Copyright

by

Robert James Resutek

2008

The Dissertation Committee for Robert James Resutek certifies that this is the approved version of the following dissertation:

**Intangible Returns, Accruals, and Return Reversal: A Multi-Period Examination of
the Accrual Anomaly**

Committee:

Robert N. Freeman, Supervisor

Michael B. Clement

Ross Jennings

Sheridan Titman

Yong Yu

**Intangible Returns, Accruals, and Return Reversal: A Multi-Period Examination of
the Accrual Anomaly**

by

Robert James Resutek, B.S., M. S.

Dissertation

Presented to the Faculty of the Graduate School of
the University of Texas at Austin
in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

The University of Texas at Austin

August, 2008

Dedication

To Sarah and Stephen

Acknowledgements

I express sincere gratitude to my dissertation advisor, Robert Freeman, for his guidance and feedback. His guidance has been invaluable to me not only on this project, but throughout my five years in the doctoral program. I also wish to thank Michael Clement, Ross Jennings, Sheridan Titman, and Yong Yu for their helpful comments and suggestions on this project. I also acknowledge the generous financial support of the Deloitte Foundation and the McCombs School of Business.

I also want to collectively acknowledge the University of Texas at Austin accounting doctoral students. I will always treasure the friendships formed with the other doctoral students and consider the time spent with them to be the best part of the doctoral student experience.

Finally, I would like to thank my wife Sarah for her support and the sacrifices she made on my behalf. She consistently sacrificed her preferences for work and leisure to support me throughout the program. Whether it was working a very undesirable job or taking care of our infant son, her sacrifices made it possible for me to complete doctoral program. For this, and her love and support, I am truly grateful.

Intangible Returns, Accruals, and Return Reversal: A Multi-Period Examination of the Accrual Anomaly

Publication No. _____

Robert James Resutek, Ph.D.

The University of Texas at Austin, 2008

Supervisor: Robert N. Freeman

This dissertation reexamines the theoretical and empirical relation between future period returns and current period accruals. Prior studies find a negative relation between current period accruals and future returns. This finding (the accrual anomaly) is often attributed to either (a) investors mispricing accrual persistence or (b) investors mispricing the growth information contained in current accruals. In this study, I show that accruals are a natural manifestation of firm growth and contraction and that the information contained in accruals is not associated with future returns. This finding holds for multiple accrual definitions and decompositions. My study provides an alternative explanation for the accrual anomaly. In addition, I provide economic intuition and empirical evidence suggesting that the accrual anomaly is a function of the value/growth anomaly.

In contrast to prior studies which use a two-period model to show the negative association between accruals in period one and returns in period two, I employ a three

period log-linear model decomposed from a firm's book-to-market ratio and show that investors do not misprice the information contained in accruals. My study shows that in the four year period prior to accrual recognition, equity prices tend to be driven disproportionately by intangible returns, or returns not explained by accounting measures. Accordingly, the relation between prior-period intangible returns and future-period returns may subsume the relation between current-period accruals and future returns. Empirical tests support this explanation.

Table of Contents

List of Tables and Figures.....	x
Chapter 1: Introduction.....	1
Chapter 2: Prior Literature.....	5
2.1 Accrual Accounting.....	5
2.2 Literature Review – Persistence-based explanations of the accrual anomaly.....	6
2.3 Literature Review – Growth-based explanations of the accrual anomaly.....	9
2.4 Literature Review – Alternative explanations of the accrual anomaly.....	10
2.5 Prior Literature Discussion and Hypothesis Development.....	12
2.6 Research Design Advantages.....	17
Chapter 3: Research Design and Empirical Methods.....	19
3.1 Variable Intuition.....	19
3.2 Log-linear decomposition of book-to-market	23
3.3 Log returns vs. Log changes	25
3.4 Intangible Value Changes.....	28
3.5 Alternative interpretation of $iss_{t-\tau,t}$	29

Chapter 4: Empirical Analysis.....	31
4.1 Sample section and variable measurement.....	31
4.2 Data summary.....	32
4.3 Multivariate Regression Analysis.....	34
4.3.1 One-period decomposition.....	35
4.3.2 Multi-period decomposition.....	36
4.4 Additional Tests: Alternative Accrual Definitions.....	40
4.5 Signed Non-Accrual Growth (N_TACC) Analysis.....	44
4.6 Non-parametric: Portfolio Tests.....	45
4.7 Non-parametric: Ranked Regressions.....	48
4.8 Discretionary Accruals.....	48
4.9 Additional Robustness Tests.....	51
Chapter 5: Conclusion.....	54
Appendix 1: Variable Definitions.....	71
Appendix 2: Total accrual decomposition for 4.4.....	74
References.....	75
Vita	78

List of Tables and Figures

Table 1:	Sample characteristics.....	57
Table 2:	Year characteristics.....	58
Table 3:	Cross-sectional correlations.....	59
Table 4:	Fama and MacBeth Regressions: Single period decomposition.....	60
Table 5:	Fama and MacBeth Regressions: Multiperiod decomposition.....	61
Table 6:	Fama and MacBeth Regressions: Alternative Accrual Definitions.....	64
Table 7:	Fama and MacBeth Regressions: Signed non-accrual growth variables.....	65
Table 8:	Non-parametric Analysis – Portfolio sorts.....	66
Table 9:	Non-parametric Analysis – Ranked Regressions.....	69
Table 10:	Fama and MacBeth Regressions: Discretionary Accrual Analysis.....	70

Chapter 1: Introduction

The “accrual anomaly” is the term used by researchers over the past 10 years to describe an anomalous reversal pattern in future returns that is associated with current period accruals. First documented by Sloan (1996), there have been scores of subsequent studies examining the negative association between current period accruals and future returns. The economic significance of the accrual anomaly is material, with annual abnormal returns averaging around 7-8% per year over the last 45 years. Despite the attention given to this return anomaly by accounting researchers, there has been very little advancement in the literature to explain why investors appear to misprice the information contained in accruals. Given the substantial theoretical and empirical evidence supporting the existence of an efficient market with rational participants arbitraging away abnormal returns, the persistence and significance of the accrual anomaly are disturbing to the proponents of efficient markets.

This dissertation reexamines the empirical evidence and theory supporting the accrual anomaly. This is not virgin territory as many prior studies have examined the underpinnings of the accrual anomaly. However, this study proposes and implements several significant departures from the standard theoretical and empirical methods employed in prior accrual studies. Specifically, this study uses a log-linear return decomposition of the book-to-market ratio to derive the variable of interest (accruals) and associated control variables. This empirical methodology allows me to endogenously derive economically important variables that have been largely ignored in prior studies and may have an effect of the inferences between future returns and current period accruals.

There are multiple advantages to the empirical method I employ. First, by using the log return over a given period as a proxy for the total information, I can partition total information into two separate return components: tangible and intangible returns.

Tangible returns refer to the component of equity returns that is explained by summary accounting returns over the same period of time. These summary accounting measures include change in book value, sales growth, accruals, and other accounting metrics.

Intangible returns refer to the component of equity returns that is not explained by summary accounting measures over that same period. The significance of the return decomposition lies in the ability to empirically quantify all value-relevant information used by investors over a given period of time without having to exogenously specify each piece of information.

Second, by using log returns as a proxy for total information, I can decompose aggregate tangible and intangible returns into multiple subperiod return measures.

Specifically, I decompose five year periods into the one year current period when accruals are recognized and the four year period prior to accrual recognition. By considering the tangible and intangible returns realized in the four year period prior to accrual recognition, I can assess the effects of prior period tangible and intangible information on the relation between current period accruals and future returns.

The third important departure from prior empirical studies examining the accrual anomaly is to define accruals as a log-return metric. As interpreted in prior literature, accruals are a type of financial information used by investors. However, as traditionally defined, accruals include other information (e.g., equity issuance) that can affect inferences between current period accruals and future returns. By defining accruals in

log-return scale, I capture a pure measure of accrual information not distorted by other correlated growth variables.

The empirical evidence provided in this study strongly suggests that return reversal is not associated with the *information* contained in accruals. Rather, the negative association between future period returns and current period accruals documented in prior literature appears to be driven by prior period intangible returns which have been omitted from consideration in prior accrual studies. The empirical results reported in this study follow a general paradigm of replicating the empirical results of seminal accrual studies and then showing how the economic and statistical significance of the accrual/return relation becomes insignificant once prior period intangible returns are introduced as a control variable.

This paper proceeds as follows. In Chapter 2, I provide a brief summary of the relevant prior literature relating to the accrual anomaly, highlighting the two dominant streams of literature seeking to explain the accrual anomaly. I then discuss the empirical and theoretical deficiencies of these prior literature streams and suggest why a multi-period examination of tangible and intangible returns could provide an alternative explanation of the accrual anomaly. In Chapter 3, I discuss the log-linear decomposition empirical method I employ. Specifically, Section 3.1 discusses the economic intuition supporting the use of a multi-period decomposition. Section 3.2 describes the construction of the log-linear variables decomposed from the book-to-market ratio and their economic interpretation. Section 3.3 discusses the empirical variable I use to transform log change variables into log return variables and the interpretative significance of transforming the variables into log return scale. Section 3.4 details the

empirical method I use to construct the intangible return variable. Section 3.5 discusses an alternative interpretation of the equity issuance variable, $iss_{t-\tau,t}$. In Chapter 4, I report the primary and supplemental empirical evidence supporting my claim that investors do not misprice the information contained in accruals. Finally, in Chapter 6 I summarize my empirical results and their significance relative to the current literature examining the accrual anomaly.

Overall, the empirical evidence presented in this dissertation casts serious doubt upon the widely held belief that the negative association between accruals and future returns is due to investors' inability to properly incorporate the information contained in accruals into stock price.

Chapter 2: Prior Literature.

2.1 Accrual Accounting

One of the primary goals of accrual accounting is to assist firm stakeholders in their investment decisions. Accrual accounting has emerged as the preferred method for providing financial information to firm stakeholders. Based on the identification and measurement of non-cash assets and liabilities, accruals represent changes in non-cash assets and liabilities. Given their importance in the financial reporting process, accruals have been an extensively studied area of the academic accounting literature as researchers have examined how investors incorporate accrual information into stock price. While studies such as Dechow (1994) almost unanimously support the contention that accrual-based summary accounting metrics are superior to cash-based summary accounting metrics in the assessment of future firm performance, subsequent research suggests that the components of earnings may lead to suboptimal investment decision by investors. Of particular interest to this study, Sloan (1996) shows that while investors appear to correctly incorporate aggregate earnings information into stock price, investors do not appear to properly incorporate the components of earnings into stock price. Specifically, Sloan provides empirical evidence suggesting that investors do not appear to properly incorporate the information contained in accruals into stock price, leading to significant return reversal in the subsequent period.

Future return reversal associated with current period accruals that cannot be explained by standard risk models or firm characteristics has been termed the “accrual anomaly” and comprises a non-trivial portion of the accounting and finance literature

over the past 10 years. While the existence of the negative relation between current period accruals and future returns is relatively uncontroversial, there is some disagreement as to the cause of the relation. Subsequent literature examining the cause of the negative relation between future returns and current period accruals can be broadly classified into two streams: persistence-based explanations and growth-based explanations. Relevant literature examining these two explanations will be discussed in sections 2.2 and 2.3 respectively. Section 2.4 discusses several other relevant accrual studies that examine other characteristics of the accrual anomaly and their effect on inferences between current period accruals and future returns. Section 2.5 discusses possible deficiencies in the prior accrual literature and develops the primary hypothesis tested in this dissertation. Section 2.6 discusses the relative advantages of the empirical methods employed in this dissertation.

2.2 Literature Review – Persistence-based explanations of the accrual anomaly

Sloan (1996) argues that the components of earnings (i.e., accruals and cash flows) do not have equivalent persistence in future periods. Differential persistence implies that one dollar of current period accrual earnings translates into a different dollar amount of future earnings relative to that implied by one dollar of current period cash flow earnings. Sloan suggests that investors appear to “fixate” on the aggregate level of earnings and fail to distinguish the different persistence properties of accruals and cash flows and the implications for future earnings realizations. As a result, return reversal occurs in subsequent periods as investors reassess their expectation of future earnings and bid down (up) the prices of firms that recognized high (low) accruals in the prior period.

The key difference between the accrual and cash flow components of earnings, as argued by Sloan, is that the accrual component is subject to greater subjectivity in measurement. Hence, there is greater measurement error inherent in the accrual component of earnings relative to the cash flow component. The accrual component of earnings incorporates estimates of future cash flow realizations, deferrals of prior period cash flow expenditures, and allocations of costs incurred on tangible and intangible productive assets. These estimates are subject to greater subjectivity relative to cash flows, leading Sloan to reason that when the accrual component of earnings is unusually high (low), earnings will be less persistent in future periods. As posited by Sloan (and others), investors do not appear to understand the properties of differential persistence, and are surprised in future periods when expected earnings are not realized.

Subsequent literature has extended Sloan's persistence argument to other accrual components and settings. Xie (2001) shows that discretionary accruals are less persistent than non-discretionary accruals. Xie shows that the lower persistence of the accrual component of earnings (relative to the cash flow component) is attributable to the discretionary component of accrual earnings where the discretionary/non-discretionary components are defined via the modified Jones model. Xie attributes non-discretionary accruals to opportunistic managerial discretion. Supporting Xie's claim, Teoh, Welch, and Wong (1998a, 1998b) show that discretionary accruals tend to increase in the periods immediately before seasoned equity offerings and initial public offerings. Teoh et al. suggest that manager incentives to maximize the capital raised in equity offerings leads them to use their reporting discretion to opportunistically inflate accruals before equity

offerings. Hence, in the subsequent periods after equity is issued, return reversal occurs as investors reassess their future earnings estimates based on accruals.

Richardson, Sloan, Soliman, and Tuna (2005) (hereafter, RSST 2005) extend the definition of accruals initially examined by Healy (1985) and Sloan (1996) to include all accruals. Reasoning that without accruals, the balance sheet would consist only of cash and owners equity, RSST 2005 examine the persistence of all non-cash/non-owners equity balance sheet accounts. Their empirical evidence suggests that Sloan's persistence argument extends to non-current accruals and that future returns are negatively associated with accrual reliability. Further, the economic significance of the return reversal associated with accruals is negatively correlated with accrual reliability (i.e., as the reliability of current period accruals decreases, the magnitude of subsequent period return reversal increases).

Despite the prominence of the persistence explanation, several recent papers have questioned its validity. Francis and Smith (2005) re-examine Sloan's persistence argument, focusing on two aspects of persistence that are critical to Sloan's differential persistence hypothesis: time specificity and firm specificity. Francis and Smith show that the construction of the accrual variable used in the extant literature leads to predictable biases in persistence computations. More specifically, Francis and Smith show that because accruals include economic transactions that affect future earnings *and* economic transactions that affect current and past earnings, persistence coefficients will be predictably biased. Further, they show that firm specific estimates of persistence further reduce the biases documented by Sloan.

Zhang (2007) examines whether the strength of the accrual anomaly increases in firms with less persistent earnings. The idea examined by Zhang suggests that if investors truly fixate of the aggregate level of earnings and do not account for the differential pricing implications of persistence, then firms with lower earnings persistence should have the highest level of return reversal. However, Zhang finds very little difference in the level of return reversal across portfolios of firms sorted into persistence quintiles. Rather, Zhang shows that the return reversal associated with accruals appears to be a function of firm growth – see section 2.3.

2.3 Literature Review – Growth-based explanations of the accrual anomaly

A second stream of accrual literature suggests that the accrual anomaly is due to the economic characteristics captured by accruals that are correlated with the lower persistence of accruals. Fairfield, Whisenant, and Yohn (2003) (hereafter, FWY) suggest that the accrual anomaly extends from the working capital accruals examined by Sloan (1996) to growth in non-current assets (non-current accruals). Linking both types of accruals to overall firm-growth, FWY suggest that the accrual anomaly can be attributed to investors overvaluing *both* working capital accruals and growth in non-current net operating assets. Rather than attributing this relation to investor failure to account for differential persistence in the different accrual accounts, FWY attribute the accrual anomaly to investors failing to adjust for the diminishing returns on investment that accompanies firm growth.

Similar to FWY, other studies showing a negative association between future returns and asset growth/contraction include Cooper, Gulen, and Schill (2007), Titman, Wie, and Xie (2004), Anderson and Garcia-Feijoo (2006), and Zhang (2007). Distinct

from the research paradigm used in prior studies which relies upon accrual-based accounting metrics to capture firm growth, Zhang (2007) uses non-accounting measures of growth (specifically, employee growth). By using employee growth, Zhang avoids the measurement error problem inherent in almost all accounting measures. Zhang shows that the return reversal associated with accruals is strongest in firms experiencing the highest employee growth. Coupling this positive evidence with the lack of evidence supporting the persistence argument, discussed in section 2.2, Zhang posits that the accrual anomaly is due to investors improperly pricing the growth information contained in accruals.

2.4 Literature Review – Alternative explanations of the accrual anomaly

Other studies question the validity of the persistence and growth based explanations of the accrual anomaly. Desai, Rajgopal, and Venkatachalam (2004) suggest that the accrual anomaly could be a derivative of the value/growth anomaly. Specifically, Desai et al. (2004) propose that CFO/P (cash flow from operations scaled by market equity) explains the cross-sectional future return variation previously attributed separately to either accrual variables or value/growth variables. In doing so, Desai et al. (2004) suggest that the accrual anomaly is actually a derivative of the value/growth anomaly. However, Desai et al. do not seek to explain *why* CFO/P subsumes the accrual variable and other common value/growth proxies. Rather, their study provides an econometric link between the accrual anomaly and the value/growth anomaly, not an economic link.

Khan (2008) proposes a risk-based explanation for the anomalous relation between current accruals and future returns. Khan constructs a four-factor model based

on the Intertemporal Capital Asset Pricing Model and shows that a considerable portion of the cross-sectional future return variation of high and low accrual firms can be explained by risk. Specifically, Khan's results suggest that low (high) accrual firms expose investors to increased (decreased) distress risk. Accordingly, in a multi-period world where investors hedge against shocks to both current wealth and future investment opportunities, the expected returns generated by his ICAPM model are insignificantly different from the realized returns of firms sorted according to accruals.

Other studies such as Marshuwalla, Rajgopal, and Shevlin (2006) and Collins and Hribar (2003) show that certain market frictions reduce the magnitude of the abnormal returns earned on an accrual-based trading strategy. These market frictions include arbitrage risk, low stock price, low institutional holdings. However, economically significant abnormal returns still exist even after these frictions are accounted.

Finally, other studies examine the empirical properties of accruals and returns and question whether some of these properties explain the accrual anomaly. For example, studies such as Zach (2003), and Kraft, Leone, and Wasley (2006) examine the effects of influential observations on inferences between future returns and accruals. Ball and Shivakumar (2006) examine the asymmetric properties of GAAP-based financial accounting and its effect on return/accrual inferences. These studies are econometric in nature and raise important issues relating to legitimacy of the inferences made in prior accrual studies between future returns and current period accruals. However, these studies do not provide complete explanations for the anomalous relation between current period accruals and future returns.

2.5 Prior Literature Discussion and Hypothesis Development

While the two primary streams of literature examining the accrual anomaly (persistence and growth) are distinct, they share some similarities. Both explanations suggest that investors are subject to behavioral biases that prevent them from properly pricing equities given publicly available accounting information. These explanations are counter to an efficient equity market where rational arbitrageurs erase profitable trading strategies based on publicly available accounting information.

Second, almost all prior studies do not discriminate between different causes of accruals. For example, general accrual-based growth (positive accruals) can occur due to organic growth in non-cash assets and liabilities, driven by the reinvestment of free cash flow into productive assets. However, positive accruals can also occur from firms using debt or equity proceeds to fund productive assets. These latter types of accruals can lead to incorrect inferences between current period accruals and future returns if the relation between future returns and debt/equity issuance is not properly controlled. There is an extensive finance literature that shows a negative empirical relation between current period equity issuance and future returns. However, to date the accounting literature examining the relation between future returns and accruals has been relatively silent on this possible effect.

Finally, both streams of literature examine the relation between accruals and future returns within the confines of a strict two period model. For example, the studies discussed above examine whether variation in current period accruals are associated with variation in future returns after controlling for current period characteristics and factors known to be associated with future returns. This research design assumes that the market

is reasonably efficient and that information from previous periods cannot be associated with future abnormal returns. By construction, these studies ignore the possibility of long-horizon return reversal where abnormal returns are associated with prior period information. This assumption may lead to misleading inferences if accruals are associated with a characteristic from prior periods that is associated with future returns.

Evidence of anomalous return characteristics occurring in the years prior to the recognition of large accruals is provided in a recent study by Kothari et al. (2007). In this study, the authors show that in each of the four years prior to a firm recognizing abnormally high accruals, abnormally positive equity returns are realized. On an annual basis, these returns range from 5-30%. Complimenting this evidence, the authors show that in each of the four years prior to a firm recognizing abnormally low accruals, abnormally negative equity returns are realized, although the magnitude of the returns is not as large as for the positive accrual firms.

Kothari et al. (2007) suggest that even in an efficient market, stocks can become mispriced due to large price jumps/drops. Since a manager's compensation and future career options are often tied to stock performance, the manager of an overvalued firm will feel pressure to inflate reported accruals in order to perpetuate the stock performance and/or prevent a sudden price drop. Subsequently, when future earnings are realized and are not in line with the expectations formed on prior period accruals, return reversal ensues.

The return pattern noted by Kothari et al. (2007) suggests that investors react strongly to information in the periods prior to the recognition of abnormal accruals. However, Kothari et al. (2007) do not explore what kind of information investors are

reacting to and incorporating into price. This question is important because understanding whether information from prior periods that is correlated to current period accruals is priced correctly is critical to determining whether the negative association between future returns and current accruals is due to investors mispricing the information contained in accruals *or* investors mispricing other information that is correlated to accruals (and not previously considered).

To examine the information that investors are incorporating into price in the periods prior to the recognition of abnormal accruals and to synchronize this examination into an economics-based empirical model, this study builds on the information decomposition design proposed by Daniel and Titman (2006), hereafter DT. Specifically, by using logarithmic properties, this study decomposes the book-to-market ratio at time t into multiple log-return components spanning multiple periods of time.

Consistent with the information decomposition proposed in Daniel and Titman (2006), I decompose realized returns into two components. Realized returns incorporate all value-relevant information that is known by at least one market participant over the return accumulation period. Thus, realized returns are a good proxy for total information. To decompose total (log) returns into two components, I regress log market return against a select set of summary accounting log return metrics (e.g., change in book value, accruals, sales, and others). The fitted values from this regression method represent the amount of realized return variation that can be explained by summary accounting measures. Consistent with DT, I term this fitted value tangible return. Accordingly, the residual realized return variation not explained by summary accounting returns are termed intangible returns.

Intuitively, DT assume realized returns represent a linear combination of *all* value-relevant information used by investors to price equities. Some of this value-relevant information meets the recognition criteria of GAAP and is measured by accounting metrics, or tangible returns. Since the value-relevant information measured by the financial accounting system is only a subset of the total information used by investors, DT also quantify other value-relevant information not captured by summary accounting measures, or intangible returns.

Intangible returns can be generally interpreted as capturing future growth options that have not been recognized by summary accounting measures. Given the discrete, conservative nature of financial accounting, intangible returns will tend to lead tangible returns as the market prices growth more quickly than GAAP recognizes value.

DT examine multiple variables suggested in the finance literature as variables that characterize the value/growth anomaly. Specifically, price-scaled accounting variables such as book-to-market, earnings-to-price, and others have been shown to be positively associated with future returns. This association cannot be fully explained by differences in systematic risk. DT show that the positive association between price-scaled accounting variables and future returns is caused by a negative association between five year realized intangible returns. In fact, contrary to the evidence of Lakonishok, Schleifer, and Vishny (1994), DT show there is not a significant relation between future returns and realized accounting growth measures when accounting growth is defined on a per-share basis.

Given the evidence of DT suggesting that return reversal is (is not) associated with intangible (tangible) returns, the accrual anomaly may be due to the correlation

between accruals and prior period intangible returns (PPIR). PPIR represent firm growth not captured by summary accounting measures in the four year period before accruals are recognized. Since there is a strong relation between future returns, accruals, and PPIR, it is possible that the negative association between future returns and current period accruals is due to the omission of PPIR as a control variable. On the other hand, Sloan (1996) shows that while investors incorporate aggregate earnings information into price correctly, the components of earnings are incorrectly priced. Hence, components of summary tangible returns, accruals and non-accruals, may be associated with return reversal, consistent with Sloan (1996). This relation may hold even after controlling for PPIR.

The primary research question examined in this study is whether intangible returns from the period prior to accrual recognition explain the accrual anomaly. Stated formally:

H1: The relation between future returns and current period accrual-based returns becomes insignificant once prior period intangible returns are controlled.

Failing to find a significant relation between current period accruals and future returns subjects this study to the criticism that it is a “no result” study and therefore does not prove anything since it fails to find a significant relation between future returns and accruals. In other words, failing to find a significant relation does not necessarily prove that accruals are not associated with future returns. To address this possible criticism, this study replicates the empirical evidence of prior accrual studies within the structure of the log-linear model and shows how the economic and statistical significance of the

accrual/return relation disappears once prior period intangible returns are introduced as a control variable.

2.6 Research Design Advantages

There are several advantages to my research design. First, my research design employs an empirical framework that does not rely on an exogenously-specified asset valuation model. Previous accrual studies have used the Mishkin (1983) two-step model in which the persistence coefficients on cash flows and accruals are compared to the valuation coefficients on cash flows and accruals to provide an explanation for the mispricing. However, as noted in Mishkin (1983), a drawback to this methodology is that it requires the prediction model be equivalent to the valuation model. While the prediction model used in prior accrual studies may be correct, there is some evidence that valuation may not be a linear function of expected values (e.g. expected earnings) and that accounting metrics may not capture all value-relevant information affecting returns, notwithstanding systematic risk factors and assuming a price-efficient market.¹ As such, by structuring my research design to allow for all value-relevant information to be measured without exogenous specification, I am able to more precisely examine the effect of accruals on future returns.

Second, the accrual variables examined in my study are in log-return scale. As such, they are not subject to the econometric scaling bias noted in Barth and Kallapur (1996) nor are they affected by the distortive effect of equity issuance activity. Equity issuance activity has been empirically linked to future return patterns. Since equity

¹ For example, Pastor and Veronesi (2003) suggest that uncertainty in earnings growth may affect asset price under a rational expectations valuation framework. Daniel and Titman (2006) show that intangible information, or value-relevant information not measured by summary accounting metrics, is strongly associated with future returns and equity issuance activity.

issuance activity is economically linked to accrual recognition (e.g., a firm issues equity and uses the proceeds to buy inventory), controlling for it is essential to avoid spurious associations between accruals and future returns.

My study is also relevant to the literature on conditional event studies, which considers corporate decisions that are at least partially anticipated by the market (Prabhala 1997). The modal research methodology employed in studies examining the relation between accruals (*Acc*) and future returns uses a regression of the following form:

$$(risk\text{-}adj.\ return)_{i,t+1} = \gamma_0 + \gamma_1 Acc_{i,t} + \gamma_{i+1}(\text{Control Vars})_{i,t} + u_{i,t}$$

The essential assumption is that if the market is efficient and the model well-specified, *Acc* from year t should not explain risk-adjusted returns in year $t+1$ (i.e. $\gamma_1=0$). However, if γ_1 is statistically significant and all relevant control variables from years t and $t+1$ are specified, a case can be made for mispricing. In contrast, my study does not require that the market be efficient or that I have exogenously controlled for all relevant variables. Rather, the empirical specification I employ allows me to extract information not only from the cross-section of high and low accrual firms, but also from the time series of returns before the accrual measurement date.

Chapter 3: Research Design – Empirical Methods and Intuition

The primary empirical method employed in this study is Fama-MacBeth (1973) regressions that examine the relation between future monthly returns and log-linear return components of the book-to-market ratio at time t . Specifically,

$$\text{ret}_{i,t+1} = \gamma_0 + \sum_{j=1}^N \gamma_j \log \left(\text{Components of } \frac{B_{i,t}}{M_{i,t}} \right) + \mu_{i,t} \quad (1)$$

As reflected in (1), the dependent variable, $\text{ret}_{i,t+1}$, is a series of twelve months of returns beginning in the seventh month of fiscal year $t+1$ and ending in the sixth month of fiscal year $t+2$. The independent variables are log-linear variables derived from the book-to-market ratio as of fiscal year end t . The log-linear decomposition disaggregates the log book-to-market ratio at time t into log book-to-market ratio at $t-\tau$ and prior period log returns recognized between $t-\tau$ and t . Log returns are comprised of tangible, accounting-based returns and intangible, market-based returns. The subsequent sections detail the empirical methodology and economic intuition used in this study. Section 3.1 provides the economic intuition behind the log-linear variables and their relevance in an accrual study. Section 3.2 details the derivation of the log-linear return components derived from the book-to-market ratio that will be used in the study as explanatory variables. Section 3.3 introduces the issuance variable ($iss_{t-\tau,t}$) that transforms log change values into log return measures. Section 3.4 details the orthogonalization process used to derive intangible returns. Section 3.5 discusses an alternative interpretation of the issuance/repurchase variable ($iss_{t-\tau,t}$).

3.1 Variable Intuition

To explain why a log-linear decomposition of the book-to-market ratio provides the requisite economic intuition to understand the accrual anomaly, I examine the four

year period preceding the recognition of accruals and the one year period encompassing the recognition of accruals. Accruals are not recognized randomly. Rather, accruals should be highly correlated to the underlying economic realizations of the firm, subject to the expected timing differences caused by the discrete, conservative nature of accounting. Given the strong correlation between current period accruals and the economic realizations of the firm in the prior/current periods, an examination of the information investors use to make their investment decisions in the period prior to, and contemporaneous with, the recognition of accruals is important.

Given this correlation, consider the following five year scenario. Sometime between $t-5$ and $t-1$, a firm experiences a shock to its expected cash flows. An example of such a shock could be a previously restricted foreign market that unexpectedly opens to a firm's products or a decrease in the systematic risk of unexercised growth options (thereby moving these projects from negative to positive NPV). Due to the discrete, conservative nature of accounting, the shock to future cash flows will tend to be reflected in market value earlier than book value, especially for positive shocks.

For relatively small cash flow shocks, the firm will service the increased demand with existing productive assets. Positive working capital accruals will result as higher account receivable balances capture the increase in revenue, thereby increasing book value. For relatively large positive shocks, firm managers will (partially) exercise the growth option by expanding productive capacity. If the firm does not have cash or access to additional debt to fund the growth option, managers may issue equity. Equity issuance will immediately increase book value and subsequently, as the equity proceeds are

invested in productive assets, working capital will increase as higher account receivable balances result from the increased revenue.²

For purposes of this example, I assume that the primary period in which managers exercise their growth option, expand productive capacity, and recognize abnormally large accruals is between $t-1$ and t . As such, timing differences exist between when the market recognizes the value of the growth option and when the accounting system recognizes the value of the growth option. These timing differences will not affect inferences between future returns and current period accruals if the information the market uses to price the growth option maps directly into the information recognized in book value. However, if the market prices information related to the growth option that is never reflected in book value, such as the uncertainty of future earnings, inferences between current period accruals and future returns may be distorted.

Figure 1

Figure 1 suggests that sometime between $t-5$ and $t-1$ a firm's growth option moves "into the money" and the change in value of this growth option is not recognized

² For purposes of this example, managers are assumed to be free of agency conflicts and the market is assumed to be informationally efficient as it relates to accounting information. This example is counter to the agency conflict intuition that Kothari et al. (2007) uses to explain the accrual anomaly. While I cannot rule out agency issues, the economic intuition I propose to explain the accrual anomaly does not require there to be agency conflicts or inefficient pricing.

in book value until fiscal periods t and $t+1$.³ If the information the market uses to price the growth option directly maps into the information ultimately recognized in book value, market value will not reverse in periods t and $t+1$. However, if the market prices information that is never captured by accounting measures, such as the uncertainty of future cash flows, market value may rationally reverse in later periods as the uncertainty is resolved.⁴ These concurrent, but divergent changes in the firm's book and market value can have distortive effects on inferences if some of the information that investors use to price the stock is omitted from the analysis.⁵ Thus, it is important to control for all of the value-relevant information that is released prior to, and concurrent with, the recognition of accruals.

An equally valid argument explaining the 5-year evolution of the book-to-market ratio reflected in Figure 1 can be made from a behavioral perspective. Investors may tend to be too optimistic of future cash flows relating to unexercised growth options. Hence, when a growth option becomes viable, investors may bid equity price higher than rational analysis would suggest. As the growth option is exercised, accruals are recognized, and subsequent cash flows are realized, investors correct their initial cash flow expectations and return reversal occurs.

³ Note that the difference between market value and book value is the same at $t-5$ and $t+1$, implying that by the end of fiscal period $t+1$, the value of the growth option has been fully and equivalently priced in market value and book value.

⁴ See Pastor and Veronesi (2003) for evidence suggesting a positive association between the uncertainty of future cash flows and market price.

⁵ An alternative distortion to regression inferences can occur if projects with higher systematic risk die off during the future return period and the firm's portfolio of projects becomes more heavily weighted by projects with lower systematic risk – see Berk et al. (1999). Many studies estimate the systematic risk of the firm at the beginning of the future return period and assume it is constant throughout the future return period. If systematic risk changes in the future return period (due to higher systematic risk projects dieing off), regression inferences on current/prior period explanatory variables may be biased.

As discussed in subsequent sections, the log book-to-market ratio can be decomposed into variables that capture all value-relevant information used by investors to price equities in the periods prior to, and concurrent with, the recognition of accruals. Equally important is the transformation of log change values into log return metrics. As noted in the example above and prior accrual studies, large accruals are often recognized in conjunction with the issuance of equity. By transforming log changes in book value into log return measures, I can distill return reversal attributable to accounting measures (i.e. accruals) from correlated events such as equity issuance.

3.2 Book-to-market Decomposition

In log form, the book-to-market ratio at time t is equal to the book-to-market ratio at time $t-\tau$ plus log change in book value, minus log change in market value.

$$\begin{aligned}\log(B_t/M_t) &= bm_t = bm_{t-\tau} + \log(B_t/B_{t-\tau}) - \log(M_t/M_{t-\tau}) \\ &= bm_{t-\tau} + \log(\Delta B)_{t-\tau,t} - \log(\Delta M)_{t-\tau,t}\end{aligned}\tag{2}$$

Where:

- $bm_{t-\tau}$ = log book-to-market ratio with book value as of fiscal year end $t-\tau$ and market value as of the last day of trading in fiscal year $t-\tau$.
- $\log(B_t/B_{t-\tau})$ = $B_t(B_{t-\tau})$ is equal to the book value of equity as of fiscal year end t ($t-\tau$).
- $\log(M_t/M_{t-\tau})$ = $M_t(M_{t-\tau})$ is equal to the market value of equity as of the last day of trading in fiscal year t ($t-\tau$).

Roughly speaking, bm_t is equal to $bm_{t-\tau}$ plus log book return (approximately comprehensive earnings divided by book equity) minus log market return.⁶ Log change variables have convenient additive properties that allow a cumulative multi-period

⁶ Certain adjustments need to be made to convert log change metrics to log return metrics. These adjustments account for stock splits, stock dividends, rights issues, exercised stock options, equity issuance activity, cash dividends, and other treasury activities. These adjustments are described in 3.3 and are consistent with those suggested in Daniel and Titman (2006).

change variable to be decomposed into multiple single period change variables. For example, consider the following five year decomposition of the log book-to-market ratio at time t :

$$bm_t = bm_{t-5} + \log(\Delta B)_{t-5,t-1} + \log(\Delta B)_{t-1,t} - \log(\Delta M)_{t-5,t} \quad (3)$$

Cumulative log change in book value over the five year period can be computed as the sum of two subperiod log changes. Consistent with prior accrual literature that defines accruals over the latest one year period, change in book value between $t-1$ and t can be decomposed into two components: total accruals (TACC) and non accrual growth (N_TACC). This leads to the following decomposition:

$$bm_t = bm_{t-5} + \underbrace{\log\left(\frac{B_{t-1}}{B_{t-5}}\right) + \log\left(\frac{NOA_t}{NOA_{t-1}}\right)}_{\substack{\text{accruals} \\ \text{TACC}}} + \underbrace{\log\left(\frac{1 - \frac{NFO_t}{NOA_t}}{1 - \frac{NFO_{t-1}}{NOA_{t-1}}}\right)}_{\substack{\text{non accrual growth} \\ \text{N_TACC}}} - \log\left(\frac{M_t}{M_{t-5}}\right) \quad (4)$$

total log change in B_t

where NOA equals net operating assets (operating assets – operating liabilities) and NFO equals net financing obligations (financial liabilities minus financial assets) – see Appendix I for specific variable composition. The above decomposition (4) shows that bm_t is equal to bm_{t-5} plus several sub-period, accounting-based log changes in value, minus a cumulative market-based log change. Note the two log variables that comprise total log growth in book value. The definition of TACC is consistent with residual income theory of Feltham and Ohlson (1995) and similar to the TACC variables used in RSST 2005, 2006, and other studies examining total accruals. However, the construction of the variable termed non accrual growth (N_TACC) is unusual and its economic

significance may not be immediately apparent. Examination of this variable indicates that it captures the effect on log book return attributable to positive free cash flow and the effect of newly issued debt invested into net operating assets.⁷ This ratio can be viewed as a lever that amplifies (attenuates) log book returns. For example, if this ratio is positive, this implies that a firm was able to increase its cash position after operating and investing needs were met, thereby amplifying the log book returns realized by equity holders. On the other hand, if this ratio is negative, it means that some growth in net operating assets was due to an infusion of new debt (debt issued > free cash flow). As such, the log book return is attenuated since part of the book return is funded by debt.

The sum of the two log components (TACC and N_TACC) of $\log(\Delta B)_{t-1,t}$ only equate to the log book returns realized by equity investors between $t-1$ and t if there are no transactions with outside equity investors (i.e., no equity issuance/repurchase activity). If a firm issues equity between $t-1$ and t to fund its growth in net operating assets, TACC and N_TACC will no longer sum to log book return. Section 3.3 introduces a variable that transforms log change values into log returns, thereby allowing me to distinguish between different types of growth. More importantly, log returns offer a more intuitive feel for the return earned by an investor between $t-\tau$ and t that is not confounded by changes in the equity structure of the firm.

3.3 *Log Returns vs. Log Changes*

As interpreted in prior literature, the accrual anomaly is due to investors' inability to properly price *total* change in net operating asset accounts, which leads to subsequent return reversal. This is an unconditional statement that is not specific as to the type of

⁷ Alternatively, this ratio can be viewed as capturing the change in cash between $t-1$ and t not attributable to equity issuances/repurchases. In other words, this measure captures cash flow from operations plus cash flow from investing + cash flow from debt issuance/repayment.

change in net operating assets (accruals) that investors do not understand. Accruals can result from three sources: income, non-equity funding where the firm uses available cash or new debt to fund expansion, or from equity funded growth where the firm receives cash and/or services (e.g. stock-option plan) for direct ownership through an equity claim. The accrual anomaly as traditionally defined is unconditional and does not distinguish between these three types of accruals. Rather, any change in net operating assets is defined as a non-zero accrual and negatively associated with future returns.

Beginning with Loughran and Ritter (1995, 1997), there is an extensive literature that documents a negative relation between a firm's issuance activity and future returns. While subsequent studies have debated the cause of the return reversal, the general empirical consensus is that firms who issue equity tend to experience lower subsequent returns relative to non-issuing firms with matching characteristics. Since accruals can occur from equity issuance activity, it is important to distinguish return reversal due to accruals from return reversal due to equity issuance.

To control for a possible confound due to equity issuance coinciding with the recognition of accruals, I transform summary log change in book value ($\log(\Delta B)_{t-\tau,t}$) into a more intuitively pleasing log book return, noted $ret^b_{t-\tau,t}$. As noted above, log-based variables have convenient additive properties that allow for meaningful decomposition of cumulative log-based variables. More appealing though is the fact that log returns answer the question of the return earned on a \$1 investment made at time $t-\tau$. Hence, by transforming log change values into log return components, each component will be in the same scale, allowing for meaningful economic and statistical significance comparisons to be made across explanatory variables. In addition, mid-period changes in

equity ownership structure will not affect inferences between future returns and current/prior period book return metrics.

Assuming there are no equity issues, dividends, or other corporate actions affecting shareholder's equity, log change in market value between $t-\tau$ and t is equal to the log return an investor earns between $t-\tau$ and t (i.e. $\log(\Delta M)_{t-\tau,t} = ret^m_{t-\tau,t}$). However, as the time between $t-\tau$ and t increases, $\log(\Delta M)_{t-\tau,t}$ will generally not equal $ret^m_{t-\tau,t}$ because of corporate treasury actions that change the ownership structure of the firm. To convert log change in market value into a log return metric, I introduce the following variable: $iss_{(t-\tau,t)}$. This equity issuance variable, $iss_{(t-\tau,t)}$ is defined consistent with the equity issuance variable $u_{(t-\tau,t)}$ of Daniel and Titman (2006) and represents the difference between log returns and log total change in value. More specifically,

$$iss_{(t-\tau,t)} = \log(\Delta M)_{(t-\tau,t)} - ret^m_{(t-\tau,t)} \quad (5)$$

Intuitively, $iss_{t-\tau,t}$ is the log change in market value that is not attributable to log market returns ($ret^m_{t-\tau,t}$). For example, if a firm issues a number of shares, at current market price, equal to the number of shares currently outstanding (i.e. it doubles its market value through a SEO), $iss_{t-\tau,t}$ would be equal to $\log(2)$, which equals approximately 0.63. Note that the value of the shares held by the initial shareholders did not increase by 63% due to this issuance. Rather, $ret^m_{t-\tau,t}$ is zero as the initial shareholders earn a log return of zero, even though market value doubled. The $iss_{t-\tau,t}$ variable can be used to convert any summary log change variable into a summary log return value. For example $ret^m_{t-\tau,t} = \log(\Delta M)_{t-\tau,t} - iss_{t-\tau,t}$, or $ret^b_{t-\tau,t} = \log(\Delta B)_{t-\tau,t} - iss_{t-\tau,t}$.

Note that $ret^b_{t-\tau,t}$ is equal to $\log(\Delta B)_{t-\tau,t}$ minus $iss_{t-\tau,t}$. As such, the one year log book return between $t-1$ and t can be defined as follows:

$$ret_{t-1,t}^b = \log \Delta B_{t-1,t} - iss_{t-1,t} = TACC + N_TACC - iss_{t-1,t} \quad (6)$$

As (5) reflects, the log book return between $t-1$ and t can be interpreted as the sum of three components: total accruals (TACC), non-accrual growth (N_TACC), and equity issuance.⁸ When these three components are used as explanatory variables of future monthly returns, the coefficient on TACC will represent the expected average monthly return in period $t+1$ for an investor who realized \$1 of log accrual return between period $t-1$ and t , holding constant growth due to N_TACC and $iss_{t-1,t}$. Alternatively, the coefficient on the $iss_{t-1,t}$ variable will capture the expected average monthly return in period $t+1$ for an investor who invested \$1 in the new equity issued at $t-1$. Thus, I will be able to distill return reversal attributable to accruals from return reversal attributable to equity issuance.

3.4 *Intangible Value Change*

Section 3.1 introduces intuition that suggests that investors respond to two types of information. The first type of information is captured by summary accounting measures of value (e.g., change in book value). The second type of information that affects market price is information not (immediately) captured by accounting, either due to the discrete nature of accounting or due to accounting conservatism. Consistent with the nomenclature introduced by DT, I refer to the first type of information as tangible information and the second type of information as intangible information.⁹ To construct a proxy for intangible information I employ a simple process of estimating cross-sectional annual regressions by fiscal year end and define the residuals from each

⁸ Alternatively, total log change in book value can be transformed into log book return by computing a share adjustment factor, consistent with the CRSP/Compustat data manual and Daniel and Titman (2006).

⁹ Tangible (intangible) information refers to the distinct information that produces tangible (intangible) returns. Conceptually, tangible (intangible) information is the same as tangible (intangible) returns.

regression as intangible returns. For example, to compute the change in value due to intangible information over the one year current period $(t-1, t)$ and the four year prior period $(t-5, t-1)$, I regress the realized log market returns, $ret^m_{i,(t-\tau,t)}$, on $bm_{i,t-\tau}$ and the components of the $ret^b_{i,(t-\tau,t)}$ over the same period of time $(t-\tau, t)$. More specifically,

$$ret^m_{i,(t-1,t)} = \gamma_0 + \gamma_1 bm_{i,(t-1)} + \gamma_2 TACC_i + \gamma_3 N_TACC_i + \gamma_4 iss_{i,(t-1,t)} + u_{i,t} \quad (7a)$$

$$ret^m_{i,(t-5,t-1)} = \gamma_0 + \gamma_1 bm_{i,(t-5)} + \gamma_2 \log(\Delta B)_{i,(t-5,t-1)} + \gamma_3 iss_{i,(t-5,t-1)} + u_{i,t-1} \quad (7b)$$

Consistent with DT, I define the change in market value due to tangible information as the fitted component from the above regressions. Hence, change in market value due to intangible information is equal to the regression residual.

$$u_{i,t} = CPIR = \text{current period intangible return}$$

$$u_{i,t-1} = PPIR = \text{prior period intangible return}$$

By construction, total log return is equal to the sum of tangible returns *plus* intangible returns.

3.5 *Alternative interpretation of $iss_{t-\tau,t}$*

Another interpretation of $iss_{t-\tau,t}$ is that this variable captures elements of intangible information not captured by PPIR or CPIR. By construction, the intangible returns defined above (CPIR and PPIR) only capture the intangible information that investors use to price securities. Accordingly, it is reasonable to assume that a manager's intangible information is more precise and extensive than the empirical proxies defined above. In other words, managers may have access to *inside* intangible information, or information that is not measured by accounting measures *nor* known by investors. An example of inside intangible information could be future product patent approval or an undisclosed litigation liability.

Prior literature (Hovakimian, Opler and Titman (2001)) suggests that firms are more likely to issue (repurchase) equity following periods when stock prices increase (decrease) more dramatically than earnings. Accordingly, $iss_{t-\tau,t}$ may be interpreted as an additional (and possibly independent) measure of intangible information.

Chapter 4: Empirical Analysis

4.1 *Sample selection and variable measurement*

This study examines the relation between future returns and accruals in firms with fiscal year ends between 1/31/68 and 6/30/06. To be included in my sample, firms must appear on the *CRSP/Compustat* merged database and have positive book value of equity at fiscal year end for years $t-5$, $t-1$, and t . However, firms with negative book values in intermediate years are not excluded from my sample. In addition, firms must have positive net operating asset balances at fiscal year end of years $t-1$, and t . Additional accounting measures used in the later robustness tests require positive balances and reduce the sample size used in those robustness tests accordingly, although not significantly. I exclude financial firms (SIC 6000-6999) and utilities (SIC 4900-4999) as the operating accruals of firms in these industries are unconventional and do not conform closely to industrial firms. I also exclude firms with stock prices on *CRSP* of less than five dollars per share as of the last day of trading of month six of year $t+1$, firms without a complete series of (60) monthly returns between fiscal year end $t-5$ and fiscal year end t and firms without a complete series of (12) monthly returns in year $t+1$. I also require that the firm have a valid price and shares outstanding reflected on *CRSP* as of the last day of trading in fiscal year $t-5$, $t-1$, t and the last day of trading in month 6 of year $t+1$. These latter observation exclusions reduce the likelihood that market frictions occurring in small firms have a distortive effect on my results. Returns, shares outstanding, and share price are from *CRSP*. All accounting variables are computed from the *CRSP/Compustat* merged database. See Appendix I for accounting variable construction.

A firm's log book-to-market ratio at time t (bm_t) is computed as the log book value of the firm at fiscal year end of year t minus the log market value of the firm as of the last day of trading in fiscal year t as reported in *CRSP*. All log change variables are defined with two subscripts: the first subscript notes the beginning of the change period and the second subscript notes the end of the change period. For example, $\log(\Delta B)_{t-\tau,t}$ is computed as log book value as of fiscal year end t minus the log book value as of fiscal year end $t-\tau$. Similarly, log return measures (e.g., $ret^b_{t-\tau,t}$) are italicized and defined with two subscripts with the first subscript noting the beginning of the return period and the second subscript noting the end.

4.2 Data Summary

Table 1 gives the cross-sectional summary descriptive statistics for the full cross-section of firms in my sample. These statistics show that accruals appear to be a relatively symmetric variable, although there is some right skewness. This right skewness is consistent with the average firm growing over time. Given the data requirements of a trailing five year return series and subsequent twelve months of returns, my sample is skewed toward larger, more mature firms. However, the range and standard deviation of the variables suggests considerable variation in the variables, despite their relative homogeneous size characteristic.

Table 2 gives summary statistics for several years in my sample. I report individual years in addition to pooled cross-sectional summary statistics for several reasons. First, the individual years chosen are the same as those reported in Daniel and Titman (2006) Table 1 and show that although my sample is smaller due to additional data requirements, there is a high degree of symmetry between the two datasets. Second,

by reporting summary statistics from individual years, I show that there is relative stability in the key variables that I analyze across time. Finally, given that Fama and MacBeth (1973) regression coefficients and t -statistics are computed as an equal-weighted average of an annual regression process, examining the statistical properties of several random years of my sample provides better insight into the statistical attributes of my sample that may affect regression inferences than pooled cross-sectional statistics would provide.

Table 3 reports average cross-sectional Pearson (Spearman) correlation coefficients above (below) the diagonal. Overall, these univariate correlations support my hypothesis that PPIR explains the accrual anomaly. First, consistent with prior accrual literature, each accrual measure is negatively correlated with future returns (Ret) and negatively correlated with bm_t . Second, note that non-current accruals (NCACC) are more strongly correlated with PPIR than total accruals (TACC), and TACC are more strongly correlated with PPIR than working capital accruals (WCACC). These relations are consistent with managers expanding productive capacity by investing in long-term assets in response to positive intangible news. Third, note that the correlations between PPIR and the different accrual measures are positive and economically more significant than the correlations between $iss_{t-1,t}$ and $\log(\Delta NFO)_{t-1,t}$ with PPIR. This implies that the market is pricing intangible growth that is not completely funded by future equity, debt issuances, or current cash. Fourth, future returns (Ret) are negatively related to each accrual measure as well as PPIR and both issuance variables. Note that future returns are more strongly negatively associated with PPIR and both issuance variables than WCACC and TACC. Given the strong positive association between the accrual measures and

PPIR and the issuance variables, the return reversal that characterizes the accrual anomaly may be due to investor reaction to information not measured by accruals, but correlated with the recognition of accruals.

4.3 Multivariate Regression Analysis

This section examines the variation in future returns that is explained by current accruals and other components of a log-linear decomposition of the book-to-market ratio. Accordingly, this subsection reports the results of Fama and MacBeth regressions of future monthly returns on log-linear components of the book-to-market ratio as reflected in equation (1). Specifically,

$$ret_{i,t+1} = \gamma_0 + \gamma_1 bm_{i,(t-\tau)} + \sum_{j=2}^{n-1} \gamma_j ret_{i,(t-\tau,t)}^{b-components} + \sum_{j=n}^N \gamma_j ret_{i,(t-\tau,t)}^{i-components} + u_{i,t}$$

where $bm_{i,t-\tau}$ equals the log book-to-market ratio at $t-\tau$, $ret_{i,(t-\tau,t)}^{b-components}$ are various components of the log book return between $t-\tau$ and t , and $ret_{i,(t-\tau,t)}^{i-components}$ are intangible log returns over varying periods between $t-\tau$ and t . The dependent variable, $ret_{i,t+1}$, is a series of twelve monthly future returns, beginning in month seven of fiscal year $t+1$ and ending in month six of fiscal year $t+2$. Since the future return series begins in month seven following fiscal year end, the dependent variable return series ensures that investors have had adequate time to process the accounting information contained in the annual financial statements for year t and that there is no heterogeneity across the return series due to varying fiscal year ends. In addition, by beginning my return series six full months after fiscal year t , I reduce most of the (possible) confounding effects on returns due to post-earnings announcement drift.

To avoid econometric issues caused by a lack of independence in the future return series *and* qualitative issues that may arise from matching a future return series against

fiscal year ends that are more than 7 months apart, the regression results reported in tables 4, 6, 7, and 11 are for firms with a fiscal year end of 12/31. This represents 31,936 firms, or 72% of my sample. Inferences do not change when all firms are included in the regression analysis.

4.3.1 One year Decomposition

Table 4 examines a one year log-linear decomposition of the book-to-market ratio for firms with 12/31 fiscal year end. Regression 1 establishes the strong negative univariate relation between future returns and current period accruals. Regression 2 introduces the other components of current period log-return: N_TACC and $iss_{t-1,t}$. Not surprisingly, the significance (economic and statistical) of the future return/accrual relation decreases. However, a significant relation still exists. Regression 3 introduces bm_{t-1} as the last tangible return variable in the one year decomposition. The $bm_{t-\tau}$ variable can be viewed as an expectation operator that captures market expectations of future cash flows and expected returns over future periods. Interestingly, the introduction of bm_{t-1} eliminates the relation between future returns and current period accruals. In fact, only $iss_{t-1,t}$ and bm_{t-1} are significant. This fact is encouraging as it provides preliminary support that prior period intangible returns explain the accrual anomaly. This is because bm_t is the log-linear sum of tangible and intangible returns between $t-\tau$ and t as well as $bm_{t-\tau}$.

Regression 4 completes the log-linear return decomposition of bm_t by introducing $ret^m_{t-1,t}$. Since $ret^m_{t-1,t}$ is the log market return in the current period, it includes all tangible and intangible information in the current period. Therefore, in this multivariate regression, the coefficients on the tangible return components do not represent a relation

between tangible return components and future returns. Rather, these coefficients represent the differential persistence of the individual components with future returns relative to the persistence of $ret_{t-1,t}^m$ with future returns. The coefficient on $ret_{t-1,t}^m$ represents the relation between future returns and the component of $ret_{t-1,t}^m$ that is *orthogonal* to the other independent variables (tangible components). Thus, in regression 4 when current period intangible returns (CPIR) is substituted into regression 3 for $ret_{t-1,t}^m$, predictably the coefficients on the tangible return variables are the same as in regression 2 and the coefficient on CPIR is the same as the coefficient on $ret_{t-1,t}^m$ in regression 3.

Overall, the empirical evidence from Table 4 is consistent with PPIR explaining the accrual anomaly. However, a decomposition of bm_{t-1} is necessary to determine which component of bm_{t-1} subsumes the negative association between future returns and current period accruals.

4.3.2 *Multi-period Decomposition*

Table 5 Panel A examines the relation between current period accruals, prior period returns (tangible and intangible), and future return for firms with fiscal year end 12/31. Specifically, I begin by establishing the negative relation between current period accruals and future returns. I then introduce other tangible and intangible components of total market return over the current period. These variables complete the one-year decomposition of the bm_t and largely confirm inferences from prior accrual literature. Finally, I complete the five-year decomposition of bm_t by incrementally introducing the log-linear return components from the prior four year period.

Panel A reflects the results of Fama and MacBeth regressions of raw monthly returns on components of log book-to-market. Specifically,

$$\text{ret}_{i,t+1} = \gamma_0 + \sum_{j=1}^N \gamma_j \log \left(\text{Components of } \frac{B_{i,t}}{M_{i,t}} \right) + \mu_{i,t}$$

where ret is a series of 12 raw monthly returns beginning in month seven of fiscal year $t+1$ and the log-linear components of bm_t are defined as in sections 3.2, 3.3, and 3.4.¹⁰

Regression 1 of Panel A shows that in a univariate specification, total accruals (TACC) are strongly negatively associated with future returns, consistent with prior studies. Regression 2 shows that the negative relation holds after controlling for non-accrual growth (N_TACC). Regression 3 shows that controlling for equity issuance and non-accrual growth, there is still a strong negative association between TACC and future returns.

Note the difference in the interpretation of TACC in regression 3 relative to the interpretation of TACC in regressions 1 and 2. A positive TACC value can be recognized in the financial statements under any of the following three conditions: i) income based accruals (e.g., an increase in accounts receivable), ii) available cash or debt invested in working capital or non-current assets, or iii) equity issue proceeds invested in working capital or non-current assets. The univariate relation between future returns and TACC reflected in regression 1 is unconditional and implies a negative association between the change in net operating assets and future returns, regardless of the cause of the change. Regression 3 controls for accruals funded by non-equity and equity sources (conditions ii and iii referenced above). As such, the coefficient on TACC in regression

¹⁰ I also use size-adjusted returns as the dependent variable. The use of size-adjusted returns produces very little change in the regression coefficients and the statistical and economic inferences do not change.

3 represents the relation between future monthly returns and income-based accruals, independent of accruals due to debt and/or equity proceeds. The interpretation of the coefficient on TACC in regressions 1 – 3 is important because it suggests that while negative relation between accruals and future returns attenuates once non-income based accruals and debt/equity issuances are controlled, there still exists a strong relation between future returns and income based accruals. These results are consistent with prior literature that controls for contemporaneous measures of growth.

Subsequent specifications (5) through (7) introduce tangible information from the four year period prior to accrual recognition. Specifically, prior period equity issuance ($iss_{t-5,t-1}$), prior period log book growth (PPBG), and long-horizon expectations (bm_{t-5}) are introduced respectively in regressions 5-7. Consistent with prior accrual literature from the investment/growth class of accrual studies, the economic and statistical significance of accruals and future returns decreases. However, even though other tangible measures of growth from prior periods diminish the relation between future returns and accruals, the relation is still there, implying that some return reversal can be attributed to the information contained in accruals. However, once PPIR is introduced as an explanatory variable in (8), completing the log-linear decomposition of bm_t , accruals are no longer associated with future returns.

Regression 8 implies that PPIR is a necessary control variable to show that accruals are not associated with future returns. However, a more powerful statement of PPIR could be made if it is a sufficient control variable that eliminates the relation between future returns and accruals. Building off regression 4 which shows that TACC are associated with future returns after current period tangible and intangible returns are

controlled, regression 9 adds PPIR as a control variable. Regression 9 shows that after PPIR is controlled, TACC is no longer associated with future returns. This finding implies that PPIR is a powerful control variable that can distort inferences of accounting growth metrics and future returns when omitted.

Overall, the inferences from Panel A imply that the magnitude of the accrual anomaly is a partial function of tangible firm growth, but the existence of the accrual anomaly is due to an interaction of tangible *and* intangible firm growth from current and prior periods.

Panel B reports the results from regressing monthly returns beginning 7 months after fiscal year end against the log-linear components of the book-to-market ratio for the full sample. Because there is variation in the fiscal year ends of the firms, the set of independent variables changes each month. This decreases the power of the regression due to new sets of independent variables being added each month while other sets of independent variables drop out each month. However, overall the inferences in Panel B of Table 5 are consistent with those in Panel A.

Panel C of Table 5 reports the results from regressing monthly returns between July of year $t+1$ and June of year $t+2$ against the log-linear components of the book-to-market ratio for the full sample. Specifically, Panel C reports coefficients from regressing 12 future monthly returns beginning in July of year $t+1$ against the log-linear components of the book-to-market ratio at fiscal year end t , regardless of when the actual fiscal year end occurred in year t . This process standardizes all firms fiscal year end to be 12/31 of year t and begins each firm's future return series in July of year $t+1$. This design

is employed by Daniel and Titman (2006) and the results reflected in Panel C are consistent with those of Panel A.

4.4 *Additional Tests: Alternative Accrual Definitions*

Table 6 examines other measures of accruals examined in prior literature to examine whether the exclusion of prior period intangible returns in prior studies explain the relation between accruals in future returns. To establish the empirical credibility of my tests, I replicate the primary empirical results of prior accrual studies that examine the relation between future returns and other accrual definitions within the confines of my log-linear regression methodology. I then show how the negative relation between future returns and other measures of current period accruals disappears once prior period intangible returns (PPIR) are introduced. Consistent with Table 4, I use an incremental regression method of regressing raw monthly returns on log components of bm_t .

$$ret_{i,t+1} = \gamma_0 + \sum_{j=1}^N \gamma_j \log \left(\text{Components of } \frac{B_{i,t}}{M_{i,t}} \right) + \mu_{i,t}$$

The first set of regressions in Table 6 examines the relation between the components of total accruals suggested by RSST 2006 and future returns. RSST 2006 derive a linear decomposition of total accruals, decomposing total accruals into three parts: change in sales ($\Delta Sales$), change in asset turnover (ΔATO), and an interaction between $\Delta Sales$ and ΔATO . By using a log-linear decomposition I avoid the complicating interaction term, yielding log total accruals (TACC) as the log sum of $\log(\Delta Sales)_{t-1,t}$ and $\log(\Delta ATO)_{t-1,t}$ – see Appendix II for calculations supporting this decomposition.

RSST 2006 suggest that accruals are recognized for two economic reasons: growth or loss of operating efficiency. Intuitively, a growing firm will naturally

recognize positive accruals as increases in sales lead to higher net working capital balances. RSST 2006 call these accruals “growth” accruals and proxy for them with one year change in sales variable ($\Delta\text{Sales}_{t-1,t}$). The second economic reason for positive accruals to be recognized, according to RSST 2006, is a decrease in operating efficiency. The intuition behind this claim is that when a firm needs to carry a higher level of operating capital to support the same level of sales, positive accruals will result. For example, if a firm begins to carry higher inventory balances or needs higher levels of property, plant and equipment to support a given level of sales, a decrease in the firm’s asset turnover ratio will be noted. RSST 2006 claim that change in asset turnover ($\Delta\text{ATO}_{t-1,t}$) captures the effects of changes in efficiency. However, while ΔATO quantitatively captures changes in operating efficiency, RSST 2006 qualitatively interpret this variable as capturing the effects of measurement error. The intuition supporting this claim lies in the construction of the ΔATO variable. Since the latitude managers have in manipulating reported sales is relatively small compared to the latitude managers have in manipulating asset turnover, RSST 2006 claim that the effects on future returns due to manager discretion is better captured by this variable. Hence, in a multivariate setting that includes ΔSales (and the accompanying interaction term), ΔSales will represent “growth” accruals and ΔATO will represent “efficiency” accruals.

Table 6, Panel A examines the intuition of RSST 2006 within the confines of the log-linear framework. Consistent with the intuition of RSST 2006, I show a strong statistical and economic relation between both $\log(\Delta\text{Sales})_{t-1,t}$ and $\log(\Delta\text{ATO})_{t-1,t}$ and future returns. This finding is consistent with RSST 2006 who show that each of these components contributes to return reversal. In regression 2, I control for issuance activity

and intangible information spanning the same period as accruals. The growth component of accruals ($\log(\Delta \text{Sales})_{t-1,t}$) is no longer significantly associated with future returns. However, there is still a statistically and economically strong relation between $\log(\Delta \text{ATO})_{t-1,t}$ and future returns. Since RSST 2006 claim that this variable captures the effect on persistence due to measurement error, regression 2 suggests that future returns may be associated with the inherent measurement error that characterizes accruals.

Regression 3 of Panel A controls for prior period tangible information. Consistent with the investment/growth argument, the significance of $\log(\Delta \text{ATO})_{t-1,t}$ decreases some, but is still associated with future returns. However, once PPIR is added as an explanatory variable in regression 4, neither accrual component is associated with future returns.

Panel B of Table 6 examines working capital accruals. Similar to Healy (1985), Sloan (1996) and other subsequent accrual studies, I define working capital accruals (WCACC) as the difference between the log working capital at fiscal year end t less the log working capital at fiscal year end $t-1$ – see Appendix I for specific variable construction details.¹¹ Due to the logarithmic nature of this variable, I omit depreciation from my working capital accrual variable. This omission will lead to positive working capital accruals on average (Table 1), but should not affect regression inferences. Regressions 1 and 2 of Panel B show that working capital accruals are (marginally) associated with future returns even after other current period measures of growth are introduced into the regression specification. Regressions 3 and 4 of Panel B complete the decomposition of bm_t and show that future returns are not associated with WCACC. The

¹¹ See chapter 5 for discussion and empirical evidence suggesting an empirical bias embedded in the linear construction of the accrual variable that has been used in prior literature.

large drop in the significance between future returns and WCACC after other measures of growth are introduced is consistent with the investment/growth explanation of the accrual anomaly.

Panel C of Table 6 examines the relation between non-current accruals (NCACC) and future returns. RSST 2005 suggest that if the inherent measurement error in accruals is negatively associated with future returns, then less reliable accruals should have a stronger negative relation with future returns than more reliable accruals since less reliable accruals have larger measurement error. RSST 2005 classify different balance sheet accruals as low, medium and high reliability and empirically show that “less reliable” accruals have greater return reversal associated with them.

Consistent with RSST 2005, NCACC are more strongly associated with future returns than working capital accruals (WCACC). Regression (2) shows that NCACC are still negatively associated with future returns after controlling for current period tangible and intangible returns. Interestingly, NCACC are still negatively associated with future returns after controlling for prior period tangible information in regression 3. However, once PPIR are controlled for in regression 4, NCACC are not associated with future returns.

Note the distinction in explanations of the relation between accruals and future returns suggested in my study and the explanation suggested by RSST 2005. RSST 2005 suggest that NCACC are more strongly negatively associated with future returns (relative to WCACC) due to the relatively greater measurement error inherent in non-current accruals. However, non-current accruals are also more likely to be strongly associated with prior period intangible returns and issuance activity, especially positive non-current

accruals. For example, a firm that experiences a significant positive intangible return will more likely respond to this shock by accruing more non-current assets to the balance sheet than accruing current assets. Thus, the stronger relation between non-current accruals and future returns (relative to working capital accruals and future returns) may not be due to differences in accrual reliability, but due to differences in the magnitude of prior period intangible returns.

The results reflected in Table 6 Panel C are consistent with the investment/growth argument. Note the decrease in the statistical and economic significance of NCACC between Panel C, regression 1 and Panel C, regression 3. Other growth variables from current and prior periods decrease the relation between NCACC and future returns, but do not eliminate it. However, Panel C, regression 4 suggests the importance of PPIR when making inferences between current period accounting measures and future returns.

4.5 *Signed Non-Accrual Growth (N_TACC) Regressions*

As discussed in Chapter 3.2, N_TACC is a non-traditional variable and its economic significance may not be immediately apparent. This ratio can be viewed as a lever that amplifies (attenuates) log book returns. For example, if this ratio is positive, this implies that a firm was able to increase its cash position after operating and investing needs were met, thereby amplifying the log book returns realized by equity holders. On the other hand, if this ratio is negative, it means that some growth in net operating assets was due to an infusion of new debt (net debt issued > free cash flow). As such, the log book return is attenuated since part of the book return is funded by debt.

To examine if there is differential significance across the different signs of N_TACC, Table 7 decomposes bm_t in a manner similar to the decomposition in Table 5.

However, (+)N_TACC equals the positive values of N_TACC, zero otherwise and (-)N_TACC equals the negative values of N_TACC, zero otherwise.

Table 7, Regression 1 reflects results similar to that of Table 5, regression 2. However, note the strong negative association between (+)N_TACC and future returns. As noted above, (+)N_TACC occurs when a firm increases its net cash position (cash and cash equivalents minus debt) after operating and investing needs are met. However, this variable will capture increases in net cash position due to equity financing activities. Indeed, in subsequent regressions that control for current and prior period equity issuance, the coefficient on (+)N_TACC becomes insignificant. Likewise, consistent with prior results, there is no relation between future period returns and current period accruals after prior period intangible returns are controlled.

4.6 Non-Parametric Robustness Tests: Portfolio tests

Portfolio methodologies are often employed in accrual studies to control for possible non-linearities in the accrual/return relation. In addition to the portfolio evidence that the mispricing of accruals is strongest in the extreme deciles, portfolio evidence is also mounting that the accrual anomaly is asymmetric and that the abnormal returns earned on an accrual trading strategy are concentrated in the high accrual deciles. To examine whether my results hold in a non-parametric, portfolio setting, I employ a series of dependent sorts that minimize the variation in the control variables, while maximizing the variation in the variable of interest. The variable of interest I examine is total adjusted accruals ($TACC^{adj}$) and the two control variables are total period intangible return (TPIR) and non-accrual growth (N_TACC). TPIR is the five year intangible return

that is orthogonal to the components of log book return between $t-5$ and t (i.e., $TACC^{adj}$, N_TACC , $PPBG$, and $iss_{t-5,t-1}$)

Note that $TACC^{adj}$ is a measure of per share accruals, or per share growth in net operating assets. As noted in Daniel and Titman (2006), this measure of growth captures the growth in net operating assets between $t-1$ and t per dollar invested at time $t-1$. Hence, $TACC^{adj}$ adjusts for growth in net operating assets due to equity issuance activity.

The dependent portfolio sort methodology I employ is defined as follows. To hold TPIR constant, I sort all observations into annual deciles ranked on TPIR. Each of these ten annual TPIR deciles is then sorted into 10 annual sub-deciles based on N_TACC . Each of these annual sub-deciles is then sorted into annual quintiles based on $TACC^{adj}$. I then pool the sub-deciles together based on their respective $TACC^{adj}$ rank. The result is five portfolios with significant variation in accruals and minimal variation across the control variables (e.g., TPIR and N_TACC).

Table 8 Panel A shows the average hedge portfolio return (size-adjusted and raw) from implementing an unconditional portfolio strategy of sorting firms each year into accrual deciles based on $TACC$ and taking a long (short) position in the low (high) accrual firms. Size-adjusted returns are denoted $sRet$ and raw returns are denoted Ret . For comparative purposes, I also reflect $TACC^{adj}$ to show the close similarity between $TACC$ and $TACC^{adj}$ ($TACC - iss_{t-1,t}$).

Panel A suggests that the hedge returns are statistically significant, and the economic significance is comparable to those reflected in prior accrual studies. Panels B, C, D, E will use this same sample of firms, dependently sorted into quintiles as described

above, to determine whether accruals explain future returns after controlling for correlated characteristics.

Panel B of Table 8 shows that once TPIR and N_TACC are controlled, accruals marginally explain future returns, with minimal economic significance. In fact, there is not even a discernable return pattern across the quintiles. The series of dependent sorts cannot completely control for variation in N_TACC as there is still a monotonic relation across N_TACC based quintiles. However, since the goal of the dependent sorts is to minimize the variation in control variables, not eliminate the variation, the tenor of my results in Table 8 is unaffected.

Panel C in Table 8 examines the abnormal returns that can be earned on TPIR, controlling for $TACC^{adj}$ and N_TACC. This panel shows that economically and statistically significant abnormal returns can be earned on portfolios sorted on TPIR, suggesting that intangible returns capture important cross-sectional differences in either risk or some type of behavioral bias.

Panel D in Table 8 examines the abnormal returns that can be earned on N_TACC controlling for TPIR and $TACC^{adj}$. This panel shows statistically significant returns (with smaller economic significance relative to TPIR). The abnormal return reflected in Panel D may be driven by debt issuance. Many prior studies show that debt issuance is negatively associated with future returns. Given that N_TACC captures debt issuance, the abnormal returns could be related to debt issued to fund investment.

Panel E in Table 8 examines the abnormal returns attributable to $TACC^{adj}$, holding constant N_TACC and PPIR (prior period intangible returns). Consistent with

the tenor of Panel B, the abnormal hedge returns are economically insignificant with marginal statistical significance.

4.7 Non-Parametric Robustness Tests: Ranked Regressions

Table 9 reports the results of Fama and MacBeth regressions of annual, size-adjusted returns on annual decile ranks of $TACC^{adj}$, N_TACC , and $TPIR$. Specifically, each year I rank $TACC^{adj}$, N_TACC , and $TPIR$ into deciles 0 through 9. The decile ranks are then divided by 9, producing a uniformly distributed variable. The coefficients on these ranked variables represent the hypothetical buy-and-hold size-adjusted annual return from going short (long) on firms in the low (high) decile. Note that while the hedge return coefficient inferences hold in the univariate setting (Table 9, Regression 1), this interpretation is tenuous in multivariate settings.

Table 9, regression 1 establishes a statistically and economically strong relation between future returns and current period accruals. The significance of this relation diminishes greatly in regression 2 and disappears in regression 3 as the additional control variables are introduced. Inferences from Table 9 confirm the primary findings in prior tables: accruals are not negatively associated with future returns once intangible returns and funding sources are controlled.

4.8 Discretionary Accruals

Xie (2001), Teoh et al (1998a, 1998b), and others suggest that investors improperly incorporate the information contained in discretionary accruals more than non-discretionary accruals. Discretionary accruals are traditionally defined as the residual from an industry-specific, annual regression of accruals regressed on explanatory variables theorized to explain “normal” accruals from year to year. While the

specifications of discretionary accrual regressions vary from study to study, the general specification is as follows:

$$\text{Accruals}_{i,t} = \alpha_{0,j,t} + \gamma_{1,j,t}\Delta\text{Sales}_{i,(t-1,t)} + \gamma_{2,j,t}\text{PPE}_{i,t} + \mu_{i,t} \quad (8)$$

Where i signifies the firm, j signifies the industry, and t signifies the year. The dependent and independent variables (and sometimes the intercept) are scaled by total assets (or lag total assets) to control for heteroskedasticity and to mitigate problems stemming from an omitted size variable that may cause scale-related coefficient bias.

As this dissertation shows, accruals are strongly correlated with growth. While the discretionary accrual formula (8) attempts to control for accruals related to growth (ΔSales) and scale (PPE), arguments have been made since the first discretionary accrual model (Jones 1991) that the linear nature of the model subjects the model to material specification issues. This dissertation takes no stance on discretionary accrual specification issues. Rather, I use a discretionary accrual model (8) to decompose working capital accruals into discretionary and non-discretionary components that have been used in prior literature.¹² Consistent with the discretionary accrual literature, I require a minimum of 10 firms in each industry per fiscal year. All other methodological assumptions and variables are consistent to those used in the primary paper.

To compute the discretionary component of accruals, I employ the following regression methodology:

$$\text{WCACC}_{i,t} = \gamma_{0,j,t} + \gamma_{1,j,t}\text{ret}^{\text{Sales}}_{i,(t-1,t)} + \gamma_{2,j,t}\text{PPE}_{i,t} + \mu_{i,t} \quad (9)$$

Table 10 reports results of Fama and MacBeth regressions of monthly raw returns on log-linear components of the book-to-market ratio as of fiscal year end t (bm_t).

¹² Note, change in sales and PPE are each scaled by total assets as of fiscal year end t .

Specifically, I regress a series of twelve monthly returns beginning in month seven of fiscal year $t+1$ and ending in month 6 of fiscal year $t+2$ on log-linear components of bm_t .

Table 10 regression 1 establishes that discretionary accruals are more strongly negatively associated with future returns than non-discretionary accruals. Regression 2 examines the multivariate relation between future returns and log transforms of discretionary and non-discretionary working capital accruals, non-working capital accrual growth and bm_{t-1} . Again, consistent with prior literature, discretionary accruals and book-to-market are strongly associated with future returns.

Regression 3 completes the log-linear *return* decomposition of bm_t over a one year period. Regression 3 suggests that once equity issuance/repurchase activity is controlled (in addition to other, tangible return components from fiscal period t), discretionary accruals are not associated with future returns. Regression 4 completes the five year return decomposition of bm_t . Results reflected in regression 4 are consistent with the tenor of the primary paper. Specifically, once intangible returns and equity issuance is controlled, (discretionary) accruals are not negatively associated with future returns.

As prior discretionary accrual studies have noted, the traditional linear model used to decompose accruals into discretionary and non-discretionary components may be suffer from specification issues. Refining the specification model used to extract the discretionary accrual component from total accruals is beyond the scope of this dissertation and is left to future research. However, the log-linear return methodology employed in this dissertation may prove useful in defining a discretionary accrual model.

Specifically, by defining accruals and other growth measures in log-return scale, some of the econometric issues that plague prior discretionary accrual measures can be avoided.

4.9 Additional Robustness Tests

The following subchapters address the results from additional robustness tests. These tests confirm that the primary results of my dissertation are not sensitive to the inclusion/exclusion of certain sample periods, time horizons, variable structures, or extreme observations.

4.9.1 Time-Based Subperiod Analysis

I examine my results for two, non-overlapping subperiods of my sample. Specifically, I separately examine the association between future returns and current period accruals, controlling for contemporaneous/prior period intangible returns as well as issuance activity across periods 8/1968 – 12/1985 and 1/1986 – 6/2005. Across both subperiods, accruals do not explain future returns once prior period intangible information is controlled.

4.9.2 Multi-period Accrual Analysis

I also investigate the relation between prior period accruals, current accruals, and future returns. As noted above, since cumulative log book returns can be decomposed into log components, I decompose $ret_{t-5,t}^b$ into log return components spanning 3 periods. Specifically, I concurrently examine log book return components between $t-1$ and t , $t-2$ and $t-1$ and $t-5$ and $t-2$. This analysis allows me to examine accrual-based growth over multiple periods, not just the current period ($t-1, t$). Consistent with the tenor of my main results, prior period book returns remain insignificantly associated with future returns.

4.9.3 *Non-accrual Growth (N_TACC)*

The fact that N_TACC is a relatively uncommon variable, questions may be raised as to its importance in the regression specification. While N_TACC is constructed as a ‘plug’ variable to complete the log-linear return decomposition of $ret_{t-1,t}^b$, its economic significance is simple. Just as $iss_{t-1,t}$ captures change in book value due to equity issuance activity, N_TACC captures the change book value due to either free cash flow or accruals funded by new debt. Since TACC can be driven by equity issuance *or* non-equity financing (purchase of assets with cash or debt instruments), N_TACC serves as a natural control for non-equity financing. To examine whether N_TACC explains unique variation in future returns that cannot be replicated by other similar variables, I substitute for N_TACC a variable defined as $\log(\Delta NFO)_{t-1,t}$, where NFO is equal to net financing obligations, or financial liabilities minus financial assets – see Appendix I for specific variable construction. The tenor of my results does not change when I substitute $\log(\Delta NFO)_{t-1,t}$ in for N_TACC. Accruals continue to be insignificantly associated with future returns once prior period intangible returns are controlled.

4.9.4 *Extreme Observations*

Since I do not winsorize or trim my variables, a concern may arise that extreme accrual values attenuate the explanatory power of my regression specification and, in effect, give more explanatory power to the intangible variables. I examine the sensitivity of my results to extreme outliers by trimming the top/bottom 1% of my sample each year for the following three variables: N_TACC, TACC, $\log(\Delta NFO)_{t-1,t}$. The result of this sensitivity test suggests that extreme accrual observations do not attenuate the cross-sectional association between future returns and accruals.

4.9.5 Length of Prior Period Intangible Returns

I also investigate the sensitivity of my results to the length of the prior period intangible return period. Specifically, I shorten the prior period from 48 months to 24 months. This methodological change increases the number of firms included in my analysis (by shortening the required prior period returns from 48 months to 24 months) and (possibly) reducing the explanatory power of prior period intangible returns by decreasing the measurement period. Again, future returns are insignificantly associated with accruals.

Chapter 5: Conclusion

This study re-examines the evidence that accruals are negatively associated with future returns. Using a three period empirical model, I examine the relation between future returns in period three, current period accruals in period two, and prior period firm growth and contraction in period one. I operationalize my empirical tests through a log-linear decomposition of the book-to-market ratio. Using this decomposition method, I decompose the information investors use to price equities into two components: tangible and intangible information. Tangible information refers to the value relevant information measured by summary accounting measures. Intangible information refers to all other value relevant information not captured by summary accounting measures.

The empirical evidence suggests that current period accruals are not associated with future returns once prior period intangible returns are controlled. This finding holds for multiple definitions and decompositions of accruals. Rather, this study suggests that the negative relation between future returns and current period accruals documented in prior literature is due to a relation between prior period intangible returns and accruals. Hence, once prior period intangible returns are controlled, the negative association between future returns and current period accruals disappears. The empirical methodology and economic intuition noted in this study also suggests that the accrual anomaly is a derivative of the value/growth anomaly.

In addition, I examine the information contained in the linear accrual variable used in Sloan (1996) and in most subsequent empirical studies examining accruals. I decompose the linear variable into its primary components and show that growth in working capital, the primary variable characterizing the accrual anomaly, is not

associated with future returns. Further analysis shows that neither growth in working capital nor growth in total assets is associated with future returns. Rather, the linear accrual variable used in prior accrual literature is strongly negatively associated with future returns because of the manner in which the linear accrual variable captures firm growth.

This study adds support to the investment/growth explanation of the accrual anomaly. This study provides empirical evidence that the accrual anomaly is a function of the correlation between accruals and firm growth. In addition, this study provides substantial empirical evidence suggesting that investors do not misprice the information contained in accruals. This view differs from prior accrual studies which suggest that the accrual anomaly is due to investors mispricing the growth element of accruals. In particular, this study directly examines the growth element of accruals examined in prior studies and finds a significant association between the growth element and future returns does not exist.

The empirical methods developed and conclusions reached in this study should be of interest to researchers examining how investors incorporate the information contained in accruals into asset price. The log-linear return methodology allows researchers to control for all value-relevant information incorporated into stock price over multiple periods. This method is a substantial departure from the methods used in prior literature that are subject to model specification concerns relating to properly controlling for systematic risk. Further, the decomposition of the linear accrual variable used in Sloan (1996) and other subsequent accrual studies should also be of interest to researchers as it provides a structural model mapping firm growth into the accrual variable. Subsequent

accrual literature may investigate optimal levels of working capital growth per unit of total asset growth.

The empirical methods employed in this study impose certain limitations. First, the empirical design requires a relatively long time-series of returns which skews sample firms toward larger and more mature firms. Second, the cross-sectional regression methodology used to compute tangible and intangible returns assumes homogeneous characteristics across sample firms sharing the same fiscal year end. Future research may examine these issues more closely. Given industry differences in economic cycles, future research examining industry-specific effects could prove fruitful. Finally, intangible returns are defined as a negative (i.e., returns not explained by summary accounting measures). The composition of intangible returns is an open empirical question between competing rational and behavioral explanations. Future research can examine the composition of intangible returns.

Table 1

Table 1 reports the mean, standard deviation, lower quartile, median, upper quartile, minimum and maximum values across the entire sample. The sample spans fiscal years ending 12/31/1968 through 6/30/2006. See Appendix 1 for the CRSP/Compustat data items that comprise each variable.

	Mean	Std. Dev.	Min	25%	50%	75%	Max
BM	0.834	1.122	0.000	0.413	0.663	1.043	148.460
ShrsOut	53.014	242.849	0.210	3.948	10.636	32.343	10,605.920
Price	24.716	25.049	5.000	11.000	19.030	31.875	1,664.000
TACC	0.100	0.439	(34.378)	(0.047)	0.073	0.224	6.777
WCACC	0.082	0.503	(8.852)	(0.075)	0.080	0.240	7.665
NCACC	0.114	0.311	(6.379)	(0.019)	0.070	0.195	6.727
PPBG	0.464	0.617	(7.949)	0.164	0.397	0.699	8.742
Ret	0.16	0.53	(1.00)	(0.14)	0.08	0.35	19.79
# of Obs.	55,401						

Table 2

Table 2 reports the mean, standard deviation, minimum and maximum values for select variables for fiscal year ends 1968, 1977, 1978, 1990, 2000. See Appendix 1 for the CRSP/Compustat data items that comprise each variable.

		BM	ShrsOut	Price	TACC	WCACC	NCACC	$ret^m_{(t-5,t)}$	$iss_{(t-5,t)}$	Ret
Year	1968									
Average		0.51	10.86	34.57	0.15	0.11	0.16	1.00	(0.03)	(0.28)
Std. Dev.		0.32	27.92	23.77	0.30	0.45	0.34	0.62	0.26	0.29
Min.		0.01	0.21	5.25	(1.45)	(3.72)	(1.57)	(0.51)	(0.77)	(0.82)
Max.		2.62	549.26	337.75	2.47	2.54	3.28	3.40	2.27	2.30
Obs.	874									
Year	1977									
Average		1.18	13.84	22.10	0.12	0.13	0.11	0.09	(0.12)	0.22
Std. Dev.		1.04	33.00	16.23	0.35	0.44	0.19	0.65	0.22	0.39
Min.		0.13	0.25	5.00	(3.74)	(4.18)	(1.45)	(2.17)	(1.64)	(0.65)
Max.		31.18	652.88	257.25	3.96	5.00	1.82	3.17	1.11	3.59
Obs.	1361									
Year	1978									
Average		1.13	13.20	21.48	0.17	0.14	0.17	0.59	(0.11)	0.21
Std. Dev.		0.89	34.39	17.85	0.31	0.41	0.25	0.69	0.25	0.46
Min.		0.09	0.25	5.00	(1.73)	(3.34)	(1.45)	(1.93)	(1.69)	(0.80)
Max.		25.57	675.75	425.50	2.76	3.68	4.44	3.22	1.47	4.85
Obs.	1643									
Year	1990									
Average		0.86	42.48	23.66	0.10	0.08	0.11	0.33	(0.02)	0.22
Std. Dev.		0.70	100.96	22.44	0.36	0.53	0.26	0.74	0.38	0.55
Min.		0.00	0.39	5.00	(2.89)	(4.47)	(1.70)	(5.04)	(2.38)	(0.88)
Max.		8.14	1,244.75	428.88	2.41	4.98	2.07	2.83	3.48	6.07
Obs.	1341									
Year	2000									
Average		0.82	133.65	24.44	0.12	0.13	0.14	0.46	0.10	0.09
Std. Dev.		0.99	497.76	28.33	0.46	0.54	0.35	0.90	0.46	0.50
Min.		0.01	0.66	5.00	(4.64)	(3.45)	(2.11)	(3.10)	(3.54)	(0.96)
Max.		21.22	9,933.07	665.00	4.52	4.64	2.73	6.48	3.50	3.44
Obs.	1492									

Table 3

Table 3 reports univariate correlations with Pearson (Spearman) coefficients above (below) the diagonal. Panel A reports cross-sectional univariate correlations. Italicized correlation coefficients are insignificant at 0.10. All other coefficients are significant ≤ 0.10 .

	bm_t	bm_{t-5}	PPIR	$iss_{t-5,t-1}$	$iss_{t-1,t}$	$\log(\Delta NFO)_{t-1,t}$	N_TACC	TACC	NCACC	WCACC	Ret
bm_t	1.000	0.492	-0.564	-0.147	-0.153	-0.032	0.005	-0.085	-0.145	-0.079	0.098
bm_{t-5}	0.492	1.000	0.000	-0.133	-0.042	<i>0.001</i>	-0.015	-0.036	-0.063	-0.025	0.054
PPIR	-0.561	-0.027	1.000	0.000	0.035	0.072	0.027	0.145	0.208	0.114	-0.038
$iss_{t-5,t-1}$	-0.208	-0.211	0.017	1.000	0.198	0.038	<i>0.002</i>	0.071	0.110	0.061	-0.049
$iss_{t-1,t}$	-0.279	-0.108	0.100	0.472	1.000	0.009	0.105	0.144	0.244	0.110	-0.045
$\log(\Delta NFO)_{t-1,t}$	-0.039	<i>0.007</i>	0.101	0.041	-0.022	1.000	-0.578	0.636	0.419	0.290	-0.028
N_TACC	-0.028	-0.018	<i>-0.005</i>	<i>0.008</i>	0.131	-0.858	1.000	-0.812	-0.306	-0.250	0.018
TACC	-0.151	-0.048	0.218	0.103	0.141	0.784	-0.709	1.000	0.555	0.404	-0.033
NCACC	-0.197	-0.067	0.268	0.124	0.180	0.524	-0.390	0.685	1.000	0.178	-0.041
WCACC	-0.140	-0.042	0.175	0.094	0.145	0.503	-0.415	0.649	0.272	1.000	-0.015
Ret	0.110	0.046	-0.033	-0.097	-0.106	-0.043	0.035	-0.048	-0.049	-0.029	1.000

Table 4

Table 4 reports the results of a set of Fama and MacBeth regressions of monthly returns on components of a log-linear decomposition of the book-to-market ratio at fiscal year end t for firms with fiscal year end 12/31. The monthly return series is between month 7 of year $t+1$ and month 6 of year $t+2$ where t is between 12/31/68 – 6/30/06. All coefficients are multiplied by 100. t-statistics are reported in parentheses.

Model	Intercept	TACC	N_TACC	$iss_{t-1,t}$	bm_{t-1}	$ret^m_{t-1,t}$	CPIR
1	1.238 (5.02)	-0.437 (-2.61)	-0.103 (-0.65)	-1.060 (-3.67)			
2	1.257 (5.10)	-0.127 (-0.82)	0.137 (0.93)	-1.142 (-3.95)	0.223 (3.49)		
3	1.273 (5.36)	-0.002 (-0.02)	0.283 (2.11)	-1.158 (-4.16)	0.239 (3.56)	-0.299 (-1.97)	
4	1.257 (5.10)	-0.127 (-0.82)	0.137 (0.93)	-1.142 (-3.95)	0.223 (3.49)		-0.299 (-1.97)

Table 5 – Panel A

Table 5 reports the results of a set of Fama and MacBeth regressions of monthly returns on components of a log-linear decomposition of the book-to-market ratio at fiscal year end t for all 12/31 fiscal year end firms. The monthly return series is between month 7 of year $t+1$ and month 6 of year $t+2$ where t is between 12/31/68 – 6/30/06. All coefficients are multiplied by 100. Newey-West t-statistics are reported in parentheses.

Model	Intercept	TACC	N_TACC	$iss_{t-1,t}$	CPIR	PPIR	$iss_{t-5,t-1}$	PPBG	bm_{t-5}
1	1.242 (5.07)	-0.413 (-6.00)							
2	1.269 (5.23)	-0.635 (-3.72)	-0.277 (-1.77)						
3	1.238 (5.02)	-0.437 (-2.61)	-0.103 (-0.65)	-1.060 (-3.67)					
4	1.238 (5.02)	-0.437 (-2.61)	-0.103 (-0.65)	-1.060 (-3.67)	-0.299 (-1.97)				
5	1.241 (4.99)	-0.421 (-2.57)	-0.094 (-0.60)	-0.948 (-3.66)	-0.324 (-2.18)		-0.313 (-2.43)		
6	1.288 (5.19)	-0.423 (-2.56)	-0.113 (-0.71)	-0.968 (-3.75)	-0.334 (-2.23)		-0.200 (-1.51)	-0.114 (-1.78)	
7	1.263 (5.12)	-0.390 (-2.40)	-0.084 (-0.53)	-0.981 (-3.79)	-0.320 (-2.14)		-0.220 (-1.64)	-0.075 (-1.16)	0.051 (0.96)
8	1.241 (5.06)	-0.114 (-0.76)	0.117 (0.80)	-1.062 (-4.13)	-0.345 (-2.31)	-0.280 (-3.51)	-0.246 (-1.84)	-0.067 (-1.05)	0.061 (1.14)
9	1.218 (4.96)	-0.204 (-1.32)	0.062 (0.42)	-1.135 (-3.97)	-0.322 (-2.13)	-0.265 (-3.38)			

Table 5 – Panel B

Table 5 reports the results of a set of Fama and MacBeth regressions of monthly returns on components of a log-linear decomposition of the book-to-market ratio at fiscal year end t . The monthly return series is between month 7 of year $t+1$ and month 6 of year $t+2$ where t is between 12/31/68 – 6/30/06. All coefficients are multiplied by 100. Newey-West t-statistics are reported in parentheses.

Model	Intercept	TACC	N_TACC	$iss_{t-1,t}$	CPIR	PPIR	$iss_{t-5,t-1}$	PPBG	bm_{t-5}
1	1.192 (4.84)	-0.430 (-6.53)							
2	1.201 (4.95)	-0.533 (-3.16)	-0.121 (-0.81)						
3	1.168 (4.76)	-0.318 (-1.98)	0.063 (0.44)	-1.269 (-4.41)					
4	1.168 (4.76)	-0.318 (-1.98)	0.063 (0.44)	-1.269 (-4.41)	-0.235 (-1.68)				
5	1.170 (4.74)	-0.305 (-1.99)	0.068 (0.49)	-1.041 (-4.42)	-0.260 (-1.89)		-0.438 (-3.05)		
6	1.208 (4.94)	-0.278 (-1.83)	0.068 (0.49)	-1.115 (-4.71)	-0.260 (-1.89)		-0.329 (-2.23)	-0.099 (-1.63)	
7	1.193 (4.91)	-0.235 (-1.56)	0.110 (0.79)	-1.155 (-4.82)	-0.243 (-1.78)		-0.341 (-2.40)	-0.041 (-0.67)	0.083 (1.80)
8	1.170 (4.83)	0.048 (0.32)	0.316 (2.35)	-1.141 (-4.73)	-0.272 (-1.99)	-0.313 (-3.70)	-0.374 (-2.51)	-0.042 (-0.70)	0.090 (1.94)
9	1.144 (4.67)	-0.064 (-0.40)	0.245 (1.78)	-1.281 (-4.60)	-0.264 (-1.89)	-0.297 (-3.63)			

Table 5 – Panel C

Table 5 reports the results of a set of Fama and MacBeth regressions of monthly returns on components of a log-linear decomposition of the book-to-market ratio at fiscal year end t . The monthly return series is between July of year $t+1$ and June of year $t+2$ where t is between 12/31/68 – 6/30/06. All coefficients are multiplied by 100. Newey-West t-statistics are reported in parentheses.

Model	Intercept	TACC	N_TACC	$iss_{t-1,t}$	CPIR	PPIR	$iss_{t-5,t-1}$	PPBG	bm_{t-5}
1	1.237 (4.91)	-0.356 (-6.19)							
2	1.261 (5.09)	-0.573 (-3.61)	-0.260 (-1.80)						
3	1.232 (4.91)	-0.371 (-2.42)	-0.083 (-0.58)	-1.019 (-4.18)					
4	1.232 (4.90)	-0.370 (-2.42)	-0.082 (-0.58)	-1.020 (-4.18)	-0.346 (-2.59)				
5	1.234 (4.88)	-0.360 (-2.44)	-0.086 (-0.63)	-0.858 (-4.04)	-0.371 (-2.84)		-0.406 (-3.17)		
6	1.266 (5.06)	-0.344 (-2.36)	-0.078 (-0.56)	-0.879 (-4.12)	-0.377 (-2.87)		-0.320 (-2.56)	-0.078 (-1.39)	
7	1.251 (5.03)	-0.321 (-2.27)	-0.057 (-0.42)	-0.881 (-4.15)	-0.360 (-2.76)		-0.337 (-2.66)	-0.025 (-0.46)	0.069 (1.49)
8	1.232 (4.96)	-0.077 (-0.60)	0.129 (1.05)	-0.925 (-4.38)	-0.380 (-2.92)	-0.247 (-3.39)	-0.355 (-2.77)	-0.023 (-0.43)	0.076 (1.63)
9	1.212 (4.84)	-0.154 (-1.13)	0.079 (0.61)	-1.065 (-4.39)	-0.365 (-2.75)	-0.232 (-3.26)			

Table 6

Table 6 reports the results of a set of Fama and MacBeth regressions of monthly returns on components of a log-linear decomposition of the book-to-market ratio for all firms with fiscal year end 12/31. The monthly return series is between month 7 of year $t+1$ and month 6 of year $t+2$ where t is between 8/1968 - 12/2006. All coefficients are multiplied by 100. Newey-West t-statistics are reported in parentheses.

Panel A

Reg.	Int.	log (Δ Sales) _{t-1,t}	log (Δ ATO) _{t-1,t}	N_TACC	iss _{t-1,t}	CPIR	PPIR	iss _{t-5,t-1}	PPBG	bm _{t-5}
1	1.264 (5.22)	-0.682 (-3.12)	-0.603 (-3.72)	-0.265 (-1.79)						
2	1.229 (4.98)	-0.449 (-2.05)	-0.431 (-2.69)	-0.105 (-0.70)	-1.032 (-3.55)	-0.309 (-2.04)				
3	1.254 (5.07)	-0.364 (-1.72)	-0.409 (-2.62)	-0.107 (-0.71)	-0.952 (-3.65)	-0.336 (-2.24)		-0.210 (-1.58)	-0.082 (-1.27)	0.046 (0.87)
4	1.232 (5.01)	-0.057 (-0.29)	-0.144 (-0.97)	0.091 (0.64)	-1.043 (-4.04)	-0.362 (-2.41)	-0.283 (-3.54)	-0.237 (-1.78)	-0.077 (-1.20)	0.056 (1.05)

Panel B

Reg.	Int.	WCACC	N_WCACC	iss _{t-1,t}	CPIR	PPIR	iss _{t-5,t-1}	PPBG	bm _{t-5}
1	1.253 (5.13)	-0.588 (-3.21)	-0.388 (-2.19)						
2	1.220 (4.91)	-0.369 (-2.06)	-0.183 (-1.05)	-1.231 (-3.82)	-0.263 (-1.71)				
3	1.248 (5.02)	-0.324 (-1.87)	-0.160 (-0.94)	-1.058 (-3.66)	-0.294 (-1.94)		-0.207 (-1.51)	-0.128 (-1.89)	0.029 (0.53)
4	1.223 (4.95)	-0.045 (-0.28)	0.092 (0.58)	-1.155 (-4.03)	-0.324 (-2.13)	-0.288 (-3.50)	-0.222 (-1.60)	-0.115 (-1.71)	0.040 (0.70)

Panel C

Reg.	Int.	NCACC	N_NCACC	iss _{t-1,t}	CPIR	PPIR	iss _{t-5,t-1}	PPBG	bm _{t-5}
1	1.275 (5.28)	-0.751 (-4.04)	-0.190 (-1.23)						
2	1.245 (5.06)	-0.548 (-2.97)	-0.029 (-0.19)	-1.043 (-3.56)	-0.302 (-1.98)				
3	1.262 (5.13)	-0.487 (-2.73)	-0.020 (-0.13)	-0.968 (-3.68)	-0.323 (-2.14)		-0.215 (-1.61)	-0.071 (-1.10)	0.039 (0.73)
4	1.238 (5.06)	-0.161 (-0.97)	0.164 (1.12)	-1.069 (-4.11)	-0.347 (-2.30)	-0.274 (-3.44)	-0.237 (-1.77)	-0.067 (-1.05)	0.050 (0.92)

Table 7

Table 7 reports the results of a set of Fama and MacBeth regressions of monthly returns on components of a log-linear decomposition of the book-to-market ratio for firms with 12/31 fiscal year end. The monthly return series is between month 7 of year $t+1$ and month 6 of year $t+2$ where t is between 8/1968 - 12/2006. All coefficients are multiplied by 100. Newey-West t-statistics are reported in parentheses.

Model	Int.	TACC	(+)N_TACC	(-)N_TACC	<i>iss</i>_{t-1,t}	CPIR	PPIR	<i>iss</i>_{t-5,t-1}	PPBG	<i>bm</i>_{t-5}
1	1.308 (5.50)	-0.682 (-4.03)	-0.476 (-2.65)	-0.152 (-0.83)						
2	1.270 (5.23)	-0.504 (-2.99)	-0.264 (-1.54)	-0.025 (-0.13)	-0.976 (-3.41)	-0.276 (-1.83)				
3	1.293 (5.30)	-0.459 (-2.82)	-0.241 (-1.40)	-0.017 (-0.09)	-0.908 (-3.51)	-0.300 (-2.01)		-0.195 (-1.48)	-0.081 (-1.25)	0.041 (0.78)
4	1.262 (5.21)	-0.182 (-1.21)	0.003 (0.02)	0.135 (0.76)	-0.999 (-3.89)	-0.329 (-2.21)	-0.267 (-3.30)	-0.223 (-1.69)	-0.071 (-1.11)	0.053 (0.98)

Table 8**Panel A**

Panel A reports decile portfolios formed annually from 1968 to 2006. At the end of each fiscal year t , firms are sorted into deciles based on $TACC^{adj}$. Ret is the 12 month, buy-and-hold raw return beginning in month 7 of year $t+1$. sRet is the 12 month, buy-and-hold size-adjusted return beginning in month 7 of year $t+1$. TACC are total accruals defined as $\log(NOAt/NOA_{t-1})$. $TACC^{adj}$ are total accruals adjusted for equity issuance defined as $\log(NOAt/NOA_{t-1}) - iss_{t-1,t}$. WCACC are working capital accruals defined as $\log(WC_t/WC_{t-1})$. See Appendix I for the specific CRSP/Compustat data items that comprise each variable.

Portfolio	Mean Ret	Mean sRet	Mean TACC	Mean $TACC^{adj}$	Mean WCACC	Number of Obs.
1	0.188	0.049	(0.537)	(0.523)	(0.346)	5,522
2	0.170	0.029	(0.129)	(0.116)	(0.151)	5,542
3	0.182	0.043	(0.046)	(0.028)	(0.067)	5,546
4	0.172	0.032	0.007	0.023	0.007	5,544
5	0.178	0.033	0.052	0.062	0.066	5,537
6	0.166	0.025	0.098	0.107	0.118	5,550
7	0.142	0.002	0.152	0.154	0.162	5,547
8	0.145	0.004	0.223	0.216	0.232	5,543
9	0.139	(0.001)	0.345	0.322	0.303	5,545
10	0.089	(0.046)	0.830	0.763	0.506	5,525
<i>P1 - P10</i>	9.89%	9.51%				
<i>t-stat</i>	(8.50)	(10.04)				

Table 8 (cont'd)

Panels B, C, D, E reflect results from hedge portfolios formed on $TACC^{adj}$, TPIR, and N_TACC respectively. To maximize the variation in the variable of interest, while minimizing the variation in the two other control variables, I perform a series of dependent sorts. Each year, I sort all firms into annual deciles ranked on the first control variable. Each of these ten annual deciles is then sorted into 10 sub-deciles based on the second control variable. Each of these annual sub-deciles is then sorted into annual quintiles based on variable of interest. I then pool the sub-deciles together based on their respective variable of interest rank. Panel B examines $TACC^{adj}$, Panel C examines TPIR, and Panel D examines N_TACC .

Panel B

Portfolio	Mean sRet	Mean $TACC^{adj}$	Mean N_TACC	Mean TPIR	Number of Obs.
1	0.018	(0.195)	0.100	0.004	9,683
2	0.019	0.020	0.036	(0.003)	11,895
3	0.020	0.104	0.008	(0.001)	11,667
4	0.021	0.181	(0.016)	0.001	11,895
5	0.005	0.363	(0.072)	0.001	10,261
<i>P1 - P5</i>	1.30%	-55.75%	17.12%	0.30%	
<i>t-stat</i>	(2.04)				

Panel C

Portfolio	Mean sRet	Mean $TACC^{adj}$	Mean N_TACC	Mean TPIR	Number of Obs.
1	0.038	0.102	0.017	(0.661)	9,683
2	0.026	0.099	0.016	(0.281)	11,895
3	0.021	0.099	0.011	(0.021)	11,667
4	0.007	0.101	0.006	0.246	11,895
5	(0.006)	0.090	(0.000)	0.688	10,261
<i>P1 - P5</i>	4.41%	1.21%	1.75%	-134.93%	
<i>t-stat</i>	(6.77)				

Table 8 (cont'd)

Panel D

Portfolio	Mean sRet	Mean TACC^{adj}	Mean N_TACC	Mean TPIR	Number of Obs.
1	0.005	0.187	(0.293)	0.011	9,683
2	0.015	0.126	(0.077)	(0.006)	11,895
3	0.018	0.100	0.010	(0.004)	11,667
4	0.029	0.072	0.090	(0.001)	11,895
5	0.017	0.011	0.304	0.002	10,261
<i>P1 - P5</i>	-1.22%	17.61%	-59.73%	0.92%	
<i>t-stat</i>	-(1.89)				

Panel E

Portfolio	Mean sRet	Mean TACC^{adj}	Mean N_TACC	Mean PPIR	Number of Obs.
1	0.017	(0.191)	0.096	(0.011)	9,683
2	0.025	0.022	0.037	(0.007)	11,895
3	0.015	0.106	0.012	(0.002)	11,667
4	0.018	0.182	(0.015)	0.006	11,895
5	0.008	0.353	(0.075)	0.014	10,261
<i>P1 - P5</i>	0.90%	-54.41%	17.14%	-2.54%	
<i>t-stat</i>	(1.37)				

Table 9

Table 9 reports the results of Fama and MacBeth regressions of annual, size-adjusted returns on decile ranks of $TACC^{adj}$, N_TACC , and $TPIR$. Specifically, each year each variable is sorted into decile ranks, 0 through 9. These ranks are divided by 9, creating a uniformly distributed variable between 0 and 1. The coefficients on these variables represent the hypothetical buy-and-hold size-adjusted return from going short (long) on firms in the low (high) decile. t-statistics are reflected in parentheses.

Model	Intercept	Decile TACC	Decile N_TACC	Decile TPIR
1	0.044 (4.36)	-0.052 (-4.98)		
2	0.026 (1.31)	-0.037 (-2.07)	0.019 (1.13)	
3	0.043 (1.88)	-0.022 (-1.32)	0.033 (2.12)	-0.062 (-3.70)

Table 10

Table 11 reports the results of a set of Fama and MacBeth regressions of monthly returns on components of a log-linear decomposition of the book-to-market ratio for all firms with 12/31 fiscal year end. The monthly return series is between month 7 of year $t+1$ and month 6 of year $t+2$ where t is between 8/1968 - 12/2006. All coefficients are multiplied by 100. Newey-West t-statistics are reported in parentheses.

	Intercept	D_WCACC	ND_WCACC	N_WCACC	$iss_{t-1,t}$	bm_{t-1}	$ret^b_{t-5,t-1}$	$ret^i_{t-5,t-1}$	bm_{t-5}
1	1.145 (6.69)	-0.381 (-4.83)	-0.588 (-2.96)						
2	1.141 (6.83)	-0.579 (-2.94)	-0.588 (-2.61)	-0.242 (-1.24)					
3	1.112 (6.51)	-0.212 (-0.91)	-0.284 (-1.10)	0.110 (0.48)	-1.625 (-4.18)	0.172 (2.98)			
4	1.193 (6.97)	-0.115 (-0.49)	-0.226 (-0.87)	0.149 (0.64)	-1.665 (-4.26)		-0.136 (-1.58)	-0.206 (-2.58)	0.081 (1.59)

Appendix I

All data is from the annual CRSP/Computstat Merged Database

Book Value of Equity (B_t)

To obtain shareholder's equity I use, when not missing, stockholder's equity (data216). If data216 is missing, I use total common equity (data60) plus preferred stock – par value (data130), if both items are not missing. If both items are missing, I use total assets (data6) minus total liabilities (data181), if both items are not missing. Otherwise, total shareholder's equity is treated as missing for that year.

To obtain book equity, I subtract from shareholder's equity (as computed above) the preferred stock value. Specifically, I subtract from shareholder's equity preferred stock – redemption value (data56). If data56 is missing, I subtract from shareholder's equity preferred stock – liquidating value (data10). If both data56 and data10 are missing, I subtract from shareholder's equity preferred stock – par value (data130). If data56, data10, and data130 are all missing, I set book value of equity as missing for this year. In addition, when not missing, I add to book value of equity deferred taxes – balance sheet (data35) and subtract the FASB106 adjustment (data330).

Net Operating Assets (NOA_t)

To obtain operating assets (OA), I subtract from total assets (data6) financial assets. Financial assets (FA) are defined as the sum of Investments and Advances – Other (data32) plus short term investments (data193) plus cash and short term investments (data1).

To obtain operating liabilities (OL) I subtract financial liabilities from total liabilities (data181). Financial liabilities (FL) equal the sum of long term debt (data9) plus debt in current liabilities (data34) plus notes payable (data206) plus the amount of preferred stock in shareholder's equity (as computed above). Accordingly, Net Operating Assets (NOA) is computed as $OA - OL$. Total accruals (TACC_t) as $\log(NOA)_t - \log(NOA)_{t-1}$.

Working Capital (WC_t)

Working capital at fiscal year end of year t is computed as current assets (data4) minus cash and short-term investments (data1) minus current liabilities (data5) plus debt in current liabilities. Specifically, working capital equals $(data4 - data1)_t - (data5 - data34)_t$. Working capital accruals (WCACC_t) are defined as $\log(WC)_t - \log(WC)_{t-1}$.

Non-Current Net Operating Assets (NCO_t)

Non-current operating assets (NCOA_t) at fiscal year end of year t are computed as total assets (data6) minus current assets (data4) minus investments and advances (data32). Non-current operating liabilities (NCOL_t) at fiscal year end of year t are defined as total liabilities (data181) minus current liabilities (data5) minus long-term debt (data9). Non-current Net operating assets (NCO_t) are defined as $NCOA_t - NCOL_t$. Accordingly, non-current accruals (NCACC_t) are defined as $\log(NCO)_t - \log(NCO)_{t-1}$.

Net Financing Obligations (NFO_t)

Net financing obligations, NFO_t, is computed as financial obligations minus financial assets. Specifically, financial obligations (FO) equal the sum of long term debt (data9), short term debt (data34), notes payable (data206), and the preferred stock held in total stockholder's equity (as computed above). Financial assets (FA) are computed as the sum of cash (data1), investments and advances (data32) and short-term investments (data193). Accordingly, NFO equals FO – FA. Log change in NFO, equals log(NFO_t) minus log(NFO_{t-τ}).

Variable Definitions:

ATO _t	Asset turnover at fiscal year end t is defined as $NOA_t/Sales_t$ where NOA_t is defined as above and Sales is defined as data12.
bm_t	log book-to-market ratio at fiscal year end t where book value is of fiscal year end t and market value is of the last day of trading in fiscal year t . Book value is computed as defined above, market value is per CRSP.
bm_{t-5}	log book-to-market ratio at fiscal year end $t-5$ where book value is of fiscal year end $t-5$ and market value is of the last day of trading in fiscal year $t-5$. Book value is computed as defined above, market value is per CRSP.
BM	BM represents the book-to-market ratio computed as book value of equity at fiscal year end t divided by market value of equity at fiscal year end t . Book value is computed as defined above, market value is per CRSP.
CPIR	Current period intangible return, defined as the residual from the following annual, cross-sectional regression: $ret^m_{i,(t-1,t)} = \gamma_0 + \gamma_1 bm_{i,(t-1)} + \gamma_2 TACC_i + \gamma_3 N_TACC_i + \gamma_4 iss_{i,(t-1,t)} + u_{i,t}$
$iss_{t-\tau,t}$	log change in market value not attributable to log return. $iss_{t-\tau,t} = \log(\Delta M)_{t-\tau,t} - ret^m_{t-\tau,t}$
N_TACC	log change in book value not attributable to TACC, defined as $\log(B_t/NOA_t) - \log(B_{t-1}/NOA_{t-1})$
N_WCACC	log change in book value not attributable to WCACC, defined as $\log(B_t/WC_t) - \log(B_{t-1}/WC_{t-1})$
N_NCACC	log change in book value not attributable to NCACC, defined as $\log(B_t/NCO_t) - \log(B_{t-1}/NCO_{t-1})$

NCACC	Non-current accruals for fiscal year t computed as $\log(\text{NCO}_t)$ minus $\log(\text{NCO}_{t-1})$.
PPBG	Prior period log book value growth where the prior period as defined as the four (4) year period between fiscal year end $t-5$ and $t-1$. PPBG is computed as $\log(B_{t-1})$ minus $\log(B_{t-5})$.
PPIR	Prior period intangible return, defined as the residual from the following annual, cross-sectional regression: $ret_{i,(t-5,t-1)}^m = \gamma_0 + \gamma_1 bm_{i,(t-5)} + \gamma_2 PPBG_i + \gamma_3 iss_{i,(t-5,t-1)} + u_{i,t-1}$
Ret	Annual buy-and-hold raw return, inclusive of all distributions, beginning from the seventh month after a firm's fiscal year end.
$ret_{t-\tau,t}^b$	Log book return between $t-\tau$ and t : $\log(\Delta B)_{t-\tau,t} - iss_{t-\tau,t}$.
$ret_{t-\tau,t}^m$	Log of the buy-and-hold return computed between $t-\tau$ and t .
sRet	Annual buy-and-hold size-adjusted return, inclusive of all distributions, beginning from the seventh month after a firm's fiscal year end.
ShrsOut	Millions of shares outstanding as of the last day of trading in the sixth month after fiscal year end t .
TACC	Total accruals for fiscal year t computed as $\log(\text{NOA}_t)$ minus $\log(\text{NOA}_{t-1})$.
TACC ^{adj}	Total adjusted accruals for fiscal year t computed as $\log(\text{NOA}_t)$ minus $\log(\text{NOA}_{t-1})$ minus $iss_{t-1,t}$.
TPIR	Total period intangible return, defined as the residual from the following annual, cross-sectional regression: $ret_{i,(t-5,t)}^m = \gamma_0 + \gamma_1 bm_{i,(t-5)} + \gamma_2 TACC + \gamma_3 N_TACC + \gamma_4 PPBG + \gamma_5 iss_{i,(t-5,t)} + u_{i,t-1}$
WCACC	Working capital accruals for fiscal year t computed as $\log(\text{WC}_t)$ minus $\log(\text{WC}_{t-1})$.

Appendix II

Log-linear decomposition of total accruals (TACC) into growth ($\log(\Delta\text{Sales})$) and change in operating efficiency ($\log(\Delta\text{ATO})$) components:

$$\begin{aligned}
 TACC_{(t-1,t)} &= \log\left(\frac{NOA_t}{NOA_{t-1}}\right) \\
 &= \log\left(\frac{NOA_t S_t S_{t-1}}{NOA_{t-1} S_t S_{t-1}}\right) \\
 &= \log\left(\frac{S_t NOA_t S_{t-1}}{S_{t-1} NOA_{t-1} S_t}\right) \\
 &= \log\left(\frac{S_t}{S_{t-1}}\right) + \log\left(\frac{NOA_t S_{t-1}}{NOA_{t-1} S_t}\right) \\
 &= \log\left(\frac{S_t}{S_{t-1}}\right) + \log\left(\frac{\frac{NOA_t}{S_t}}{\frac{NOA_{t-1}}{S_{t-1}}}\right) \\
 &= \log(\Delta\text{Sales})_{t-1,t} + \log(\Delta\text{ATO})_{t-1,t}
 \end{aligned}$$

- NOA_t Net Operating Assets at fiscal year end t
- NOA_{t-1} Net Operating Assets at fiscal year end $t-1$
- S_t Sales for fiscal year ended t
- S_{t-1} Sales for fiscal year ended $t-1$
- ATO_t Asset Turnover ratio for fiscal year ended t
- ATO_{t-1} Asset Turnover ratio for fiscal year ended $t-1$

References

- Andersen, C., and L. Garcia-Feijóo. 2006. Empirical evidence on capital investment, growth options, and security returns. *Journal of Finance* 61 (February): 171-194
- Ball, R., L. Shivakumar. 2006. The Role of Accruals in Asymmetrically Timely Gain and Loss Recognition. *Journal of Accounting Research*. 44 (May): 207-242
- Barth, M., S. Kallapur. 1996. The effects of cross-sectional scale differences on regression results in empirical accounting research. *Contemporary Accounting Research*. (Fall) 527-567
- Berk, J., R. Green, V. Naik. 1999. Optimal investment, growth options, and security returns. *Journal of Finance* 54 (October): 1553-1607
- Collins, D., P. Hribar. 2003. Investor sophistication and the mispricing of accruals. *Review of Accounting Studies*. (Jun-Sep): 251-276
- Cooper, M., H. Gulen, M. Schill. 2006. What best explains the cross-section of stock returns? Exploring the asset growth effect. *University of Utah working paper*
- Daniel, K., S. Titman. 1997. Evidence on the characteristics of cross-sectional variation in common stock returns. *Journal of Finance*. 52, 1-33
- Daniel, K., S. Titman. 2006. Market reaction to tangible and intangible information. *Journal of Finance* 61 (August): 1605-1643
- DeBondt, W., R. Thaler. 1985. Does the stock market overreact? *Journal of Finance* 40 (July) 793-805
- DeBondt, W., R. Thaler. 1987. Further evidence on investor overreaction and stock market seasonality. *Journal of Finance* 42 (July) 557-581
- Dechow, P. 1994. Accounting Earnings and Cash Flows as Measures of Firm Performance. *Journal of Accounting & Economics* 18 (July): 3-42
- Desai, H., S. Rajgopal, M. Venkatachalam. 2004. Value-glamour and accrual mispricing: One anomaly or two? *The Accounting Review* 79: 355-385
- Fairfield, P., J. Whisenant, T. Yohn. 2003. Accrued earnings and growth: Implications for future profitability and market mispricing. *The Accounting Review* 78 (January) 353-371.
- Fama, E., J. and J. MacBeth. 1973. Risk, return and equilibrium: Empirical Tests. *Journal of Political Economy* 81 (May) 607-636

- Fama, E., K. French. 1992. The Cross-section of Expected Stock Returns. *Journal of Finance*. 47: (June): 427-465
- Fama, E., K. French. 1993. Common risk factors in the returns of stocks and bonds. *Journal of Financial Economics*. 33: (Feb): 3-56
- Fama, E., K. French. 1995. Size and Book-to-Market Factors in Earnings and Returns. *Journal of Finance*. 50: (Mar): 131-155
- Fama, E., K. French. 1996. Multifactor Explanations of Asset Pricing Anomalies. *Journal of Finance*. 51: (Mar): 55-84
- Feltham, G., and J. Ohlson. 1995. Valuation and clean surplus accounting for operating and financing activities. *Contemporary Accounting Research* 11 (Spring) 689-731
- Francis, J. and M. Smith. 2005. A Reexamination of the Persistence of Accruals and Cash Flows. *Journal of Accounting Research*. 43 (June): 413-451
- Healy, P., 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting & Economics*. (7) 85-107
- Hovakimian, A., T. Opler, S. Titman. 2001. The debt-equity choice. *Journal of Financial & Quantitative Analysis*. (36): 1-25
- Khan, M., Are accruals mispriced? Evidence from tests of an Intertemporal Capital Asset Pricing Model. *Journal of Accounting & Economics* (2007), doi:10.1016/j.jacceco.2007.07.001
- Kothari, S.P., E. Loutskina, V. Nikolaev. 2007. Agency theory of overvalued equity as an explanation for the accrual anomaly. *MIT working paper*
- Kraft, A., A. Leone, C. Wasley. 2006. An analysis of the theories and explanations offered for the mispricing of accruals and accrual components. *Journal of Accounting Research* (44) 297-339
- Lakonishok, J., A. Schleifer, R. Vishny. 1994 Contrarian investment, extrapolation and risk. *Journal of Finance* 49 (December) 1541-1578
- Lougrahn, T., J. Ritter. 1995. The new issues puzzle. *Journal of Finance* 50 (January):23-51
- Lougrahn, T., J. Ritter. 1997. The operating performance of firms conducting seasoned equity offerings. *Journal of Finance* 52 1823-1850
- Mashruwala, C., S. Rajgopal, T. Shevlin. 2006 Why is the accrual anomaly not arbitrated away? *Journal of Accounting & Economics* 42 3-33

Mishkin, F. 1983. *A Rational Expectations Approach to Macroeconomics: Testing Policy Effectiveness and Efficient-Markets Models*. Chicago, IL: University of Chicago Press.

Pastor, L., P. Veronesi. 2003. Stock valuation and learning about profitability. *Journal of Finance* 58 (October): 1749-1790

Richardson S., R. Sloan, M. Soliman, and I. Tuna. 2005. Accrual reliability, earnings persistence and stock prices. *Journal of Accounting & Economics* 39: 437-485

Richardson S., R. Sloan, M. Soliman, and I. Tuna. 2006. The implications of accounting distortions and growth for accruals and profitability. *The Accounting Review* 81: 713-743

Sloan, R. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71 (July): 289-315

Teoh, Siew Hong, I. Welch, T.J. Wong. 1998a. Earnings Management and the Long-Run Market Performance of Initial Public Offerings. *Journal of Finance* 53 (December) 1935-1974

Teoh, Siew Hong, I. Welch, T.J. Wong. 1998b. Earnings Management and the Underperformance of Seasoned Equity Offerings. *Journal of Financial Economics* 50 (October) 63-99

Titman, S., K.C. Wei, F. Xie. 2004. Capital Investments and stock returns. *Journal of Financial and Quantitative Analysis* (39): 677-700

Xie, H. 2001 The mispricing of abnormal accruals. *The Accounting Review* 76 (July): 357-373.

Zach, Z. 2003. Inside the Accrual Anomaly. Olin School of Business Working Paper

Zhang, X.F. 2007 Accruals, Investment, and the Accrual Anomaly. *The Accounting Review* - *forthcoming*

Vita

Robert James Resutek is the son of James and Jane Resutek of Romeo, Michigan. He was born on April, 17, 1976 in Camden, New Jersey. He is married to Sarah and has one child (Stephen). He graduated from Romeo High School in 1994 and received his bachelors in business administration and masters in accounting from the University of Michigan in 1998 and 1999 respectively. Upon graduating from the University of Michigan, he worked for PricewaterhouseCoopers in their Business Recovery Services group and for FTI Consulting, Inc. from 1999 through 2003 when he enrolled into the doctoral program in accountancy at the University of Texas at Austin.

Permanent Address: 307 Spanish Oak Trail, Dripping Springs, TX 78620

This dissertation is typed by Robert James Resutek