operating cash flows. Hribar and Collins (2002) examine these two methods of measuring accruals and show that the balance sheet method may produce substantial errors in accrual estimation. They recommend that accruals be calculated directly using equation 16.

\[
TA_{i,t} = EBI_{i,t} - CFO_{i,t}
\]

management in 23% of cases. The Jones model estimated using GMM detected induced earnings management in 44% of cases.
Here, TA again represents the total accruals, EBXI represents earnings before extraordinary items and discontinued operations, and CFO represents cash flow from operations. I follow the advice of Hribar and Collins (2002) and use the direct approach.
CHAPTER 4

RESEARCH DESIGN

Overview

This chapter outlines the methodology I follow in examining the hypotheses discussed in Chapter 2. First, I address my procedures for determining whether discretionary accrual models identify firms likely to manage earnings in a general setting. This analysis will provide evidence of the relative effectiveness of competing models, as well as evidence regarding the ability of accrual decomposition models to identify firms that manage earnings. Following this discussion, I outline my procedures for examining the accrual anomaly and the roles played in this anomaly by firms suspected of earnings management and firms that engage in different earnings management behaviors. Finally, I discuss the methods I use to examine the potential overreaction to earnings announcements by firms suspected of managing earnings and the relationship between any overreaction and the accrual anomaly.

Discretionary Accruals and Earnings Management

As discussed in the preceding chapters, the majority of earnings management studies use some measure of discretionary accruals, generated by accrual decomposition models, as proxies for earnings management. However, as Healy (1996) notes, these discretionary accruals are in actuality unexpected accruals. Accrual decomposition models generally predict an expected level of accruals. The difference between a firm’s
actual accruals and its expected accruals is merely its level of unexpected accruals. The expected accruals are assumed to be nondiscretionary, and the unexpected accruals are assumed to be discretionary. Thus the level of discretion in discretionary accruals is open to question.

While there is evidence that the models can detect earnings management in situations where earnings management is suspected (Healy, 1996), their ability to detect earnings management in a more general setting has not been tested, and one cannot simply assume that if these models work in specific situations they will work more generally. To see this, consider the following. In a situation where earnings management is suspected, if firms use accruals to manage earnings the models detect this unexpected accrual activity. However, in a more general setting, if some firms have high abnormal accruals that are truly not discretionary, the abnormal accruals will be detected and the firm will be classified as an earnings manager even though this is not the case. Thus in a general setting, it is possible that extreme accrual firms may consist of both firms that manage and firms that do not manage earnings.

In my analysis, I address this issue by examining whether or not firms in extreme discretionary accrual deciles have characteristics of firms that manage earnings. That is, do the firms in extreme discretionary accrual deciles have both the incentive and the ability to manage earnings?

Sample Selection

To answer this question, I begin with a sample of all Compustat firms for which the data to calculate discretionary accruals is available. My sample period begins in 1988, the first year in which accruals may be calculated using the direct method and runs through 2002, the most recent year for which data is available. This results in a sample of 75,980 firm-year observations. Once my full sample is formed, I identify a subsample of firms having both the incentive and ability to manage earnings. I intended to classify a firm as having the ability to manage earnings if at least half of its board members were insiders. I chose the 50% threshold based on the findings of Klein (2002). Klein presents evidence that firms with less than a majority of independent directors are
more likely to manage earnings. In addition, this is consistent with many other studies that show earnings management is negatively related to board independence, proxied by the percentage of outside board members.\footnote{These studies include Beasley (1996) and Peasnell, Pope and Young (2000).} Unfortunately, the necessary board information was not available. Thus, following Bowen, Rajgopal, and Venkatachalam (2004) I proxy independence as the proportion of top-five officers that serve on the board of directors. I classify a firm as having the ability to manage earnings if at least half of it’s top five officers are board members. This information is obtained from Execucomp.

As discussed in Chapter 2, the identification of firms having an incentive to manage earnings is more complicated. While I identify many incentives to manage earnings, many of these would be difficult to identify directly when examining a broad cross-section of stocks. I am able to directly identify firms having many of the incentives discussed and identify others by their behavior. When a firm is classified as having a particular earnings management incentive, a flag for that incentive is set to one. Methods for classification are discussed below by their general incentive categories.

**Corporate events.** Within the corporate events category of earnings management incentives, I use the Securities Data Corporation (SDC) database to directly identify firms issuing stock and acquiring firms in stock for stock mergers. A firm is classified as having either the stock issue or merger incentives in the year prior to the issuance or merger. This procedure is based on the findings of Rangan (1998), Teoh, Welch, and Wong (1998a&b), Teoh, Wong, and Rao (1998), and Erickson and Wang (1999). Erickson and Wang (1999) find that acquiring firms manage earnings upwards prior to stock-for-stock mergers and that the extent of earnings management is related to the size of the merger. Rangan (1998), Teoh, Welch, and Wong (1998a&b), and Teoh, Wong, and Rao (1998) provide evidence that firms manage earnings upwards prior to issuing stock. The rationales for these incentives are discussed in Chapter 2.

**Benchmark related incentives.** As discussed in Chapter 2, there are three earnings management incentives related to benchmarks. First, firms that have pre-managed earnings below a benchmark may have an incentive to manage earnings upwards if earnings management will allow them to reach the benchmark. Second, firms with pre-managed earnings above a benchmark may have an incentive to manage
earnings downwards towards the benchmark. Third, firms well below a benchmark, so far below that the benchmark may not reasonably be attained through earnings management, may have an incentive to take an earnings bath (i.e., manage earnings downwards in an extreme way). In the latter two instances, managing earnings downwards would allow a firm to set aside reserves for future use and could prevent future earnings targets from being ratcheted up.

In my analysis, I attempt to identify firms with each of these incentives. In the case where earnings are well above targets, identification is relatively straight forward, as all firms exceeding the benchmark should have similar incentives and earnings management should be in the same direction, downwards. However, the identification of firms in the other two categories is complicated by the fact that, in both cases, pre-managed earnings will be below a benchmark. The trick is to determine at what point a firm is unable to reasonably manage earnings upwards to reach the target. Below this point is where the big bath incentive arises. In addition, matters may be complicated when multiple benchmarks come into play. This issue is addressed later, but first, I discuss the benchmarks used and my general classification procedure.

In my analysis of benchmark incentives I include benchmarks associated with incentives identified in prior literature. Burgstahler and Dichev (1997) identify earnings management incentives associated with two benchmarks. They identify an incentive, to exceed prior year’s earnings and an incentive to report a profit. Following Burgstahler and Dichev (1997), I use each firm’s prior year’s earnings (from Compustat) and zero earnings (also from Compustat) as benchmarks in my analysis. Degeorge, Patel, and Zeckhauser (1999) identify a third incentive, the incentive to use earnings management to meet or beat market expectations. Following Degeorge, Patel, and Zeckhauser (1999), I use the most recent consensus analyst forecast prior to the earnings announcement (from IBES) as an expectations benchmark. Initially, I classify each firm into incentive categories based on each of these three benchmarks, independently.

45 To distinguish between these two cases in my discussion, I use the identifiers “moderately below,” when discussing firms who can reasonably manage earnings to reach a target, and “well below,” when discussing firms with the big bath incentive.

46 While below this point, the big bath incentive exists, it is possible that other incentives, perhaps job security may outweigh the big bath incentive causing earnings to be managed upwards. Thus, conflicting incentives also complicate matters.
To identify firms that greatly exceed benchmarks and thus have the strongest incentives to manage earnings downwards, I follow the procedure used by Peasnell, Pope, and Young (2000). With respect to the incentive to beat zero, they classify a firm as well above the zero benchmark if its pre-managed earnings exceed the 75th percentile of the above zero distribution. Similarly, with respect to the incentive to beat the prior year’s earnings, they classify a firm as well above the prior earnings benchmark when the difference between pre-managed earnings and the prior year’s earnings exceeds the 75th percentile of the above target distribution. While Peasnell, Pope, and Young (2000) do not consider a market expectations benchmark in their analysis, I adopt a similar procedure to identify firms well above the consensus analyst forecast. I classify a firm as well above the forecast benchmark if the difference between pre-managed earnings and the consensus forecast exceeds the 75th percentile of the above target distribution.

To identify firms well below each benchmark, I utilize similar procedures. For each benchmark, I classify a firm as being well below target if the difference between target and pre-managed earnings is above the 75th percentile of the below target distribution. Finally I classify firms as moderately below if they fall below the 75th percentile but above the 25th percentile of the below target distribution. The firms falling below the 25th percentile are excluded as their degree of earnings management should be small, keeping them out of the extreme deciles.

As noted above, the consideration of multiple benchmarks may result in conflicting incentives. For instance a firm that falls well below its prior year’s earnings and its consensus forecast may opt to manage earnings upwards to report positive profits, rather than downwards to take a big bath. Similarly a firm with negative earnings, well below its prior year’s earnings, may still manage upwards to meet market expectations. These examples suggest a firm is most likely to take a big bath when pre-managed earnings are well below all benchmarks. As another example, consider a firm that is well above the zero benchmark. This firm may not manage earnings downwards towards zero if doing so would drop it below other benchmarks. Combining this example with the first suggests a firm will be unlikely to manage earnings downwards unless it is either well above or well below every benchmark. On the other hand a firm moderately below any benchmark would have a stronger incentive to manage earnings upwards.
Based on the above discussion, I classify firms as having the incentive to manage earnings upwards to reach a benchmark if its pre-managed earnings fall moderately below any of the three benchmarks. On the other hand I classify firms as having an incentive to manage earnings downwards towards a benchmark only if pre-managed earnings are well above all three benchmarks, and I classify a firm as having a big bath incentive only if its pre-managed earnings are well below all three benchmarks.

**Earnings baths unrelated to benchmarks.** While the previous section discusses one situation (severely missing benchmarks) in which firms may have an incentive to take an earnings bath, as discussed in Chapter 2, other situations can also lead to earnings baths. Pourciau (1993) and Murphy and Zimmerman (1993) provide evidence that new CEOs may have an incentive to take an earnings bath. In doing so, a CEO can lower future targets and set aside reserves while blaming the poor performance on his predecessor. Thus, I also classify firms as having a big bath incentive during the first year of a new CEOs term. Firm-years with new CEOs are identified using Execucomp.

**Income smoothing.** Income smoothing is my final criteria for identifying firms having an incentive to manage earnings. I include income smoothing because it is likely to capture many of the incentives that may be difficult to capture independently when examining a large sample of stocks. However, as discussed in Chapter 2 (footnote 21), I am only interested in firms that artificially smooth earnings. Thus, my identification process must discriminate between firms with naturally smooth earnings and firms who engage in artificial income smoothing. To develop this process, I turn to prior research.

I identify three methods for identifying firms that smooth earnings. First, Eckle (1981) develops a method for identifying firms that artificially smooth earnings. Under Eckle’s (1981) method, a firm is classified as a smoother if the following conditions are met: 1) the coefficient of variation for the change in sales time series (CV_{ΔS}) is greater than the coefficient of variation for the change in income time series (CV_{ΔI}), and 2) an income smoothing index (ISI), the ratio of CV_{ΔI} to CV_{ΔS}, is more than 1 standard deviation below the industry average. The first requirement identifies potential smoothers, and the second requirement, that the ISI be at least one standard deviation
below the industry average, controls for the level of natural smoothness in each firm's industry.

More recent studies introduce alternative measures of income smoothing. Meyers and Skinner (1999) measure income smoothing as the time series correlation between changes in cash flows and changes in accruals, $\rho(\Delta ACC, \Delta CFO)$. Although a negative correlation between these variables is expected as a natural result of accrual accounting (Dechow, 1994), Meyers and Skinner (1999) argue that this correlation should be unusually strong for smoothing firms. They provide evidence supporting their argument by showing that the firms in their sample of suspected smoothers are uniformly negative and close to -1.\textsuperscript{48} In addition they show that the correlations are significantly more negative for their sample firms relative to their control firms.

The final measure of smoothing is suggested by Leuz, Nanda, and Wysocki (2002). While Leuz, Nanda, and Wysocki (2002) adopt Meyers and Skinner's (1999) correlation measure as one measure of smoothing, they develop an alternative smoothing measure, the ratio of the standard deviation of operating earnings to the standard deviation of cash flow from operations, $\frac{\sigma OE}{\sigma CFO}$. While the numerator of this ratio is simply earnings variability, they note that scaling it by cash flow variability controls for the smoothness of economic performance across firms.

While each of the three measures discussed above has some appealing aspects, each also has some problems. The Eckle (1981) model has two major drawbacks. First, it assumes gross sales may not be artificially smoothed, while later empirical evidence suggests that manipulating revenues is a commonly used form of earnings management.\textsuperscript{49} Second, Eckle (1981) notes that this method will not identify smoothers that reduce their earnings variability somewhat, but not to the extent that the variance of sales is greater than the variance of income. On the positive side, the Eckle model controls for the natural level of smoothness within a firm’s industry, so firms in more variable industries

\textsuperscript{47} Variations of Eckle's (1981) method are used in studies by Albrect and Richardson (1990); Ashari, Koh, Tan, and Wong (1994); Booth, Kallunki, and Martikainen (1995), and Michelson, Jordan-Wagner, and Wootton (1995 & 1999).
\textsuperscript{48} Meyers and Skinner (1999) report a mean correlation coefficient of -.984 (standard deviation=.04) for their earnings management sample.
may be classified as smoothers and firms in naturally smooth industries are less likely to
be wrongly classified as smoothers.

The two more recent methods are theoretically more appealing, as they allow for
manipulation of revenues and do not place restrictions on the sales-earnings relationship.
However, these measures do not control for industry effects. Because of this, I use a
I choose to use the Meyers and Skinner (1999) correlation measure, \( \rho(\Delta \text{ACC}, \Delta \text{CFO}) \)
rather than Leuz, Nanda, and Wysocki (2002) variability ratio, \( \frac{\sigma_{\text{OE}}}{\sigma_{\text{CFO}}} \), because Meyers
and Skinner (1999) show a significant difference in this measure between their earnings
management sample and control sample firms. I incorporate Eckle's (1981) procedure by
classifying a firm as a smoother if it's correlation measure is below (more negative than)
its industry average. I calculate the correlation measure over the five years preceding the
observation year. The data is obtained from Compustat, and each firm’s industry average
is calculated based on its two-digit SIC code.

**Decile Formation**

Having identified firms likely to manage earnings and all firms for which data is
available during my sample period, I measure each firm’s total accruals directly, using
equation 16.

\[
\text{TA}_{i, t} = \text{EBXI}_{i, t} - \text{CFO}_{i, t}
\]  

**eq.16**

Recall, \( \text{TA} \) represents the total accruals, \( \text{EBXI} \) represents earnings before extraordinary
items and discontinued operations, and \( \text{CFO} \) represents cash flow from operations.

Once total accruals are calculated, I estimate discretionary accruals using three
models: the KLW specification of the cross-sectional modified Jones model (the KLW
Jones model) (equations 12 and 13), the KS Model (equations 8 and 9), and the E-J
model (equations 14 and 15), developed in Chapter 3. I chose the KLW Jones model as
my base model because the modified Jones model is commonly used and this version
improves its specification (a problem with the Dechow, Sloan, and Sweeney (1995) formulation). To allow for larger sample sizes and the inclusion of IPO firms, the E-J model and the KLW Jones model are estimated cross-sectionally by industry. However, I use the Kang and Sivaramakrishnan (1995) pooled time-series approach to estimate the KS model, as the firm-specific turnover ratios are designed to capture changing conditions.

As discussed in Chapter 3, each of these models estimate a firm’s discretionary accruals as the difference between its actual total accruals and its nondiscretionary (expected) accruals, equation 4.

$$DA_{i,t} = TA_{i,t} - NDA_{i,t}$$

The models, however, differ in how they estimate the nondiscretionary accruals. When implementing the KLW Jones model, nondiscretionary accruals are estimated using Chapter 3’s equation 12 after OLS estimation of the model’s parameters using Chapter 3’s equation 13. These equations are presented below.

$$NDA_{i,t} = \alpha + \beta_{0,i} + \frac{1}{A_{i,t-1}} + \beta_{1,i} \frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} + \beta_{2,i} \frac{PPE_{i,t}}{A_{i,t-1}} + \beta_{3,i} \frac{NI_{i,t-1}}{A_{i,t-1}}$$

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha + \beta_{0,i} + \frac{1}{A_{i,t-1}} + \beta_{1,i} \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \beta_{2,i} \frac{PPE_{i,t}}{A_{i,t-1}} + \beta_{3,i} \frac{NI_{i,t-1}}{A_{i,t-1}} + \epsilon_{i,t}$$

The E-J model is implemented in a similar manner. Nondiscretionary accruals are estimated using equation 14, after the necessary parameters are estimated using equation

---

50 I include this specification of the commonly used modified Jones model to see if the KS or E-J models improve upon it. While Kang and Sivaramakrishnan (1995), show their model to be more powerful than the Jones model, their formulation of the Jones model is not typical, as they use pooled data to estimate model parameters. In addition, while the E-J model includes additional independent variables based upon theoretical relationships, the inclusion of these could result in multicollinearity problems (e.g., change in revenues is likely correlated with change in expenses). Thus a simpler modified Jones model could provide better estimates of discretionary accruals.
15. The differences between these models are the inclusion of additional independent variables and the use of GMM rather than OLS in parameter estimation. Equations 14 and 15 are presented below.

\[
\text{NDA}_{i,t} = \hat{\alpha} + \sum_{j=0}^{3} \hat{\beta}_j \left( \frac{\Delta \text{REV}_{i,t} - \Delta \text{AR}_{i,t}}{\text{A}_{i,t-1}} + \Delta \text{EXP}_{i,t} \right)
\]

\[
\text{TA}_{i,t} = \frac{\text{NDA}_{i,t}}{\text{A}_{i,t-1}} = \hat{\alpha} + \sum_{j=0}^{3} \hat{\beta}_j \left( \frac{\Delta \text{REV}_{i,t}}{\text{A}_{i,t-1}} + \Delta \text{EXP}_{i,t} \right)
\]

eq 14

\[
\text{eq.14}
\]

\[
\text{NDA}_{i,t} = \hat{\alpha} + \sum_{j=0}^{3} \hat{\beta}_j \left( \frac{\Delta \text{REV}_{i,t} - \Delta \text{AR}_{i,t}}{\text{A}_{i,t-1}} + \Delta \text{EXP}_{i,t} \right) + \sum_{j=0}^{3} \hat{\beta}_{3j} \left( \frac{\text{PPE}_{i,t}}{\text{A}_{i,t-1}} + \frac{\text{DA}_{i,t-1}}{\text{A}_{i,t-1}} + \frac{\Delta \text{OCF}_{i,t}}{\text{A}_{i,t-1}} + \frac{\text{NI}_{i,t-1}}{\text{A}_{i,t-1}} \right)
\]

\[
\text{TA}_{i,t} = \frac{\text{NDA}_{i,t}}{\text{A}_{i,t-1}} = \hat{\alpha} + \sum_{j=0}^{3} \hat{\beta}_j \left( \frac{\Delta \text{REV}_{i,t}}{\text{A}_{i,t-1}} + \Delta \text{EXP}_{i,t} \right) + \sum_{j=0}^{3} \hat{\beta}_{3j} \left( \frac{\text{PPE}_{i,t}}{\text{A}_{i,t-1}} + \frac{\text{CACC}_{i,t-1}}{\text{A}_{i,t-1}} + \frac{\Delta \text{OCF}_{i,t}}{\text{A}_{i,t-1}} + \frac{\text{NI}_{i,t-1}}{\text{A}_{i,t-1}} \right) + \varepsilon
\]

\[
\text{eq.15}
\]

The KS model is similar in spirit to the Jones models but uses instrumental variables. In this model nondiscretionary accruals are estimated using equation 8 after its parameters are estimated using GMM in equation 9.\(^{51}\) These equations are shown below.

\[
\text{NDA}_{i,t} = \hat{\phi}_0 + \hat{\phi}_1 \left( \frac{\text{AR}_{i,t-1}}{\text{REV}_{i,t}} \right) + \hat{\phi}_2 \left( \frac{\text{AP}_{i,t-1}}{\text{EXP}_{i,t}} \right) + \hat{\phi}_3 \left( \frac{\text{DEP}_{i,t-1}}{\text{PPE}_{i,t}} \right)
\]

\[
\text{TA}_{i} = \frac{\text{NDA}_{i,t}}{\text{A}_{i,t-1}} = \hat{\phi}_0 + \hat{\phi}_1 \left( \frac{\text{AR}_{i,t-1}}{\text{REV}_{i,t}} \right) + \hat{\phi}_2 \left( \frac{\text{AP}_{i,t-1}}{\text{EXP}_{i,t}} \right) + \hat{\phi}_3 \left( \frac{\text{DEP}_{i,t-1}}{\text{PPE}_{i,t}} \right) + \varepsilon
\]

\[
\text{eq.8}
\]

\[
\text{eq.9}
\]

\(^{51}\) Kang and Sivaramakrishnan (1995) use both the standard IV estimator and the GMM estimator. However, they show that their model is most powerful when parameters are estimated using GMM. Induced earnings management is detected 47% of the time when GMM is used, compared to 33% when the standard IV approach is used. Thus I use GMM when using the KS model.
After discretionary accruals are estimated using each method, sample firms are sorted into deciles based on these measures. That is, each firm will have three decile rankings based on its levels of discretionary accruals as estimated by the three models.

**Hypothesis Testing:**

Having sorted the full sample into deciles based on the three measures of discretionary accruals, the next step is to examine the proportions of firms likely to manage earnings across the deciles. Recall from Chapter 2 that my first hypothesis is that firms in the extreme accrual deciles will have a higher proportion of EM firms than the middle deciles. To test this hypothesis, for each year in the sample, I calculate the proportion of EM firms in each decile, and I use a Friedman test to determine if there are significant differences among the deciles. I then use t-tests and Wilcoxon signed rank tests for pairwise comparisons between each of the extreme deciles and each of the other deciles. While I hypothesize that the extreme deciles will contain a higher proportion of EM firms than the middle deciles, depending on the overall number of EM firms, proportions in the deciles adjacent to the extreme deciles may also contain high proportions and not be significantly different. Thus, in this analysis, I focus on the comparisons between the extreme deciles and deciles three through six.

My second hypothesis from Chapter 2 is that firms in the highest discretionary accrual decile will contain a greater proportion of firms with incentives to manage earnings upwards than firms in the other accrual deciles. To test this I calculate the percentage of firms with incentives to manage earnings upwards in each decile. I test for differences among all deciles using the Friedman test, and conduct pairwise comparisons between the extreme positive accrual decile and each of the other accrual deciles. For the pairwise analysis, I again use standard t-tests and Wilcoxon signed rank tests. As noted above, the relationship between firms in an extreme discretionary accrual decile and the discretionary accrual deciles closest to it is unclear, so I focus on the comparisons between the high accrual decile and deciles zero through six.

In a similar manner, I test my third hypothesis, that firms in the lowest discretionary accrual decile will contain a higher proportion of firms likely to manage
earnings downwards. I calculate the percentage of firms likely to manage earnings downwards for each decile. I again use the Freidman test to test for differences among all deciles, and conduct pairwise tests between the most extreme negative accrual decile and each of the other accrual deciles. Here, I hypothesize that the extreme negative decile will contain a significantly higher proportion of EM firms with an incentive to manage earnings downwards. The relationship between firms in the extreme negative discretionary accrual decile and the deciles closest to it is unclear, so I focus on the comparisons between the low accrual decile and deciles three through nine.

My fourth and fifth hypotheses are that firms with negative abnormal accruals are more likely to have an incentive to manage earnings downwards and firms with positive abnormal returns are more likely to have an incentive to manage earnings upwards. To test the fourth hypothesis, I calculate the percentages of firms with an incentive to manage earnings downwards in both the negative and positive discretionary accrual subsamples and test whether the proportion of firms likely to manage earnings downwards is significantly higher in the negative accrual subsample. Similarly, to test the fifth hypothesis, I calculate the percentages of firms with an incentive to manage earnings upwards in both the negative and positive discretionary accrual subsamples and test to determine whether the proportion of firms likely to manage earnings upwards is significantly higher in the positive accrual subsample.

The final question I address by analyzing the proportions of EM firms within deciles is that of which discretionary accrual model is most effective at identifying EM firms. To answer this question I examine the proportions of EM firms in the extreme and zero accrual deciles identified by each model. While I would like to hypothesize that one model is most effective, as each has potential problems, it is not appropriate to do so. Thus in this analysis, I simply test for significant differences in the proportions identified by the three models. Here, I suggest that the model placing the greatest proportion of earnings management firms in the extreme deciles and smallest proportion in the zero decile is the most effective model. The zero decile is the decile that includes firms with discretionary accruals closest to zero and should contain few if any EM firms. I test for differences among these three models using the Friedman test, and then use t-tests and Wilcoxon tests to perform pairwise comparisons between each of the three models.
The Accrual Anomaly and Earnings Management Incentives

In the second phase of my analysis, I address the question as to whether or not earnings management drives the accrual anomaly. I begin this analysis by first documenting the accrual anomaly in my sample period. After doing so, I address the specific hypotheses developed in Chapter 2, using both cross-sectional regression analysis and hedge portfolio analysis.

Sample Selection

For this analysis, my sample is similar to the one used in the previous section and covers the same time period, 1988-2002. However as my analysis in this section requires return calculations, I begin with all firms in both the University of Chicago’s Center for Research in Securities Prices database (CRSP) and the Compustat database. I exclude firms from the initial sample if there is insufficient Compustat data to calculate their discretionary accruals and market values of equity, or if their book value of equity is missing. The market value of equity and the book value of equity are required to construct the book-to-market ratio to be used as an independent variable in the regression analysis and in the selection of matching firms for the hedge portfolio analysis. Following Fama and French (1992), I define the book-to-market ratio as the ratio of the book value of common equity plus deferred taxes to the market value of equity, and I exclude firms with negative book values of equity. In addition, firms are eliminated if there is insufficient return data on CRSP. Finally, following Sloan (1996), I exclude financial institutions from the sample. This results in a final sample of 58,815 firm-year observations.
Regression Analysis

*Documenting the anomaly.* Sloan (1996) uses the cross-sectional regression approach of Fama and MacBeth (1973) to establish the relationship between total accruals and future stock performance. Sloan (1996) performs annual regressions, regressing each firm's annual stock returns on its total accruals, size, book-to-market ratio, earnings-price ratio, and beta. I take a similar cross-sectional approach to establish the relationship between discretionary accruals and future stock performance. First, to establish my base model, I regress the annual stock returns ($R$) of each sample firm on the natural log of its market value of equity ($SZ$), the natural log of its book-to-market ratio ($BTM$), and discretionary accruals scaled by total assets ($DA$). This model is Equation 17.

$$R_{i,t} = \alpha + \beta_0(SZ_{i,t-1}) + \beta_1(BTM_{i,t-1}) + \beta_2(DA_{i,t-1}) + \epsilon_{i,t}$$ \hspace{1cm} eq.17

For all analyses, each firm’s market value of equity, book-to-market ratio, and discretionary accruals are calculated as of the firm’s fiscal year end. Each firm’s annual returns are buy-and-hold returns for the twelve months beginning 4 months after the firm’s fiscal year end. Also for all analysis, following Fama and MacBeth (1973), I run annual regressions and test the significance of the means and medians of the time series of annual regression coefficients, using t-tests and one-sample Wilcoxon signed rank tests for the means and medians, respectively.

Unlike Sloan (1996), I do not include the earnings-price ratio or firm beta in my regression analysis. I use only size and book-to-market as control variables based on the findings of Fama and French (1992). Fama and French (1992) show that size and book-to-market variables perform well in describing the cross-section of average stock returns, and that their explanatory power subsumes that of the earnings-price ratio and firm beta. In addition, the inclusion of beta would require firms to have sufficient time series data for beta estimation and thus eliminate many IPO firms. Teoh, Welsh, and Wong (1998) present evidence that suggests the accrual anomaly may be particularly strong in IPO firms. Thus, the exclusion of these firms could bias the results.
Examining earnings management incentives. Having documented the anomaly within my sample, I now turn to my hypotheses relating to the anomaly and earnings management incentives. In this analysis, my first hypothesis (stated in its alternative form) is that the accrual anomaly is stronger in the subsample of EM firms (firms identified as having both the ability and an incentive to manage earnings). My null hypothesis is that the accrual anomaly is no different for the potential earnings management firms. To test this hypothesis, I expand equation 17 to include an earnings management dummy variable (EMDum) that is set to one for EM firms and an interaction term (EMInt) that is constructed as EMDum times DA. The cross-sectional model is expressed as:

\[ R_{i,t} = \alpha + \beta_0(SZ_{i,t-1}) + \beta_1(BTM_{i,t-1}) + \beta_2(DA_{i,t-1}) + \delta_0(EMDum) + \delta_1(EMInt) + \epsilon_{i,t} \]

eq.18

A significantly negative \( \delta_1 \) coefficient in this regression would allow for the rejection of the null hypothesis that the accrual anomaly is the same among firms regardless of earnings management incentives in favor of the alternative that the accrual anomaly is stronger in earnings management firms. However, in this equation the sign of the \( \delta_0 \) cannot be predicted as some EM firms are expected to manage earnings upwards, while others are expected to manage earnings downwards.

To provide more insight into the impact of earnings management firms, the formulation of equation 18 is modified to provide direction specific dummy variables and interaction terms. The new formulation is equation 19:

\[ R_{i,t} = \alpha + \beta_0(SZ_{i,t-1}) + \beta_1(BTM_{i,t-1}) + \beta_2(DA_{i,t-1}) + \delta_0(UpDum) + \delta_1(UpInt) + \delta_2(DownDum) + \delta_3(DownInt) + \epsilon_{i,t} \]

eq.19

Here, UpDum is a dummy variable that is set to 1 for earnings management firms that have an incentive to manage earnings upwards, while DownDum is a dummy variable that is set to 1 for earnings management firms that have an incentive to manage earnings downwards. The interaction terms UpInt and DownInt are constructed by multiplying their respective dummy variables by DA. This formulation allows for the prediction of
the signs of the dummy variable coefficients. Here, $\delta_0$ is expected to be negative, as firms managing up should have negative future returns; and $\delta_2$ is expected to be positive, as firms managing down should have positive future returns. The interaction term coefficients, $\delta_1$ and $\delta_3$, are expected to be negative, as this would indicate the discretionary accruals coefficient is more negative for the earnings management firms.

To further examine the impact of earnings management related to different earnings management incentives, I expand equation 17 to include dummy variables for each of the identified earnings management incentives. The result is equation 20.

$$R_{i,t} = \alpha + \beta_0(SZ_{i,t-1}) + \beta_1(BTM_{i,t-1}) + \beta_2(DA_{i,t-1}) + \delta_1Stock + \delta_2Merger$$

$$+ \delta_3BMBeat + \delta_4BMDown + \delta_5BMBath + \delta_6CEObat + \delta_7Smooth + \varepsilon_{i,t} \quad \text{eq.20}$$

In this equation, Stock, Merger, BMBeat, BMDown, BMbath, CEObath, and Smooth represent the stock, merger, benchmark beating, managing down to benchmarks, benchmark-related big bath, new CEO bath, and smoothing incentives, respectively. The delta coefficients are hypothesized to be significantly negative for incentive variables representing an incentive to manage earnings upwards (Stock, Merger, and BMBeat) and significantly positive for incentive variables representing an incentive to manage earnings downwards (BMDown, BMbath, and CEObath). As income smoothers may manage earnings either upwards or downwards, depending on their situation and underlying incentive, no hypothesis regarding the income smoothing delta is made.

**Hedge Portfolio Analysis**

Following Sloan (1996) and Xie (2001), I use hedge portfolio analysis to further test my hypotheses. First, I return to the hypothesis that the accrual anomaly will be strongest in EM firms. I test this hypothesis by testing the difference in the time series of means and medians of the annual hedge portfolio returns across the earnings management
and non-earnings management samples. I use the standard t-test and the Wilcoxon signed rank test to perform this analysis. Second I examine the returns to the different positions. Abnormal returns to the long position should be positive, and abnormal returns to short position should be negative.

To test these hypotheses, some measure of abnormal returns must be used. While Sloan (1996) and Xie (2001) use size-matched reference portfolios as their benchmarks to calculate abnormal returns, Zach (2001) documents that the accrual anomaly is lessened when the book-to-market ratio is included in the reference portfolio selection procedure. As this finding suggests that part of the previously documented abnormal returns attributed to the accrual anomaly may be attributable to the previously documented book-to-market effect (Fama and French, 1992), I include both size and book-to-market in my matching procedure. This procedure is described below.

In addition, Barber and Lyon (1997) document three biases in the early methods of calculating long-run abnormal returns. They document a rebalancing bias, a new listing bias, and a skewness bias. Lyon, Barber, and Tsai (1999) show that the reference portfolio approach used in the Sloan (1996) and Xie (2001) studies corrects for the rebalancing bias and the new listing bias, but not the skewness bias, while the matched firm approach corrects for all three. Based on this finding, I use the matched firm approach, rather than the reference portfolio approach.

Thus, in testing each of my hypotheses, abnormal returns to a firm are estimated as the difference between the compounded return to an individual firm, i, and the compounded return to a matched firm, j, over the 12 month observation period, T. This is shown in equation 21.

\[ BHAR_{i,T} = \prod_{t=1}^{12} (1 + R_{i,t}) - \prod_{t=1}^{12} (1 + R_{j,t}) \]  

The observation period, begins 4 months following the fiscal year end in order to ensure accrual information is available to investors. Abnormal returns for each accrual decile

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52 This is similar to the method used by Ali, Hwang, and Trombley (2000) to compare the strength of the
are calculated as the equally weighted average of the abnormal returns of the individual firms in that decile.

To select a matching company for a sample firm, all non-sample firms for that year are screened to identify those with the same fiscal year-end as the sample firm, whose market capitalization is within 20% of that of the sample firm. From these firms the one having a book-to-market ratio closest to that of the sample firm and return data available from CRSP at the start of the return calculation period is selected. If a matched firm delists during the return calculation period, the delisting return is included as the return for the delisting month, and the return on the CRSP equally-weighted index is substituted in subsequent months. This is consistent with an investor shifting to a broad index fund. The fiscal year-end requirement is included to ensure that accrual information on the matched firm is available at the beginning of the return period.

The Accrual Anomaly and Earnings Management Behavior

In my next analysis, I classify firms as earnings managers based on their behavior, rather than their incentives. This methodology allows me to examine the stock market response to different earnings management behaviors and allows me to include all extreme accrual firms, including those for which incentives are not theoretically or empirically identified. For this analysis, I classify firms in the extreme deciles into five categories based on the earnings dimensions discussed by Bhattacharya, Daouk, and Welker (2002).

Bhattacharya, Daouk, and Welker (2002) discuss four dimensions of earnings management: earnings smoothing, earnings aggressiveness, earnings conservatism, and loss avoidance. As loss avoidance was included in my earlier analysis of benchmark beating, I focus on the first three categories here. However, I further break down the aggressiveness and conservatism categories to allow for the distinction between firms based on the frequency of their aggressiveness or conservatism. I suggest that if a firm adopts a regular pattern of earnings management, the market will learn from it. For anomaly across levels of investor sophistication.
example, if a firm regularly inflates earnings, the market may come to expect this and be less likely to overreact to its earnings, so negative long-run abnormal returns would be less likely or less extreme. Alternatively, a firm that rarely manages earnings would be more likely to fool the market with its earnings, leading to negative abnormal returns as the truth is revealed. Thus, for this analysis, I utilize five earnings management classifications: regular aggressiveness, rare aggressiveness, regular conservatism, rare conservatism, and earnings smoothing.

Sample Selection

My sample for this analysis starts as the sample used in the analysis of earnings management incentives. However, as five years are required to classify a firm’s behavior, the first five years are excluded, leaving a final sample of 35,445 firm-year observations. Firms are divided into discretionary accrual deciles, as before. Each firm in the extreme deciles is then classified into one of the five earnings management categories. Income smoothers are identified by the methodology discussed in the income smoothing section found earlier in this chapter. Recall that a firm is classified as a smoother if its time series correlation between changes in cash flows and changes in accruals, $\rho(\Delta ACC, \Delta CFO)$, is below (more negative than) the average for its industry.

A firm is classified into the rare aggressiveness category if it appears in the highest accrual decile, it is not a smoother, and it has extreme positive accruals (accruals in the highest decile) in two or fewer of the five years prior to its observation year. Similarly, a firm is classified into the rare conservatism category if it appears in the lowest discretionary accrual decile, it is not a smoother, and it has extreme negative accruals (accruals in the lowest decile) in two or fewer of the five years prior to its observation year. Firms are classified into the regular aggressiveness category if they are in the highest accrual decile, they are not identified as income smoothers, and they have extreme positive accruals in at least three of the five years prior to the observation year. Finally, firms are classified into the regular conservatism category if they are in the lowest accrual decile, they are not identified as income smoothers, and they have extreme negative accruals in at least three of the five years prior to the observation year.
Regression Analysis

Having classified extreme accrual firms into the five categories, I use regression analysis and hedge portfolio analysis to test the hypothesis that the abnormal returns from the accrual anomaly will be greater for firms in the two rare categories than for the firms that smooth earnings or regularly manage earnings in one direction or the other. Here, my regression analysis is similar to that used in the previous section. Again, I use the cross-sectional approach of Fama and MacBeth (1973) and begin with equation 17, regressing returns on size, book-to-market ratios, and discretionary accruals to establish the presence of the anomaly. Next, I move on to regressions using dummy variables and interaction terms for various earnings management behaviors to determine if there are indeed differences between them. These models are represented by equations 22-29:

\begin{align*}
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(EMDum) + \delta_1(EMInt) + \epsilon_{i,t} \\
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(regEMDum) + \delta_1(regEMInt) + \epsilon_{i,t} \\
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(rareEMDum) + \delta_1(rareEMInt) + \epsilon_{i,t} \\
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(SmoothDum) + \delta_1(SmoothInt) + \epsilon_{i,t} \\
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(regAggDum) + \delta_1(regAggInt) + \epsilon_{i,t} \\
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(regConsDum) + \delta_1(regConsInt) + \epsilon_{i,t} \\
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(rareAggDum) + \delta_1(rareAggInt) + \epsilon_{i,t} \\
R_{i,t} &= \alpha + \beta_0(SZ_{i,j-1}) + \beta_1(BTM_{i,j-1}) + \beta_2(DA_{i,j-1}) + \delta_0(rareConsDum) + \delta_1(rareConsInt) + \epsilon_{i,t}
\end{align*}

In these equations, the dummy variables EMDum, regEMDum, rareEMDum, SmoothDum, regAggDum, regConsDum, rareAggDum, and rareConsDum are set to one when firms fall into their respective categories: earnings management (all extreme decile) firms, regular earnings management firms, rare earnings management, smoothing firms, regular aggressive firms, regular conservative firms, rare aggressive firms, and rare conservative firms. The interaction terms EMInt, regEMInt, rareEMInt, SmoothInt, regAggInt, regConsInt, rareAggInt, and rareConsInt are constructed by multiplying their
associated dummy variables by the discretionary accruals variable, DA. Also note equation 22 is distinguished from equation 18 by the ‘b’ subscripts on the dummy and interaction variables.

**Hedge Portfolio Analysis**

To test the hypothesis using hedge portfolio analysis, I first establish the presence of the anomaly using the entire sample of extreme decile firms. I then calculate the abnormal returns to the accrual anomaly for firms based on their assigned earnings management behavior and test for differences between them. To examine the differences in returns, I use two methods. First, I test the differences in the time series of abnormal returns accruing to the different groups, using a standard t-test and the Wilcoxon signed rank test. Second, I use pooled data to conduct two-sample t-tests and two sample Wilcoxon tests to test for difference in the means and medians of both the long and short positions.

**The Accrual Anomaly and Overreaction to Earnings**

My final analysis investigates the possibility that the accrual anomaly arises from an overreaction to earnings. The question I analyze here is whether extreme decile firms have abnormal returns around the dates of their original earnings announcements, and if they do, is the reversal of these abnormal returns the source of the long-run abnormal returns that are documented as the accrual anomaly.

Recall from Chapter 2, my first hypothesis relating to this analysis is that high accrual firms having incentives to manage earnings upwards, should have positive abnormal returns around their announcement dates, and these returns should be offset by long-run negative abnormal returns. My second hypothesis related to this analysis is that low accrual firms having incentives to manage earnings downwards, should have negative abnormal returns around their announcement dates, and these returns should be offset by long-run positive abnormal returns. I use a two-step process to test these hypotheses. First, I use standard event study analysis to test for abnormal returns around
the announcement dates. Second, I regress the long-run abnormal returns estimated in my earlier analyses on the announcement date abnormal returns.

**Announcement Date Abnormal Returns**

To estimate announcement date abnormal returns, I use standard event study methodology outlined in MacKinlay (1998). However, first, I segment my data into an expected positive abnormal return (positive) sample and an expected negative abnormal return (negative) sample. The positive sample contains high accrual firms, while the negative sample contains low accrual firms. After segmenting my data, I identify announcement dates using Compustat and IBES, and I define two event windows. The first event window is simply the earnings announcement date, while my second event window is defined as the three days centered on the announcement date. For the second window, I include the date prior to the announcement date to capture any information leakage, and I include the day following the announcement in case the announcement occurs after the market has closed (MacKinlay, 1998). I calculate daily abnormal returns (AR) during the event window using the market model, equation 30.

\[
AR_{i,t} = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i (R_{m,t})
\]

Here, R represents a daily return and the subscripts \( i \) and \( m \) indicate the return is associated with an individual firm or the market, respectively. I estimate the market model parameters over the 120 day period beginning 160 days prior to the event date, and I use the CRSP value-weighted index as my market proxy. A firm’s cumulative abnormal return (CAR) over the three-day event window is calculated by summing the daily abnormal returns. To test the significance of the abnormal returns, I aggregate the CARs for the positive and negative samples separately. For the positive sample, I test the

\[\text{Results from this methodology are robust to alternative specifications, including the use of an equal-weighted market index and alternative estimation periods. Additionally, results are comparable when market-adjusted rather than market model returns are used.}\]
hypothesis that that the CARs are significantly positive. For the negative sample, I test the hypothesis that that the CARs are significantly negative.

Regression Analysis

Once event window abnormal returns are estimated, the second step is to investigate the relationships between the short-term (announcement date and announcement window) abnormal returns and the long-run abnormal returns estimated for the hedge portfolio analysis. I test the hypothesis that the long-run abnormal returns may be explained as the reversal of short-term overreaction using equations 31 and 32:

\[ AR_{LR} = \alpha + \beta (AR_{AnnDate}) + \epsilon \]  
\[ eq.31 \]

\[ AR_{LR} = \alpha + \beta (AR_{AnnWindow}) + \epsilon \]  
\[ eq.32 \]

Equations 31 and 32 are estimated cross-sectionally. Long-run abnormal returns, announcement date abnormal returns, and announcement window abnormal returns are represented by the variables \( AR_{LR} \), \( AR_{AnnDate} \), and \( AR_{AnnWindow} \), respectively. In each equation, a significantly negative beta coefficient would support the reversal hypotheses. Ideally, if the long-run abnormal returns represent the reversal of short-term returns around an earnings announcement date, this coefficient would be negative one. This occurrence, however, when examining the all EM firms, is unlikely, as some earnings management may prevent negative, rather than generate positive, abnormal returns.

Summary of Chapter 4

This chapter contains the methods I use to examine the research questions outlined in Chapter 2. First, to address the question of whether or not discretionary accruals estimated by accrual decomposition models likely represent earnings management, I examine whether or not there are significant differences in the proportions
of EM firms across deciles and whether any differences are consistent with earnings management. Second, I use regression analysis and hedge portfolio analysis to address the question of whether or not the accrual anomaly results from earnings management. Finally, I use event study analysis combined with cross-sectional regression analysis to investigate the possibility that the accrual anomaly arises as the result of overreaction to the earnings announcements of EM firms. The results of these analyses are presented in Chapter 5.
CHAPTER 5

RESULTS

Overview

This chapter presents the results from the analyses that were discussed in Chapter 4. These analyses were designed to address each of the research questions and hypotheses presented in Chapter 2. I begin by presenting the results that address the question as to whether or not accrual decomposition models identify earnings management in the general population of firms. I then present the results from my comparisons of the different discretionary accrual models. Next, I present the results addressing whether or not the accrual anomaly results from earnings management. Lastly, I present the results relating to my final analysis, whether or not the anomaly results from the reversal of overreaction to earnings announcements of earnings management firms.

Accrual Decomposition Models and Earnings Management Firms

My first research question addresses whether or not accrual decomposition models identify earnings management firms when examining a large population of firms. In Chapter 2, I developed five hypotheses to examine this issue. I begin my discussion with the first three of these hypotheses. My first hypothesis is that extreme decile firms will contain higher proportions of earnings management firms than the middle deciles. My second hypothesis is that firms in the highest discretionary accrual decile will contain
a greater proportion of firms with an incentive to manage earnings upwards. Similarly, my third hypothesis is that firms in the lowest discretionary accrual decile will contain a greater proportion of firms with an incentive to manage earnings downwards. To test these hypotheses, I compare the proportions of earnings management firms in each of the extreme deciles with the proportions of earnings management firms in every other decile. Comparisons are made using three earnings management proportions to address the three hypotheses: the proportion of all earnings management firms, regardless of the direction of expected earnings management (EM firms); the proportion of earnings management firms with an incentive to manage earnings upwards (up firms); and the proportion of earnings management firms with an incentive to manage earnings downwards (down firms).

The results of these analyses are presented in Table 1. Panel A presents the results to this analysis when the KLW Jones model is used to estimate discretionary accruals, and Panels B and C present the results for the KS Model and E-J Model, respectively. In each panel, Section 1 compares each of the three earnings management proportions for decile zero, the lowest discretionary accrual decile, with those for every other decile. Section 2 compares the three earnings management proportions for decile nine, the highest discretionary accrual decile, with those for every other decile. As discussed in Chapter 4, the proportions and differences reported are the averages of annual proportions and differences. Reported p-values result from Friedman tests and t-tests on the series of differences.  

With regards to the first hypothesis, that extreme accrual firms should have higher proportions of EM firms, the results are mixed. For each model, Friedman tests reveal that there are significant differences in the proportions of EM firms among the deciles. However, for all three models, decile zero has a smaller proportion of EM firms than every other decile, and the difference between deciles is significant for nearly all of the deciles. In retrospect, this may be explained by the fact that fewer firms with the incentive to manage downwards were identified which would explain the lower

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54 Pairwise tests of differences in the medians are also conducted, but not reported. The results from the analysis of medians are consistent with those presented in Table 1.
This table presents comparisons of the proportions of earnings management firms across discretionary accrual deciles for each of the three models examined. Panel A presents the results where discretionary accruals are measured using the KLW Jones model. Panel B presents the results where discretionary accruals are measured using the KS model, and Panel C presents the results where discretionary accruals are measured using the Extended Jones model. In each panel, section 1 compares proportions of earnings management firms in decile zero (the lowest accrual decile) with each other decile, and section 2 compares proportions of earnings management firms in decile nine (the highest accrual decile) with each other decile. Comparisons are made on three earnings management proportions: the proportion of all (regardless of incentive) earnings management firms (EM Firms), the proportion of earnings management firms with an incentive to manage earnings upwards (Up Firms), and the proportion of earnings management firms with an incentive to manage earnings downwards (Down Firms). Each comparison presents the proportions of earnings management firms for the deciles compared, the difference between them, and a p-value to indicate whether or not the difference is statistically significant. The last column contains the p-value from a Friedman test of the differences among all 10 deciles. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively.

### Panel A: Discretionary Accruals Estimated using the KLW Jones model

#### Section 1: Differences between Decile Zero and other Deciles

<table>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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<td>0.0183</td>
<td>0.0183</td>
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<td>0.0359</td>
<td>0.0208</td>
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<tr>
<td>Difference (Decile Zero minus Comparison Decile)</td>
<td>(0.0046)</td>
<td>(0.0091)</td>
<td>(0.0034)</td>
<td>(0.0114)</td>
<td>(0.0196)</td>
<td>(0.0377)</td>
<td>(0.0321)</td>
<td>(0.0176)</td>
<td>(0.0025)</td>
<td>0.0002</td>
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<tr>
<td>p-value (two-sided)</td>
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<td>0.0024</td>
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<td>0.0008</td>
<td>0.0003</td>
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<td>0.0000</td>
<td>0.0002</td>
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</table>

#### Section 2: Differences between Decile Nine and other Deciles

<table>
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<th>2</th>
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<th>4</th>
<th>5</th>
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<th>Friedman F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decile Nine Proportion of EM Firms</td>
<td>0.0051</td>
<td>0.0056</td>
<td>0.0054</td>
<td>0.0053</td>
<td>0.0052</td>
<td>0.0051</td>
<td>0.0050</td>
<td>0.0050</td>
<td>0.0051</td>
<td>0.0052</td>
<td>0.0051</td>
</tr>
<tr>
<td>Comparison Decile Proportion of EM Firms</td>
<td>0.0082</td>
<td>0.0112</td>
<td>0.0107</td>
<td>0.0177</td>
<td>0.0275</td>
<td>0.0445</td>
<td>0.0416</td>
<td>0.0282</td>
<td>0.0158</td>
<td>0.0158</td>
<td>0.0158</td>
</tr>
<tr>
<td>Difference (Decile Nine minus Comparison Decile)</td>
<td>(0.0031)</td>
<td>(0.0019)</td>
<td>0.0034</td>
<td>0.0023</td>
<td>0.0039</td>
<td>0.0028</td>
<td>0.0056</td>
<td>0.0066</td>
<td>0.0093</td>
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</tr>
<tr>
<td>p-value (one-sided)</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0008</td>
<td>0.0000</td>
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<td>0.0000</td>
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</tr>
</tbody>
</table>

**Table 1**

Comparisons of the Proportions of Earnings Management Firms Across Discretionary Accrual Deciles

### Panel B: Discretionary Accruals Estimated using the KS model

### Panel C: Discretionary Accruals Estimated using the Extended Jones model
### Panel B: Discretionary Accruals Estimated using the KS model

#### Section 1: Differences between Decile Zero and other Deciles

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<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Freidman F</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.0106</td>
<td>0.0106</td>
<td>0.0106</td>
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<td>0.0106</td>
<td>0.0106</td>
<td>0.0106</td>
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<td>0.0106</td>
</tr>
<tr>
<td>Comparison Decile Proportion of EM Firms</td>
<td>0.0156</td>
<td>0.0185</td>
<td>0.0249</td>
<td>0.0249</td>
<td>0.0349</td>
<td>0.0371</td>
<td>0.0412</td>
<td>0.0419</td>
<td>0.0364</td>
<td>0.0364</td>
<td></td>
</tr>
<tr>
<td>Difference (Decile Zero minus Comparison Decile)</td>
<td>(0.0050)</td>
<td>(0.0078)</td>
<td>(0.0142)</td>
<td>(0.0143)</td>
<td>(0.0242)</td>
<td>(0.0264)</td>
<td>(0.0305)</td>
<td>(0.0303)</td>
<td>(0.0257)</td>
<td>(0.0257)</td>
<td></td>
</tr>
<tr>
<td>p-value (two-sided)</td>
<td>0.0059</td>
<td>0.0036</td>
<td>0.0003</td>
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<td>0.0000</td>
<td>0.0000</td>
<td>0.0001</td>
<td></td>
</tr>
</tbody>
</table>

| Decile Zero Proportion of Up Firms | 0.0023 | 0.0023 | 0.0023 | 0.0023 | 0.0023 | 0.0023 | 0.0023 | 0.0023 | 0.0023 | 0.0023 | 0.0023 |
| Comparison Decile Proportion of Up Firms | 0.0064 | 0.0089 | 0.0125 | 0.0134 | 0.0234 | 0.0267 | 0.0317 | 0.0327 | 0.0287 | 0.0287 |
| Difference (Decile Zero minus Comparison Decile) | (0.0041) | (0.0066) | (0.0102) | (0.0111) | (0.0244) | (0.0294) | (0.0304) | (0.0264) | (0.0264) | (0.0264) |
| p-value (one-sided) | 0.0018 | 0.0016 | 0.0002 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 |

| Decile Zero Proportion of Down Firms | 0.0084 | 0.0084 | 0.0084 | 0.0084 | 0.0084 | 0.0084 | 0.0084 | 0.0084 | 0.0084 | 0.0084 | 0.0084 |
| Comparison Decile Proportion of Down Firms | 0.0092 | 0.0096 | 0.0124 | 0.0115 | 0.0115 | 0.0104 | 0.0095 | 0.0083 | 0.0077 | 0.0077 |
| Difference (Decile Zero minus Comparison Decile) | (0.0008) | (0.0013) | (0.0040) | (0.0031) | (0.0020) | (0.0011) | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| p-value (one-sided) | 0.5708 | 0.5540 | 0.0749 | 0.1851 | 0.0953 | 0.2303 | 0.6095 | 0.9664 | 0.7129 | 0.0830 |

#### Section 2: Differences between Decile Nine and other Deciles

<table>
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<tr>
<th>Decile Subtracted</th>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Freidman F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decile Nine Proportion of EM Firms</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
<td>0.0364</td>
</tr>
<tr>
<td>Comparison Decile Proportion of EM Firms</td>
<td>0.0106</td>
<td>0.0156</td>
<td>0.0185</td>
<td>0.0249</td>
<td>0.0249</td>
<td>0.0349</td>
<td>0.0371</td>
<td>0.0412</td>
<td>0.0419</td>
<td>0.0364</td>
<td>0.0364</td>
</tr>
<tr>
<td>Difference (Decile Nine minus Comparison Decile)</td>
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<td>0.0207</td>
<td>0.0179</td>
<td>0.0134</td>
<td>0.0114</td>
<td>0.0015</td>
<td>0.0071</td>
<td>0.0042</td>
<td>0.0053</td>
<td>0.0041</td>
<td>0.0041</td>
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<tr>
<td>p-value (two-sided)</td>
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<td>0.0000</td>
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<td>0.0000</td>
<td>0.0000</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

| Decile Nine Proportion of Up Firms | 0.0287 | 0.0287 | 0.0287 | 0.0287 | 0.0287 | 0.0287 | 0.0287 | 0.0287 | 0.0287 | 0.0287 | 0.0287 |
| Comparison Decile Proportion of Up Firms | 0.0223 | 0.0223 | 0.0198 | 0.0162 | 0.0153 | 0.0053 | 0.0020 | 0.0030 | 0.0004 | 0.0004 | 0.0004 |
| Difference (Decile Nine minus Comparison Decile) | 0.0064 | 0.0064 | 0.0125 | 0.0134 | 0.0125 | 0.0234 | 0.0267 | 0.0317 | 0.0317 | 0.0287 | 0.0287 |
| p-value (one-sided) | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 |

| Decile Nine Proportion of Down Firms | 0.0077 | 0.0077 | 0.0077 | 0.0077 | 0.0077 | 0.0077 | 0.0077 | 0.0077 | 0.0077 | 0.0077 | 0.0077 |
| Comparison Decile Proportion of Down Firms | 0.0084 | 0.0092 | 0.0096 | 0.0124 | 0.0124 | 0.0115 | 0.0115 | 0.0104 | 0.0095 | 0.0083 | 0.0083 |
| Difference (Decile Nine minus Comparison Decile) | (0.0007) | (0.0015) | (0.0047) | (0.0039) | (0.0038) | (0.0027) | (0.0018) | (0.0006) | (0.0006) | (0.0006) | (0.0006) |
| p-value (one-sided) | 0.3564 | 0.1953 | 0.1510 | 0.0110 | 0.0286 | 0.0110 | 0.0757 | 0.0960 | 0.3333 | 0.0830 | 0.0830 |
### Table 1 Continued

**Panel C: Discretionary Accruals Estimated using the E-J model**

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<th>Decile Subtracted</th>
<th>Decile Zero (Low Accrual Decile)</th>
<th>Comparison Decile Proportion of EM Firms</th>
<th>Difference (Decile Zero minus Comparison Decile)</th>
<th>p-value (two-sided)</th>
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<td>(0.0036)</td>
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<td>(0.0036)</td>
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<tr>
<td></td>
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<td>(0.0036)</td>
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</thead>
<tbody>
<tr>
<td>Comparison Decile Proportion of EM Firms</td>
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</tr>
<tr>
<td>Difference (Decile Zero minus Comparison Decile)</td>
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<tr>
<td>p-value (one-sided)</td>
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</table>

<table>
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<tr>
<th>Decile Zero Proportion of Up Firms</th>
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<tbody>
<tr>
<td>Comparison Decile Proportion of Up Firms</td>
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<td>Difference (Decile Zero minus Comparison Decile)</td>
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<td>p-value (one-sided)</td>
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<tr>
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<tr>
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<td>p-value (one-sided)</td>
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#### Section 2: Differences between Decile Nine and other Deciles

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<th>Decile Subtracted</th>
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<th>Comparison Decile Proportion of EM Firms</th>
<th>Difference (Decile Nine minus Comparison Decile)</th>
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</thead>
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<td>0.0434</td>
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<td>(0.0000)</td>
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<tr>
<td>Difference (Decile Nine minus Comparison Decile)</td>
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</tr>
<tr>
<td>p-value (two-sided)</td>
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</table>

<table>
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<tr>
<td>Comparison Decile Proportion of Up Firms</td>
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</tr>
<tr>
<td>Difference (Decile Nine minus Comparison Decile)</td>
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</tr>
<tr>
<td>p-value (one-sided)</td>
<td>0.8692</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decile Nine Proportion of Down Firms</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Comparison Decile Proportion of Down Firms</td>
<td>0.0100</td>
</tr>
<tr>
<td>Difference (Decile Nine minus Comparison Decile)</td>
<td>0.0000</td>
</tr>
<tr>
<td>p-value (one-sided)</td>
<td>0.8692</td>
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</table>
proportions. The comparisons of decile zero up and down firms discussed below will shed more light on this issue.

The decile nine EM proportion comparisons also raise questions. Panel A reveals that, for the KLW Jones Model, the proportion of earnings management firms generally increases across the deciles from 1.83% in decile zero to 5.60% and 5.03% in deciles six and seven, respectively, before dropping back to 3.59% and 2.08% for deciles eight and nine, respectively. As a result decile nine has a lower proportion of EM firms than every decile except decile zero. For the KS and the E-J models the drop off is not as severe. Panel B shows that when using the KS model, the proportion of EM firms rises monotonically from 1.06% in decile zero to 4.12% in decile seven before falling to 4.10% in decile eight and 3.64% in decile nine. Similarly, Panel C shows that when the E-J model is used the proportion of EM firms rises steadily from 1.38% in decile zero to 5.72% in decile six before falling to 4.84%, 4.80%, and 4.34% in deciles seven through nine, respectively. Despite the drop off, the decile nine proportion for the KS model is not significantly different from that of the adjacent deciles six, seven, and eight, and is significantly higher than that of deciles zero through four. Similarly Panel C shows that the decile nine proportion resulting from E-J model is also significantly higher than that of deciles zero through four and is only significantly less than that of decile six. A possible explanation for the lower proportions in decile nine may be related to differing earnings management incentives and differing needs. For instance deciles six through eight may contain many benchmark beaters who do not need to manage upwards to the same degree as other earnings management firms.

Comparisons of the proportions of up and down firms present a clearer picture of model performance and suggest that each of the models has some success in classifying firms correctly. Under each of the models, decile zero has a significantly lower proportion of up firms than all other deciles. Although there is some variation, decile nine comparisons of up firms are also similar across models. Panel A reveals that when the KLW Jones model is used, decile nine has a significantly higher proportion of up firms than the low to mid deciles, zero through three. Panels B and C show that decile nine has a significantly higher proportion of up firms than deciles zero through four, using the KS model, and zero through five using the E-J model. The differences in the
decile nine comparisons arise within the high accrual deciles. As the EM analysis suggested, when the KLW Jones model is used, decile nine actually has a significantly lower proportion of up firms than deciles five through eight. For the E-J model, the decile proportion of EM firms is significantly less than that of deciles six through eight, though the decile seven difference is significant at only the 10% level. For the KS model decile nine is significantly less than only decile eight and only at a 10% level.

While the KLW Jones model places lower percentages of up firms in decile nine than the other models, it places higher percentages of down firms in decile zero than the other two models. The KLW model places a significantly higher proportion of down firms in decile zero than in deciles three, five, seven, eight, and nine. In addition, decile nine has a significantly lower proportion of down firms than nearly every other decile. The ability of the other two models to distinguish between the proportions of down firms across deciles is much weaker. Note the Friedman tests of differences among the deciles are only significant at the 10% level for both the KS and E-J models. For the KS model, decile zero’s proportion of down firms is not significantly greater than that of any other decile, and for the E-J model, decile zero has a significantly (10%) greater proportion of down firms than only decile eight. Looking at decile nine for these models, decile nine has a significantly smaller proportion of down firms than only decile two when the E-J model is used. When the KS model is used, decile nine has a lower proportion of down firms than deciles three through seven, but as the Freidman test for differences among deciles had a p-value of only .088, this difference is significant only at the 10% level.

As stated above, overall, the results presented in Table 1 are mixed. The first hypothesis, that extreme accrual firms should have a higher proportion of earnings management firms, is partially upheld for two of the models. The first extreme decile, decile zero, has the lowest proportion of EM firms under each model, and it is significantly less than every other decile. So this hypothesis, as it relates to decile zero, can be rejected. However, in retrospect, this should have been expected as far fewer firms with an incentive to manage earnings downwards than with an incentive to manage earnings upwards were identified. Turning to decile nine, both the KS and the E-J models place higher proportions of EM firms in decile nine than in the middle and low
deciles. It is, however, the comparisons with the middle deciles on which I focus. The significant differences between decile nine and the middle deciles under these models supports the hypothesis relating to decile nine. With regards to the KLW model, this hypothesis is not supported due to the drop in the proportion for EM firms in decile nine.

Analysis of the second and third hypotheses provides more and, perhaps, superior information about each model’s ability to reflect earnings management. Where the examination of the proportion of EM firms allowed primarily for comparisons against the middle deciles, the examination of up and down proportions allows for comparisons against both the middle and opposite deciles. In addition, tests of the first hypothesis could result in erroneous conclusions if high proportions of EM firms found in the high decile contain firms predicted to be in the lowest decile and vice versa. By segmenting the EM firms by the direction of anticipated earnings management, the tests of hypotheses two and three should be more informative and provide more accurate information.

The second hypothesis, that the highest accrual decile has a greater proportion of up firms than the middle and low deciles is supported by tests of all three models. Under the KLW Jones model decile nine has a significantly higher proportion of up firms than deciles zero through three. Under the E-J model, decile nine has a significantly higher proportion of up firms than deciles zero through four, and under the KS model decile nine has a significantly higher proportion of up firms than deciles zero through five.

The third hypothesis, that the lowest accrual decile has a greater proportion of down firms than the middle and high deciles, is supported when the KLW Jones model is used to estimate discretionary accruals. In this case, decile zero has a higher proportion of down firms than deciles three through nine, and this difference is significant at 5% or better for deciles five, seven, eight, and nine. The difference is significant at the 10% level for decile three. The third hypothesis is not supported by the KS model, and is only weakly supported for the E-J model. When the E-J model is used, decile zero has a

---

55 I focus on the comparisons with the middle decile because, as noted above, the lower proportion of EM firms in the low deciles is to be expected based on the lower number of down firms relative to up firms in the sample. Also, as discussed in Chapter 2, the hypotheses between extreme deciles and those closest to them are unclear, as the extent of earnings management sample-wide is unknown.
greater proportion of down firms for deciles five, seven, eight, and nine; however, the
difference is only significant (10%) for decile eight.

Thus when focusing on the second and third hypotheses, the K LW Jones model is
superior to the other two models. It provides support for each of these hypotheses,
placing significantly higher proportions of up firm in the highest decile and significantly
higher proportions of down firms in the lowest decile. While both the E-J model and the
KS model provide support for the second hypothesis, the KS model provides no support
for the third hypothesis, and the E-J evidence supporting the third hypothesis is weak.

Having discussed the first three hypotheses, I now turn to the fourth and fifth
hypotheses, dealing with the direction of a firm’s accruals. The fourth hypothesis is that
firms with negative discretionary accruals are more likely to have an incentive to manage
earnings downwards. The fifth hypothesis is that firms with positive accruals are more
likely to have an incentive to manage earnings upwards. I test these hypotheses by
comparing the proportions of up and down firms in the positive and negative
discretionary accrual subsamples.

The results of these comparisons are presented in Table 2. Panel A shows the
mean and median differences in the time series of annual proportions for the 1988-2002
sample period, while Panel B presents the actual proportions over the entire period, along
with the results of t-tests testing whether or not the means of the positive and negative
subsample differ. The results of both panels are consistent, but in both panels the results
differ somewhat by model.

Panel A shows that for all three models the proportion of up firms is significantly
higher for the positive accrual subsample, and Panel B reflects similar results. Once
again, the primary differences appear while examining the down firms. For the K LW
model, firms with negative accruals have significantly higher proportions of down firms
in both panels. The KS model conversely shows no significant difference in either panel.
The E-J model, again, falls somewhere in between. Panel A reveals that negative accrual
firms have higher mean and median proportions of down firms than the positive accrual
subsample. However, only the difference in means is significant. Panel B also finds that
the negative accrual subsample has a higher mean proportion of down firms, but here the
difference is significant at only the 10% level.
Table 2
Proportions of EM Firms by the Direction of Accruals

This table presents the results of comparisons between the proportions of earnings management firms (Up Firms and Down Firms) in the positive accrual and negative accrual subsamples. 'Up Firms' are earnings management firms with an incentive to manage earnings upwards, and 'Down Firms' are earnings management firms with an incentive to manage earnings downwards. Comparisons are shown for each of the three models examined, the KLW Jones model, the KS model, and the extended Jones model. Panel A presents the means and medians of the time series of annual Up Firm and Down Firm proportions for each subsample, along with the mean and median of the annual pairwise differences between subsamples. P-values presented result from t-tests and Wilcoxon signed ranks tests testing whether any proportions and differences are different from zero. Panel B presents the actual proportions of Up and Down firms in the positive and negative accrual subsamples over the entire sample period, along with the differences in proportions across subsamples. The p-values presented result from a two-sample t-test of the means of the two subsamples. The results in both panels are for the 1988-2002 period. All p-values reflect one-sided tests. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Mean and Median Differences in the Time Series of Annual Proportions of Earnings Management Firms

**KLW Jones Model**

<table>
<thead>
<tr>
<th></th>
<th>Mean Proportion</th>
<th>Median Proportion</th>
<th>Mean Proportion</th>
<th>Median Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up Firms p-value</td>
<td>Up Firms p-value</td>
<td>Down Firms p-value</td>
<td>Down Firms p-value</td>
</tr>
<tr>
<td>Firms with Positive Accruals</td>
<td>0.0309 0.0001</td>
<td>0.0330 0.0001</td>
<td>0.0090 0.0001</td>
<td>0.0078 0.0001</td>
</tr>
<tr>
<td>Firms with Negative Accruals</td>
<td>0.0091 0.0001</td>
<td>0.0092 0.0001</td>
<td>0.0137 0.0001</td>
<td>0.0159 0.0001</td>
</tr>
<tr>
<td>Difference (positive-negative)</td>
<td>0.0218 0.0001</td>
<td>0.0238 0.0001</td>
<td>(0.0047) 0.0003</td>
<td>(0.0046) 0.0002</td>
</tr>
</tbody>
</table>

**KS Model**

<table>
<thead>
<tr>
<th></th>
<th>Mean Proportion</th>
<th>Median Proportion</th>
<th>Mean Proportion</th>
<th>Median Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up Firms p-value</td>
<td>Up Firms p-value</td>
<td>Down Firms p-value</td>
<td>Down Firms p-value</td>
</tr>
<tr>
<td>Firms with Positive Accruals</td>
<td>0.0272 0.0001</td>
<td>0.0284 0.0001</td>
<td>0.0101 0.0001</td>
<td>0.0099 0.0001</td>
</tr>
<tr>
<td>Firms with Negative Accruals</td>
<td>0.0079 0.0001</td>
<td>0.0080 0.0001</td>
<td>0.0096 0.0001</td>
<td>0.0090 0.0001</td>
</tr>
<tr>
<td>Difference (positive-negative)</td>
<td>0.0193 0.0001</td>
<td>0.0199 0.0001</td>
<td>0.0005 0.2938</td>
<td>0.0007 0.2807</td>
</tr>
</tbody>
</table>
### Table 2 Continued

#### Extended Jones Model

<table>
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<tr>
<th></th>
<th>Mean Proportion</th>
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<th>Mean Proportion</th>
<th>Median Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up Firms</td>
<td>p-value</td>
<td>Up Firms</td>
<td>p-value</td>
</tr>
<tr>
<td>Firms with Positive Accruals</td>
<td>0.0358</td>
<td>0.0001</td>
<td>0.0389</td>
<td>0.0001</td>
</tr>
<tr>
<td>Firms with Negative Accruals</td>
<td>0.0087</td>
<td>0.0001</td>
<td>0.0089</td>
<td>0.0001</td>
</tr>
<tr>
<td>Difference (positive-negative)</td>
<td>0.0270</td>
<td>0.0001</td>
<td>0.0270</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Proportion</th>
<th>p-value</th>
<th>Proportion</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up Firms</td>
<td></td>
<td>Down Firms</td>
<td>p-value</td>
</tr>
<tr>
<td>Firms with Positive Accruals</td>
<td>0.0205</td>
<td>0.0093</td>
<td>0.0093</td>
<td>0.0093</td>
</tr>
<tr>
<td>Firms with Negative Accruals</td>
<td>0.0092</td>
<td>0.0143</td>
<td>0.0092</td>
<td>0.0143</td>
</tr>
<tr>
<td>Difference (positive-negative)</td>
<td>0.0213</td>
<td>0.0001</td>
<td>(0.0050)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

#### KLW Jones Model

<table>
<thead>
<tr>
<th></th>
<th>Proportion</th>
<th>p-value</th>
<th>Proportion</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up Firms</td>
<td></td>
<td>Down Firms</td>
<td>p-value</td>
</tr>
<tr>
<td>Firms with Positive Accruals</td>
<td>0.0274</td>
<td>0.0105</td>
<td>0.0105</td>
<td>0.0105</td>
</tr>
<tr>
<td>Firms with Negative Accruals</td>
<td>0.0080</td>
<td>0.0098</td>
<td>0.0080</td>
<td>0.0098</td>
</tr>
<tr>
<td>Difference (positive-negative)</td>
<td>0.0194</td>
<td>0.0001</td>
<td>0.0007</td>
<td>0.1739</td>
</tr>
</tbody>
</table>

#### KS Model

<table>
<thead>
<tr>
<th></th>
<th>Proportion</th>
<th>p-value</th>
<th>Proportion</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up Firms</td>
<td></td>
<td>Down Firms</td>
<td>p-value</td>
</tr>
<tr>
<td>Firms with Positive Accruals</td>
<td>0.0352</td>
<td>0.0109</td>
<td>0.0109</td>
<td>0.0109</td>
</tr>
<tr>
<td>Firms with Negative Accruals</td>
<td>0.0089</td>
<td>0.0121</td>
<td>0.0089</td>
<td>0.0121</td>
</tr>
<tr>
<td>Difference (positive-negative)</td>
<td>0.0263</td>
<td>0.0001</td>
<td>(0.0012)</td>
<td>0.0691</td>
</tr>
</tbody>
</table>

#### Extended Jones Model

<table>
<thead>
<tr>
<th></th>
<th>Proportion</th>
<th>p-value</th>
<th>Proportion</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up Firms</td>
<td></td>
<td>Down Firms</td>
<td>p-value</td>
</tr>
<tr>
<td>Firms with Positive Accruals</td>
<td>0.0358</td>
<td>0.0001</td>
<td>0.0099</td>
<td>0.0001</td>
</tr>
<tr>
<td>Firms with Negative Accruals</td>
<td>0.0087</td>
<td>0.0001</td>
<td>0.0116</td>
<td>0.0001</td>
</tr>
<tr>
<td>Difference (positive-negative)</td>
<td>0.0270</td>
<td>0.0001</td>
<td>(0.0016)</td>
<td>0.0312</td>
</tr>
</tbody>
</table>

### Panel B: Actual Proportions of Earnings Management Firms for the Entire Sample Period
Selecting a Model

While the primary purpose of the analyses discussed above is to examine the question of whether or not discretionary accrual models identified could be used to identify earnings management firms, a secondary objective is to determine which model performs best at this task. The weakness of the KS and E-J models in placing down firms in the low deciles and negative accrual subsamples suggests the KLW Jones model may be best suited for identifying earnings management firms. I examine this issue directly by comparing the proportions of earnings management firms identified by each model.

In this analysis, for each model, I calculate the proportions of up firms in the highest decile, up firms in the lowest decile, down firms in the highest decile, down firms in the lowest decile, and EM firms in the zero decile. Recall from Chapter 4 that the zero decile is not decile zero, but rather the decile that contains the firms having discretionary accruals closest to zero. I then conduct Freidman tests to determine if these proportions differ across models, and perform pairwise comparisons between each of the models.56 The results are presented in Table 3. The Freidman tests find no significant differences the proportion of EM firms in the zero decile or the proportion of up firms in the Low decile. There are, however, significant differences among the models in the other categories. Most of these differences are between the KS and the KLW Jones models and the E-J and KLW Jones models. The KS and the E-J model differ significantly only in the proportions of up firms in the high decile. Here, the E-J model has a significantly higher proportion of up firms in the high decile, but the difference is significant only at the 10% level. While the E-J model contains a higher proportion of high decile up firms than the KS model, both models produce significantly higher proportions than the KLW Jones model.

Though the KLW model underperforms the other two models in the proportions of up firms in the highest decile, it beats them in the remaining two categories, having a lower percentage of down firms in the high decile and a higher proportion of down firms

---

56 Recall from Chapter 4 the pairwise comparisons are based on t-tests of the average annual differences in proportions across models. An analysis of the medians was also conducted, but is not reported. The results of the median comparisons are consistent with the results presented in Table 3.
Table 3
Model Comparisons

This table presents comparisons of the three models examined based on their proportions of earnings management firms in the High, Low, and Zero Deciles. The ‘High Decile’ is the decile containing firms with the highest levels of discretionary accruals. The ‘Low Decile’ is the decile containing firms with the lowest levels of discretionary accruals. The ‘Zero Decile’ is a middle decile containing firms with levels of discretionary accruals closest to zero. The proportions are presented in Panel A, and the pairwise differences in proportions between models, along with their associated p-values, are presented in Panel B. ‘Up Firms’ represent earnings management firms with the incentive to manage earnings upwards. ‘Down Firms’ represent earnings management firms with the incentive to manage earnings downwards. ‘EM Firms’ represent all earnings management firms, regardless of incentive. The final row of Panel B contains the p-values from a Friedman test comparing proportions among all three models. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are two-tailed.

Panel A: Proportions of Earnings Management Firms by Decile

<table>
<thead>
<tr>
<th>Model</th>
<th>Up Firms in High Decile</th>
<th>Up Firms in Low Decile</th>
<th>Down Firms in High Decile</th>
<th>Down Firms in Low Decile</th>
<th>EM Firms in Zero Decile</th>
</tr>
</thead>
<tbody>
<tr>
<td>KLW</td>
<td>0.0158</td>
<td>0.0039</td>
<td>0.0050</td>
<td>0.0143</td>
<td>0.0297</td>
</tr>
<tr>
<td>KS</td>
<td>0.0287</td>
<td>0.0023</td>
<td>0.0077</td>
<td>0.0084</td>
<td>0.0246</td>
</tr>
<tr>
<td>E-J</td>
<td>0.0334</td>
<td>0.0034</td>
<td>0.0100</td>
<td>0.0103</td>
<td>0.0271</td>
</tr>
</tbody>
</table>

Panel B: Pairwise Differences in Proportions of Earnings Management Firms by Decile

<table>
<thead>
<tr>
<th></th>
<th>Up Firms in High Decile</th>
<th>Up Firms in Low Decile</th>
<th>Down Firms in High Decile</th>
<th>Down Firms in Low Decile</th>
<th>EM Firms in Zero Decile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference KLW minus E-J</td>
<td>0.0176</td>
<td>0.0005</td>
<td>(0.0050)</td>
<td>0.0040</td>
<td>0.0026</td>
</tr>
<tr>
<td>p-value</td>
<td><strong>0.0001</strong></td>
<td>0.5414</td>
<td><strong>0.0164</strong></td>
<td>0.0584</td>
<td>0.2671</td>
</tr>
<tr>
<td>Difference KS minus E-J</td>
<td>(0.0047)</td>
<td>(0.0012)</td>
<td>(0.0024)</td>
<td>(0.0019)</td>
<td>(0.0025)</td>
</tr>
<tr>
<td>p-value</td>
<td><strong>0.0643</strong></td>
<td>0.2209</td>
<td>0.1605</td>
<td>0.3796</td>
<td>0.3879</td>
</tr>
<tr>
<td>Difference KS minus KLW</td>
<td>0.0129</td>
<td>(0.0017)</td>
<td>0.0026</td>
<td>(0.0060)</td>
<td>(0.0051)</td>
</tr>
<tr>
<td>p-value</td>
<td><strong>0.0001</strong></td>
<td>0.1836</td>
<td><strong>0.0036</strong></td>
<td><strong>0.0036</strong></td>
<td>0.1681</td>
</tr>
<tr>
<td>Friedman F p-value</td>
<td><strong>0.0001</strong></td>
<td>0.1836</td>
<td><strong>0.0005</strong></td>
<td><strong>0.0036</strong></td>
<td>0.1681</td>
</tr>
</tbody>
</table>
in the low decile. Based on these results and the results presented in the preceding section, I conclude that the KLW model performs better than the other two models and use this model for the remainder of my analyses.

**The Accrual Anomaly and Earnings Management Incentives**

The second phase of my analysis addresses whether or not the accrual anomaly is driven by earnings management firms. While the analysis of proportions of earnings management firms did not show that the majority of extreme decile firms were identified as earnings management firms, it is still possible that these firms drive the anomaly. For this analysis, I use the KLW Jones model to estimate discretionary accruals. I first document the accrual anomaly in my sample and then proceed to examine the hypotheses outlined in Chapter 2.

**Regression Analysis**

To begin my analysis, I document the accrual anomaly in my entire sample of firms using regression analysis. My regression analysis uses the cross-sectional regression approach of Fama and MacBeth (1973) to identify the relationship between stock returns and discretionary accruals. The model, presented in Chapter 4, is equation 17.

\[ R_{i,t} = \alpha + \beta_0 (SZ_{i,t-1}) + \beta_1 (BTM_{i,t-1}) + \beta_2 (DA_{i,t-1}) + \epsilon_{i,t} \]  

eq.17

The results of the regression analysis using all sample firms are presented in Panel A of Table 4. In Panel A, both the mean and median coefficients for discretionary accruals are negative and significant, revealing that the accrual anomaly is present during my sample period.

To begin my analysis addressing whether earning management drives this anomaly, I split the sample into earnings management (EM) and non-earnings
### Table 4
The Accrual Anomaly
Cross-Sectional Regression Analysis

This table contains the mean and median coefficients from annual cross-sectional regressions from 1988 through 2002. P-values reported result from t-tests and Wilcoxon signed rank tests of whether or not the mean and median coefficients differ from zero. In all panels, the dependent variable is one-year buy-and-hold stock returns and the independent variables are the natural log of size (Size), the natural log of the book-to-market ratio (BTM), and discretionary accruals scaled by total assets (DA). The results in Panel A are from all sample firms, while the results in Panels B and C are obtained using subsamples of only earnings management (EM) firms and non-earnings management (non-EM) firms, respectively. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are one-sided.

#### Panel A: Do Discretionary Accruals Explain Stock Returns

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coefficient</td>
<td>0.3008</td>
<td>(0.0180)</td>
<td>0.0475</td>
<td>(0.1547)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0087</td>
<td>0.1027</td>
<td>0.0272</td>
<td>0.0013</td>
</tr>
<tr>
<td>Median Coefficient</td>
<td>0.1686</td>
<td>(0.0077)</td>
<td>0.0725</td>
<td>(0.0942)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0017</td>
<td>0.1372</td>
<td>0.0065</td>
<td>0.0017</td>
</tr>
</tbody>
</table>

#### Panel B: Do Discretionary Accruals Explain Stock Returns in EM Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coefficient</td>
<td>0.3948</td>
<td>(0.0314)</td>
<td>(0.0239)</td>
<td>(0.0218)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td>0.0049</td>
<td>0.1995</td>
<td>0.4468</td>
</tr>
<tr>
<td>Median Coefficient</td>
<td>0.4404</td>
<td>(0.0329)</td>
<td>(0.0179)</td>
<td>(0.0648)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0051</td>
<td>0.1796</td>
<td>0.3193</td>
</tr>
</tbody>
</table>

#### Panel C: Do Discretionary Accruals Explain Stock Returns in Non-EM Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coefficient</td>
<td>0.3052</td>
<td>(0.0193)</td>
<td>0.0492</td>
<td>(0.1604)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0002</td>
<td>0.0892</td>
<td>0.0235</td>
<td>0.0013</td>
</tr>
<tr>
<td>Median Coefficient</td>
<td>0.1737</td>
<td>(0.0107)</td>
<td>0.0732</td>
<td>(0.0948)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0017</td>
<td>0.1156</td>
<td>0.0065</td>
<td>0.0011</td>
</tr>
</tbody>
</table>
management (non-EM) subsamples. The EM subsample contains firms identified as having both the ability and an incentive to manage earnings (EM firms). I estimate equation 17 separately for each subsample. The results to this analysis are presented in Table 4, Panels B and C. Panel C contains the results from the non-EM subsample. The results for this subsample are similar to those for the entire sample; both the mean and median coefficients for discretionary accruals are negative and significant. Panel B presents the results for the EM subsample. Here, the mean and median coefficients for the discretionary accrual variable are negative, but they are less negative than those from the non-EM subsample, and they are not statistically significant. These results suggest that the earnings management firms identified do not drive the accrual anomaly.

To further examine this question, I utilize three regression equations involving dummy variables and interaction terms. These are equations 18, 19, and 20 from Chapter 4:

\[ R_{it} = \alpha + \beta_0(SZ_{i,t-1}) + \beta_1(BTM_{i,t-1}) + \beta_2(DA_{i,t-1}) + \delta_0(EMDum) + \delta_1(EMInt) + \epsilon_{i,t} \]  
**eq.18**

\[ R_{it} = \alpha + \beta_0(SZ_{i,t-1}) + \beta_1(BTM_{i,t-1}) + \beta_2(DA_{i,t-1}) + \delta_0(UpDum) + \delta_1(UpInt) + \delta_2(DownDum) + \delta_3(DownInt) + \epsilon_{i,t} \]  
**eq.19**

\[ R_{it} = \alpha + \beta_0(SZ_{i,t-1}) + \beta_1(BTM_{i,t-1}) + \beta_2(DA_{i,t-1}) + \delta_0(Stock) + \delta_2(Merger) + \delta_3(BMBeat) + \delta_4(BMdown) + \delta_5(BMbath) + \delta_6(CEObath) + \delta_7(Smooth) + \epsilon_{i,t} \]  
**eq.20**

Equation 18 examines the impact of being an EM firm in two ways. First the EM dummy variable shows if being an EM firm results in higher or lower returns in general, and second, the EM interaction term, constructed as EM times DA, indicates whether being an EM firm makes the coefficient for discretionary accruals more or less negative. If earnings management firms drive this anomaly the coefficient for the interaction variable should be negative. That would show that the DA coefficient is more negative for EM firms, indicating a stronger impact for EM firms. The expectation for the EM interaction coefficient is less clear, however, as firms that manage upwards are expected to have
negative returns, while those that manage downwards are expected to have positive returns. Given the disproportionate number of firms with the incentive to manage upwards, I would expect the coefficient to be negative. However, I avoid the necessity of interpreting this coefficient by including equation 19 in my analysis.

Equation 19 replaces the single EM dummy variable in equation 18 with two direction specific dummy variables, in an attempt to provide clearer predictions on the general impacts of EM firms having different incentives. In addition, it replaces the single interaction term in equation 18 with two interaction terms, associated with the new dummy variables. This formulation provides the ability to distinguish the impact of up and down firms. Splitting of the original interaction term into two contributes to this distinction, but as each of the new interaction terms now represents fewer firms, their associated coefficients may not be significant even if the coefficient for the interaction term in equation 18 is significant. In this analysis, if EM firms drive the anomaly, the coefficient on the up dummy variable should be positive, the coefficient on the down dummy variable should be negative, and the coefficient on both interaction terms should be negative.

The final regression formulation in this analysis is equation 20. This equation uses dummy variables representing each earnings management incentive to see the impact of each. As discussed in Chapter 4, the coefficients for Stock, Merger, and BM Beat are expected to be negative, while the coefficients for BM Down, BM Bath, and CEO Bath are expected to positive. There is no expectation on the sign for Smooth, as some firms will smooth up, while others will smooth down.

The results of these analyses are presented in Table 5. Panel A shows the results for equation 18. While discretionary accruals are negative and significant, the EM interaction term is positive, though not significant. Panel B presents the results from the estimation of equation 19. Here again, the discretionary accruals coefficient is negative and significant. However, the coefficients for both dummy variables are positive and significant, and both interaction terms are positive, though not significant. Finally, Panel C reveals that, of all the incentives proxied in equation 20, only the coefficients associated with the new CEO bath and benchmark beating incentives have the expected signs and are significant.
This table contains the mean and median coefficients from annual cross-sectional regressions from 1988 through 2002. P-values reported result from t-tests, and Wilcoxon signed rank tests of whether or not the mean and median coefficients differ from zero. In all panels, the dependent variable is one-year buy-and-hold stock returns. In Panel A, the independent variables are the natural log of size (Size), the natural log of the book-to-market ratio (BTM), discretionary accruals scaled by total assets (DA), an earnings management dummy variable (EM Dum) that is set to 1 for earnings management firms, and an interaction term (EM Int) that is constructed as EM Dum*DA. The regression equation used to produce Panel B is similar to that of Panel A, but the variable EM Dum is replaced by two dummy variables Up Dum and Down Dum and the variable EM Int is replaced by two interaction variables Up Int and Down Int. Up Dum is set to 1 when an earnings management firm has the incentive to manage earnings upwards, and Up Int is constructed as Up Dum*DA. Down Dum is set to 1 when an earnings management firm has the incentive to manage earnings downwards, and Down Int is constructed as Down Dum*DA. The regression equation used to produce Panel C is also similar to that of Panel A, but replaces EM Dum and EM Int with a series of dummy variables, reflecting various earnings management incentives. The variables Stock, Merger, BM Beat, BM Down, BM Bath, CEO, And Smooth represent the stock issuance, merger, benchmark beating, managing down to a benchmark, benchmark related big bath, New CEO, and Smoothing incentives, respectively. Each is set to one when a firm has the related incentive. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are one-sided.

### Panel A: The Impact of Earnings Management

<table>
<thead>
<tr>
<th>Mean Coefficient</th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>EM Dum</th>
<th>EM Int</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3049</td>
<td>(0.0196)</td>
<td>0.0470</td>
<td>(0.1601)</td>
<td>0.0692</td>
<td>0.1208</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0078</td>
<td></td>
<td>0.0280</td>
<td>0.0013</td>
<td>0.0008</td>
<td>0.2276</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Coefficient</th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>EM Dum</th>
<th>EM Int</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1718</td>
<td>(0.0109)</td>
<td>0.0724</td>
<td>(0.0946)</td>
<td>0.0702</td>
<td>0.0483</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0017</td>
<td></td>
<td>0.0665</td>
<td>0.0011</td>
<td>0.0021</td>
<td>0.2997</td>
</tr>
</tbody>
</table>

### Panel B: The Impact of Earnings Management Incentives by Direction

<table>
<thead>
<tr>
<th>Mean Coefficient</th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Up Dum</th>
<th>Up Int</th>
<th>Down Dum</th>
<th>Down Int</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3049</td>
<td>(0.0196)</td>
<td>0.0472</td>
<td>(0.1610)</td>
<td>0.0762</td>
<td>0.0647</td>
<td>0.0860</td>
<td>0.2011</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0081</td>
<td></td>
<td>0.0279</td>
<td>0.0012</td>
<td>0.0003</td>
<td>0.3831</td>
<td>0.0002</td>
<td>0.2261</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Coefficient</th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Up Dum</th>
<th>Up Int</th>
<th>Down Dum</th>
<th>Down Int</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1699</td>
<td>(0.0096)</td>
<td>0.0724</td>
<td>(0.0956)</td>
<td>0.0751</td>
<td>0.0295</td>
<td>0.0935</td>
<td>0.1210</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0017</td>
<td></td>
<td>0.0665</td>
<td>0.0007</td>
<td>0.0002</td>
<td>0.3394</td>
<td>0.0001</td>
<td>0.1651</td>
</tr>
</tbody>
</table>

### Panel C: The Impact of Specific Earnings Management Incentives on Stock Returns

<table>
<thead>
<tr>
<th>Mean Coefficient</th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Stock</th>
<th>Merger</th>
<th>BM Beat</th>
<th>BM Down</th>
<th>BM Bath</th>
<th>CEO</th>
<th>Smooth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3270</td>
<td>(0.0213)</td>
<td>0.0505</td>
<td>(0.1268)</td>
<td>0.0191</td>
<td>0.0230</td>
<td>(0.0409)</td>
<td>(0.0531)</td>
<td>(0.0782)</td>
<td>0.1192</td>
<td>(0.0295)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0061</td>
<td></td>
<td>0.0079</td>
<td>0.0113</td>
<td>0.0061</td>
<td>0.3099</td>
<td>0.0010</td>
<td>0.0586</td>
<td>0.0200</td>
<td>0.0004</td>
<td>0.1761</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Coefficient</th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Stock</th>
<th>Merger</th>
<th>BM Beat</th>
<th>BM Down</th>
<th>BM Bath</th>
<th>CEO</th>
<th>Smooth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1874</td>
<td>(0.0165)</td>
<td>0.0708</td>
<td>(0.0814)</td>
<td>0.1400</td>
<td>-</td>
<td>(0.0397)</td>
<td>(0.0423)</td>
<td>(0.1051)</td>
<td>0.0938</td>
<td>-</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0013</td>
<td></td>
<td>0.0065</td>
<td>0.0222</td>
<td>0.0002</td>
<td>0.4039</td>
<td>0.0013</td>
<td>0.0719</td>
<td>0.0222</td>
<td>0.0002</td>
<td>0.4829</td>
</tr>
</tbody>
</table>
In total, regression analysis provides virtually no support for the hypothesis that earnings management firms drive the accrual anomaly. Only the coefficient for the down dummy variable is significant in the direction expected. If anything, the results suggest EM firms weaken the anomaly. However, hedge portfolio analysis could reveal a non-linear relationship.

Hedge Portfolio Analysis

I use hedge portfolio analysis as a second method to analyze the accrual anomaly. In this analysis, a zero-investment portfolio is created by shorting the stock of firms in the highest discretionary accrual decile and purchasing the stock of firms in the lowest discretionary accrual decile. The abnormal returns to the entire strategy are calculated as the abnormal return to the long position minus the abnormal returns to the short position. For this analysis, I first document the accrual anomaly using the entire sample. I then divide the sample into EM and non-EM subsamples and compare the strategy’s returns for the two subsamples. The results of these analyses are presented in Tables 6 and 7.

Table 6 documents the accrual anomaly for the entire sample period. Panel A presents the results using the pooled data, representing the entire sample period; Panel B shows the abnormal returns by year; and Panel C presents the means and medians of the annual returns. Interestingly, abnormal returns to the strategy are much smaller than have been documented previously. Panel A reveals an average return of only 5.29% with only the return to short position being statistically significant. Similarly the average annual return presented in panel C is only 5.17% and significant only at the 10% level. Panel B reveals that the average return to this strategy is positive in only 10 of the 15 years examined. I believe the lower abnormal returns found here could be attributable to the time period examined. Panel B shows that the negative returns to this strategy are concentrated in the most recent four years. This could indicate that the anomaly is strongest during bull markets, or, as during the past four years accounting scandals have received a great deal of attention in the popular press, analysts and investors may have begun paying more attention to accrual information, lessening the impact of accruals. Future research may examine this issue.
Table 6
The Accrual Anomaly - Abnormal Returns to Hedge Portfolios

This table contains the abnormal returns to a zero-investment trading strategy that is long firms in the lowest accrual decile and short firms in the highest accrual decile. Abnormal returns are relative to firms matched on size, book-to-market ratio, and fiscal year end. Panel A contains the mean and median returns to this strategy calculated using the pooled data for the 1988-2002 period. P-values in Panel A result from two-sample t-tests and two-sample Wilcoxon tests. Panel B contains the mean and median returns to this strategy for each year from 1988 through 2002. Panel C contains the means and medians of the time series of mean and median annual hedge returns. P-values in Panels B and C result from standard t-tests and Wilcoxon signed rank tests. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All p-values are one-sided.

Panel A: Mean and Median Returns, 1988-2002 Pooled

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>(0.0204)</td>
<td>0.3675</td>
<td>(0.0347)</td>
<td>0.3375</td>
</tr>
<tr>
<td>1989</td>
<td>0.0074</td>
<td>0.4539</td>
<td>(0.0375)</td>
<td>0.2234</td>
</tr>
<tr>
<td>1990</td>
<td>0.1007</td>
<td>0.2889</td>
<td>(0.0173)</td>
<td>0.3633</td>
</tr>
<tr>
<td>1991</td>
<td>0.0333</td>
<td>0.3417</td>
<td>(0.0467)</td>
<td>0.4366</td>
</tr>
<tr>
<td>1992</td>
<td>0.0334</td>
<td>0.2748</td>
<td>(0.0063)</td>
<td>0.2918</td>
</tr>
<tr>
<td>1993</td>
<td>(0.0103)</td>
<td>0.4078</td>
<td>(0.0008)</td>
<td>0.1880</td>
</tr>
<tr>
<td>1994</td>
<td>0.0220</td>
<td>0.3733</td>
<td>(0.0158)</td>
<td>0.4817</td>
</tr>
<tr>
<td>1995</td>
<td>(0.0539)</td>
<td>0.1138</td>
<td>(0.0468)</td>
<td>0.1043</td>
</tr>
<tr>
<td>1996</td>
<td>(0.1891)</td>
<td>0.0011</td>
<td>(0.1395)</td>
<td>0.0002</td>
</tr>
<tr>
<td>1997</td>
<td>0.0293</td>
<td>0.3324</td>
<td>(0.0438)</td>
<td>0.2384</td>
</tr>
<tr>
<td>1998</td>
<td>0.3050</td>
<td>0.0610</td>
<td>0.1170</td>
<td>0.0801</td>
</tr>
<tr>
<td>1999</td>
<td>(0.2033)</td>
<td>0.0048</td>
<td>(0.0404)</td>
<td>0.0199</td>
</tr>
<tr>
<td>2000</td>
<td>(0.0886)</td>
<td>0.4523</td>
<td>(0.1062)</td>
<td>0.0255</td>
</tr>
<tr>
<td>2001</td>
<td>(0.0315)</td>
<td>0.3090</td>
<td>(0.0673)</td>
<td>0.0515</td>
</tr>
<tr>
<td>2002</td>
<td>0.2721</td>
<td>0.0062</td>
<td>0.1157</td>
<td>0.0278</td>
</tr>
</tbody>
</table>

Panel B: Mean and Median Annual Returns By Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>(0.0156)</td>
<td>0.2615</td>
<td>(0.0337)</td>
<td>0.0082</td>
</tr>
<tr>
<td>1989</td>
<td>0.0082</td>
<td>0.0000</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1990</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1991</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1992</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1993</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1994</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1995</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1996</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1997</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1998</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>1999</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>2000</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>2001</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
<tr>
<td>2002</td>
<td>0.0190</td>
<td>0.0190</td>
<td>0.0529</td>
<td>0.0195</td>
</tr>
</tbody>
</table>

Years Positive 10 12
Table 6 Continued

Panel C: Means and Medians of the Time Series of Annual Returns

<table>
<thead>
<tr>
<th>Hedge Return</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of the Time Series of Mean and Median Returns</td>
<td>0.0517</td>
<td>0.0220</td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.0579</td>
<td>0.1178</td>
</tr>
<tr>
<td>Median of the Time Series of Mean and Median Returns</td>
<td>0.0814</td>
<td>0.0273</td>
</tr>
<tr>
<td>( p )-value</td>
<td>0.0535</td>
<td>0.0603</td>
</tr>
</tbody>
</table>
In any event, the hedge portfolio analysis does reveal the anomaly is present. Now, I turn to the comparison of the strategy’s returns to EM and non-EM firms. For this analysis, I first compare the mean and median differences in the time series of annual abnormal returns to EM and non-EM firms. Second, to gain more power via a larger sample size I use pooled data over all years and test for differences in the means and medians of the two subsamples. The results of these analyses are presented in Table 7.

Panel A of Table 7 reports the mean and median differences in the time series of abnormal returns to EM and non-EM firms. Here, though the mean difference is negative, suggesting that the strategy is more effective for non-EM firms, the difference is not significant. Also, the median differences are positive, though again insignificant, suggesting that the negative average is driven by only a few years.

Panel B paints a different picture. Here, both the annual mean and median returns to the long position of EM firms (16.19% and 16.98%, respectively) are significantly positive, and they are significantly greater than the long position returns accruing to non-EM firms by a large margin (15.03% and 21.00%). Differences in returns arising from the short position are less severe, and only the difference in medians is significant. However, both the mean and median abnormal returns are higher for EM Firms. This lessens the difference in the overall hedge portfolio returns. However, the mean and median hedge returns of 13.76% and 13.58% for EM firms exceed the mean and median returns of non-EM firms by 8.72 and 10.99 percentage points respectively.

Thus the hedge portfolio analysis suggests that the anomaly is stronger for earnings management firms. Also worth comment is the difference in the average returns to EM firms between Panels A and B. The average negative return is driven by three extreme negative returns to the strategy in the most recent three years. As there are only 15 observations in the time series of returns, these observations have a substantial impact on the mean.

To summarize the findings relating to the accrual anomaly and earnings management firms identified by their incentives, the results are mixed. The regression analysis does not support the contention that the EM firms drive the anomaly. It, however, provides slight evidence that firms that manage down may contribute to the anomaly as the dummy variable for down firms is positive and significant. However, this
Table 7
Comparison of Hedge Portfolio Returns by Firm Type
EM versus Non EM Firms

This table compares the hedge portfolio returns of earnings management (EM) firms with those of non-earnings management (Non EM) firms. Panel A presents the means and medians of the time series for hedge portfolio returns for each firm type, along with the means and medians of the differences between the EM and Non EM time series. In this analysis, p-values reported result from t-tests and Wilcoxon signed rank tests of whether or not the means and medians differ from zero. Panel B presents comparisons of the returns from the long and short positions using pooled data. Here, significance tests of the difference in means and medians are conducted using two sample t-tests and two sample Wilcoxon tests, respectively. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are one-sided.

Panel A: Mean and Median Annual Returns and Differences Estimated Using the Time Series of Annual Returns

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM</td>
<td>(0.0222)</td>
<td>0.4490</td>
<td>0.1081</td>
<td>0.4452</td>
</tr>
<tr>
<td>Non EM</td>
<td>0.0498</td>
<td>0.0595</td>
<td>0.0820</td>
<td>0.0416</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean Difference</th>
<th>p-value</th>
<th>Mean Difference</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0.0720)</td>
<td>(0.0443)</td>
<td>0.3340</td>
<td>0.3860</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median Difference</th>
<th>p-value</th>
<th>Median Difference</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0093</td>
<td>0.4452</td>
<td>0.0501</td>
<td>0.2997</td>
</tr>
</tbody>
</table>

Panel B: Mean and Median Annual Returns and Differences Estimated Using Pooled Data

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM</td>
<td>0.1619</td>
<td>0.0289</td>
<td>0.1698</td>
<td>0.0144</td>
<td>0.0242</td>
<td>0.3920</td>
<td>0.0440</td>
<td>0.1224</td>
</tr>
<tr>
<td>Non EM</td>
<td>0.0116</td>
<td>0.3219</td>
<td>(0.0402)</td>
<td>0.0029</td>
<td>(0.0389)</td>
<td>0.0167</td>
<td>(0.0561)</td>
<td>0.0000</td>
</tr>
<tr>
<td>Difference</td>
<td>0.1503</td>
<td>0.0453</td>
<td>0.2100</td>
<td>0.0030</td>
<td>0.0631</td>
<td>0.2424</td>
<td>0.1001</td>
<td>0.0276</td>
</tr>
</tbody>
</table>
finding is weakened somewhat by the fact that the dummy variable for up firms is also positive and significant. Results from the hedge portfolio analysis, on the other hand, support the hypothesis that the anomaly is stronger for EM firms, particularly over the first two-thirds of the sample period. This is evidenced by mean and median hedge returns that are, respectively, 9 and 11 percentage points higher for EM firms. Also of particular interest, abnormal returns of 16% per year arise from the long position in EM firms. The conflicting results between the two analyses suggest that the relationship driving the anomaly is not linear.

The Accrual Anomaly and Earnings Management Behavior

One limitation of the previous analysis is the difficulty in identifying earnings management firms. In addition to the previously discussed problems with identifying firms with various earnings management incentives, another problem arises from segmenting firms based on their earnings management abilities. Specifically, the use of Execucomp to determine a firm’s ability precludes non-Execucomp firms from receiving the EM designation. As a result, the proportions of earnings management firms in all deciles, including the extreme deciles, are almost certainly too low, and the question as to whether or not extreme decile firms represent earnings management firms is still cloudy. Are the non-EM firms in the extreme deciles really non-EM firms or are they EM firms that could not be identified due to data limitations or unidentified motives. As this issue remains unresolved, in this analysis, I assume that discretionary accrual models do detect accruals that represent earnings management. Hence, all extreme decile firms are assumed to manage earnings, and these firms are segmented into categories on the basis of their behaviors, rather than their incentives. These categories, discussed in Chapter 4, are regular aggressiveness, regular conservatism, rare aggressiveness, rare conservatism, and earnings smoothing.

In this analysis, I suggest that, over time, the market is likely to detect earnings management patterns and is thus more likely to see through the earnings management of firms that regularly manage earnings. Thus, my primary hypothesis is that the accrual anomaly should be weaker for firms that regularly manage earnings, and stronger for
firms that only do so rarely. Once again, I use regression analysis and hedge portfolio analysis to test this hypothesis.

**Regression Analysis**

I begin my regression analysis based on earnings management behavior in the same way I began my earlier examination based on earnings management incentives: I establish that the anomaly exists in my sample as a whole. I again estimate equation 17, regressing annual stock returns on firm sizes, book-to-market ratios, and discretionary accruals. This regression is different from that of my earlier analysis in that the sample period is from 1993 to 2002. The shorter time period reflects the fact that five years of data are required to classify firms into the rare and regular categories. Panel A of Table 8 contains the results of this regression and reveals that the anomaly is present during the sample period. The coefficient on discretionary accruals is negative and significant at the 5% level. The larger p-value relative to that from my earlier analysis is likely due to the shorter time series of coefficients.

Having established that the anomaly is once again present, I estimate regression equations 22-29 from Chapter 4 to determine if the anomaly differs with earnings management behavior. Panel B presents the results from the estimation of equation 22. In addition to the variables in equation 17, this equation includes a dummy variable that is set to 1 for earnings management firms (in this case all extreme decile firms) and an interaction term constructed by multiplying the earnings management dummy variable by the discretionary accrual variable.

As with the regressions in the previous section, the coefficient for the dummy variable will reflect the general impact of being an earnings management firm on returns and the coefficient for the interaction term will reflect whether or not the coefficient for the discretionary accrual variable is more or less negative for extreme decile firms. Here, the expectation for the earnings management dummy variable is unknown as it reflects both high and low accrual firms, but separate dummy variables representing the high and low accrual deciles are used in later equations to determine their impacts separately. For equation 22, however, a negative coefficient on the interaction term would indicate the
Table 8
The Impact of Earnings Management Behaviors on the Accrual Anomaly
Cross-Sectional Regression Analysis

This table contains the mean and median coefficients from annual cross-sectional regressions from 1993 through 2002. P-values reported result from t-tests and Wilcoxon signed rank tests of whether or not the mean and median coefficients differ from zero. In Panel A, the dependent variable is one-year buy-and-hold stock returns and the independent variables are the natural log of size (Size), the natural log of the book-to-market ratio (BTM), and discretionary accruals scaled by total assets (DA). The results in Panels B through E come from similar regressions that also include dummy variables and interaction terms to determine if various earnings management behaviors strengthen the accrual anomaly. In this analysis the dummy variables Reg Dum, Rare Dum, and Smooth Dum are set to one when firms are classified as regular managers, rare managers, and smoothers, respectively. EM Dum is a dummy variable that is set to one when any of the first three dummy variables are set to one. Reg EM Int, Rare EM Int, Smooth Int, and EM Int are set to one when any of the first three dummy variables are set to one. Reg EM Int, Rare EM Int, Smooth Int, and EM Int are set to one when any of the first three dummy variables are set to one. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are one-sided.

Panel A: Do Discretionary Accruals Explain Stock Returns

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coefficient</td>
<td>0.3207</td>
<td>0.0189</td>
<td>0.0451</td>
<td>0.1149</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0512</td>
<td>0.1851</td>
<td>0.0980</td>
<td>0.0499</td>
</tr>
<tr>
<td>Median Coefficient</td>
<td>0.1518</td>
<td>0.0007</td>
<td>0.0850</td>
<td>0.0553</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0801</td>
<td>0.4229</td>
<td>0.0801</td>
<td>0.0654</td>
</tr>
</tbody>
</table>

Panel B: Is the Accrual Anomaly Stronger EM Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>EM Dum</th>
<th>EM Int</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coefficient</td>
<td>0.3277</td>
<td>0.0199</td>
<td>0.0420</td>
<td>0.1970</td>
<td>0.0247</td>
<td>0.1097</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0371</td>
<td>0.1525</td>
<td>0.0990</td>
<td>0.0503</td>
<td>0.2942</td>
<td>0.1747</td>
</tr>
<tr>
<td>Median Coefficient</td>
<td>0.1853</td>
<td>0.0045</td>
<td>0.0839</td>
<td>0.1776</td>
<td>0.0629</td>
<td>0.0665</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0322</td>
<td>0.3125</td>
<td>0.0801</td>
<td>0.0527</td>
<td>0.1875</td>
<td>0.2158</td>
</tr>
</tbody>
</table>

Panel C: Is the Accrual Anomaly Stronger for Regular EM Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Reg EM Dum</th>
<th>Reg EM Int</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coefficient</td>
<td>0.3215</td>
<td>0.0190</td>
<td>0.0450</td>
<td>0.1084</td>
<td>0.0121</td>
<td>0.0255</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0509</td>
<td>0.1842</td>
<td>0.0989</td>
<td>0.0916</td>
<td>0.1776</td>
<td>0.3975</td>
</tr>
<tr>
<td>Median Coefficient</td>
<td>0.1550</td>
<td>0.0003</td>
<td>0.0848</td>
<td>0.0307</td>
<td>0.0134</td>
<td>0.1278</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0801</td>
<td>0.4229</td>
<td>0.0801</td>
<td>0.1162</td>
<td>0.2158</td>
<td>0.1611</td>
</tr>
</tbody>
</table>

Panel D: Is the Accrual Anomaly Stronger for Rare EM Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Rare EM Dum</th>
<th>Rare EM Int</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Coefficient</td>
<td>0.3263</td>
<td>0.0199</td>
<td>0.0421</td>
<td>0.1666</td>
<td>0.0238</td>
<td>0.0986</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0377</td>
<td>0.1508</td>
<td>0.0958</td>
<td>0.0206</td>
<td>0.3469</td>
<td>0.2048</td>
</tr>
<tr>
<td>Median Coefficient</td>
<td>0.1799</td>
<td>0.0040</td>
<td>0.0839</td>
<td>0.1797</td>
<td>0.0881</td>
<td>0.1582</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0420</td>
<td>0.3125</td>
<td>0.0801</td>
<td>0.0186</td>
<td>0.1875</td>
<td>0.2158</td>
</tr>
</tbody>
</table>
### Table 8 Continued

#### Panel E: Is the Accrual Anomaly Stronger for Smoothing Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Smooth Dum</th>
<th>Smooth Int</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Coefficient</strong></td>
<td>0.3229</td>
<td>(0.0190)</td>
<td>0.0454</td>
<td>(0.1095)</td>
<td>(0.0635)</td>
<td>(0.0285)</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0511</td>
<td>0.1841</td>
<td>0.0963</td>
<td>0.0671</td>
<td>0.0507</td>
<td>0.3823</td>
</tr>
<tr>
<td><strong>Median Coefficient</strong></td>
<td>0.1535</td>
<td>0.0006</td>
<td>0.0852</td>
<td>(0.0304)</td>
<td>(0.0309)</td>
<td>(0.0702)</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0801</td>
<td>0.4229</td>
<td>0.0801</td>
<td>0.1162</td>
<td>0.0654</td>
<td>0.4229</td>
</tr>
</tbody>
</table>

#### Panel F: Is the Accrual Anomaly Stronger for Regular Aggressive Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Reg Agg Dum</th>
<th>Reg Agg Int</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Coefficient</strong></td>
<td>0.3206</td>
<td>(0.0189)</td>
<td>0.0450</td>
<td>(0.1205)</td>
<td>(0.1634)</td>
<td>0.6723</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0505</td>
<td>0.1838</td>
<td>0.0981</td>
<td>0.0607</td>
<td>0.1622</td>
<td>0.1786</td>
</tr>
<tr>
<td><strong>Median Coefficient</strong></td>
<td>0.1518</td>
<td>0.0005</td>
<td>0.0855</td>
<td>(0.0500)</td>
<td>(0.1100)</td>
<td>0.4763</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0801</td>
<td>0.4229</td>
<td>0.0801</td>
<td>0.0967</td>
<td>0.2158</td>
<td>0.1875</td>
</tr>
</tbody>
</table>

#### Panel G: Is the Accrual Anomaly Stronger for Regular Conservative Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Reg Cons Dum</th>
<th>Reg Cons Int</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Coefficient</strong></td>
<td>0.3194</td>
<td>(0.0188)</td>
<td>0.0453</td>
<td>(0.1084)</td>
<td>0.3341</td>
<td>1.0668</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0512</td>
<td>0.1856</td>
<td>0.0975</td>
<td>0.0565</td>
<td>0.0007</td>
<td>0.0013</td>
</tr>
<tr>
<td><strong>Median Coefficient</strong></td>
<td>0.1536</td>
<td>0.0006</td>
<td>0.0856</td>
<td>(0.0634)</td>
<td>0.2080</td>
<td>1.0185</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0801</td>
<td>0.4229</td>
<td>0.0654</td>
<td>0.0527</td>
<td>0.0010</td>
<td>0.0020</td>
</tr>
</tbody>
</table>

#### Panel H: Is the Accrual Anomaly Stronger for Rare Aggressive Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Rare Agg Dum</th>
<th>Rare Agg Int</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Coefficient</strong></td>
<td>0.3214</td>
<td>(0.0193)</td>
<td>0.0431</td>
<td>(0.0799)</td>
<td>0.0408</td>
<td>(0.2093)</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0437</td>
<td>0.1669</td>
<td>0.0994</td>
<td>0.2745</td>
<td>0.2023</td>
<td>0.2192</td>
</tr>
<tr>
<td><strong>Median Coefficient</strong></td>
<td>0.1670</td>
<td>(0.0022)</td>
<td>0.0877</td>
<td>0.1174</td>
<td>0.0232</td>
<td>(0.2525)</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0527</td>
<td>0.3848</td>
<td>0.0801</td>
<td>0.3477</td>
<td>0.3477</td>
<td>0.1377</td>
</tr>
</tbody>
</table>

#### Panel I: Is the Accrual Anomaly Stronger For Rare Conservative Firms

<table>
<thead>
<tr>
<th></th>
<th>Intercept</th>
<th>Size</th>
<th>BTM</th>
<th>DA</th>
<th>Rare Cons Dum</th>
<th>Rare Cons Int</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Coefficient</strong></td>
<td>0.3272</td>
<td>(0.0199)</td>
<td>0.0418</td>
<td>(0.1778)</td>
<td>(0.0229)</td>
<td>0.1318</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td>0.0404</td>
<td>0.1557</td>
<td>0.0972</td>
<td><strong>0.0176</strong></td>
<td>0.2892</td>
<td>0.3674</td>
</tr>
<tr>
<td><strong>Median Coefficient</strong></td>
<td>0.1740</td>
<td>(0.0032)</td>
<td>0.0848</td>
<td>(0.1772)</td>
<td>(0.0066)</td>
<td>0.4573</td>
</tr>
<tr>
<td><strong>p-value</strong></td>
<td><strong>0.0420</strong></td>
<td>0.3125</td>
<td><strong>0.0801</strong></td>
<td><strong>0.0186</strong></td>
<td>0.3125</td>
<td>0.2158</td>
</tr>
</tbody>
</table>
anomaly is stronger for extreme decile (earnings management) firms. Panel B reveals the opposite outcome. The coefficient on the interaction term is positive, but not significant. Thus the accrual anomaly is not stronger for extreme decile firms in general.

Next I seek to determine if the anomaly is weaker for firms that manage earnings regularly or stronger for firms that manage rarely. Regular earnings management firms include those in the smoothers, regular aggressiveness, and regular conservatism categories. For this analysis, I use equation 23. Equation 23 is similar to equation 22, but here dummy variable and interaction term represent only regular earnings management firms. The results from equation 23 are presented in Panel C; the coefficient on the interaction term is negative though not significant.

Panel D presents the results from equation 24. Equation 24 is analogous to equation 23, but the regular earnings management dummy variable and interaction term are replaced with their rare counterparts. The results reveal a positive (though insignificant) coefficient for interaction term. This is the opposite of what is expected. If anything the positive coefficient for rare firms and the negative coefficient for regular firms suggest the anomaly is stronger for regular EM firms.

The final five equations estimated in this analysis (equations 24-29) are similar to the two previous regression equations, but, in these, the dummy variables and interaction terms represent each of the five EM categories separately. As above, in each of these regressions, the interaction term coefficient is expected to be negative. Here, as noted above, the sign of the coefficient for the dummy variable may also be predicted for four of the five equations. It is expected to be positive for the each conservative category, and negative for each aggressive category. From these analyses, significant results arise in only one panel, Panel G.

Panel G presents the results where the dummy variable and interaction term represent firms in the regular conservatism category. Here the coefficient on the interaction term is positive and significant, which is the opposite of what is expected. However, the coefficient on the dummy variable is also positive, as expected, and

57 Significant results are found in only Panel G. While the coefficients on the smoother dummy variable in Panel E appear to be significant at the 10% level, this is misleading. The p-values reflect a one-sided test, however, as no sign is predicted for this coefficient a two-side p-value is appropriate, and reported p-values should be multiplied by two.
significant. Further examination reveals that the positive interaction term coefficient is more than offset by the impact of the positive dummy variable coefficient. As a result, the total average returns to regular conservative firms are approximately ten percentage points higher than those to other firms.

Overall, the results of this analysis provide little support for the hypothesis that the anomaly is stronger for earnings management firms, in general, or that the anomaly is particularly strong in rare earnings management firms and less strong in regular earnings management firms. Of interest, however are the results in Panel G. Although the coefficient on the interaction term is positive, more than offsetting the negative coefficient on discretionary accruals, the resulting negative impact on returns is more than offset by the positive coefficient on the dummy variable. As a result, regular conservative firms have average one-year returns that are approximately ten percentage points higher than those of other firms.

**Hedge Portfolio Analysis**

I use hedge portfolio analysis as a second method in examining the impact of earnings management behavior on the accrual anomaly. Here, I utilize the same strategy as before. The strategy involves shorting the stock of firms in the highest accrual decile and purchasing that of firms in the lowest accrual decile. I begin by examining the hedge portfolio returns obtained using all sample firms, and proceed to compare the returns accruing to the different behavior subsamples.

The abnormal returns to the strategy utilizing all sample firms are presented in Table 9. This table is identical to Table 6, except it covers the shorter 1993 to 2002 sample period. The period is shorter because 5 years of data are required to classify firms into the rare and regular categories. Using the shorter time period greatly reduces the strength of the accrual anomaly. Using pooled data the mean annual return to the hedge portfolio is only 4.21%, and most of the return comes from the short position which is significant only at the 10% level. The average return to the strategy is positive in only five of the ten years examined, and the average annual return is only 3.81% and not significantly different from zero. These weaker results are expected, however, given that
Table 9

Abnormal Returns to Hedge Portfolios - Behavior Analysis Period

This table contains the abnormal returns to a zero-investment trading strategy that is long firms in the lowest accrual decile and short firms in the highest accrual decile. Abnormal returns are relative to firms matched on size, book-to-market ratio, and fiscal year end. Panel A contains the mean and median returns to this strategy calculated using pooled data for the 1993-2002 period. P-values in Panel A result from two-sample t-tests and two-sample Wilcoxon tests. Panel B contains the mean and median returns to this strategy for each year from 1993 through 2002. Panel C contains the means and medians of the time series of mean and median annual hedge returns. P-values in Panels B and C result from standard t-tests and Wilcoxon signed rank tests. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All p-values are one-sided.

Panel A: Mean and Median Annual Returns, 1993-2002 Pooled

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
<th>Hedge Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>0.0094</td>
<td>0.3748</td>
<td>(0.0361)</td>
<td>0.0061</td>
<td>0.0783</td>
<td>0.0534</td>
<td>0.0001</td>
<td>(0.0421)</td>
<td>0.0173</td>
</tr>
</tbody>
</table>

Panel B: Mean and Median Returns By Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
<th>Hedge Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>0.0103</td>
<td>0.4078</td>
<td>(0.0008)</td>
<td>0.1880</td>
<td>(0.0640)</td>
<td>0.0574</td>
<td>(0.0915)</td>
<td>0.0662</td>
<td>(0.0537)</td>
</tr>
<tr>
<td>1994</td>
<td>0.0220</td>
<td>0.3733</td>
<td>(0.0158)</td>
<td>0.4817</td>
<td>(0.0975)</td>
<td>0.3627</td>
<td>(0.0967)</td>
<td>0.0392</td>
<td>(0.0540)</td>
</tr>
<tr>
<td>1995</td>
<td>0.0539</td>
<td>0.1138</td>
<td>(0.0468)</td>
<td>0.1043</td>
<td>(0.1781)</td>
<td>0.0000</td>
<td>(0.1389)</td>
<td>0.0000</td>
<td>(0.0921)</td>
</tr>
<tr>
<td>1996</td>
<td>0.1891</td>
<td>0.0011</td>
<td>(0.1395)</td>
<td>0.0002</td>
<td>0.0110</td>
<td>0.4086</td>
<td>0.0208</td>
<td>0.1923</td>
<td>(0.2001)</td>
</tr>
<tr>
<td>1997</td>
<td>0.0293</td>
<td>0.3324</td>
<td>(0.0438)</td>
<td>0.2384</td>
<td>(0.1082)</td>
<td>0.0153</td>
<td>(0.1111)</td>
<td>0.0003</td>
<td>(0.1374)</td>
</tr>
<tr>
<td>1998</td>
<td>0.3050</td>
<td>0.0610</td>
<td>0.1170</td>
<td>0.0801</td>
<td>(0.0093)</td>
<td>0.4689</td>
<td>0.0027</td>
<td>0.4947</td>
<td>0.3142</td>
</tr>
<tr>
<td>1999</td>
<td>0.2033</td>
<td>0.0048</td>
<td>(0.0404)</td>
<td>0.0199</td>
<td>(0.0890)</td>
<td>0.0473</td>
<td>(0.0677)</td>
<td>0.0117</td>
<td>(0.1142)</td>
</tr>
<tr>
<td>2000</td>
<td>0.0086</td>
<td>0.4523</td>
<td>(0.1062)</td>
<td>0.0255</td>
<td>0.0225</td>
<td>0.3621</td>
<td>(0.0561)</td>
<td>0.4155</td>
<td>(0.0311)</td>
</tr>
<tr>
<td>2001</td>
<td>0.0315</td>
<td>0.3909</td>
<td>(0.0673)</td>
<td>0.0515</td>
<td>0.0209</td>
<td>0.2861</td>
<td>(0.0138)</td>
<td>0.3931</td>
<td>(0.0106)</td>
</tr>
<tr>
<td>2002</td>
<td>0.2721</td>
<td>0.0244</td>
<td>0.1157</td>
<td>0.0278</td>
<td>0.2845</td>
<td>0.0244</td>
<td>0.0681</td>
<td>0.0526</td>
<td>(0.0124)</td>
</tr>
</tbody>
</table>

Years Positive

5  7

Panel C: Means and Medians of the Time Series of Annual Returns

<table>
<thead>
<tr>
<th>Hedge Return</th>
<th>Mean Return</th>
<th>Median Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of the Time Series of Mean and Median Returns</td>
<td>0.0381</td>
<td>0.0229</td>
</tr>
<tr>
<td>p-value</td>
<td>0.2145</td>
<td>0.2095</td>
</tr>
<tr>
<td>Median of the Time Series of Mean and Median Returns</td>
<td>0.0215</td>
<td>0.0508</td>
</tr>
<tr>
<td>p-value</td>
<td>0.2461</td>
<td>0.1611</td>
</tr>
</tbody>
</table>
the recent weak years discussed earlier are given more weight here, and five strong years are lost.

The results of the hedge return comparisons based on behavior are presented in Tables 10 through 12. Once again, the primary hypothesis in this analysis is that the returns will be stronger for rare earnings management firms or weaker for regular earnings management firms. Table 10 presents the results of this analysis. Panel A reports the mean and median annual differences in the time series of abnormal returns to rare earnings management and regular earnings management firms, while Panel B presents the mean and median returns and the differences by position based on pooled data. Both panels show that the hedge portfolio returns are approximately 12 percentage points higher for regular earnings management firms and essentially non-existent in the rare earnings management subsample.

As smoothing behavior may be treated differently than other regular earnings management, I continue my analysis by comparing the returns to smoothers with those to other regular earnings management firms. The results of this comparison are presented in Table 11. Panel A shows that the average return to smoothers is over 14% and significant, while the average return to other regular earnings managers is 5.8% and not significantly different from zero. Though the difference of 8.26% is not significant, this is likely due to the short (10 observation) time period. Panel B also provides some interesting information. The hedge portfolio results from the pooled sample are once again similar to those from the annual time series. However the pooled data also reveals that the returns to the smoother subsample come almost entirely from the short position and that the returns to short position are significantly greater for the smoothers. Interestingly, the returns to the regular earnings management subsample come primarily from a long position return of 5.11%, though this is not significantly different from zero.

The results above suggest that the smoothing subsample drove the difference reported in Table 9. To examine this further, I compare smoothers with all non-smoothers. The results, presented in Table 12, are along the lines of those in Table 11. The smoothers have significantly higher hedge returns, but these come almost entirely from the short position.
### Table 10
Comparison of Hedge Portfolio Returns by Earnings Management Behavior
Rare versus Regular Earnings Management

This table compares the hedge portfolio returns of rare earnings managers with those regular earnings managers (including smoothers). Panel A presents the means and medians of the time series for hedge portfolio returns for each firm type, along with the means and medians of the differences between the EM and Non EM time series. In this analysis, p-values reported result from t-tests and Wilcoxon signed rank tests of whether or not the means and medians differ from zero. Panel B presents comparisons of the returns from the long and short positions using pooled data. Here, significance tests of the difference in means and medians are conducted using two sample t-tests and two sample Wilcoxon tests, respectively. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are one-sided.

#### Panel A: Mean and Median Annual Returns and Differences Estimated Using the Time Series of Annual Returns

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare EM</td>
<td>(0.0001)</td>
<td>0.4992</td>
<td>0.0084</td>
<td>0.3848</td>
</tr>
<tr>
<td>Regular EM</td>
<td>0.1246</td>
<td>0.0177</td>
<td>0.1382</td>
<td>0.0322</td>
</tr>
<tr>
<td>Mean Difference</td>
<td>(0.1247)</td>
<td>0.0266</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Difference</td>
<td>(0.1471)</td>
<td>0.0322</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Panel B: Mean and Median Annual Returns and Differences Estimated Using Pooled Data

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Long Position</th>
<th>Short Position</th>
<th>Hedge Return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Return</td>
<td>p-value</td>
<td>Median Return</td>
</tr>
<tr>
<td>Rare EM</td>
<td>0.0018</td>
<td>0.4798</td>
<td>(0.0542)</td>
</tr>
<tr>
<td>Regular EM</td>
<td>0.0306</td>
<td>0.2600</td>
<td>0.0073</td>
</tr>
<tr>
<td>Difference</td>
<td>(0.0287)</td>
<td>0.3150</td>
<td>(0.0615)</td>
</tr>
</tbody>
</table>

(Rare - Regular)
Table 11
Comparison of Hedge Portfolio Returns by Earnings Management Behavior
Smoothers versus Regular Earnings Management

This table compares the hedge portfolio returns of smoothers with those regular earnings managers. Panel A presents the means and medians of the time series for hedge portfolio returns for each firm type, along with the means and medians of the differences between the EM and Non EM time series. In this analysis, p-values reported result from t-tests and Wilcoxon signed rank tests of whether or not the means and medians differ from zero. Panel B presents comparisons of the returns from the long and short positions using pooled data. Here, significance tests of the difference in means and medians are conducted using two sample t-tests and two sample Wilcoxon tests, respectively. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are one-sided.

Panel A: Mean and Median Annual Returns and Differences Estimated Using the Time Series of Annual Returns

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoother</td>
<td>0.1410</td>
<td>0.0085</td>
<td>0.0770</td>
<td>0.1639</td>
</tr>
<tr>
<td>Regular EM</td>
<td>0.0584</td>
<td>0.2886</td>
<td>0.0003</td>
<td>0.4981</td>
</tr>
<tr>
<td>Mean Difference</td>
<td>0.0826</td>
<td>(0.0768)</td>
<td>0.2706</td>
<td>0.4690</td>
</tr>
<tr>
<td>Median Difference</td>
<td>0.0086</td>
<td>(0.0229)</td>
<td>0.2465</td>
<td>0.3848</td>
</tr>
</tbody>
</table>

Panel B: Mean and Median Annual Returns and Differences Estimated Using Pooled Data

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoother</td>
<td>0.0115</td>
<td>0.4061</td>
<td>0.0405</td>
<td>0.1851</td>
<td>(0.1310)</td>
<td>0.0065</td>
<td>(0.0491)</td>
<td>0.0290</td>
<td>0.1425</td>
<td>0.0896</td>
</tr>
<tr>
<td>Regular EM</td>
<td>0.0511</td>
<td>0.2714</td>
<td>(0.0137)</td>
<td>0.3072</td>
<td>(0.0170)</td>
<td>0.2567</td>
<td>(0.0535)</td>
<td>0.0006</td>
<td>0.0681</td>
<td>0.0398</td>
</tr>
<tr>
<td>Difference</td>
<td>(0.0396)</td>
<td>0.3410</td>
<td>0.0542</td>
<td>0.4272</td>
<td>(0.1140)</td>
<td>0.0255</td>
<td>0.0045</td>
<td>0.3560</td>
<td>0.0744</td>
<td>0.0498</td>
</tr>
</tbody>
</table>
Table 12
Comparison of Hedge Portfolio Returns by Earnings Management Behavior
Smoothers versus Non-Smoothers

This table compares the hedge portfolio returns of smoothing firms (Smoothers) with those non-smoothers. Panel A presents the means and medians of the time series for hedge portfolio returns for each firm type, along with the means and medians of the differences between the EM and Non EM time series. In this analysis, p-values reported result from t-tests and Wilcoxon signed rank tests of whether or not the means and medians differ from zero. Panel B presents comparisons of the returns from the long and short positions using pooled data. Here, significance tests of the difference in means and medians are conducted using two sample t-tests and two sample Wilcoxon tests, respectively. P-values highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. All tests are one-sided.

Panel A: Mean and Median Annual Returns and Differences Estimated Using the Time Series of Annual Returns

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Mean Return</th>
<th>p-value</th>
<th>Median Return</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Smoothers</td>
<td>0.0187</td>
<td>0.3532</td>
<td>0.0129</td>
<td>0.3848</td>
</tr>
<tr>
<td>Smoothers</td>
<td>0.1410</td>
<td>0.0085</td>
<td>0.1173</td>
<td>0.0029</td>
</tr>
<tr>
<td>Mean Difference</td>
<td>(0.1223)</td>
<td>(0.0642)</td>
<td>0.0060</td>
<td>0.2147</td>
</tr>
<tr>
<td>Median Difference</td>
<td>(0.0944)</td>
<td>(0.0873)</td>
<td>0.0049</td>
<td>0.2461</td>
</tr>
</tbody>
</table>

Panel B: Mean and Median Annual Returns and Differences Estimated Using Pooled Data

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Long Position</th>
<th>Short Position</th>
<th>Hedge Return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Return</td>
<td>p-value</td>
<td>Median Return</td>
</tr>
<tr>
<td>Non-Smoothers</td>
<td>0.0090</td>
<td>0.3924</td>
<td>(0.0495)</td>
</tr>
<tr>
<td>Smoothers</td>
<td>0.0115</td>
<td>0.4061</td>
<td>0.0405</td>
</tr>
<tr>
<td>Difference</td>
<td>(0.0024)</td>
<td>0.4836</td>
<td>(0.0900)</td>
</tr>
</tbody>
</table>

(Non-Smoothers - Smoothers)
Overall, the results from the hedge portfolio analysis provide no support for the hypothesis that the anomaly is weaker in firms that manage regularly. In fact, they suggest the opposite, that the anomaly is stronger in these firms. Interestingly, this finding is driven by smoothers and comes almost entirely from the short position. Also of note are the positive abnormal returns (5.11%) to long position of regular earnings management firms. Though not significant, these returns are consistent with the regression analysis results that suggest being a regular conservative firm adds approximately 10% to the returns of these firms. The differences in magnitude and significance are likely due to the difference in the ways abnormal returns are calculated.

The Reversal of Announcement Date Overreaction

If a low accrual firm manages downwards to report lower earnings, the market might react negatively when earnings are announced. Similarly the market may react positively to the earnings announcement of a firm that has managed upwards to report higher earnings. In each case, over time, the market may gain a better understanding of the firm’s true earnings situation and reverse its initial actions. This is the final question I address in this dissertation. I examine the possibility that the market overreacts to the earnings announcements of earnings management firms and the accrual anomaly represents the reversal of this initial overreaction.

My analysis begins with an event study of the market response to the earnings announcements of earnings management firms segmented by accrual deciles. For this analysis, I assume all extreme decile firms are earnings management firms.\footnote{My primary analysis uses all extreme decile firms rather than only EM firms, those identified as having the ability and an incentive to manage earnings. For robustness, I also conduct this analysis using only EM firms. The results from the two analyses do not materially differ. Only the results obtained using the sample of all extreme decile firms are presented.} Firms in decile nine are assumed to manage earnings upwards, while firms in decile zero are assumed to manage earnings downwards. I estimate their abnormal returns on the announcement date and for the three day window centered on the announcement date.\footnote{As discussed in Chapter 4, abnormal returns are estimated using the market model. Market model parameters are estimate over the 120 day period beginning 160 days prior to the event date.} The three-day window is used to allow for any information leakage on the day prior to
the earnings announcement, and to allow for any reaction that may come the next day if earnings are announced after the market is closed. Figure 2 plots the cumulative abnormal returns (CARs) for each decile. The plot suggests that abnormal returns do occur around the announcement dates of these firms, beginning several days before. Based on this, I add the 21-day window centered on the announcement date to my analysis. The plot also reveals that abnormal returns tend to be positive prior to the announcement date and negative after the announcement date for both deciles.

The results from the event study analysis are presented in Panel A of Table 13. Panel A presents the abnormal returns for each event window analyzed, along with their associated test statistics.\footnote{Four test statistics are used in this analysis: t-sign is the test statistic from a sign test; t is the test from a standard t-test; t-patell is the test statistic from Patell’s (1976) t-test; and t-bmp is the test statistic from the Boehmer, Musumeci, and Poulsen (1991) t-test.} It shows that announcement date returns to firms in the low accrual decile are on average negative, as expected, but the magnitude of the returns is so small that only the sign test is significant, indicating only that significantly more than half of low decile firms have negative returns. The average abnormal return to the high accrual decile is positive, also as expected, and is significant under all three t-tests. Here again, however, the magnitude of abnormal returns is small. The abnormal returns of -.09% and .27 % for the low and high accrual deciles are so small that their reversals could not explain the returns to the accrual anomaly. Panel B reveals that this is indeed the case.

Panel B presents the results of the regression of the one-year buy-and-hold abnormal returns resulting from the accrual anomaly on the short-term (announcement date or announcement window) returns from the event study analysis. If the short-term returns explain the long-run returns the coefficients for the short-term return variables should be negative and significant. The first row reveals that the coefficient for the announcement date returns is positive and significant at the 10% level with a minuscule r-squared. Thus the hypothesis long-run abnormal returns represent a reversal of announcement date returns is not supported.

The results obtained using the three day and twenty-one day announcement windows also fail to support the reversal hypothesis. For the three-day window, once again, the firms in the low decile on average generated negative abnormal returns. Their
Figure 2: Plot of the average cumulative abnormal returns to extreme decile firms over the 21 day window centered on earnings announcement dates. Low accrual firms are those firms in the lowest discretionary accrual decile, and high accrual firms are those in the highest discretionary accrual decile.
Table 13
Announcement Date Overreaction and Long Run Reversal Analysis

This table presents the results from the overreaction/reversal analysis. Panel A contains the earnings announcement date abnormal returns for firms in the low accrual and high accrual deciles, as well as the cumulative abnormal returns over three day and twenty-one day event windows for these same firms. Four significance tests accompany these results: a sign test (t-sign), a t-test (t), the Patell (1976) t-test (t-patell), and the Boehmer, Musumeci, and Poulsen (1991) t-test (t-bmp). Panel B contains the regression coefficients from a regression of one-year buy-and-hold abnormal returns on announcement window cumulative abnormal returns. The associated p-values are also presented. P-values and test statistics highlighted by bold-italics, bold, or italics indicate significance at the 1%, 5%, and 10% levels, respectively. Reported p-values are for two-tailed tests.

Panel A: Event Study Results

<table>
<thead>
<tr>
<th>Announcement Date</th>
<th>Abnormal Percent</th>
<th>Percent Positive</th>
<th>t-sign</th>
<th>t</th>
<th>t-patell</th>
<th>t-bmp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Decile</td>
<td>Returns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low Decile</td>
<td>(0.0009)</td>
<td>0.4799</td>
<td>(2.5057)</td>
<td>0.6554</td>
<td>0.7267</td>
</tr>
<tr>
<td></td>
<td>High Decile</td>
<td>0.0027</td>
<td>0.4940</td>
<td>(0.7921)</td>
<td>2.2740</td>
<td>3.2188</td>
</tr>
<tr>
<td>Three Day Window</td>
<td>Low Decile</td>
<td>(0.0018)</td>
<td>0.4830</td>
<td>(2.1202)</td>
<td>(0.8620)</td>
<td>1.3214</td>
</tr>
<tr>
<td></td>
<td>High Decile</td>
<td>0.0018</td>
<td>0.4833</td>
<td>(2.1934)</td>
<td>0.9833</td>
<td>1.2386</td>
</tr>
<tr>
<td>Twenty-one Day Window</td>
<td>Low Decile</td>
<td>0.0079</td>
<td>0.5023</td>
<td>0.2891</td>
<td>1.8420</td>
<td>5.0080</td>
</tr>
<tr>
<td></td>
<td>High Decile</td>
<td>0.0026</td>
<td>0.4773</td>
<td>(2.9855)</td>
<td>0.6902</td>
<td>1.3627</td>
</tr>
</tbody>
</table>

Panel B: Overreaction/Reversal Analysis

<table>
<thead>
<tr>
<th>Announcement Window AR</th>
<th>Announcement Date</th>
<th>Intercept</th>
<th>Coefficient</th>
<th>R-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-value</td>
<td></td>
<td>0.0034</td>
<td>0.3543</td>
<td>0.0004</td>
</tr>
<tr>
<td></td>
<td>0.8336</td>
<td>0.0701</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three Day Window</td>
<td>p-value</td>
<td>0.0037</td>
<td>0.1966</td>
<td>0.0003</td>
</tr>
<tr>
<td></td>
<td>0.8175</td>
<td>0.1258</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twenty-one Day Window</td>
<td>p-value</td>
<td>0.0016</td>
<td>0.2307</td>
<td>0.0010</td>
</tr>
<tr>
<td></td>
<td>0.9209</td>
<td>0.0046</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
magnitude, however, is small and only the sign test suggests this result is significant. On average firms in the high decile have positive abnormal returns, but the mean is not significantly different from zero. Regression analysis using the three day window produces a positive but insignificant coefficient for the announcement window returns.

The use of a twenty-one day window produces even stronger results against the reversal hypothesis. Here, the announcement window coefficient for both firms is positive, but it is only significant for the low accrual decile. The coefficient for announcement window returns in the regression announcement is positive and significant at the 1% level, suggesting drift rather than reversal.

Thus, there is no evidence that the accrual anomaly results from the reversal of an overreaction to the earnings announcements of earnings management firms. Despite the lack of support for the reversal hypothesis, some interesting results arise from this analysis. First, I find it is interesting that over the twenty-one day window, significant positive abnormal returns accrue to the low accrual decile, but not the high accrual decile. Based on this finding and the appearance of what could be the beginning of an upward trend for the low accrual decile in figure 2, I estimate the cumulative abnormal returns for the two deciles over 61 day and 121 day windows centered on their announcement dates, and find an even more interesting result. Over the 121 day window significant CARs of 11.7% accrue to low decile firms. The CARs for the 61-day and 121-day windows are shown in Figures 3 and 4, respectively. Both figures show strong positive CARS over the windows for low accrual firms with much weaker insignificant CARS for the high accrual firms. This suggests researchers should begin calculating long-run abnormal returns immediately following the announcement date, rather than waiting until 4 months after the fiscal year end. Although some firms would be lost, the percentage of firms lost would be relatively small. In this case, 74% of extreme decile firms had an announcement date in either Compustat or IBES.
Figure 3: Plot of the average cumulative abnormal returns to extreme decile firms over the 61 day window centered on earnings announcement dates. Low accrual firms are those firms in the lowest discretionary accrual decile, and high accrual firms are those in the highest discretionary accrual decile.
Figure 4: Plot of the average cumulative abnormal returns to extreme decile firms over the 121 day window centered on earnings announcement dates. Low accrual firms are those firms in the lowest discretionary accrual decile, and high accrual firms are those in the highest discretionary accrual decile.
CHAPTER 6

CONCLUSIONS AND AREAS FOR FUTURE RESEARCH

Introduction

The primary purpose of this dissertation is to examine earnings management as it relates to the accrual anomaly. In choosing this topic, I was motivated by three areas of financial research: market efficiency, earnings management, and the accrual anomaly. The accrual anomaly, first documented by Sloan (1996), is the finding that accruals can be used to predict future stock returns. Like other anomalies, this one challenges the notion of market efficiency by suggesting abnormal returns can be made from a trading strategy based on publicly available information. This anomaly, however, is of particular interest as it stands up to many of the challenges put forth by the efficient markets camp.

In this dissertation, I focus on three primary research questions relating to discretionary accruals, earnings management, and the accrual anomaly. First, I address the question as to whether or not accrual decomposition models can, in actuality, be used to identify earnings management firms in the general population of firms. Second, I address the question as to whether or not earnings management firms drive the accrual anomaly. Third, I address the question as to whether or not the accrual anomaly results from a reversal of an overreaction to the earnings announcements of earnings management firms. I examine several hypotheses relating to these questions. I summarize my findings and draw conclusions regarding these analyses in the sections that follow.
Do Accrual Decomposition Models Identify Earnings Management Firms?

To examine the first research question, relating to the effectiveness of accrual decomposition models, I compare the proportions of EM firms across discretionary accrual deciles. Several interesting findings arise. First, I find that the KS, E-J, and KLW Jones models all have some success in classifying earnings management firms into appropriate deciles. Each of these models places significantly higher proportions of up firms in the highest accrual decile than in the low to mid deciles. However, while the KS and E-J models perform slightly better than the KLW Jones model on this dimension, the KLW Jones model performs much better than the other two at classifying down firms into low, rather than high accrual deciles. Direct comparisons among the models produce similar results, leading me to conclude that the KLW Jones model is most effective at classifying firms on the basis of earnings management.

Despite this, based on the results of the decile comparisons, I cannot conclude that extreme decile firms, in general, are those that manage earnings. This is because the proportions of earnings management firms are simply too low. Among all of the deciles, the highest proportion up firms is only 4.45%, while the greatest percentage of down firms is only 1.62%. These low percentages are at least partially attributable to data limitations. As EM firms were identified using several databases, firms not in these could not be classified as EM firms. Also, as noted previously, there are certainly some earnings management incentives that were not identified theoretically or could not be identified empirically. These firms could also contribute to the low percentages. Unfortunately, there is no way of knowing whether the large proportions of non-EM firms are truly non-EM firms or if they are actually unidentified EM firms.

Although I am unable to conclude that extreme deciles are dominated by earnings management firms, I can conclude that as a whole, the decile proportions related to the KLW Jones model suggest positive and high accrual firms are more likely to be up firms and negative and low accrual firms are more likely to be down firms. This suggests that extreme decile firms are more likely to be EM firms than those in the middle deciles.
Do Earnings Management Firms Drive the Accrual Anomaly?

I examine my second research question, as to whether or not earnings management can explain the anomaly, in two phases. First, I examine this question defining earnings management firms as EM firms, those having both the ability and an incentive to manage earnings. Second, I examine the question, assuming all extreme decile firms are earnings management firms, comparing firms on the basis of their earnings management behaviors. The results from my incentive-based analyses are mixed.

The regression analysis provides virtually no evidence that the anomaly is stronger in earnings management firms, and if anything, it seems to suggest the opposite. On the other hand, the hedge portfolio analysis does produce results consistent with the idea that EM firms drive the anomaly. Using the pooled sample, the average annual return to the long position for EM firms is 16.19% and is significantly higher than that produced by non-EM firms. Though the returns to the short position are stronger for non-EM firms, the return to the strategy of 13.76% for EM firms is approximately nine percentage points higher than the return to non-EM firms.

Like the regression results from the incentive-based analysis, my analysis based on earnings management behavior provides little support for the earnings management hypothesis. Regression analysis reveals that being an extreme decile firm does not significantly affect returns. In addition, out of all of the behavior-based subsamples, only regular conservative firms had a significant impact on returns. Being a regular conservative firm added on average ten percentage points to annual returns. Although the higher return for a regular manager is contrary to my predictions concerning the behavior of rare versus regular managers, the higher returns to conservative firms in general would be expected under the earnings management hypothesis.

The hedge portfolio analysis based on earnings management behavior also provides little support for the earnings management hypothesis. While here, the returns are not compared to those of firms outside of the extreme deciles, the comparisons between rare and regular managing behaviors produce results contrary to my hypotheses.
The returns are greater for regular EM firms. Further analysis reveals that the returns are greatest for smoothers, but that these returns come primarily from the short position.

As a whole, there is some evidence supporting the hypothesis that earnings management drives the accrual anomaly, though drives is likely too strong a word. Interestingly, while the anomaly is found in the whole sample when using both regression and hedge portfolio analysis, the difference between the two subsamples is only evident in the hedge portfolio analysis, suggesting that only a portion of firms provides large returns to the EM subsample. Also of interest, this analysis sheds light on the sources of returns to this anomaly. The incentive-based analysis suggests that substantial returns are available from the long position in EM firms, while the behavior analysis suggests that returns arise from the short position of smoothing firms and the long position in regular conservative firms. Thus, it appears attainable returns can be gained by purchasing firms that regularly manage downwards, particularly those that can be identified as having the ability and an incentive to manage downwards.

**Does the Anomaly Represent a Reversal of Announcement Date Overreaction?**

With regards to my final research question, no, the anomaly does not arise from the reversal of announcement date overreaction. In this examination, although I find some evidence of positive abnormal returns accruing to high accrual firms and negative abnormal returns to low accrual firms around their announcement dates, the magnitudes of these returns are far too small to explain the long-run returns that have been documented. Despite this, some interesting insights were gained during this analysis. First, there appear to be substantial abnormal returns to low accrual firms beginning well before and continuing well past the announcement dates. This is consistent with the evidence summarized above suggesting that abnormal returns can be made from the long positions in low accrual firms. In addition, this finding suggests that long-run returns should be calculated beginning at or shortly after the announcement date. When the four-month approach (beginning the abnormal return accumulation four months following
fiscal year-end) is utilized, potentially substantial returns occurring in the first 30 to 60
days following the announcement will be missed.

This finding provides another possible explanation for the lower returns to the
accrual anomaly relative to previous studies. In Chapter 5, I suggest that the lower
returns here may be due to the recent bear market or that they may be due to the increased
attention given to accounting scandals. This finding of a more timely effect may indicate
the increased attention has led to a more timely incorporation of cashflow and accrual
data, rather than a reduction of the effect.

Contributions and Areas for Further Research

This dissertation makes several contributions to the earnings management and
efficient markets literature, but also reveals many areas for future research. It provides
evidence that earnings management contributes to the anomaly, weakening the efficient
markets argument. Also, contrary to the efficient markets hypothesis, it provides
evidence that substantial returns may be earned by purchasing low accrual firms, in
general, and, in particular, those that can be identified as EM firms. However, given the
low proportions of EM firms in the extreme deciles, more refinements in the
identification process are clearly needed.

This dissertation also contributes to the earnings management literature by
providing evidence that the KLW Jones model is the most appropriate accrual
decomposition model for the identification of earnings management firms when
analyzing a large population of stocks. However, as is often noted, improved
discretionary accrual models are needed. Future research could seek to develop a
matching approach like that of Kothari, Leone, and Wasley, that could be utilized across
all firms.

Another contribution is the analysis of the accrual anomaly over the more recent
time period. However, here again, new questions arise. Are the weaker results
attributable to the strategy’s poor performance during bear markets? Is it due to
increased scrutiny on earnings management? Or, is the effect still as strong, but only
beginning shortly after earnings are announced, so that the four-month approach misses a good deal of the returns?

As a final area for future research, researchers may focus on other causes for this anomaly. While I provide evidence suggesting earnings management may contribute to the anomaly, it is possible that more substantial evidence may be found supporting alternative explanations, as multiple factors likely contribute to this anomaly.
REFERENCES


BIOGRAPHICAL SKETCH

Brett Cotten is originally from Statesboro, Georgia. He received his bachelors of business administration degree from the University of Georgia and received his masters of business administration degree from Georgia State University. After working in finance and operations administration for SunTrust Bank, Savannah, N.A., Brett returned to school, earning his doctorate at Florida State University. Brett has accepted a faculty position at East Carolina University and will begin working there in August of 2005.