

BUSINESS CYCLES AND EARNINGS MANAGEMENT

By

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ABSTRACT

This study investigates the impact of business cycles on earnings management in the United States. Using a large cohort of firms in the United States from the S&P 1500 index and the period of 2000-2010, we employ estimates based on a pooled least squares model, a fixed effects model, and a random effects model. Our findings show that firm discretionary accruals increase during expansionary economic periods and decrease during contractionary periods. We also find that the Sarbanes-Oxley Act has had no effect on mitigating discretionary accruals. Our primary contribution to the existing literature is a thorough econometric analysis of discretionary accruals and their relationship to economic cycles and the Sarbanes-Oxley Act using a large and comprehensive data set.

TABLE OF CONTENTS

Approval		ii
Abstract		iii
Table of Contents		iv
List of Tables		vi
Acknowledgement		vii
Chapter I	Introduction	1
Chapter II	Review of Literature and Hypothesis Development	6
Section 2.1	Definitions of Earnings Management	6
Section 2.2	Accrual Determination Models	8
Section 2.3	Empirical Studies in Earnings Management and Hypothesis Development	17
Section 2.4	Earnings Management, Reversals, and Recent Developments	32
Chapter III	Database and Methodology	36
Section 3.1	Database	36
Section 3.2	Methodology	39
Chapter IV	Empirical Results	41
Section 4.1	Descriptive Statistics	41
Section 4.2	Correlation Matrix	42
Section 4.3	Empirical Results	44
Section 4.4	Summary of Results	48
Chapter V	Conclusions	50
Bibliography		52

LIST OF TABLES

Table 2.1	Discretionary Accrual Proxies	16
Table 3.1	Description of Variables Used in the Study	38
Table 4.1	Descriptive Statistics of Financial Parameters of US Non-Financial Corporate Sector Firms 2000-2010 (Balanced)	42
Table 4.2	Correlation Matrix of Variables, Balanced Panel	43
Table 4.3	Determinants of Discretionary Accruals in the United States, 2000-2010	47

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CHAPTER I

INTRODUCTION

Earnings management refers to the willful attempts by managers of a firm to manipulate their earnings to meet pre-determined targets. 'Earnings' refers in its simplest form to the profits of a company, and earnings management refers to the practice of cooking books and creating juiced-up accounts. Investors and analysts look to earnings to determine the attractiveness of a particular stock. The management of profits is sometimes used interchangeably with income smoothing¹. Motivations for this management of earnings vary, but common reasons are (a) to meet targets of profitability set by analysts or the market, (b) to convey information about future earnings, (c) to signal the market as a low risk firm, and (d) to appropriate executive compensations, like bonuses, stock options etc.

Earnings management has become a topic of increased interest for financial regulators. The numerous recent accounting scandals (like Enron, WorldCom, Parmalat, Waste Management, Tyco, Satyam, Olympus, etc.) has cast doubts about truthfulness of the financial statements of firms and eroded investor confidence and adversely affected market sentiments. Industry regulators, auditors, analysts and company stakeholders (whether individual or institutional investors) all have a substantial interest in transparent and accurate earnings

¹ Income smoothing is a form of earnings management and is generally defined as the smoothing of reported earnings over time (Ronen and Yaari, 2008, p. 317)

information and can greatly benefit from greater accuracy in financial reporting by firms.

Healy and Wahlen (1999) state ‘...earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers’. Most of the empirical literature on earnings management has centered on how firms keep two sets of accounts (one internally) with one to be publicly issued, whether for required reporting or for an initial public offer (Dechow et al., 1995; Healy and Wahlen 1999; Graham et al., 2005; Ball and Shivakumar, 2008).

Prior literature has classified earnings management into two broad categories: real earnings management (i.e. affecting cash flows) and accruals management (through changes in accounting policies and calculations). Roychowdhury (2006) states that operational decisions such as acceleration of sales, alterations in shipment schedules, delaying of research and development, and delaying of maintenance expenditures are all real earnings management methods available to managers. The amount of managed earnings is the difference between reported earnings and true earnings. The most common way of detecting accrual-based earnings management is through company financial statements. Accounting adjustments known as accruals are the difference between reported earnings and operating cash flows. Accruals consist of a discretionary portion which is often manipulated by managers and a non-discretionary portion which is

dictated by business conditions. There exists considerable difficulty to accurately separate reported accruals into their managed (discretionary) and unmanaged (non-discretionary) components. Researchers use empirical models to decompose total accruals into non-discretionary and discretionary accruals. Discretionary accruals are then used as proxy for earnings management. The most widely used discretionary accrual models are the Jones and 'modified' Jones models which used the variables of 'firm revenues', 'gross property, plant, and equipment', and 'total assets', to break down the total accruals values into non-discretionary and discretionary components.

Earnings management is broadly classified into three types: white, gray, and black (Ronen and Yaari, 2008). White refers to earnings management where reports are made more transparent to emphasize private information about future cash flows. Gray earnings management refers to choosing a particular accounting treatment that is opportunistic or economically efficient. Black earnings management refers to willful tricks and misrepresentation, or purposefully decreasing the transparency of financial reports (Ronen and Yaari, 2008).

An understanding of earnings management practices helps public authorities (like governments and regulators) improve functioning of financial markets, reduce asymmetry of information, reduce cost of capital, protect small and minority shareholder's interests, promote financial stability, and lead to efficient allocation of capital. A regulation like the Sarbanes-Oxley Act in the United States in 2002 is a classic example of an effort to promote more accurate financial reporting, standards, and accountability to company issued financial

statements (Cohen et al., 2007). These interventions allow auditors to have a more consistent and precise framework for evaluating the financial statements of firms. In turn, both financial analysts and shareholders benefit from not only more accurate financial information, but more consistent financial reporting by firms. This applies across industries, allowing the best possible conclusions to be drawn.

Much research has been done in the past in attempts to determine levels of earnings management that firms indulge in by studying their financial statements. Various models have been developed to detect earnings management by studying different models of accruals. Most models in the area of earnings management relate to its prevalence over time or at the time of IPO issue (Teoh, Welch, and Wong 1998; Teoh, Wong, & Rao 1998), seasoned equity offerings (Rangan, 1998), and mergers and acquisitions (Erickson and Wang, 1999). Very little attempt has been made to examine whether earnings management has diminished after the introduction of regulations like the Sarbanes-Oxley Act² and whether discretionary accruals vary over the course of business cycles³. The present study contributes to the literature by examining the determinants of accruals in the US corporate sector for the period 1980-2010 by examining its behavior over different phases of business cycles using a large cohort of firms (1125 firms) which could provide robust results.

² Studies of interest in firm earnings management behavioral changes before and after the introduction of the Sarbanes-Oxley Act include Graham et al., 2005; Cohen, Dey, & Lys 2007; and Cohen & Zarowin 2010.

³ Although much more limited, the best work on the relationship of accruals and business cycles was examined by Teoh, Welch, & Wong 1998; Teoh, Wong, & Rao 1998; Hirshleifer et al., 2009; and Kang et al., 2010. Additionally, important work on stock prices and economic cycles has been done by Braun & Larrain 2005; Wei 2009; Covas & Den Haan 2011; and Naes et al., 2011.

This study is organized into five chapters: Chapter II reviews the literature on the subject and sets the hypotheses for empirical investigation. Chapter III discusses the database and methodology of the study. Chapter IV presents the empirical results, and Chapter V summarizes the concluding observations.

CHAPTER II

REVIEW OF LITERATURE AND HYPOTHESIS DEVELOPMENT

This chapter briefly reviews the literature on the subject of earnings management. This chapter is organized as follows: Section 2.1 briefly reviews the definition of and literature on earnings management, Section 2.2 discusses the different discretionary accruals models, and Section 2.3 summarizes the results of the empirical studies related to accrual-based earnings management, and develops hypothesis for empirical investigation.

2.1 Definition of Earnings Management

In addition to white, gray, and black definitions of earnings management discussed in Chapter 1, earnings management can further be classified into two forms: (a) real earnings management and (b) accrual-based earnings management. Real earnings management refers to ‘changes in the timing or structure of an operating, investing, or financial activity to affect earnings’ (Edelstein et al., 2009). From a practical point of view, this can involve changes in the timing of product shipments, strategically timed pricing discounts, or sales of long-term assets. All of these actions represent ‘real’ alterations in company operations with the motivation and objective of altering a company’s quarterly or annual financial data. A commonly studied form of real earnings management is the opportunistic

reduction in R&D expenditure to reduce reported expenses (Rowchowdhury, 2006, p.338). In addition, there is anecdotal evidence of managers engaging in providing limited time discounts to increase sales and building up excess inventory to lower reported cost of goods sold (ibid., p.338). Additionally, Bens et al., (2002, 2003) report that managers repurchase stock to avoid earnings-per-share dilution arising from exercising employee stock options or stock option grants.

Accrual-based earnings management is a more subtle and sophisticated method of accomplishing the same task. Through a company's accrual accounts (accounts receivable, accounts payable, provisioning, etc.) management has the ability to manipulate their earnings to meet pre-determined targets. Accruals as defined in accounting are accounts on a balance sheet representing liabilities or non-cash assets. Because of leeway provided by accounting standards and practices, management has the ability to increase or decrease income by creating these accruals (Li et al., 2009). Discretionary accruals can be considered changes in the value of accruals that are based on inventory write down, alterations of debt valuations, provisioning, etc. Because values in these categories have a certain level of subjectivity, management has the ability to alter these numbers to achieve pre-determined goals. Isolating the discretionary and non-discretionary portions of an accrual account is the most important factor in developing a good earnings management detection model.

2.2 Accrual Determination Models

Many models have been developed by researchers for the estimation of non-discretionary and discretionary accruals components from financial statements of firms. The difficulty in isolating the non-discretionary and discretionary portions from total accruals by investigators (auditors, analysts, investors, and researchers) makes it an ideal mechanism for firms looking to engage in earnings management. One of the earliest discretionary accrual models is the Healy model (1985) which is discussed below:

(a) The Healy Model (1985)

The earliest discretionary accrual model was developed by Healy (1985). In this model, earnings management could be detected by looking at the deviations in the accruals from the normal (mean) level of past accruals:

$$ACR_t = \frac{(\Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta STD_t - Dep_t)}{A_{t-1}} \quad (2.1)$$

Where:

ACR_t = total working capital accruals (total accruals).

ΔCA_t = change in current assets.

ΔCL_t = change in current liabilities.

$\Delta Cash_t$ = change in cash and cash equivalents.

ΔSTD_t = change in debt included in current liabilities.

Dep_t = depreciation and amortization expense.

A_{t-1} = assets in the previous period.

Non-discretionary accruals are given as:

$$NDA_t = \frac{(\sum_{\tau} TA_{t\tau})}{T} \quad (2.2)$$

Where:

NDA_t = non-discretionary accruals

TA_t = total accruals scaled by lagged total assets

t = subscript for year included in the estimation period

τ = subscript indicating a year in the event period

T = a year subscript for years included in the estimation period

The result of $TA - NDA$ then gives the value for discretionary accruals.

(b) The DeAngelo Model (1986)

The subsequent model by DeAngelo (1986) assumed that first order differences in accruals have an expected value of zero.

Therefore:

$$NDA_t = TA_{t-1} \quad (2.3)$$

However, it is unlikely that accruals are constant over time, or dependent on the previous year in such a one dimensional way.

(c) The Industry Model (1991)

The industry model (Dechow and Sloan, 1991) is a further refined attempt to isolate discretionary accruals. Instead of directly isolating non-discretionary accruals to obtain discretionary accruals, the model assumes that 'variation in the

determinants of non-discretionary accruals is common across firms in the same industry' (ibid., 1991). The Industry model for nondiscretionary accruals is:

$$NDA_t = \gamma_1 + \gamma_2 \text{median}_l(TA_t) \quad (2.4)$$

Where:

γ_1 and γ_2 = firms 1 and 2
 $\text{median}_l(TA_t)$ = the median value of total accruals scaled by lagged assets for all non-sample firms in the same 2-digit SIC code

(d) *The Jones Model (1991)*

The model by Jones (1991) used the variables of 'firm revenues', 'gross property, plant, and equipment', and 'total assets', to break down the total accruals values into non-discretionary and discretionary components. The original Jones model is given as:

$$\frac{\Delta TA_{it}}{A_{it-1}} = \alpha \left(\frac{1}{A_{it-1}} \right) + \beta_{1i} \left(\frac{\Delta REV_{it}}{A_{it-1}} \right) + \beta_{2i} \left(\frac{PPE_{it}}{A_{it-1}} \right) + \varepsilon_{it} \quad (2.5)$$

Where:

TA_{it} = total accruals in year t for firm i

ΔREV_{it} = revenues in year t minus revenues in year t-1 for firm i

PPE_{it} = gross property, plant, and equipment in year t for firm i

A_{it-1} = total assets in year t-1 for firm i

ε_{it} = error term in year t for firm i

Non-discretionary accruals are calculated as:

$$NDA_t = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 (\Delta REV_t) + \alpha_3 (PPE_t) \quad (2.6)$$

The result of TA – NDA then gives the value for discretionary accruals.

Although this model did give some predictability, it has subsequently been improved on and modified, most notably by Dechow et al., (1995) and Kothari et al., (2005).

(e) The 'Modified' Jones Model (1995)

A major limitation of the Jones model lies in its inability to capture the impact of sales-based manipulation since changes in sales are assumed to give rise to non-discretionary accruals. Dechow, Sloan, and Sweeney (1995) proposed a modification to the standard Jones model. The 'modified' Jones model is identical to the standard Jones model, with the exception that the changes in 'debtors' (ΔREC) is subtracted from ΔREV at the second stage. In effect, the 'modified' Jones model assumes that all changes in credit sales in the event period result from earnings management. Dechow et al., use this 'modified' Jones model to detect earnings management among firms and to test the results of this model in comparison to results from the DeAngelo, Healy, Jones, and Industry models of discretionary accrual calculation. Their 'modified' Jones model is designed to 'eliminate conjectured tendency of the Jones model to measure discretionary accruals with error when discretion is exercised over revenues' (Dechow et al.,

1995). The formula for non-discretionary accruals in the ‘modified’ Jones model is as follows:

$$NDA_t = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 (\Delta REV_t - \Delta REC_t) + \alpha_3 (PPE_t) \quad (2.7)$$

Where:

NDA_t = non-discretionary accruals in year t

A_{t-1} = total assets in year t-1

ΔREV_t = net revenues in year t less net revenues in year t-1 scaled by total assets at t-1

ΔREC_t = net receivables in year t less net receivables in year t-1 scaled by total assets at t-1

PPE_t = gross property, plant, and equipment in year t

The above formula (equation 2.7) ‘implicitly assumes that all changes in credit sales in the event period result from earnings management’ (Dechow et al., 1995). As in the earlier versions non-discretionary accruals are subtracted from the total accruals value to derive the discretionary accruals value. This formula has become the most widely used in empirical literature and gives the best predictability in discretionary accruals based earnings management detection (Kothari et al., 2005).

(f) The Kothari ‘Modified’ Jones Model (2005)

A significant contribution to the work on derivation of discretionary accruals was done by Kothari, Leone, and Wasley (2005). Kothari et al., (2005)

created a 'performance-matched' discretionary accruals formula which involved derivation of a control sample of firms that are assumed to have a 'mean' level of earnings management. Against this benchmark, individual firms were compared to derive 'abnormal' earnings management, with managing earnings at a rate higher or lower than the control sample (Kothari et al., 2005, p.165). The authors find that the 'modified' Jones model continues to be the one with the greatest ability to detect earnings management, but they augment the existing 'modified' Jones model with the addition of the variables of current return on assets (ROA_t) and past return on assets (ROA_{t-1}). The rationale for this addition to the equation is that 'earnings deflated by assets equals return on assets, which measures performance, and prior research analyzing long-run abnormal stock return performance and abnormal operating performance finds matching on ROA is better specified and more powerfully tests compared to other matching variables' (Kothari et al., 2005, p.169). The authors also found that for their regressions the firm 'matching' technique used by Teoh et al.,(1998) provides a better result compared with the industry matching technique. Kothari et al. argue believe that firms of similar size and industry are likely to have similar non-discretionary accrual amounts, and argue that discretionary accruals for any firm arise from three causes:

- 1) Accruals related to the 'treatment' event (eg. A seasoned equity offering).
- 2) Accruals related from incentives (eg. Employee bonuses, meeting analyst's expectations).
- 3) Accruals correlated with performance.

Kothari et al., argue that the firm being tested and the control (matching) firm are likely to have similar values for the second and third causes, as they are of similar size and industry. Therefore, Kothari et al., are able to isolate the earnings management that is directly correlated to the ‘treatment’ event (Kothari et al., 2005, p. 171). The authors create a new version of the ‘modified’ Jones equation using the ROA for periods t and t-1:

$$TA_{it} = \alpha_1 \left(\frac{1}{A_{it-1}} \right) + \alpha_2 (\Delta SALES_{it}) + \alpha_3 (PPE_{it}) + \alpha_4 ROA_{it(or\ it-1)} + v_{it}$$

(2.8)

Where:

TA_{it} = total accruals in year t for firm i

A_{it-1} = total assets in year t-1 for firm i

$\Delta SALES_{it}$ = change in sales in year t for firm i

PPE_{it} = gross property, plant, and equipment in year t for firm i

$ROA_{it(or\ it-1)}$ = return on assets in time t or t-1 for firm i

V_{it} = the residual

Kothari et al., (2005) found in their empirical investigations that the ‘matching’ technique yielded better results, and that their alteration of the ‘modified’ Jones model yielded lower chance of misspecification than the original ‘modified’ Jones model. The design of the ‘modified’ Jones model, assumed that all credit sales represent accrual manipulation, although this is unlikely to be the case all the time (Kothari et al., 2005, p.186). The authors conclude that the Jones

and ‘modified’ Jones models suffer from ‘severe misspecification in stratified random samples’ (Kothari et al., 2005, p.186). When there are negative discretionary accruals, there is an over-rejection of the null hypothesis, and when there are positive discretionary accruals, there is an under-rejection of the null hypothesis. They admit that their modification of the formula does have its own misspecification problems, but that it is a viable alternative to the existing reliance on the ‘modified’ Jones formula for earnings management detection.

In summary, the accrual-based earnings management models discussed above have relied on a number of firm-specific variables in the attempt to estimate accurate accruals and non-discretionary accruals. Table 2.1 presents a summary of the various accrual models used in the earnings management literature. In a survey of five commonly used models of discretionary accruals, Dechow, Sloan, and Sweeney (1995) conclude that the ‘modified’ Jones model works best. Moreover, the results of all the five models are fairly similar. Therefore, in our empirical investigation (presented in Chapter IV), we use the ‘modified’ Jones model (equation 2.7) for estimating discretionary accruals.

Table 2.1 Discretionary Accrual Proxies

Panel A: Aggregate accrual proxy	
Authors	Discretionary accrual proxy
Healy (1985)	Total accruals
DeAngelo (1986)	Change in total accruals
Jones (1991)	Residual from regression of total accruals on change in sales and property, plant and equipment
Modified Jones Model from Dechow et al., (1995)	Residual from regression of total accruals on change in sales and property, plant and equipment, where revenue is adjusted for change in receivables in the event period
Kang and Sivaramakrishnan (1995)	Residual from a regression of noncash current assets less liabilities on lagged levels of these balances, adjusted for increases in revenues, expenses and plant and equipment
Panel B: Specific accrual models	
Authors	Discretionary accrual proxy
McNichols and Wilson (1988)	Residual provision for bad debt, estimated as the residual from a regression of the provision for bad debts on the allowance beginning balance, and current and future write-offs
Petroni (1992)	Claim loss reserve estimation error, measured as the five year development of loss reserves of property casualty insurers
Beaver and Engel (1996)	Residual allowance for loan losses, estimated as the residual from a regression of the allowance for loan losses on net charge-offs, loan outstanding, nonperforming assets and one year ahead change in nonperforming assets
Beneish (1997)	Days in receivables index, gross margin index, asset quality index, depreciation index, selling general and administrative expense index, total accruals to total assets index
Beaver and McNichols (1998)	Serial correlation of one year development of loss reserves of property casualty insurers
Panel C: Frequency distribution approach	
Authors	Test for earnings management
Burgstahler and Dichev (1997)	Test whether the frequency of annual earnings realizations in the region above (below) zero earnings and last year's earnings is greater (less) than expected
Degeorge et al. (1999)	Test whether the frequency of quarterly earnings realizations in the region above (below) zero earnings, last quarter's earnings and analysts' forecasts is greater (less) than expected
Myers and Skinner (1999)	Test whether the number of consecutive earnings increase is greater than expected absent earnings management

Source: McNichols (2000), p. 317.

2.3 Empirical Studies of Earnings Management

The creation and refinement of the above mentioned models to isolate the discretionary portion of firm total accruals data has led to a substantial amount of empirical research. Application of these models to different aspects of finance has been researched with the objective of identifying firms who actively engage in accruals based earnings management. The empirical literature can be broadly classified as (a) earnings management and stock price, (b) earnings management and seasoned equity offerings, (c) earnings management and initial public offerings, (d) earnings management and cumulative abnormal returns, (e) earnings management and mergers, and (f) earnings management and banks.

(a) Earnings Management and Stock Price

As the 'modified' Jones formula for discretionary accruals determination became widespread, K.R. Subramanyam's (1996) study attempted published a paper to determine if discretionary accrual values of firms impacted firm's stock prices. Using the 'modified' Jones formula, Subramanyam's study of US firms using the CRSP database of 2808 firms over a 20 firm-years period found that discretionary accruals were an important variable in future predictability of stock prices across many industries, and the inclusion of discretionary accruals 'improved the ability of firm income to explain future profitability' (Subramanyam, 1996, p.273). With regard to earnings management, the author also found that there was 'evidence of pervasive income smoothing that improves the persistence and predictability of earnings' (Subramanyam, 1996, p.273).

Subramanyam's (1996) paper was one of the first to show that earnings management had an active role in the modification of discretionary accrual values for the purposes of income smoothing.

(b) Earnings Management and Seasoned Equity Offerings

A study by Srinivasan Rangan (1998) tested the discretionary accrual values of firms (using the 'modified' Jones model) during the period surrounding a seasoned equity offering (non-IPO). Specifically, discretionary accrual values were tested in the years $t-1$, t , and $t+1$ surrounding an equity offering by an established firm. Using quarterly data for the US, Rangan (1998) found that there was reliable predictability in the stock price of firms. Using data for 230 established firms over a four year period (1987-1990), Rangan (1998) found that 'a one-standard-deviation increase in earnings management (discretionary accruals) during the year before the equity offering resulted with a decline in market-adjusted returns in the year following the seasoned equity offering of about 10%' (Rangan, 1998, p.102). Rangan (1998) also found that earnings management was most common in the quarter in which the equity offering was announced and the quarter following the announcement.

(c) Earnings Management and IPO's (Initial Public Offerings)

Empirical studies on earnings management have generally found it to be more prevalent in the event of initial public offerings (IPO's). Altering the financials of a firm and therefore manipulating the expectations and consensus of stakeholders and analysts in the lead up to an IPO can have significant positive

effects on the stock price at the time of offering. There has been substantial research showing the existence of earnings management (both accrual-based and real) in the lead-up to IPO's (Teoh, Welch, & Wong 1998; Teoh, Wong, & Rao 1999; DuCharme et al., 2001).

Teoh, Welch, and Wong (1998) further discuss evidence of discretionary accruals management and income smoothing for companies during IPO's. The authors found that companies who had high earnings management (highest quartile) at the time of the IPO, had in the third year after the IPO ($t+3$) an average stock price of 20% less than companies in the lowest quartile of earnings management. Companies with high earnings management at the time of the IPO also had 20% less seasoned equity offerings in the 5-year period following the IPO (Teoh, Welch, & Wong 1998, p. 1935). In their study they used data for 1,974 IPO's from the 1980-1984 periods, and a further 3,197 IPO's for the 1985-1992 periods, using data from the CRSP database (ibid., p. 1942). With alternative measures of abnormal returns, benchmarks, cumulation periods, sample partitions, and regression test specifications (cross-sectional, time-series, Fama-MacBeth) the authors found that 'discretionary current accruals reliably predict post-IPO returns' (ibid., p. 1949).

A subsequent paper published by Teoh, Wong, and Rao (1998) compared 'abnormal' accruals of firms in the year of their IPO. 'Abnormal' accruals were calculated as accruals above the benchmark for firms of similar industry and size. Because there is an incentive for firms to seek a boost in earnings before their initial public offering, the authors found that financial statements of the firms

showed ‘unusually high positive accruals’ (Teoh, Wong, & Rao 1998, p. 176). The authors also found that ‘firms with unusually high accruals in the IPO year consistently had low post-IPO earnings, and that high IPO accrual levels predicted low post-IPO earnings compared to industry benchmarks’ (ibid., p. 176). In their sample, the authors used 1,682 IPO’s between 1980 and 1990. For companies to qualify, they had to have an IPO stock price of <\$1.00, gross proceeds of >\$1,000,000, only common stock offered, and the offering handled by an investment bank. Data was gathered from the Compustat database. In the calculation of abnormal accruals, the authors compared the firm accruals across industry benchmarks, and used the ‘modified’ Jones method of accruals calculation. One interesting technique that the authors used in their paper was an alternative system of capturing abnormal accruals. Because IPO firms are likely to have extreme performance compared to the overall industry, many of the IPO firm financial values will be outliers compared to the industry. To properly capture abnormal accruals of IPO firms, the authors matched each IPO firm with a firm in the same industry and of the same size, but which was not having an IPO. The authors state that this ‘matching’ technique is beneficial as ‘systematic errors in the Jones model abnormal accruals for similar performing firms are eliminated’ (ibid., p.183). The authors do note, however, that accruals information can be underestimated, as there still may be motivation for the non-IPO-issuing matching firm to engage in earnings management themselves for reasons of their own. In their results, the authors found that there were inferior returns for IPO firms in the years following the IPO. Compared both to industry benchmarks and the

‘matching firm’, the IPO firms underperformed in years t through $t+6$ of the IPO. It is of interest that the underperformance was worse for the IPO firms when using the ‘matching firm’ technique. In their summary, the authors claim that ‘abnormal current accruals has the greatest consistent explanatory power among all the proxies, perhaps because it is the component most easily subject to successful managerial manipulation’ (ibid., p.195). In general, evidence suggests that firms in the lead up to their IPO have significant negative abnormal cash flows and manipulate accruals to inflate reported earnings (Bao et al., 2012). In addition, it has been shown that decisions to manipulate earnings in the lead-up to an IPO are positively related to IPO proceeds, and negatively related to analyst reputation ranking (Bao et al., 2012).

(d) Earnings Management and CAR's (Cumulative Abnormal Returns)

In a recent paper Hirshleifer, Hou, and Teoh (2009) examined whether accruals contained information about the discount rate, or whether firms managed earnings in response to market under or overvaluation. The authors used the CRSP value-weighted market index for their data, over the period 1965-2005. Similar to Kang et al., (2010), they found that firms with high accruals but low cash flows were consistently overvalued, and suffered from low future cumulative abnormal returns (CAR's). Similarly, they found that firms with low accrual levels but high cash flows were consistently undervalued by the markets, and enjoyed high future CAR's. They felt that the cash flows at the firm level should be dissected into cash and accrual components to give the best picture of the actual firm's status (Hirshleifer et al., 2009, p. 390). The authors also found that at

the aggregate level, a one-standard-deviation increase in accruals in time t led to a 7% increase in the stock price in time $t+1$. They also found that high aggregate cash flow levels negatively affected stock prices in the aggregate. Like Kang et al., (2010), the authors found that the ‘lean against the wind’ hypothesis was also a valid explanation of their findings. If firms become undervalued, they will be especially eager to report higher earnings by increasing accruals relative to their cash flows (Hirshleifer et al., 2009, p. 405). However, the authors note that some explanation must be made as to why firms are prone to this ‘leaning’ effect more often during aggregate (industry or market) undervaluation rather than simply firm-specific undervaluation.

Related to Hirshleifer et al., (2009), one of the most telling papers related to accruals-based earnings management detection is ‘Predicting stock market returns with aggregate discretionary accruals’ by Kang, Liu, and Qi (2010). Published shortly after Hirshleifer et al., (2009), the authors make more direct conclusions than the Hirshleifer et al., paper. They find that on the aggregate, discretionary accruals contain little information about overall firm business conditions compared to normal non-discretionary accruals, but ‘aggregate (industry or market) accrual levels reflect aggregate fluctuations in earnings management, thereby favoring the behavioral explanation that managers time aggregate equity markets to report earnings’ (Kang et al., 2010, p. 815). The authors begin with the premise that a change in accruals in the aggregate represents either a change in the discount rate, or the fact that firms are managing earnings in response to market undervaluation. They found that aggregate

accruals can positively predict aggregate stock returns. They also found using the 'modified' Jones formula that the forecasting power was entirely driven by discretionary accruals (as opposed to total or non-discretionary accruals). Non-discretionary accruals provided no predictive power whatsoever, while discretionary accruals provided very robust results. The authors did add that there is a misspecification problem that exists as the 'modified' Jones accrual formula fails to take into account business cycles. They also noted that non-discretionary accrual levels correlated with the rate of GDP growth. Additionally, discretionary accruals tended to have no correlation with any other macroeconomic variables. The authors were able to completely rule out the argument that discretionary accrual amounts were based on changes in the discount rate. They limited the causes of changes in discretionary accrual amounts to be based on manager's decisions to 'lean against the wind' in the form of managing earnings based on market timing. Managers also responded to decreases in equity market firm valuations by the adjusting up of current period accruals, and vice versa during times of increased firm valuations.

Kang et al., used three different regressions in deriving their results. The first was the standard 'modified' Jones model with all firms included. The second was the same, but with the deletion of firms experiencing 'extreme events'. In the third regression they used the Kothari version of the 'modified' Jones formula. They used the CRSP database to obtain data for 2,450 US firms over the period 1965-2004. Any firm with less than ten data points was omitted.

Interestingly, the authors speculated that in the face of reputation damage or litigation, managers will manage earnings based on the aggregate market level rather than their own firm's individual stock price. In addition, they found that aggregate level discretionary accruals showed a stronger ability to predict firm-level returns than firm-level discretionary accrual values did. Predictability also increased in power when the target firm was of a larger size. The authors speculated this was because the managers of very large firms have 'more at stake' (Kang et al., 2010, p. 820).

(e) Earnings Management and Mergers

The study Erickson and Wang (1999) examined earnings management by acquiring firms when using their own stock during a merger. In these mergers, stock of the acquiring firm is used as payment. There is an agreed upon price between the acquiring and target firms, and that price is paid by the equity (stock) of the acquiring firm. Logic follows that if the acquiring firm can increase the price of their stock by some means (including earnings management) they will be able to obtain the target firm for a lower 'real' price (lower acquiring-firm number of shares) than if acquiring-firm stock was valued at a lower price without earnings management. The authors also believe that this artificial stock price inflation is in the interest of the existing acquiring-firm shareholders because 'existing shareholders prefer a higher price to minimize the likelihood of earnings dilution, and secondly a stock issue dilutes voting power and control of existing shareholders' (Erickson & Wang, 1999, p. 150).

To analyze the hypothesis, the authors looked at 55 acquiring firms who used stock for a merger between 1985 and 1990. They used the Kothari version of the ‘modified’ Jones model for their analysis, but scaled all variables by total assets of the firm:

$$\frac{TTAC_{it}}{AST_{it}} = \beta_0 \left(\frac{1}{AST_{it}} \right) + \beta_1 \left(\frac{\Delta REV_{it}}{AST_{it}} \right) + \beta_2 \left(\frac{PPE_{it}}{AST_{it}} \right) + \beta_3 Q_1 + \dots + \beta_6 Q_4 + \beta_7 Y_{85} + \dots + \beta_{12} Y_{90} + \varepsilon_{it} \quad (2.9)$$

Where:

$TTAC_{it}$ = Total accruals of firm i in time t

AST_{it} = Total assets of firm i in time t

ΔREV_{it} = Change in revenue for firm i in time t

PPE_{it} = Gross property, plant, and equipment for firm i in time t

$Q_1 - Q_k$ = Quarterly variable taking a value of 1 for quarters 1-4 of the fiscal year, and 0 otherwise

$Y_{85} - Y_{90}$ = A year indicator variable taking the value of 1 for 1985-1990 and 0 otherwise

Regressions by Erickson and Wang showed that there was consistent earnings management on the part of the acquiring firm, and this earnings management was ‘based on an increasing function of the economic benefits at stake in the merger by relative deal size’ (Erickson & Wang, 1999, p.151). The authors also studied competing firms who had completed mergers of similar scale during the same time frame, but used only cash to acquire the target firm. They

found in that case that there was 'no evidence of pre-merger earnings management by these firms' (ibid., p.151).

Over twenty years of articles related to earnings management using discretionary accruals has led to an almost complete consensus on the use of the 'modified' Jones version when attempting to calculate discretionary accruals. That being the case, there has been some criticism as to the 'modified' Jones models ability to accurately separate discretionary accruals from non-discretionary accruals. There is also criticism as to whether discretionary accruals data is the most important or reliable means of detecting earnings management.

An article by Fields, Lys, and Vincent (2001) examines the expansion in the 1990's of many scholarly accounting techniques and critiques their relevance, their actual advancement of accounting literature, and their applicability and predictability in the real world. Although the paper looks at many techniques used for firm analysis, they devote a section of the paper to the current state of affairs in discretionary accrual analysis. The authors cite an article published by Kang and Sivaramakrishnan who use an 'instrumental variables' approach to discretionary accrual detection, and show that their model performs better than the benchmark 'modified' Jones model (Fields et al., 2001, p.289). The authors believed that three approaches were open to future scholarly papers regarding detection of earnings management:

- 1) The continued use of discretionary accruals in earnings management detection

- 2) The development of more powerful techniques, like those developed by Kang & Sivaramakrishnan
- 3) To 'return to the basics' and use accounting expertise to directly measure accounting choice via financial statements

(Fields et al., 2001, p.290)

The study by Kang and Sivaramakrishnan proposes an alternate method of discretionary accrual calculation, as they feel that the existing 'modified' Jones model causes 'simultaneity, errors-in-variables, or omitted variable problems, any of which leads to reduced statistical power and erroneous inferences regarding earnings management' (Kang & Sivaramakrishnan, 1995, p. 354).

The authors create a model based on instrumental variables (IV) method, and measure the results against the 'modified' Jones model, and also measure the amount of Type I and II errors versus 'modified' Jones. Using the GMM regression technique (generalized method of moments) they find that their model is superior to the 'modified' Jones model in discretionary accrual detection, and also has less Type I errors. In the conclusion of the paper, the authors state that there is great opportunity to further develop the model by creating more specific variables than those used in their paper depending on what future scholars wish to capture with their analysis. In addition, the GMM technique allows lagged or double lagged variables to be added to the model without any need to change the model itself. Although this model appears to show improvement in discretionary accruals detection, there seems to be no real expansion of this model in other scholarly work.

(f) Earnings Management and Banks

Like all other firms, earnings management in the form of income smoothing improves the risk perception of a bank to its investors, analysts, and regulators. It maintains a steady compensation to managers regardless of their actual competency. In addition, bank failures, declining earnings, deposit flights to mutual funds, erosion of reserves, hostile takeovers, tightened regulations, and pressures from boards of directors significantly increase the pressures on banks to smooth their incomes (Bhat, 1996, p.505). Unlike firms from other industries, banks earn a large proportion of their income from loans. Therefore, a significant portion of risk regarding earnings comes from loans. During the 1990's in the United States there was significant evidence that banks were under-reporting or over-reporting their loan book sizes, and 'maintaining significant amounts of unsupported reserves ... not clearly linked to likely losses' (Liu & Ryan, 2006). The difference in reported book values of loans and actual book values, as well as the value of loans that are 'written off' and the actual value that are 'written off' can be determined by managers. Likewise, the size of reserves that they must keep on hand to cover these 'written off' loans can likewise be determined by management's discretion. Prior literature on management of provision for loan losses states that in good times banks have an incentive to decrease income, and increase income in bad times. In addition, provisions can be managed for the purposes of managerial compensation (Liu & Ryan, 2006, p.424). Accrual-based earnings management is likely as prevalent in this industry as in any other, but

because of the significantly different accounting reporting standards in the financial industry (Teoh & Wong, 2002, p. 873) the inclusion of the banking sector has not been included in the scope of this paper.

2.4 Hypothesis Development

Dechow et al., (1995) and Kasznik (1999) both describe how discretionary accruals estimated from the Jones base model or the 'modified' Jones model variation are both positively related to return on assets. This positive correlation has been accredited to the misspecification inherent in these two models, with the assumption that there is no relationship between earnings management and firm performance or growth (Jevons Lee et al., 2006, p. 306). Additionally, managers choose the level of reported earnings to maximize their utility, which is an increasing function of the firm's market value. This leads to our first hypothesis:

H₁: Earnings management and return on assets (RoA) are positively related.

Earnings management is related to firm characteristics like size, leverage, etc. It also makes practical sense that highly leveraged firms would have a greater impetus to meet or exceed their industry peers as well as analyst predictions when it comes to earnings reporting. Any substantial drop in their share price would have serious negative effects on their debt-to-equity ratio, as it would increase in the event of a lowering of their stock price. Consequentially, an increase in the debt-to-equity ratio could erode investor confidence in the firm's ability to manage payments on the higher leverage ratio. Therefore, it is hypothesized that:

H₂: Earnings management and firm leverage are positively related.

Large firms are more closely monitored by investors (especially institutional investors) and analysts. There are incentives to step-up earnings reports. Specifically, managers of large companies have greater amounts of compensation at risk, as well as personal prestige and reputation. Because of this they have a greater incentive to indulge in earnings management than managers of smaller firms (Kim et al., 2003), especially for the purposes of avoiding reports of earnings decreases and potentially putting their compensation at risk. This leads to the following hypothesis:

H₃: Earnings management and firm size (TA) are positively related.

The Sarbanes-Oxley Act is a federal law that set enhanced standards for all US public company boards, management, and public accounting firms (Kieso et al., 2005). With the passage of this act, management must now individually certify the accuracy of financial information and penalties for fraudulent financial activity are much more severe. The act also increased the independence of outside auditors who review corporate financial statements, and increased the oversight of boards of directors. Prior to the passage of the Sarbanes-Oxley Act (2002) managers were able to manage earnings with a lower chance of detection. Compared to industry peers, earnings shortfalls were rare and when they did occur the market interpretation of the earnings shortfall was substantial. Cohen et al., (2007) present findings that after the passage of the Sarbanes-Oxley Act the

amount of accrual-based earnings management was attenuated. This leads to the following hypothesis:

H₄: The amount of accrual-based earnings management will be smaller after the implementation of heightened financial regulation (SOX) compared to before the passage of the increased financial regulation.

Utilizing the train of thought of Barberis et al., (1998) and Veronesi (1999) during expansionary economic phases investors will become highly confident that the market is in a good state. Under such circumstances, firm-specific bad news causes firm stock prices to fall, since bad news causes poor investor sentiment that the firm is in a good state in relation to the industry as a whole. Additionally, as uncertainty in the true state of the economy increases, risk-averse investors ask for a higher expected return (greater firm earnings). In times of economic uncertainty a further asymmetry is caused in investor response to bad news. When investors believe that the economy is in a bad state, additional bad news will have minimal impact on an investor's firm-specific sentiment, as they cannot separate the firm specific event from overall macroeconomic uncertainty. There is therefore a motivation for firms to maintain their earnings at levels similar to their industry peers during good times, and report lower-than-actual amounts during bad times. This leads to hypothesis five:

H₅: Positive earnings management and business cycles are positively related.

2.4 Earnings Management, Reversals and Recent Developments

The most recent development in earnings management literature is related to accrual reversals. The study by Baber, Kang, and Li (2011) examine accrual 'reversals' which is based on the argument that any positive or negative discretionary accruals that are created for the purposes of earnings management must be reversed in future financial reporting, as they must be 'paid back'. With this assumption Baber et al., (2011) examine not only absolute accrual values as in the 'modified' Jones model, but also examine changes in discretionary accrual values between different time periods. The differences in these values are referred to as 'net' discretionary accruals, and Baber et al., (2011) propose that these are the true indicators for determining companies' levels of earnings management. With the addition of these net discretionary accruals to the 'modified' Jones model, the authors have created a test that has more robust results than traditional regression modeling (cross section and time series), and also has little specification problem that has been inherent to discretionary accruals modeling empirical discourse.

In the study of these reversals, Baber et al., point out that there is an inverse association between the reversal speed and the probability of meeting or beating analyst forecasts (Baber et al., 2011, p.1191). The reversal speed refers to the length of time that a discretionary accrual can exist 'on the books' before it must be paid back. The authors also note that since the introduction of Sarbanes-Oxley regulation there has been a reduction in discretionary accruals-based

earnings management (ibid., p.1190). The framing of reversals is given as the following:

$$X_t = X_t^* + (d_t^{new} - d_t^{reversed}) \quad (2.10)$$

Where:

X_t = reported earnings

X_t^* = unmanged earnings

d_t^{new} = new discretionary accruals

$d_t^{reversed}$ = previous discretionary accruals that reverse in time t

$(d_t^{new} - d_t^{reversed})$ therefore gives the 'net' discretionary accrual for t

The authors state the proxies for reversals are the residual autocorrelation coefficients. Given discretionary accruals for a firm, the order of autocorrelation of residuals that is the smallest is equal to the period of full reversal (ibid., p.1195). The isolation of net non-current discretionary accruals is given through the following formula:

$$ACC - \frac{NC_t}{A_{t-1}} = \beta_{0t} + \beta_{1t} \frac{1}{A_{t-1}} + \beta_{2t} \frac{\Delta SALES_t}{A_{t-1}} + \beta_{3t} \frac{PPE_t}{A_{t-1}} + \varepsilon_t \quad (2.11)$$

Where:

$ACC - NC_t =$ the difference in working capital accounts (ACC_WC_t) and total accruals (ACC_0)

$\Delta SALES_{it}$ = change in sales in year t

PPE_{it} = gross property, plant, and equipment in year t

ε_t = net non-current discretionary accruals

Faster reversal speed of prior discretionary accruals imposes greater constraints on management's ability to undertake subsequent earnings management. In addition, a given amount of net discretionary accrual overstatement imposes 'different degrees of constraint on subsequent earnings management depending on the reversal speed of discretionary accruals' (ibid., p.1209).

The most recent study integrating net discretionary accrual and reversals is by Dechow, Hutton, Kim, and Sloan (2012). Working under similar equations to Baber et al., (equation 2.10), the authors describe in detail why the addition of reversals in current discretionary accruals calculation improves the current formula. Specifically, they find that reversals 'increase test power by 40% and mitigate misspecification problems from correlated omitted variables' (Dechow et al., 2012, p.2).

In their testing, the authors create a sample from 1950-2009, for a total of 209,530 firm years. They omit financial firms, as discretionary accruals calculation is based on working capital, and this variable is of less meaning to financial firms (ibid., p.15). In their tests, they find that if the researcher models reversals when they do not actually exist, the test power decreases. However, if they are right about the timing of reversals 50% of the time, test power increases, and if their timing is as right for reversals as it is for the timing of earnings management, predictive power is increased by >50% compared to traditional t-tests. In addition, they find that the best results come from modeling reversals as occurring in $t+1$ and $t+2$ periods (ibid., p.26).

To overcome misspecification, the authors find the correlated omitted variable bias 'is overcome by reversals as long as the omitted variables don't reverse in the same period as the discretionary accruals' (ibid., p.30). They find that modeling reversals in any period $>t+2$ causes over-correction. As opposed to Kothari et al., the authors also find that firm performance matching does not work well, as omitted variables cannot be known.

The examination of earnings management to date has been extensive. Developments in modeling discretionary accrual isolation (using various models) have evolved, and studies involving the application of these models are substantial. Most of the studies are based on the 'modified' Jones model and these have shown that there exists substantial earnings management, especially in the United States. The majority of studies focus on discretionary accruals and their relationship to initial public offerings, seasoned stock offerings, firm returns, cumulative abnormal returns, mergers, and the effectiveness of regulations (like the Sarbanes-Oxley Act).

CHAPTER III

DATA AND METHODOLOGY

This chapter discusses the database and methodology used in the empirical investigation. This chapter is divided into two sections. Section 3.1 discusses the database used in the study and Section 3.2 discusses the methodology used in the study.

3.1 Database

In order to capture the overall picture of the US corporate sector, we started the investigation with all firms in the S&P 1500 in 2010. Data was obtained from the CRSP (The Center for Research in Security Prices) database. Using the S&P 1500 index, all relevant financial variables required to calculate discretionary accruals values using the ‘modified’ Jones formula were obtained for the panel 2000-2010. Using SIC (Standard Industry Classification) codes, the 6000 series of companies were removed from the panel, as their financial dynamics are quite different from non-financial firms (Dechow et al. 2012). The residual panel data set contained 1125 of the original S&P 1500 companies for the periods 2000-2010.

Regressions were completed using a balanced panel, which was composed of data from the 2000-2010 periods. The list of variables used in both the ‘modified’ Jones model of discretionary accrual calculation and the empirical investigation are provided in Table 3.1

To derive values for the business cycle dummy variable data was obtained from the National Bureau of Economic Research (NBER). Quarterly economic data was obtained for the time period 2000-1010 for the United States. Any years in this period with one or more quarters of economic contraction were given a value of zero. Years having economic expansion in all four quarters were given a value of one.

Table 3.1 Description of Variables Used in the Study

Notation	Definition	Description
DA	Discretionary accruals	Discretionary accrual values as determined by 'modified' Jones
NDA	Non-discretionary accruals	Non-discretionary accruals as determined by 'modified' Jones
Δ REV	Net revenues	Net revenues in year t less net revenues in year t-1 scaled by total assets at t-1
Δ REC	Net receivables	Net receivables in year t less net receivables in year t-1 scaled by total assets at t-1
PPE	Property, plant, and equipment	Gross property, plant, and equipment in year t
SOX	Dummy Variable 1	Dummy variable with the value of zero before the introduction of the Sarbanes-Oxley Act (1980-2001) and a value of one after (2002-2010)
BUS_CYC	Dummy Variable 2	Dummy variable with the value of zero in periods of economic peak to trough, and one in periods of trough to peak
ROA	Return on assets	Earnings before interest and taxes divided by total assets of the firm
TOTAL ASSETS	Total assets	Total assets of the firm
LEV	Leverage	Debt to equity ratio of the firm

3.2 Methodology

Equation 2.7 was estimated using a panel regression framework. From this regression non-discretionary values were obtained for the S&P 1500 using the ‘modified’ Jones model:

$$NDA_t = \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 (\Delta REV_t - \Delta REC_t) + \alpha_3 (PPE_t)$$

These values were then subtracted from given total accrual values for the matching year, and discretionary accrual amounts were obtained for each firm.

With these discretionary accrual values, an equation was estimated of the following form:

$$DA_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 TOTAL_ASSETS_{it} + \beta_3 LEV_{it} + \beta_4 SOX_{it} + \beta_5 ECON_CYC_{it} + \varepsilon_{it}$$

Where:

$$\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0, \beta_5 > 0$$

The details of data and their description are reported in Table 3.1. In terms of empirical methodological frameworks, we present estimates based on pooled least squares, fixed effects model, and random effects model. It should be noted that each model comes with its own shortcomings.

Fixed effects estimation assumes that the firm-specific effects are uncorrelated with the explanatory variation of any individual variable from all past, current, and future time periods. Assuming that the changes in the firm-

specific portion of these variables is constant over time, the fixed effects model will attribute changes in the dependent variable to influences other than these 'fixed' components (Stock & Watson, 2011, p. 372). Unfortunately, this type of regression comes with the inherent problem that it is unlikely that all the unobserved variation that affects the dependent variable is static over time. From a practical perspective in this study, the unbalanced panel data set contains observations over a 30 year time period, and it is impossible that all of the unobserved variation in the regression had no effect on the dependent variable (discretionary accruals).

The random effects model also attempts to eliminate a portion of variation from the model, but in this case assumes that the individual firm variables are constant over time, all of the variation is attributed to changes over time. Because time contingent variation is important for this form of regression, the constant is excluded as it exhibits no change over time periods. Although this model can also be helpful in identifying the portion of change that is purely a function of changes in time (and perhaps the phase of the macroeconomic cycle), it will also not be able to identify all of the variation alone. It is also worth noting that both the fixed and random effects models are inferior if the panel data set contains many outliers (extreme values) (Stock & Watson, 2011, p. 361).

CHAPTER IV

EMPIRICAL RESULTS

This chapter discusses the empirical results of the panel regressions of determinants of discretionary accruals of 1125 US firms for the period 2000-2010. This chapter is organized as follows: Section 4.1 discusses the descriptive statistics of the variables used in the empirical investigation. Section 4.2 provides the correlation matrix of these variables. Section 4.3 discusses the empirical results of the pooled least squares, random effects, and fixed effects regression models. Section 4.4 summarizes the conclusions of this chapter.

4.1 Descriptive Statistics

Table 4.1 reports descriptive statistics of the variables used in the empirical investigation. The average firm size for this period was US\$7.25 billion with the largest firm having a value of US\$ 797.76 billion and the smallest having a value of US\$ 2.62 million. The median size was US\$ 1.41 billion which indicates that there is a substantial variation in the data. The average debt-to-equity ratio for this period was 50%, with the highest leveraged firm having a ratio of 354% and the lowest leveraged ratio being -76%. The mean discretionary accruals value (as a percentage of total accruals) is 2% of total accruals per year, with the highest discretionary accruals percentage being 16.37% of total accruals, and the lowest being -10.82%. Return on assets, as measured by earnings before interest and taxes divided by total assets, had a mean value of 9%. The highest

return on assets was 488%, and the lowest was -569%. The economy of the United States was in a state of expansion for 64% of the periods included in the panel, as determined by BUS_CYC, a dummy variable with a value of 0 during any year with at least one quarter of recessionary activity, and 1 otherwise.

Table 4.1: Descriptive Statistics of Financial Parameters of US Non-Financial Corporate Sector 2000-2010 (Balanced).

This table presents the variables for the analysis of measuring the relationship of discretionary accruals to a number of firm-specific, regulatory, and business cycle based variables. The variable DA is defined as discretionary accrual amounts as a percentage of total assets calculated using the 'modified' Jones model. SOX refers to the introduction of the Sarbanes-Oxley Act. BUS CYC states whether the economy is in an expansionary or contractionary phase. ROA is defined as firm earnings before taxes and interest divided by total assets. TOTAL ASSETS refers to firm total assets in millions. LEV is defined as firm debt-to-equity ratio in percentage (See Table 3.1 for descriptions). Note: Data relates to 1125 firms for the period 2000-2010.

	DA(% of total accruals)	SOX	BUS CYC	ROA (%)	TOTAL ASSETS (in billions)	LEV (%)
Mean	0.02	0.83	0.67	9.01	7.26	45.44
Median	-0.02	1.00	1.00	9.35	1.41	47.92
S. Dev	0.29	0.37	0.47	18.59	27.55	22.89
Skewness	9.15	-1.79	-0.71	-6.73	16.08	48.35
Minimum	-10.82	0.00	0.00	-569.62	0.0026	0
Maximum	16.37	1.00	1.00	487.47	797.77	354.27

4.2 Correlation Matrix

None of the variables in the correlation matrix are highly correlated, either positively or negatively. This shows that there is very little chance of multicollinearity occurring in panel regression. In the next section, we present the results of the empirical investigation of equation 2.1.

Table 4.2 Correlation Matrix of Variables, Balanced Panel

This table presents the correlation of the variables used in the analysis of the relationship of discretionary accruals to a number of firm-specific, regulatory, and business cycle based variables. The variable DA is defined as discretionary accrual amounts as a percentage of total assets calculated using the 'modified' Jones model. SOX refers to the introduction of the Sarbanes-Oxley Act. BUS CYC states whether the economy is in an expansionary or contractionary phase. ROA is defined as firm earnings before taxes and interest divided by total assets. TOTAL ASSETS refers to firm total assets in millions. LEV is defined as firm debt-to-equity ratio in percentage (See Table 3.1 for descriptions). Note: Data relates to 1125 firms for the period 2000-2010.

	DA	SOX	ECON CYC	ROA	TOTAL ASSETS	LEV	Δ REC	Δ REV	PPE
DA	1								
SOX	0.10 (0.00)	1							
ECON CYC	0.18 (0.00)	0.13 (0.00)	1						
ROA	0.09 (0.00)	0.03 (0.00)	0.07 (0.00)	1					
TOTAL ASSETS	-0.01 (0.29)	0.03 (0.00)	-0.01 (0.17)	-0.01 (0.77)	1				
LEV	0.01 (0.33)	-0.03 (0.00)	-0.02 (0.07)	-0.09 (0.00)	0.14 (0.00)	1			
Δ REC	0.01 (0.14)	0.01 (0.47)	0.05 (0.00)	-0.01 (0.39)	-0.01 (0.63)	-0.00 (0.87)	1		
Δ REV	0.02 (0.06)	-0.01 (0.24)	0.04 (0.00)	0.01 (0.25)	-0.01 (0.57)	-0.01 (0.21)	0.19 (0.00)	1	
PPE	-0.01 (0.52)	0.04 (0.00)	-0.02 (0.03)	0.01 (0.23)	-0.01 (0.33)	-0.04 (0.00)	0.05 (0.00)	0.18 (0.00)	1

4.3 Empirical Results

Table 4.3 reports the results of the panel estimation of equation 2.1 using pooled regression, fixed effects, and random effects models for the balanced panel for the period 2000-2010. The estimates and fit for all three regression models are good as evidenced by relatively high R^2 .

The empirical results show that earnings management and return on assets are positively related as evident from the statistically significant positive coefficient (hypothesis 1). Growth-based firms tend to be smaller in size and because of their growth focus have an increased motivation to engage in earnings management, which is validated by this empirical result. In all models the coefficient for return on assets is positive and relatively high compared to other independent variables, and is statistically significant at 1% level.

The empirical results also show a positive relationship between firm leverage and earnings management (hypothesis 2). Firms that are highly leveraged have the potential to suffer additional complications from having quarterly earnings that are lower than expectations. An obvious case would be that a significant decrease in their share price from a poor earnings report would fundamentally alter their debt-to-equity ratio in a negative way. This could lead to additional financing costs as the firm's credit rating or ability to repay existing debt could be jeopardized. The coefficient sign for leverage was expected across all models, however it was not significant in the fixed effects model which is our preferred model. Because of the large sample size it is likely that heterogeneous

firm leverage has less of an effect on earnings management than was hypothesized.

Among the control variables, total assets (TA) was hypothesized to have a positive sign in hypothesis 3, with the rationale being that large firms have highly compensated managers compared to smaller firms. Because of the large compensation (especially performance-based compensation) that comes with the management of very large firms, it was hypothesized that as firm size increases, discretionary accrual amounts would also increase as the motivation for managers to engage in earnings management is greater. Our results do not validate this hypothesis as we find a negative relationship between discretionary accruals and total assets. As company size (as measured by total assets) increases, it appears that earnings management in the form of discretionary accruals decreases consistently among all three models. This could be explained by the fact that as companies achieve a large size, they are audited more thoroughly, and also have greater monitoring by individual and institutional shareholders and industry analysts, removing the 'flexibility' that managers of smaller, less closely monitored firms would have. It should be noted that this coefficient log of total assets has a very low value, and only the fixed effects model yielded statistically significant results.

The SOX variable in hypothesis 4 was posited to have a negative relationship to discretionary accrual values. Introduction of regulations like the Sarbanes-Oxley Act has been shown to decrease accrual-based earnings management by a number of researchers (Graham et al. 2005, Cohen et al. 2007,

Cohen and Zarowin, 2010). Our results are at variance with these results. In all three regression models, the SOX variable was positively related to discretionary accruals and was statistically significant (at 1% level). A possible explanation for the positive association could be that the Sarbanes-Oxley Act is more about reforms at internal control of firms rather than earnings management.

As hypothesized in Chapter 2 (hypothesis 5), the business cycle dummy has the predicted sign (positive) implying that earnings management varies with phases of the business cycle; it is high during upward phases of the business cycle and lower during contractionary phases of the business cycle. The variable is also statistically significant. This result is similar to the results of Kang et al. (2010). Firms indulge in higher earnings management (by maintaining large discretionary accruals) to maintain earnings similar to their industry peers regardless of their actual performance. During recessionary periods, there is a contraction in the economy as a whole, and this decrease is likely caused by macroeconomic events outside of any specific industry. Since all firms experience a decrease in stock value regardless of their relative peer-related performance, managers will take this opportunity to reverse the discretionary accruals they accumulated during the previous period of economic expansion.

Table 4.3 Determinants of Discretionary Accruals in the United States – 2000-2010.

The dependent variable is DA (discretionary accruals). SOX is a dummy variable with a value of 0 previous to the introduction of the Sarbanes-Oxley Act and a value of 1 after. BUS_CYC is a dummy variable with a value of 0 for any year where there was a contractionary quarter during the year and a value of 1 during years with four quarters of economic expansion. ROA is earnings before interest and taxes divided by total assets. Total Assets is the natural logarithm of firm total assets. LEV is the debt-to-equity ratio.

	Expected Sign	Pooled	Fixed Effects	Random Effects
Constant	+/-	-0.090 (0.021)***	0.254 (0.084)***	-0.089 (0.021)***
SOX	(-)	0.057 (0.006)***	0.072 (0.007)***	0.057 (0.006)***
BUS_CYC	+	0.089 (0.005)***	0.082 (0.005)***	0.089 (0.005)***
ROA	+	0.114 (0.013)***	0.098 (0.016)***	0.114 (0.014)***
Log(Total Assets)	+	-0.001 (0.001)	-0.025 (0.006)***	-0.001 (0.002)
LEV	+	0.028 (0.011)*	0.026 (0.019)	0.029 (0.011)**
Observations (N)		11964	11964	11964
R ²		0.045	0.047	0.045
Adj-R ²		0.045	0.028	0.045
Jarque-Bera		96265602***	49217241***	96265602***
Normality test of residuals				
Hausman Test (x ² statistic)				35.04***

Note:

Figures in brackets are standard errors.

***, **, * indicates statistical significance at 1%, 5%, and 10% respectively (two-sided test).

We had presented empirical results of the models pooled, fixed effect, and random effect. As discussed in Chapter 3 (Section 3.2), the pooled regression model suffers from correlation of independent variables with the error term. Moreover, the pooled regression model does not recognize or model heterogeneity of firms in the panel which is a major limitation of pooled regression estimates. Fixed effects and random effects models recognize heterogeneity among firms and are attractive from a statistical inference point of view. A comparison of the fixed effects and random effects models was done using the Hausman test. The large and significant value of the Hausman statistic shows that there is a significant difference between the coefficients of the two models, and therefore the fixed effect model would be the more prudent choice.

4.4 Summary of Results

The fixed effect model assumes that there are individual firm specific effects correlated with the independent variables, and this makes intrinsic sense, as yearly firm-specific discretionary accrual values are likely linked to the yearly financial variables of the firm, in addition to the current macroeconomic environment. The results show a strong relationship between the overall business cycle and firm-specific discretionary accrual values. Specifically, discretionary accruals increase during times of economic expansion, and decrease during contractionary periods. The Sarbanes-Oxley Act appears to have had little effect on discretionary accrual values, as these values have increased since the introduction of Sarbanes-Oxley. Additionally, as firm size increases (measured in total assets) discretionary accrual values decrease. This is likely attributed to the

fact that large firms have higher quality boards, and audit committees meet with greater frequency as well as have greater financial sophistication. This constrains managerial propensity to engage in discretionary accruals-based earnings management (Xie et al. 2003).

CHAPTER V

CONCLUSIONS

This study has been undertaken at a time of considerable global economic uncertainty stemming from the 2008 recession centered in the United States and Europe. Although this recession has many causes, one issue that has exacerbated the crisis is a lack of transparency in the financial reporting of firms. An important issue in financial reporting is the extent to which managers manipulate reported earnings. Following Healy (1985), accrual-based earnings management measures continue to be a main focus of academic research. Compared to earlier studies, our study focusses on the impact of business cycles on earnings management in the United States over 11 years using 1125 firms (2000-2010). The results show that in economic expansionary times firms actively engage in earnings management to maintain earnings levels comparable to their industry peers. Similarly, during contractionary times when share prices fall across the all industries (regardless of firm-specific performance), these accrual accounts will be 'washed' clean. During recessions, shareholders expect poor earnings, and having large negative discretionary accruals (to offset the positive ones created during expansionary periods) has little effect on overall market sentiment, and therefore individual firm share prices.

This study validates some of the empirical results from prior earnings management research but also gives some additional insights. As shown by

existing research, growth-oriented firms demonstrate higher discretionary accrual amounts versus value-oriented firms on the aggregate. Additionally, larger firms appear to have lower discretionary accrual amounts (as a percentage of total assets). This result has also been found by many prior studies, namely that larger firms are monitored more closely by auditors, shareholders, analysts, and regulators. Additionally, large firms tend to have more sophisticated boards and auditing committees, limiting opportunities by managers of large firms to engage in earnings management.

Contrary to a number of prior studies, we found across all pooled regression models that the introduction of the Sarbanes-Oxley Act (2002) has not abated earnings management among US firms. Although the Sarbanes-Oxley Act has likely created additional transparency in financial reporting, its limited effect on discretionary accruals-based earnings management may simple be accredited to the great difficulty in identifying discretionary accruals from financial statements.

This study contributes to the existing literature on earnings management by illustrating a highly significant positive connection between the level of earnings management in the major US firms over a long period of time (2000-2010). An opportunity for future research would be a study of economic cycles and discretionary accruals among firms using the ‘reversals’ development in discretionary accruals by Baber et al., 2011 and Dechow et al., 2012.

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