Earnings Management and Excess Investment: Accrual-Based versus Real Activities

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Abstract

We examine the relation between both real and accrual-based earnings management activities and firms' investment behavior. We find overinvestment in firms that engage in either real or accrual earnings management, but firms that engage in real earnings management overinvest more than firms that engage in accrual earnings management, suggesting that real earnings management may be more detrimental than accrual management. By providing the first evidence that real earnings management has significant real effects on firms' investment, we contribute important evidence on the consequences of earnings management.

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1. Introduction

In this paper, we compare the effects of real and accrual-based earnings management by examining the extent to which firms managing earnings each way make suboptimal investments. Although there is a large literature on earnings management, Healy and Wahlen (1999) point out that earnings management studies have paid only minimal attention to its effects on firms' real activities. In addition, no study to date has compared the consequences of real versus accrual-based earnings management. Research on the effects of earnings management has concentrated largely on announcement and post event stock market returns. By contrast, we study the impact of earnings management on real decisions firms undertake. Studying firms' real activities is important, because stock returns studies can only determine whether securities are mispriced, which causes wealth redistribution between different groups of shareholders. As McNichols and Stubben (2008) point out, earnings management may affect resource allocation by causing firms to make suboptimal investment decisions which might be more costly than the observed share price effects.

To our knowledge, only Kedia and Philippon (2009) and McNichols and Stubben (2008) have addressed how earnings management affects firms' real activities. Both studies focus exclusively on *accrual-based* earnings management. Kedia and Philippon study a sample of firms that were forced by the SEC to restate previous fraudulently overstated reported earnings. They find that, relative to industry peers, overstating firms overinvested by making excessive capital investments and over hired during the earnings manipulation period, and then underinvested and shed employment after the enforcement action. Kedia and Philippon hypothesize that manipulating firms invest and hire excessively to pool with better performing firms, in order to avoid detection.

McNichols and Stubben study firms that overstated earnings and were either investigated by the SEC for accounting irregularities, sued by their shareholders for improper accounting, or restated their financial statements. Consistent with Kedia and Philippon, they find that such firms engaged in excess capital investment (relative to either industry peers or to a Q-based optimal investment model) during the misreporting period, and then underinvested during the post-event period. McNichols and Stubben hypothesize that the excessive investment is caused by the misleading signals that the misstated information sends to both internal decision makers and external suppliers of capital. Regardless of the underlying reason for the relation between earnings management activities and overinvestment, both studies find that accrual-based misreporting has significant real effects.[1]

We contribute beyond these studies by comparing the investment behavior of firms that engage in real or accrual-based earnings management. While most earnings management studies have focused on abnormal accruals, there is growing evidence that firms engage in real earnings management activities (e.g., Gunny 2005, Roychowdhury 2006, and Zang 2006). Since it alters firms' behavior, and not just their accounting records, real earnings management may have greater effects than accrual earnings management. For example, Cohen and Zarowin (2009) find that the decline in post-SEO operating performance due to real earnings management is more severe than that due to accrual earnings management.

In a recent survey of top executives, Graham et al. (2005) provide evidence suggesting that managers prefer real earnings management activities compared to accrual-based earnings management. This is the case since real management activities can be indistinguishable from optimal business decisions, and thus more difficult to detect, although the costs involved in such

[1] A related study by Polk and Sapienza (2008) finds that discretionary accruals are positively related to abnormal investment. However, they use discretionary accruals as a measure of market mispricing (since high discretionary accruals are followed by negative abnormal returns), rather than as a measure of earnings management.

activities can be economically significant to the firm. For example, they report that most corporate managers would willingly sacrifice positive NPV investment opportunities in order to meet earnings targets such as consensus analysts' forecasts. Consistent with Graham et al. (2005), Cohen et al. (2008) find that mangers have shifted away from accrual-based to real earnings management in the post Sarbanes-Oxley Act (SOX) period. This evidence implies that in the post-SOX period following highly publicized accounting scandals, the need to avoid detection of accrual-based earnings management is greater than in previous periods, inducing managers to shift from accrual-based to real earnings management activities. Thus, it is important to document the economic effects of real earnings management and to know how these effects compare to those of accrual-based earnings management.

To capture accrual-based earnings management we use the cross-sectional Jones model (Jones 1991). With regards to real earnings management, we follow Roychowdhury (2006), who focuses on three methods of real earnings management: (1) boosting sales through accelerating their timing and/or through increased price discounts or more lenient credit terms, resulting in increased sales and lower cash flows from operations (CFO); (2) overproducing and thereby allocating more overhead to inventory and less to cost of goods sold (COGS), resulting in increased inventory and lower COGS; and (3) reducing discretionary expenditures, such as research and development, advertising, and SG&A, resulting in lower R&D, advertising, and SG&A expenses. We define firms as real earnings managers if they report either: (1) increased sales and lower CFO; (2) increased inventory and lower COGS; or (3) earnings before discretionary expenditures less than *last year's* discretionary expenditures (so the firm can report a profit by cutting discretionary expenditures).

Additionally, whereas both Kedia and Philippon and McNichols and Stubben used small event-based samples that identified the most extreme cases of financial accounting misreporting, our sample is not based on a specific event. Thus, our results are not just applicable to the most extreme firms, but more generalizable.

Similar to McNichols and Stubben and Kedia and Philippon, we find that firms managing earnings with accruals overinvest (relative to comparable firms or to a statistical model of optimal investment) in the year up to and including the period of high earnings management, and then underinvest, indicating that the accrual management is associated with significant real effects. We also find that firms managing earnings by real activities overinvest and subsequently underinvest in the years surrounding the earnings management. Most important, we find that firms engaging in real earnings management initially overinvest more and subsequently underinvest more than firms engaging in accrual-based earnings management. Thus, while firms engaging in either type of earnings management invest in a suboptimal way, the overinvestment and subsequent underinvestment is greater for firms engaging in real earnings management than for firms engaging in accrual-based earnings management. Our study is the first empirical evidence comparing the consequences of real versus accrual-based earnings management on firms' investment decisions, and thus advances our knowledge on how each type of earnings management activity may affect resource allocation. Our results directly address the call for more research on the effects and economics consequences of earnings management activities (e.g., Fields et al. 2001).

The rest of the paper is organized as follows. Section 2 reviews the literatures on earnings management, with emphasis on real earnings management. Section 3 discusses our empirical

methodology, including our sample construction and estimation equations. Section 4 discusses our empirical evidence on the real effects of earnings management. Section 5 concludes.

2. Related Literature and Research Objectives

Our paper unites two streams of research that have previously been disparate, one on the economic consequences of earnings management, and the other on real earnings management. We first discuss related research, and then we build on the existing body of evidence to state our research objectives.

2.1 Consequences of Earnings Management

With the exception of the recent papers by Kedia and Philippon (2009) and McNichols and Stubben (2008) cited above, studies on the consequences of earnings management have focused primarily on stock price effects related to earnings management. Research has examined earnings management around specific corporate events such as IPOs, SEOs, management buyouts, stock repurchases, and stock for stock acquisitions, and how *ex-ante* earnings management activities relates to observed post event abnormal stock returns. For example, Rangan (1998) and Teoh et al. (1998) find positive abnormal accruals (i.e., upwardly managed reported earnings) on average for SEO firms during the year around the SEO, followed by poor stock performance in the following year. They conclude that firms manage earnings upward around SEOs, and that the stock market is mislead by the upwardly managed earnings, temporarily overvaluing issuing firms and then being disappointed by their predictable earnings declines, which cause their stock prices to subsequently fall. Similarly, Teoh, Wong, and Rao

(1998) find upward accruals management during IPOs, followed by negative post event abnormal stock returns, which they interpret in the same manner as the SEO evidence.[2]

Bhojraj et al. (2009) examine firms that beat analysts' forecasts benchmarks, either by managing accruals or by cutting discretionary expenditures. They find that compared to firms that just miss the analyst forecasts, benchmark beaters have lower subsequent (three year) stock returns, ROA, and investment (capital expenditures + R&D). While Bhojral et al. study firms that engage in both types of earnings management activities, they do not examine each group separately or compare the subsequent real activities of the two groups and as such they do not provide any evidence on the relative effects of real versus accrual-based earnings management.

2.2 Real Earnings Management Activities

Although real earnings management has not been as widely studied as accrual-based earnings management, Graham et al.'s (2005) survey finds that managers prefer real activities manipulation, by such means as reducing discretionary expenditures, over accruals manipulation as a way to manage reported earnings. These real earnings management activities are significantly different than accrual-based ones as they have direct cash flows effects. Graham et al. (2005, p. 32) find

> *.....strong evidence that managers take real economic actions to maintain accounting appearances. In particular, 80% of survey participants report that they would decrease discretionary spending on R&D, advertising, and maintenance to meet an earnings target. More than half (55.3%) state that they*

[2]Shivakumar (2000) also finds evidence consistent with accrual-based earnings management around SEOs, but in contrast to Rangan and to Teoh et al., he shows that the stock market does not react inefficiently to the upwardly managed earnings, but that investors rationally undo these effects. Similarly, Brav, Geczy, and Gompers (2000) argue that the post event abnormal stock returns of IPO firms are not negative.

would delay starting a new project to meet an earnings target, even if such a delay entailed a small sacrifice in value. . . .

There are at least two reasons for executives' greater willingness to manage earnings through real activities than through accruals. First, accrual-based earnings management is more likely to draw auditor or regulatory scrutiny than real decisions, such as those related to product pricing, production, and expenditures on research and development or advertising. Second, relying on accrual manipulation alone is risky. The realized shortfall between unmanaged earnings and the desired threshold can exceed the amount by which it is possible to manipulate accruals after the end of the fiscal period. If reported income falls below the threshold and all accrual-based strategies to meet it are exhausted, managers are left with no options because real activities cannot be adjusted at or after the end of the fiscal reporting period.

Consistent with these predictions, researchers have documented variations in R&D expenditures and asset sales linked to firms meeting and/or beating earnings benchmarks. For example, Bartov (1993) finds that firms with negative earnings changes report higher profits from asset sales, suggesting that the profits are used to blunt the bad earnings news. Dechow and Sloan (1991) document that executives near the end of their tenure reduce R&D expenditures to increase reported short-term earnings. In related studies, Baber et al. (1991) and Bushee (1998) report evidence consistent with firms reducing R&D expenditures to meet earnings benchmarks such as positive earnings or positive earnings changes.

Recently, three related studies examine real earnings management activities and their capital market consequences. Roychowdhury (2006) focuses on real activities manipulations, which he defines as management actions that deviate from normal business practices, undertaken with the primary objective to mislead certain stakeholders into believing that earnings

benchmarks have been met in the normal course of operations. Focusing on the zero earnings threshold and examining annual data, he finds evidence consistent with firms trying to avoid reporting losses in three ways: (1) boosting sales through accelerating their timing and/or generating additional unsustainable sales through increased price discounts or more lenient credit terms; (2) overproducing and thereby allocating more overhead to inventory and less to cost of goods sold, which leads to lower cost of goods sold and increased operating margins; or (3) aggressively reducing aggregate discretionary expenses (defined as the sum of research and development, advertising, and SG&A expenses) to improve margins. This is most likely to occur when such discretionary expenses do not generate immediate revenues and income.

Zang (2006) analyzes the tradeoffs between accrual manipulations and real earnings management. She suggests that decisions to manage earnings through "real" actions precede decisions to manage earnings through accruals. Her results show that real manipulation is positively correlated with the costs of accrual manipulation, and that accrual and real manipulations are negatively correlated. These findings lead her to conclude that managers treat the two strategies as substitutes.

Gunny (2005) finds that real earnings management has a significant negative relation with future operating performance. Additionally, she documents that capital markets participants mostly recognize the future earnings implications of managers' myopic behaviors. In summary, there is strong evidence of real earnings management activities, achieved via multiple means, and it is likely linked to meeting certain earnings benchmarks.

Given the dearth of evidence on the economic consequences of earnings management, combined with evidence on firms' use of real earnings management tools, we examine how both

real and accrual-based earnings management activities affect firms' investment activities. Next, we discuss the empirical methodology we employ to address our research objectives.

3. Empirical Methodology

3.1 Data and Sample Description

We collect our financial data from the COMPUSTAT annual industrial and research files for a sample period spanning 1987-2007. We restrict our sample to all nonfinancial firms with available data, and require at least 8 observations in each 2-digit SIC grouping per year. Further, we require that each firm-year observation has the data necessary to calculate all the variables we use throughout our analysis. This restriction is likely to introduce a survivorship bias into the sample resulting in the inclusion of larger and more successful firms. We expect that this will reduce the variation in our earnings management metrics resulting in a more conservative test of our research questions.

Following Collins and Hribar (2002), we use cash flows from operations obtained from the Statement of Cash Flows reported under the Statement of Financial Accounting Standards No. 95 (SFAS No. 95, FASB 1987).[3] The sample period of 1987-2007 permits us to use SFAS No. 95 statement of cash flow data to estimate accruals, rather than a balance sheet approach. These procedures produce an initial sample of 82,039 firm-year observations.

3.2 Suspect firms

According to the survey by Graham, Harvey and Rajgopal (2005, p. 21) "Several performance benchmarks have been proposed in the literature….such as previous years' or

[3] SFAS No. 95 requires firms to present a statement of cash flows for fiscal years ending after July 15, 1988. Some firms early-adopted SFAS No. 95, so our sample begins in 1987.

seasonally lagged quarterly earnings, loss avoidance, or analysts' consensus estimates." Following the standard approach in the literature, we define firms that are suspected to have managed earnings as those that fall in the areas immediately to the right of zero, in the cross-sectional distribution of earnings before extraordinary items. The presumption is that in these areas of the cross-sectional distribution, there is a higher frequency of firms that have managed earnings, including firms that managed earnings through real activities (e.g., Burgstahler and Dichev, 1997). By increasing the likelihood that we identify firms that manage earnings, focusing on these specific "suspect" firms enables us to increase the power of our tests. As in Roychowdhury (2006), we classify suspect firms as those whose annual earnings before extraordinary items (scaled by total assets) are between 0 and 0.005 (labeled *SUSPECT*). We acknowledge that classifying firm-year observations into the "suspect" categories has its drawbacks. Since this classification is based on ex-post realizations, we are likely to overlook some firms that managed earnings but did not fall into the narrow range immediately to the right of the relevant yardstick, and to include firms that had small positive earnings but did not manage earnings.

Earnings Management Metrics - Accrual-based Earnings Management

We identify firms as either accrual-based or real earnings managers. We use a cross-sectional model to calculate discretionary accruals, where for each year we estimate the model for every industry classified by its 2-digit SIC code. Thus, our approach partially controls for industry-wide changes in economic conditions that affect total accruals while allowing the coefficients to vary across time (Kasznik, 1999; DeFond and Jiambalvo, 1994).[4]

Our primary model for estimating discretionary accruals is based on the following cross-

[4] We obtain qualitatively the same results when we use a time-series approach which assumes temporal stationarity of the parameters for each firm.

sectional model estimated for each 2 digit SIC-year grouping as follows:

$$\frac{TA_{it}}{Assets_{i,t-1}} = k_{1t}\frac{1}{Assets_{i,t-1}} + k_2\frac{\Delta REV_{it}}{Assets_{i,t-1}} + k_3\frac{PPE_{it}}{Assets_{i,t-1}} + \varepsilon_{it} \qquad (1)$$

where, for fiscal year *t* and firm *i*, *TA* represents total accruals defined as:

$TA_{it} = EBXI_{it} - CFO_{it}$, where *EBXI* is the earnings before extraordinary items and discontinued operations (annual Compustat data item 123) and *CFO* is the operating cash flows (from continuing operations) taken from the statement of cash flows (annual Compustat data item 308 – annual Compustat data item 124), $Asset_{it-1}$ represents total assets (annual Compustat data item 6), ΔREV_{it} is the change in revenues (annual Compustat data item 12) from the preceding year, and PPE_{it} is the gross value of property, plant and equipment (annual Compustat data item 7).

The coefficient estimates from equation (1) are used to estimate the firm-specific normal accruals (NA_{it}) for our sample firms:

$$NA_{it} = \hat{k}_{1t}\frac{1}{Assets_{i,t-1}} + \hat{k}_2\frac{\Delta \mathrm{Re}v_{it}}{Assets_{i,t-1}} + \hat{k}_3\frac{PPE_{it}}{Assets_{i,t-1}} \qquad (2)$$

where our measure of discretionary accruals is the difference between total accruals and the fitted normal accruals, defined as $DA_{it} = (TA_{it} / Asset_{it-1}) - NA_{it}$. We define firm-year observations as accrual-based earnings managers if their discretionary accruals are in the top decile in a given year.

In our robustness tests, we also repeat our tests by using a measure based on the performance-matched discretionary accruals advanced in Kothari Leone, and Wasley (2005). As suggested by Kothari et al. (2005), we match each firm-year observation with another from the

same two-digit SIC code and year with the closest return on assets in the current year, ROA_{it} (net income divided by total assets).[5]

Real Earnings Management

We rely on prior studies to develop our proxies for real earnings management. We focus on the three following manipulation methods, building on Roychowdhury (2006):

1. Acceleration of the timing of sales through increased price discounts or more lenient credit terms. Such discounts and lenient credit terms will temporarily increase sales volumes, but these are likely to disappear once the firm reverts to old prices. The additional sales will boost current period earnings, assuming the margins are positive. However, both price discounts and more lenient credit terms will result in lower cash flows in the current period. We identify firms as engaging in this type of real activities manipulations if the observed change in sales in the current year compared to the previous year is positive, and at the same time the observed change in cash flows from operations is negative. We refer to this group of firms as INCR_SALES&DECR_CFO.

2. Reporting of lower cost of goods sold through increased production. Managers can increase production more than necessary in order to increase earnings. When managers produce more units, they can spread the fixed overhead costs over a larger number of units, thus lowering fixed costs per unit. As long as the reduction in fixed costs per unit is not offset by any increase in marginal cost per

[5]We also carry out performance matching based on two-digit SIC code, year and ROA (both current ROA and lagged ROA) and obtain results similar to those reported in the paper. Our results using these alternate measures of accruals are consistent with those reported in the paper.

unit, total cost per unit declines. This decreases reported COGS and the firm can report higher operating margins. We identify the firm-year observation as over-production observation if the observed change in cost of goods sold for the year is negative, and at the same time the change in inventories in the current year is positive. We refer to this group of firms as COGS_CUT&ΔINV>0.

3. Decreases in discretionary expenses which include advertising expenses and SG&A expenses. Reducing such expenses will boost current period earnings. It could also lead to higher current period cash flows (at the risk of lower future cash flows) if the firm generally paid for such expenses in cash. Following Baber et al. (1991), we consider three groups of firms, based on their level of pre-tax earnings before discretionary expenditures in the current year ($EBDISX_t$) compared to their expenditures in the previous year ($DISX_{t-1}$). Since we assume that firms manage earnings to avoid losses (the earnings benchmark is zero earnings), we create the following groupings based on $EBDISX_t$ compared to $DISX_{t-1}$:

Group 1	Group 2	Group 3
$EBDISX_t < 0$	$0 < EBDISX_t < DISX_{t-1}$	$DISX_{t-1} < EBDISX_t$

Group 1 firms are performing so poorly that they show losses even before considering current discretionary expenditures. By contrast, group 3 firms are successful enough that they would show current year pre-tax profits even if current year discretionary expenditures

maintained at last year's level. Group 2 would show losses if they maintained discretionary expenditures at last year's level, but can show profits by cutting discretionary expenditures.

Group 2 is the primary group of interest. Since firms in groups 1 and 3 will show losses and profits, respectively, by maintaining discretionary expenditures at last year's level, they have less incentive to cut expenditures than firms in group 2, who can show profits only by cutting expenditures.

Note that our proxies for real earnings management activities are objective measures of the assumed manipulation methods, whereas our proxy for accrual-based earnings management is based on a model of non-discretionary accruals, and thus more vulnerable to measurement error. This is important since as McNichols (2000) points out, the measurement error in abnormal (discretionary) accruals is likely to be correlated with investment. Thus, excess investment of firms with high discretionary accruals is likely to be overstated, which would bias our tests against finding greater excess investments for firms that use real earnings management.

4. Results

4.1 Sample Statistics

Table 1, Panel A shows characteristics of our sample of SUSPECT firm-years, relative to the non-SUSPECT firms in the population of 82,039 firm-years on Compustat that meet our data requirements. Whereas both Kedia and Philippon (2009) and McNichols and Stubben (2008) used event-based samples that identified the most extreme cases of financial accounting misreporting, our sample is not based on a specific event. Thus, our results are not just applicable to the most extreme firms and are likely to be more generalizable than theirs.

In Table 1, Panel A we document that SUSPECT firms are smaller (in terms of assets, sales, and market value) and less profitable than the rest of the population, but have greater investments (both capital and non-capital expenditures, as a percent of total assets) and greater growth in assets and employees. Our finding of relatively high growth by firms assumed to be earnings managers is consistent with the results of Kedia and Philippon and McNichols and Stubben.

Table 1, Panel B reports the distribution of our sample and for subgroups based on the type of earnings management. SUSPECT firms comprise about 5% of the sample, and firms identified with the three methods of real earnings management comprise about 2.5% - 3% of the sample firm-year observations. By construction, firms identified as accrual managers are 10% of the sample. Firms identified as both SUSPECT and engaging in each of the four types of earnings management comprise about 1% of the overall sample. Thus, the intersection of SUSPECT with our measures of real and accrual-based earnings management produces very similar sample sizes for all four measures. This gives us confidence that all four subgroups have comparable degrees of earnings management. In our regression tests, below, we focus on these four subgroups, both because they are likely to have managed reported earnings and since we can identify the method of earnings management. Thus, with these firms we can calculate the relation between the method of earnings management and the extent of over- or under investment.

4.2 Preliminary Evidence

As a prelude to our primary analysis, Table 2 shows the excess investment behavior from years t-3 through t+3, for our SUSPECT firms, i.e., firms with small positive earnings in year t=0. We define excess investment relative to control groups of firms ranked by size and industry.

Results are shown for total investment and its components, capital expenditures, and non-capital expenditures, all deflated by the firm's beginning of year total assets. For comparison with Kedia and Philippon and McNichols and Stubben, we also report growth rate in total assets and the growth rate in the total number of employees.

Consistent with Kedia and Philippon's and McNichols and Stubben's results, columns 1 through 3 show that SUSPECT firms are increasing their overinvestments in the years up to and through year 0, after which they underinvest. For example, column 1 (total investment) shows that in the earnings management year (the year in which the firm beats the benchmark) SUSPECT firms invest 1.9% more than comparable firms (as a percentage of their total assets), and then invest 2.8% less than comparable firms in the subsequent year, and both differences are statistically significant. Thus, relative to their peers, firms that are suspected of earnings management have a relative investment decline of 4.7%. The results in columns 2 and 3 (capital expenditures and non-capital expenditures, respectively) are similar, but the effects are slightly greater. These results imply that firms suspected of upwardly managing earnings overinvest during the period of upward management, and then subsequently underinvest.

Analogous to Table 2, Table 3 shows excess investment statistics (again relative to control groups of firms ranked by size and industry, and deflated by the firm's beginning of year total assets) for years t-3 through t+3 for groups of firms that follow different earnings management strategies: firms with large positive discretionary accruals (Panel A); firms that reported increased sales and decreased CFO (Panel B); firms that cut discretionary expenditures (Panel C); and firms that cut COGS and increased inventory (Panel D).

The results in Table 3 show that, similar to SUSPECT firms in Table 2, firms that follow each strategy overinvest in the period up to and including the earnings management year, and

then subsequently underinvest. However, the relative magnitudes of over- and underinvestment are different across the strategies. Panel A reports that firms with extreme discretionary accruals invest 1.5% more than comparable firms (as a percentage of their total assets) in the earnings management year, and then invest 2.1% less than comparable firms in the subsequent year. Thus, relative to peers, high accrual earnings management firms have a relative investment decline of 3.6%. The results in columns 2 and 3 (capital expenditures and non-capital expenditures, respectively) are similar, but the effects are somewhat smaller. Together, these results imply that firms with large positive accruals overinvest during the period up to and including the year of extreme accruals, and then subsequently underinvest.

Panels B – D show that firms using real earnings management have even greater over- and underinvestment than firms using accrual management. For example, firms that cut discretionary expenditures (Panel C) overinvest by 2.4% of total assets in year 0, and subsequently underinvest by 2.9% in year t+1, for a relative investment decline of 5.3%, while firms that cut COGS and increase inventory (Panel D) overinvest by 3.7% of total assets in the earnings management year, and subsequently underinvest by 4.6%, for a relative investment decline of 8.3%.

In summary, the findings in Table 2 suggest that SUSPECT firms overinvest in the earnings management year and subsequently underinvest; Table 3 shows that firms engaging in either real or accrual earnings management overinvest and subsequently underinvest, and real earnings management firms overinvest and underinvest even more than firms managing earnings with accruals.

We now focus on firms that are *both* classified as SUSPECT firms *and* engage in accrual-based or real earnings management. These are the most important firms for our study, both

because they are likely to have managed earnings and we can identify the method of earnings management. Thus, by focusing on these firms we can calculate the relation between the method of earnings management and the effect on investment. Importantly as well, we expand our analysis to control for factors that drive firms' investments, beyond size and industry.

Investments and SUSPECT – Multivariate Analysis

In Tables 2 and 3 we have used a firm's actual expenditures, relative to the firm's peer group based on industry and size, as our overinvestment measure. However, it is well known that investment is a function of many factors, such as investment opportunities and liquidity (availability of funds). If these factors are correlated with our measures of earnings management, then any relation we find between investment and earnings management may be due to these omitted factors. That is, what we believe is excess investment might really be optimal given the firm's investment opportunity set. To address this issue, we regress firms' investment expenditures against firm specific characteristics that proxy for investment opportunities and liquidity, and our earnings management proxies:[6]

$$Y_{i,t} = \beta_0 + \beta_1 LOG\_ASSET_{i,t-1} + \beta_2 MKT\_BK_{i,t-1} + \beta_3 LEVERAGE_{i,t-1} + \beta_4 SLACK_{i,t-1} + \beta_5 AGE_{i,t-1} + \beta_6 OP\_CYCLE_{i,t-1} + \beta_7 LOSS_{i,t-1} + \beta_8 TANGIBLE_{i,t-1} + \beta_9 DIVIDEND_{i,t-1} + \beta_{10} SUSPECT_{i,t} + \beta_{11} EM_{i,t} + \beta_{12} SUSPECT * EM + \varepsilon_{i,t}$$

(10)

The dependent variable is either *INVEST*, *CAPEX*, or *NONCAPEX*. *INVEST* is the sum of capital expenditures, research and development expenses, and acquisition expenditures less cash receipts from sale of property, plant and equipment, scaled by total assets. *CAPEX* is capital

[6]We estimate all regressions and report t-statistics using clustered standard errors at the firm and year level based on Petersen (2009).

expenditures scaled by total assets, whereas *NONCAPEX* is the sum of research and development expenditures and acquisition expenditures scaled by total assets. *LOG_ASSET* is the log of total assets; *MKT_BK* is the ratio of the market value of equity divided by the book value of total assets; *LEVERAGE* is the ratio of long term debt to the market value of equity; *SLACK* is the ratio of cash to property plant, and equipment; *AGE* is the difference between the first year when the firm appeared on CRSP and the current year; *OP_CYCLE* is the log of receivables to sales plus inventory to cost of goods sold multiplied by 360; *LOSS* is a dummy variable that takes the value of one if net income before extraordinary items is negative and zero otherwise; *TANGIBLE* is the ratio of property, plant and equipment to total assets; *DIVIDEND* is a dummy variable that takes the value of one if the firm paid dividends and zero otherwise. SUSPECT, our proxy for earnings management, is a dummy variable that equals one if a firm's reported earnings are in the bin just to the right of zero. EM is a dummy variable that equals one if a firm is in the top decile of discretionary accruals (column 1), cut its discretionary expenditures and are in group 2 as defined on page 16 (column 2), increased its inventory and cut its COGS (column 3), or increased its sales and decreased its CFO (column 4), and zero otherwise.

We jointly examine SUSPECT firms and firms engaging in accrual-based or real earnings management strategies by focusing on the interaction of SUSPECT and EM, SUSPECT*EM. SUSPECT*EM equals one only when both SUSPECT and EM equal one; thus SUSPECT*EM designates firms that are most likely to have managed earnings (SUSPECT firms) and compares them by the type of earnings management strategy, accrual or one of the three real strategies.

We base our multivariate regression (10) on the evidence in Biddle, Hilary, and Verdi (2009), who model firms' investment as a function of firm size, the market-to-book ratio, leverage, financial slack, age, length of operating cycle, a loss firm dummy, tangibility, and

dividend payout. As Biddle, Hilary, and Verdi point out, these variables are related to investment activities. The market-to-book ratio is a widely used proxy for investment opportunities, with higher market-to-book ratios having greater opportunities. Thus, we expect a positive coefficient on the market-to-book ratio. Slack and dividend payout are proxies for availability of funds; firms with a lot of slack likely have sufficient funds for investment, while firms that pay dividends may be cash constrained. Thus, we expect a positive (negative) coefficient on slack (dividend).[7] Similarly, leverage and tangibility relate to investment through liquidity. More highly levered firms have fewer available funds, constraining investment, and tangible investments have greater access to funds, since they are more liquid than intangible investments. Thus, we expect a negative (positive) coefficient on leverage (tangibility).

Biddle et al. (2009) point out that age, length of operating cycle, and loss capture factors related to different stages of the business cycle that may give rise to different discretionary accruals unrelated to earnings management, and size is a proxy for many things that affect investment, including opportunities and access to funds. Thus, it is important to control for these factors. We expect the coefficient on loss to be negative, since loss firms have both poorer opportunities and less access to funds. Since age, length of operating cycle, and size may proxy for multiple factors, we make no prediction about their coefficients.[8]

Table 4 reports the results for each one of the three investment measures: Panel A for total investment, Panel B for CAPEX, and Panel C for NONCAPEX. As expected, the coefficients on market-to-book are positive, while the coefficients on leverage and dividend are negative in all

[7] However, dividends may be a signal of cash availability, in which case we expect a positive relation.

[8] Biddle, Hillary, and Verdi (2009) also include σ(CFO), Z-score, Industry debt/assets, CFO/Sales, and Cash in their model. We do not include the cash or cash flow variables, to avoid inducing a relation with our abnormal CFO measure of earnings management. We don't include Z-score, since it is highly correlated with leverage and profitability, which we already have, and we don't include industry capital structure, since we benchmark our firms relative to their industry.

regressions. The coefficients on slack and tangible are mixed, but generally significant. The coefficients on the controls age and loss are uniformly significantly negative, while the coefficients on size and operating cycle are mixed by generally significant, indicating the importance of including these controls. Overall, the coefficients on the investment opportunity and liquidity proxies are extremely similar for all four measures of earnings management and are consistent with our expectations, and the regressions explain about 25% of the cross-firm variation in investment.

For total investment (Panel A), we find that SUSPECT firms show statistically significant overinvestment of about 6% of total assets (coefficients on SUSPECT range from .062 to .065), and firms that engage in each of the accrual or real strategies show varying amounts of overinvestment, between about 2-4% of total assets (coefficients on EM range from .019 to .038). These results confirm the evidence in Tables 2 and 3.

Most important for our analysis are the coefficients on SUSPECT*EM. By focusing on firms most likely to have managed earnings, but by different means, the coefficients on SUSPECT*EM capture the overinvestment for suspect firms differentiated by strategy. Thus, they enable us to compare the effects of different earnings management strategies on excess investment. These coefficients show that firms managing earnings by any of the strategies overinvest as the coefficients on all of the interaction terms are significantly positive; however, the coefficients on the real earnings management interactions are two to four times as great as the coefficient on the accrual interaction. For example, for EM=DA, the coefficient on SUSPECT*EM is .031, indicating that SUSPECT firms that manage earnings with accruals overinvest by 3.1% of total assets. The *smallest* coefficient on SUSPECT*EM for the real earnings management strategies is .063 for firms increasing sales and decreasing CFO.

Increasing production to cut COGS is associated with the greatest overinvestment, followed by cutting discretionary expenditures. Firms that manage earnings by increasing production to cut COGS overinvest by 14.2% of total assets, while firms that cut discretionary expenditures overinvest by 8.1% of total assets.

In addition to the coefficients on SUSPECT*EM, we also focus on the coefficients on EM. These coefficients are important, because as discussed above, since SUSPECT is based on ex-post realizations, it is likely to miss some firms that managed earnings but did not fall into the narrow range immediately to the right of zero, and to include firms that had small positive earnings but did not manage earnings. Thus, the coefficients on EM provide additional evidence on the investment behavior of firms that manage earnings by different means.

Table 4, Panel A shows that the coefficients on EM are greater for real earnings management than for discretionary accruals; the coefficient on DA is .019, while the coefficients on the real earnings management variables range from .025 to .038, supporting our evidence from SUSPECT*EM that firms using real earnings management overinvest more than firms using discretionary accruals.

In Panel D, we test for the statistical significance of the differences in the coefficients in Panel A, by combining the accrual earnings management observations with each of the real earnings management observations into three "joint" regressions. The coefficients on DA and SUSPECT*DA capture the overinvestment for all firms and SUSPECT firms, respectively, with high positive abnormal accruals. The coefficients on EM and SUSPECT*EM capture the overinvestment for all firms and SUSPECT firms, respectively, that engage in each of the three methods of real earnings management. As shown at the bottom of Panel D, all of the real earnings management coefficients are significantly greater than the DA coefficients, confirming

that firms that engage in real earnings management overinvest more than firms that engage in accrual earnings management. As pointed out above, since the measurement error in discretionary accruals is likely to be correlated with investment, our tests are biased against finding greater excess investment for real earnings management firms. Despite this, we find statistically significant evidence that they overinvest more than firms that manage earnings with accruals.[9,10]

In Panels B and C of Table 4 we report results for the investment regressions with capital expenditures and non-capital expenditures, respectively, as the dependent variables. These results show that capital expenditures are the primary reason for the total investment results in Panel A. The results for capital expenditures mirror the total investment results, as all SUSPECT*EM interaction terms are significant, and the coefficients on the real earnings management variables are economically greater than the coefficient on accrual earnings management. For non-capital expenditures, all of the SUSPECT*EM interaction terms are small compared to the coefficients in Panel B, and none of the coefficient differences are statistically significant. Overall, the results in Table 4 imply that while firms that engage in either accrual or real earnings management both overinvest, firms that use real earnings management overinvest more than firms that use accrual earnings management, and this is due primarily to overinvestment in capital expenditures.[11]

Finally, we provide evidence on the intertemporal relation between earnings management activities and investment, controlling for firms' investment opportunities. This issue is important

[9]We also estimated the regressions in Panel A of Table 4 by including future change in sales ($sales_{t+1}$-$sales_t$) as an additional control for growth opportunities. The results are strongly consistent with what we report in the table, giving us added confidence that our reported results are not due to an omitted growth factor.

[10] Ball and Shivakumar (2008) make a similar point about studies that find positive abnormal accruals for IPO firms, which tend to have high investment opportunities and positive abnormal accruals.

[11]We also estimated equation (10) including lagged investment as an additional explanatory variable to control for possible correlated omitted variables. None of our results are affected by this alternative specification.

to examine, because it shows how firms' earnings management behavior varies intertemporally relative to their excess investments, and in particular, whether earnings management precedes the over or under investment. As McNichols and Stubben point out, if earnings management causes overinvestment, then the overinvestment should be related to current and past earnings management. To perform this analysis, we estimate the investment model (equation (10)), augmented with measures of firms' earnings management activities from t-2 thru t+1. Since we are estimating the relation between investment and both past and future earnings management, we do not include SUSPECT in the Table 5 regressions, since SUSPECT only pertains to year t. Thus, Table 5 shows more generally how investment and earnings management are related through time, regardless of whether a firm is suspect or not.

Table 5 shows that current investments are significantly associated with both accrual-based and real current, past, and future earnings management activities, as the coefficients on EM_t, EM_{t-1}, and EM_{t+1} are generally significantly positive. The results suggest that the relationship between investments and earnings management activities is the strongest in the concurrent year, consistent with the findings in McNichols ad Stubben (2008). As McNichols and Stubben point out, the relation between investments and earnings management activities in year t+1 is consistent with some portion of earnings management to offset poor returns from over investments made in past periods. Consistent with the results in Tables 2-4, the effects of real earnings management activities on investment are greater than the effects of accrual earnings management, providing additional evidence that firms that engage in real earnings management experience greater overinvestment than firms that engage in accrual earnings management.

5. Conclusion

We examine the relation between both real and accrual-based earnings management activities and firms' investment behavior. Our research is important, because studies on the effects of earnings management have focused almost exclusively on stock returns, ignoring the effects on firm's real economic activity. While two recent papers by Kedia and Philippon (2009) and McNichols and Stubben (2008) address how earnings management affects firms' real activities, both studies focus exclusively on *accrual-based* earnings management. Ours is the first paper to examine and compare the economic effects of real earnings management activities in addition to the accrual-based one. In addition, whereas both Kedia and Philippon and McNichols and Stubben used small event-based samples that identified ex-post the most extreme cases of financial accounting misreporting, our sample is not based on a specific event. Thus, our results are not just applicable to the most extreme firms, but more generalizable.

We find overinvestment in firms that engage in either real or accrual-based earnings management, but firms that engage in real earnings management overinvest more than firms that engage in accrual earnings management. As McNichols and Stubben (2008) point out, earnings management may affect resource allocation by causing firms to make suboptimal investment decisions; if real earnings management is associated with greater excess investment than accrual earnings management, then real earnings management may be more detrimental.

Our study is the first empirical evidence comparing the consequences of real versus accrual-based earnings management on firms' investment decisions, and thus advances our knowledge on how each type of earnings management activities may affect resource allocation. Our results directly address the call for more research on the effects and economics consequences of earnings management activities (e.g., Fields et al. 2001). Thus, by providing the first evidence

that real earnings management has significant effects on firms' investment, we contribute important evidence on the consequences of earnings management.

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Table 1. Comparison of Investment Activities and Earnings Management Strategies among Different Group of Firms: SUSPECT vs. NON-SUSPECT Firms

	SUSPECT FIRMS		NON-SUSPECT		DIFF. in	
	MEAN	MEDIAN	MEAN	MEDIAN	MEAN (t-stat.)	MEDIAN (z-stat.)
INVEST	0.231	0.184	0.143	0.094	0.088	0.090
					(5.67)	(4.21)
CAPEX	0.364	0.248	0.284	0.173	0.080	0.075
					(4.37)	(3.64)
NONCAPEX	0.081	0.076	0.046	0.018	0.035	0.058
					(3.04)	(4.32)
GROW	0.089	0.064	0.064	0.053	0.025	0.011
					(4.51)	(5.49)
EMPL	0.051	0.042	0.034	0.027	0.017	0.015
					(2.86)	(2.15)
Total Accruals	-91.371	-9.643	-72.39	-6.324	-18.981	-3.319
($Million)					(-8.37)	(-6.81)
CFO ($Million)	85.694	7.742	152.312	13.264	-66.618	-5.522
					(-6.81)	(-9.37)
Total Assets	1357.341	264.371	1423.231	176.341	-65.890	88.03
					(-5.14)	(4.53)
MVE	763.491	86.374	1634.218	203.054	-870.727	-116.68
					(-11.37)	(-8.17)
Sales	1432.697	267.153	1543.141	295.327	-110.444	-28.174
					(-7.68)	(-4.06)
ROA	0.031	0.043	0.087	0.064	-0.056	-0.021
					(-3.16)	(-4.67)

Panel B: Sample Distribution

	Number of Firm-Year Observations	**Percentage (%)**
Overall Sample	82,039	100%
SUSPECT	3,831	4.67%
INCR_SALES&DECR_CFO	2,174	2.65%
COGS_CUT&ΔINV>0	2,609	3.18%
$0 < EBDISX_t < DISX_{t-1}$	2,043	2.49%
DA	8,204	10%
SUSPECT & INCR_SALES&DECR_CFO	673	0.82%
SUSPECT & COGS_CUT&ΔINV>0	796	0.97%
SUSPECT & $0 < EBDISX_t < DISX_{t-1}$	730	0.89%
SUSPECT & DA	755	0.92%

Notes to Table 1: INVEST is the sum of capital expenditures, research and development expenses, and acquisition expenditures less cash receipts from sale of property, plant and equipment, scaled by total assets; CAPEX is capital expenditures scaled by total assets; NONCAPEX is the sum of research and development expenditures scaled by total assets; GROW is the growth rate in total assets; EMPL is the growth rate in the total number of employees; CFO is cash flows from operations; MVE is market value of equity; ROA is the return on total assets, where the return on assets is defined as income before extraordinary items divided by beginning of period total assets; SUSPECT gets the value of one if annual earnings before extraordinary items (scaled by total assets) are between 0 and 0.005 and zero otherwise; INCR_SALES&DECR_CFO gets the value of one if the observed change in sales in the current year compared to the previous year is positive and at the same time whether the observed change in cash flows from operations is negative and zero otherwise; COGS_CUT&ΔINV>0 gets the value of one if the observed change in cost of goods sold for the year is negative and at the same time whether the change in inventories in the current year is positive, and zero otherwise; EBDISX is pre-tax earnings before discretionary expenditures whereas DISX is discretionary expenditures. We define discretionary expenditures as the sum of advertising expenses and SG&A expenses; DA is discretionary accruals calculated using the Jones (1991) model.

Table 2. Investments Activities partitioned by Alternative Earnings Management Strategies throughout Time among SUSPECT Firms

Year	SUSPECT FIRMS				
	INVEST	**CAPEX**	**NONCAPEX**	**GROW**	**EMPL**
-3	0.001	0.002	0.001	0.002	0.001
-2	0.002	0.004	0.002	0.003	0.002
-1	**0.014**	**0.022**	**0.019**	**0.017**	0.006
0	**0.019**	**0.026**	**0.029**	**0.013**	0.005
1	**-0.028**	**-0.032**	**-0.026**	**-0.024**	-0.001
2	**-0.012**	**-0.011**	**-0.009**	-0.007	-0.002
3	-0.004	-0.003	-0.002	-0.003	0.002

Notes to Table 2: INVEST is the sum of capital expenditures, research and development expenses, and acquisition expenditures less cash receipts from sale of property, plant and equipment, scaled by total assets; CAPEX is capital expenditures scaled by total assets; NONCAPEX is the sum of research and development expenditures scaled by total assets; GROW is the growth rate in total assets; EMPL is the growth rate in the total number of employees;

Table 3: Investment Activities for Different EM strategies

Year	Panel A - Extreme decile of DA					Panel B - INCR_SALES&DECR_CFO				
	INVEST	**CAPEX**	**NONCAPEX**	**GROW**	**EMPL**	**INVEST**	**CAPEX**	**NONCAPEX**	**GROW**	**EMPL**
-3	0.002	0.003	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.001
-2	0.002	0.002	0.001	0.001	0.002	0.001	0.002	0.001	0.003	0.002
-1	**0.013**	0.006	0.005	**0.010**	0.003	**0.015**	**0.011**	0.005	**0.009**	0.003
0	**0.015**	**0.012**	**0.013**	**0.012**	0.005	**0.029**	**0.023**	**0.018**	**0.017**	0.005
1	**-0.021**	**-0.023**	**-0.019**	**-0.018**	-0.001	**-0.013**	**-0.017**	**-0.009**	**-0.026**	-0.004
2	**-0.016**	**-0.015**	**-0.014**	-0.008	-0.004	-0.008	-0.004	-0.001	**-0.008**	0.003
3	-0.003	-0.004	-0.003	0.002	0.001	0.001	0.002	0.003	-0.002	0.001

Table 3: Investment Activities for Different EM strategies, Contd'

Year	Panel C - DISX_CUT					Panel D - COGS_CUT&ΔINV>0				
	INVEST	**CAPEX**	**NONCAPEX**	**GROW**	**EMPL**	**INVEST**	**CAPEX**	**NONCAPEX**	**GROW**	**EMPL**
-3	0.001	0.002	0.001	0.002	0.002	0.003	0.002	0.001	0.003	0.001
-2	0.002	0.003	0.002	0.001	0.003	0.011	0.003	0.002	0.005	0.002
-1	**0.017**	0.008	0.003	0.004	0.006	**0.029**	**0.017**	0.003	**0.012**	0.004
0	**0.024**	**0.018**	**0.017**	**0.011**	0.009	**0.037**	**0.035**	**0.027**	**0.019**	0.003
1	**-0.029**	**-0.021**	**-0.023**	**-0.014**	-0.003	**-0.046**	**-0.041**	**-0.029**	**-0.026**	-0.002
2	**-0.012**	**-0.016**	**-0.013**	-0.007	-0.002	**-0.014**	**-0.016**	**-0.017**	**-0.011**	-0.003
3	-0.008	-0.002	-0.003	0.002	0.001	-0.007	-0.002	-0.002	-0.005	0.002

Notes to Table 3: INVEST is the sum of capital expenditures, research and development expenses, and acquisition expenditures less cash receipts from sale of property, plant and equipment, scaled by total assets; CAPEX is capital expenditures scaled by total assets; NONCAPEX is the sum of research and development expenditures scaled by total assets; GROW is the growth rate in total assets; EMPL is the growth rate in the total number of employees; INCR_SALES&DECR_CFO gets the value of one if the observed change in sales in the current year compared to the previous year is positive and at the same time whether the observed change in cash flows from operations is negative and zero otherwise; COGS_CUT&ΔINV>0 gets the value of one if the observed change in cost of goods sold for the year is negative and at the same time whether the change in inventories in the current year is positive, and zero otherwise; EBDISX is pre-tax earnings before discretionary expenditures whereas DISX is discretionary expenditures. We define discretionary expenditures as the sum of advertising expenses and SG&A expenses; DA is discretionary accruals calculated using the Jones (1991) model.

Table 4. Relation between Investments and Alternative Earnings Management Strategies

Panel A: Dependent variable is INVEST

	EM = DA	**EM = DISX_CUT**	**EM = COGS_CUT &ΔINV>0**	**EM = INCR_SALES &DECR_CFO**
LOG_ASSET	0.083 (1.39)	0.082 (1.69)	0.078 (3.15)	0.085 (3.71)
MKT-BK	2.408 (11.17)	2.506 (12.08)	2.574 (13.57)	2.498 (14.23)
LEVERAGE	-5.638 (-13.07)	-5.572 (-12.35)	-5.664 (-8.17)	-5.617 (-9.61)
SLACK	-0.053 (-0.69)	-0.049 (-0.63)	-0.052 (-1.09)	-0.058 (-0.92)
AGE	-0.071 (-8.26)	-0.074 (-7.05)	-0.069 (-5.67)	-0.071 (-7.12)
OP_CYCLE	-0.867 (-3.51)	-0.853 (-3.61)	-0.842 (-4.99)	-0.857 (-2.95)
LOSS	-3.613 (-12.18)	-3.704 (-11.94)	-3.657 (-8.64)	-3.639 (-7.63)
TANGIBLE	11.183 (12.79)	11.374 (14.06)	11.327 (9.84)	11.403 (9.23)
DIVIDEND	-0.431 (-3.26)	-0.442 (-3.26)	-0.433 (-3.57)	-0.439 (-3.83)
SUSPECT	0.065 (3.72)	0.062 (4.01)	0.064 (3.72)	0.064 (3.54)
EM	0.019 (4.05)	0.025 (4.16)	0.038 (5.06)	0.027 (4.38)
SUSPECT*EM	0.031 (2.71)	0.081 (3.04)	0.142 (3.37)	0.063 (4.12)
Adj. R^2	0.263	0.243	0.284	0.253

Panel B: Dependent variable is CAPEX

	EM = DA	EM = DISX_CUT	EM = COGS_CUT &ΔINV>0	EM = INCR_SALES &DECR_CFO
LOG_ASSET	0.091 (2.15)	0.093 (2.14)	0.088 (2.96)	0.096 (3.26)
MKT-BK	2.854 (8.16)	2.813 (7.34)	2.896 (10.67)	2.746 (9.34)
LEVERAGE	-4.643 (-10.27)	-4.439 (-10.16)	-4.536 (-8.61)	-4.494 (-8.75)
SLACK	-0.033 (-0.57)	-0.035 (-0.72)	-0.031 (-0.67)	-0.036 (-0.79)
AGE	-0.061 (-5.78)	-0.059 (-6.02)	-0.064 (-4.98)	-0.055 (-5.36)
OP_CYCLE	-0.741 (-4.78)	-0.709 (-3.94)	-0.712 (-4.11)	-0.723 (-3.16)
LOSS	-3.126 (-10.81)	-3.137 (-10.68)	-2.998 (-9.36)	-3.113 (-9.49)
TANGIBLE	10.718 (11.76)	10.824 (12.67)	10.735 (10.32)	10.647 (11.46)
DIVIDEND	-0.327 (-3.57)	-0.329 (-3.56)	-0.332 (-3.69)	-0.431 (-3.98)
SUSPECT	0.046 (3.23)	0.045 (3.51)	0.047 (3.96)	0.043 (4.18)
EM	0.014 (2.84)	0.019 (2.98)	0.036 (4.67)	0.025 (3.81)
SUSPECT*EM	0.024 (2.98)	0.074 (3.26)	0.086 (2.83)	0.051 (3.45)
Adj. R^2	0.271	0.273	0.314	0.288

Panel C: Dependent variable is NONCAPEX

	EM = DA	EM = DISX_CUT	EM = COGS_CUT &ΔINV>0	EM = INCR_SALES &DECR_CFO
LOG_ASSET	0.026 (1.32)	0.024 (0.94)	0.018 (2.73)	0.021 (-3.34)
MKT-BK	1.554 (4.43)	1.539 (3.69)	1.631 (4.58)	1.627 (3.92)
LEVERAGE	-2.402 (-3.76)	-2.417 (-4.10)	-2.411 (-4.56)	-2.334 (-3.89)
SLACK	-0.015 (-0.61)	-0.013 (-0.13)	-0.012 (-0.22)	-0.011 (-0.43)
AGE	-0.066 (-5.23)	-0.067 (-5.16)	-0.064 (-4.36)	-0.063 (-4.68)
OP_CYCLE	0.616 (3.16)	0.591 (3.29)	0.584 (4.32)	0.603 (3.28)
LOSS	-2.478 (-7.84)	-2.467 (-9.39)	-2.513 (-8.94)	-2.498 (-7.82)
TANGIBLE	-9.286 (-7.14)	-9.258 (-6.34)	-9.239 (-7.03)	-9.351 (-6.81)
DIVIDEND	-0.215 (-2.69)	-0.218 (-2.71)	-0.212 (-3.07)	-0.214 (-2.67)
SUSPECT	0.008 (2.27)	0.011 (1.42)	0.009 (1.27)	0.013 (1.46)
EM	0.014 (2.39)	0.018 (1.83)	0.024 (2.14)	0.015 (2.03)
SUSPECT*EM	0.008 (1.48)	0.004 (0.83)	0.006 (1.09)	0.007 (1.89)
Adj. R^2	0.248	0.217	0.221	0.259

Panel D: Investments (INVEST) and Different Earnings Management Strategies

	EM = &DISX_CUT	EM = CUTS&ΔINV>0	EM = INCR_SALES& DECR_CFO
SUSPECT	0.064 (3.81)	0.063 (3.86)	0.064 (3.79)
DA	0.018 (4.27)	0.017 (4.12)	0.019 (4.22)
EM	0.026 (4.59)	0.039 (5.27)	0.028 (4.52)
SUSPECT*DA	0.030 (2.86)	0.029 (3.01)	0.028 (3.16)
SUSPECT*EM	0.083 (3.72)	0.146 (3.64)	0.067 (4.96)
F-Tests for DA = EM and SUSPECT*DA = SUSPECT*EM			
DA = EM	12.37	13.21	11.98
SUSPECT*DA = SUSPECT*EM	16.92	27.48	17.35

Control variables are omitted in Panel D

Notes to Table 4: The estimated equation is:

$$Y_{i,t} = \beta_0 + \beta_1 LOG\_ASSET_{i,t-1} + \beta_2 MKT\_BK_{i,t-1} + \beta_3 LEVERAGE_{i,t-1} + \beta_4 SLACK_{i,t-1} + \beta_5 AGE_{i,t-1} + \beta_6 OP\_CYCLE_{i,t-1} + \beta_7 LOSS_{i,t-1} + \beta_8 TANGIBLE_{i,t-1} + \beta_9 DIVIDEND_{i,t-1} + \beta_{10} SUSPECT_{i,t} + \beta_{11} EM_{i,t} + \beta_{12} SUSPECT * EM + \varepsilon_{i,t}$$

INVEST is the sum of capital expenditures, research and development expenses, and acquisition expenditures less cash receipts from sale of property, plant and equipment, scaled by total assets; CAPEX is capital expenditures scaled by total assets; NONCAPEX is the sum of research and development expenditures scaled by total assets; SUSPECT gets the value of one if annual earnings before extraordinary items (scaled by total assets) are between 0 and 0.005 and zero otherwise; INCR_SALES&DECR_CFO gets the value of one if the observed change in sales in the current year compared to the previous year is positive and at the same time whether the observed change in cash flows from operations is negative and zero otherwise; COGS_CUT&ΔINV>0 gets the value of one if the observed change in cost of goods sold for the year is negative and at the same time whether the change in inventories in the current year is positive, and zero otherwise; EBDISX is pre-tax earnings before discretionary expenditures whereas DISX is discretionary expenditures. We define discretionary expenditures as the sum of advertising expenses and SG&A expenses; DA is discretionary accruals calculated using the Jones (1991) model; LOG_ASSET is the log of total assets; MKT_BK is the ratio of the market value of equity divided by the book value of total assets; LEVERAGE is the ratio of long term debt to the market value of equity; SLACK is the ratio of cash to property plant, and equipment; AGE is the difference between the first year when the firm appeared on CRSP and the current year; OP_CYCLE is the log of receivables to sales plus inventory to cost of goods sold multiplied by 360; LOSS is a dummy variable that takes the value of one if net income before extraordinary items is negative and zero otherwise; TANGIBLE is the ratio of property, plant and equipment to total assets; DIVIDEND is a dummy variable that takes the value of one if the firm paid dividends and zero otherwise; Reported t-statistics are based on robust standard errors that are clustered by both firm and year (Petersen, 2009).

Table 5. Investments and Earnings Management Strategies over Time

Panel A: Dependent variable is INVEST

	EM = DA	**EM = DISX_CUT**	**EM = COGS_CUT &ΔINV>0**	**EM = INCR_SALES &DECR_CFO**
LOG_ASSET	0.083 (2.45)	0.078 (1.74)	0.071 (3.29)	0.079 (3.12)
MKT-BK	2.473 (9.12)	2.541 (12.25)	2.532 (13.07)	2.487 (13.41)
LEVERAGE	-5.401 (-10.24)	-5.613 (-11.69)	-5.598 (-8.39)	-5.628 (-9.17)
SLACK	-0.057 (-0.83)	-0.0451 (-0.68)	-0.049 (-1.02)	-0.053 (-0.81)
AGE	-0.076 (-5.29)	-0.077 (-6.08)	-0.068 (-5.41)	-0.073 (-7.38)
OP_CYCLE	-0.857 (-3.41)	-0.862 (-3.43)	-0.859 (-4.84)	-0.848 (-2.83)
LOSS	-3.504 (-9.79)	-3.721 (-10.38)	-3.662 (-8.73)	-3.645 (-7.86)
TANGIBLE	11.591 (11.34)	11.238 (12.34)	11.289 (9.17)	11.368 (9.46)
DIVIDEND	-0.429 (-3.68)	-0.448 (-3.81)	-0.441 (-3.12)	-0.447 (-3.46)
EM $_{t-2}$	0.005 (0.96)	0.004 (0.68)	0.005 (0.84)	0.003 (0.57)
EM $_{t-1}$	0.009 (1.56)	0.011 (1.74)	0.019 (1.87)	0.014 (2.01)
EM $_{t}$	0.018 (4.33)	0.025 (4.16)	0.038 (5.06)	0.027 (4.38)
EM$_{t+1}$	0.009 (2.23)	0.013 (2.19)	0.016 (2.31)	0.014 (1.98)
Adj. R^2	0.262	0.258	0.296	0.272

Panel B: Dependent variable is CAPEX

	EM = DA	EM = DISX_CUT	EM = COGS_CUT &ΔINV>0	EM = INCR_SALES &DECR_CFO
LOG_ASSET	0.094 (2.58)	0.095 (2.37)	0.091 (2.84)	0.093 (3.01)
MKT-BK	2.772 (8.28)	2.834 (7.12)	2.858 (10.29)	2.863 (9.67)
LEVERAGE	-4.541 (-8.79)	-4.583 (-10.35)	-4.561 (-8.14)	-4.486 (-8.28)
SLACK	-0.037 (-0.93)	-0.034 (-0.65)	-0.032 (-0.62)	-0.034 (-0.83)
AGE	-0.059 (-4.52)	-0.054 (-6.36)	-0.058 (-4.46)	-0.056 (-5.09)
OP_CYCLE	-0.719 (-4.16)	-0.721 (-3.34)	-0.719 (-4.38)	-0.728 (-3.21)
LOSS	-3.138 (-9.89)	-3.156 (-10.39)	-3.104 (-10.67)	-3.116 (-9.63)
TANGIBLE	10.674 (11.78)	10.786 (11.37)	10.763 (10.41)	10.656 (11.14)
DIVIDEND	-0.34 (-3.12)	-0.326 (-3.42)	-0.334 (-3.76)	-0.329 (-3.37)
EM_{t-2}	0.004 (0.68)	0.005 (0.72)	0.004 (0.42)	0.004 (0.72)
EM_{t-1}	0.011 (2.89)	0.012 (1.86)	0.018 (1.93)	0.015 (2.24)
EM_{t}	0.015 (4.39)	0.019 (2.98)	0.036 (4.67)	0.025 (3.81)
EM_{t+1}	0.008 (2.79)	0.012 (2.58)	0.013 (2.26)	0.012 (1.88)
Adj. R^2	0.278	0.291	0.334	0.316

Panel C: Dependent variable is NONCAPEX

	EM = DA	EM = DISX_CUT	EM = COGS_CUT &ΔINV>0	EM = INCR_SALES &DECR_CFO
LOG_ASSET	0.026 (2.75)	0.026 (0.83)	0.022 (2.36)	0.027 (3.17)
MKT-BK	1.606 (4.81)	1.536 (3.42)	1.643 (4.15)	1.629 (3.74)
LEVERAGE	-2.452 (-4.61)	-2.412 (-4.16)	-2.414 (-4.61)	-2.329 (-3.41)
SLACK	-0.013 (-0.63)	-0.012 (-0.19)	-0.011 (-0.26)	-0.013 (-0.38)
AGE	-0.064 (-4.38)	-0.061 (-5.25	-0.063 (-4.32)	-0.065 (-4.16)
OP_CYCLE	0.614 (3.97)	0.587 (3.42)	0.586 (4.63)	0.611 (3.47)
LOSS	-2.497 (-7.56)	-2.456 (-8.61)	-2.521 (-8.14)	-2.493 (-7.54)
TANGIBLE	-9.2401 (-6.42)	-9.267 (-6.63)	-9.243 (-7.11)	-9.357 (-6.43)
DIVIDEND	-0.209 (-3.44)	-0.215 (-2.74)	-0.216 (-3.23)	-0.218 (-2.76)
EM $_{t-2}$	0.003 (0.61)	0.004 (0.51)	0.003 (0.21)	0.002 (0.43)
EM $_{t-1}$	0.007 (1.64)	0.008 (1.26)	0.011 (1.78)	0.008 (1.53)
EM $_{t}$	0.009 (1.39)	0.018 (1.83)	0.024 (2.14)	0.015 (2.03)
EM$_{t+1}$	0.004 (1.59)	0.008 (1.42)	0.012 (1.98)	0.008 (1.57)
Adj. R^2	0.253	0.223	0.246	0.277

Notes to Table 5: The estimated equation is:

$$Y_{i,t} = \beta_0 + \beta_1 LOG\_ASSET_{i,t-1} + \beta_2 MKT\_BK_{i,t-1} + \beta_3 LEVERAGE_{i,t-1} + \beta_4 SLACK_{i,t-1} + \beta_5 AGE_{i,t-1} + \beta_6 OP\_CYCLE_{i,t-1} + \beta_7 LOSS_{i,t-1} + \beta_8 TANGIBLE_{i,t-1} + \beta_9 DIVIDEND_{i,t-1} + \beta_{10} EM_{i,t-2} + \beta_{11} EM_{i,t-1} + \beta_{12} EM_{i,t} + \beta_{13} EM_{i,t+1} + \varepsilon_{i,t}$$

INVEST is the sum of capital expenditures, research and development expenses, and acquisition expenditures less cash receipts from sale of property, plant and equipment, scaled by total assets; CAPEX is capital expenditures scaled by total assets; NONCAPEX is the sum of research and development expenditures scaled by total assets; SUSPECT gets the value of one if annual earnings before extraordinary items (scaled by total assets) are between 0 and 0.005 and zero otherwise; INCR_SALES&DECR_CFO gets the value of one if the observed change in sales in the current year compared to the previous year is positive and at the same time whether the observed change in cash flows from operations is negative and zero otherwise; COGS_CUT&ΔINV>0 gets the value of one if the observed change in cost of goods sold for the year is negative and at the same time whether the change in inventories in the current year is positive, and zero otherwise; EBDISX is pre-tax earnings before discretionary expenditures whereas DISX is discretionary expenditures. We define discretionary expenditures as the sum of advertising expenses and SG&A expenses; DA is discretionary accruals calculated using the Jones (1991) model; LOG_ASSET is the log of total assets; MKT_BK is the ratio of the market value of equity divided by the book value of total assets;

LEVERAGE is the ratio of long term debt to the market value of equity; SLACK is the ratio of cash to property plant, and equipment; AGE is the difference between the first year when the firm appeared on CRSP and the current year; OP_CYCLE is the log of receivables to sales plus inventory to cost of goods sold multiplied by 360; LOSS is a dummy variable that takes the value of one if net income before extraordinary items is negative and zero otherwise; TANGIBLE is the ratio of property, plant and equipment to total assets; DIVIDEND is a dummy variable that takes the value of one if the firm paid dividends and zero otherwise; Reported t-statistics are based on robust standard errors that are clustered by both firm and year (Petersen, 2009).