The Relation Between Earnings Management Using Real Activities Manipulation and Future Performance: Evidence from Meeting Earnings Benchmarks*

KATHERINE A. GUNNY, *University of Colorado*

1. Introduction

Earnings management can be classified into two categories: accruals management and real activities manipulation (RM). Accruals management involves within generally accepted accounting principles (GAAP) accounting choices that try to "obscure" or "mask" true economic performance (Dechow and Skinner 2000). RM occurs when managers undertake actions that change the timing or structuring of an operation, investment, and/or financing transaction in an effort to influence the output of the accounting system. Schipper (1989, 92) includes RM in her definition of earnings management and describes earnings management as "a purposeful intervention in the external financial reporting process, with the intention of obtaining some private gain…[a] minor extension of this definition would encompass 'real' earnings management, accomplished by timing investment or financing decision to alter reported earnings or some subset of it." This paper examines the extent to which RM is associated with firms just meeting earnings benchmarks. Then, I examine the extent to which RM affects subsequent operating performance.

Accruals management is not accomplished by changing the underlying operating activities of the firm, but through the choice of accounting methods used to represent those activities. In contrast, RM involves changing the firm's underlying operations in an effort to boost current-period earnings. Both types of earnings management involve managers' attempts to increase/decrease earnings; however, one type affects operations and the

* Accepted by Jeffrey Callen. I am grateful for the guidance and support I have received from my dissertation chair Xiao-Jun Zhang at the University of California, Berkeley. I appreciate the helpful comments of Qintao Fan, Sunil Dutta, Maria Nondorf, Shai Levi, Phil Shane, John Jacob, Naomi Soderstrom, Steve Rock, Joel Demski, Eli Bartov, Baruch Lev, Paul Zarowin, Thomas Lys, Ronald Dye, Tracey Zhang, Shimon Kogan, Gavin Cassar, Kin Lo, Bjorn Jorgensen, Brian Burnett, and Qiang Cheng. I am also grateful to the workshop participants at University of California at Berkeley, New York University, Northwestern University, University of Florida, Georgia Tech, and University of British Columbia.

doi:10.1111/j.1911-3846.2010.01029.x

other has no affect on operating activities.[1] Examples of RM include overproduction to decrease cost of goods sold (COGS) expense and cutting desirable research and development (R&D) investments to boost current-period earnings.[2]

Managers may want to engage in RM versus using accruals management for several reasons. First, ex post aggressive accounting choices with respect to accruals are at higher risk for Securities and Exchange Commission (SEC) scrutiny and class action litigation. Second, the firm may have limited flexibility to manage accruals. For example, accruals management is constrained by the business operations and accrual manipulation in prior years (Barton and Simko 2002). Further, accruals management must take place at the end of the fiscal year or quarter, and managers face uncertainty as to which accounting treatments the auditor will allow at that time. Operating decisions are controlled by the manager, whereas accounting choices are subject to auditor scrutiny. On the other hand, managers may prefer accruals management to RM because accruals management can take place after the fiscal year end when the need for earnings management is the most certain, whereas RM decisions must be made prior to fiscal year end.

Prior studies provide evidence on the existence of RM (Roychowdhury 2006; Baber, Fairfield, and Haggard 1991; Bartov 1993; Bens, Nagar, and Wong 2002). The use of RM by managers is supported by Graham, Harvey, and Rajgopal 2005, who survey 401 financial executives about key factors that drive decisions about reported earnings and voluntary disclosure. They report that 78 percent of the executives interviewed indicated a willingness to sacrifice economic value to manage financial reporting perceptions. Graham et al. (2005, 40) report that "the opinion of 15 of 20 interviewed executives is that companies would/should take actions such as these to deliver earnings, as long as the actions are within GAAP and the real sacrifices are not too large." "Actions such as these" refers to postponing or eliminating expenses (hiring, R&D, advertising, travel, maintenance,

1. Conventional wisdom in prior studies is that managers prefer a higher stock price and stock price is increasing in earnings (see Fischer and Verrecchia 2000). While the focus of this study is on income-increasing RM, there are situations in which the manager may benefit by decreasing earnings. Firms prior to a management buyout, during the award date of stock options, vulnerable to an antitrust investigation, or seeking import relief may have incentives to lower reported earnings (e.g., Perry and Williams 1994; Watts and Zimmerman 1978; Jones 1991).
2. The distinction between cash-based earnings management and RM is that income-increasing RM will not always affect abnormal cash flow from operations (CFO) and earnings in the same direction. Reductions of discretionary expenses will lead to abnormally high CFO at the end of the period (assuming discretionary expenses are typically paid in cash). If a manager engages in overproduction to decrease COGS, the firm will most likely incur costs on the overproduced items that are not recovered in the current period through sales which will lead to abnormally low CFO. If the manager engages in more than one RM method at the same time, then the effect on CFO may be ambiguous.

and capital expenditures to avoid depreciation expense), selling bonds to book gains, and cutting prices in the fourth quarter. Furthermore, extant empirical accounting literature provides evidence on the existence of RM to achieve various income objectives (see section 2).

Given the existence of RM, I examine the association between RM and future performance. In particular, I examine the future operating performance of firms that use RM to just meet earnings benchmarks. A negative association is consistent with managers using operational discretion to influence the output of the accounting system for managerial rent extraction. A positive association is consistent with managers using operational discretion to just meet benchmarks in an effort to: (a) attain benefits that allow the firm to perform better in the future or (b) signal future firm value. For example, managers may engage in RM to meet benchmarks in an effort to enhance the firm's credibility and reputation with stakeholders (Bartov, Givoly, and Hayn 2002; Burgstahler and Dichev 1997). The enhanced reputation will enable the firm to perform better in the future because relationships with customers, suppliers, and/or creditors are stronger. Alternatively, managers can choose to just meet benchmarks by undertaking RM as a way to signal superior future earnings.

The results indicate that, after controlling for size, performance, growth opportunities, and industry, RM (reducing R&D to increase income, reducing selling, general, and administrative (SG&A) expenses to increase income, cutting prices to boost sales in the current period, and/or overproducing to decrease COGS expense) is positively associated with firms just meeting earnings benchmarks. Next, I find firms engaging in RM to just meet earnings benchmarks have relatively better subsequent performance than firms that do not engage in RM and miss or just meet the benchmarks. In this particular setting, the results suggest that engaging in RM is not opportunistic, but consistent with the firm attaining current-period benefits that allow the firm to perform better in the future or signaling.

Understanding the implications of RM is important not only to stakeholders of the firm, but also to accounting regulators. RM is one potential consequence of regulations intended to restrict the discretion in accounting earnings management. For example, through an analytical model, Ewert and Wagenhofer (2005) demonstrate that RM increases when tightening accounting standards make accruals management more difficult. Although this study does not specifically address the trade-off between accruals management and RM, examining the consequences of RM provides general information relevant to assessing the costs and benefits of accounting standards that may interact with the use of RM.

This paper contributes to the literature on earnings management. By undertaking a comprehensive examination of four types of RM, this paper extends extant research investigating the consequences of earnings management. Although there are several studies documenting whether RM occurs in various situations, the existing literature provides little evidence of the effect of RM on firms' subsequent operating performance. This study provides a direct assessment of the impact of RM on future earnings. Examining the implications of RM on operating performance is important, given the significance of future performance to the firm and its owners. This paper shows that using empirical measures to identify firms that engage in RM to meet zero or last year's earnings is incrementally informative about future earnings.

The remainder of the paper is organized as follows. Section 2 discusses the various types of RM and presents existing evidence. Section 3 develops testable hypotheses. Section 4 describes the data and methodology. Section 5 presents the results and sensitivity analysis. Section 6 provides concluding remarks.

2. Types of RM activities and prior evidence

This study focuses on the following four types of RM demonstrated to exist empirically in the prior literature:

(1) decreasing discretionary R&D expense (R&D RM),
(2) decreasing discretionary SG&A expense (SG&A RM),
(3) timing the sale of fixed assets to report gains (asset RM), and
(4) overproduction reflecting an intention to cut prices or extend more lenient credit terms to boost sales and/or overproduction to decrease COGS expense (production RM).

Evidence on RM

Under current accounting rules, R&D expenditures must be charged to expense as incurred because of the uncertainty of future benefits associated with investment in R&D (*SFAS No. 2*, October 1974).[3] As a result, a manager interested in boosting current-period income could choose to cut investment in R&D, particularly if the realization of the benefit associated with the forfeited R&D project impacts the firm in a future period rather than the current period. SG&A is included in the analysis because portions of this expense are similarly subject to managerial discretion. GAAP does not recognize intangible assets such as brands, technology, customer loyalty, human capital, and commitment of employees — all of which are created by expenditures on SG&A — as accounting assets. If the manager decided to cut employee-training programs intended to increase human capital and commitment of employees, the economic consequence may not materialize in the short term, but in the long term.

Several studies provide evidence that managers cut discretionary spending to achieve earnings targets. Roychowdhury (2006) develops empirical measures to proxy for RM of discretionary expense and reports that managers avoid reporting losses by undertaking RM. Baber et al. (1991) provide evidence that R&D spending is significantly less when spending

3. The Financial Accounting Standards Board (FASB) permits R&D capitalization only for certain kinds of software (*SFAS No. 86*).

jeopardizes the ability to report positive or increasing income in the current period. Dechow and Sloan (1991) show that chief executive officers spend relatively less on R&D in their final years in office. Bushee (1998) provides evidence consistent with institutional investors mitigating this myopic investment problem. Bens et al. (2002) show that managers cut R&D and capital expenditure when faced with earnings per share dilution due to stock option exercises. Cheng (2004) provides evidence consistent with compensation committees mitigating opportunistic reductions in R&D spending. The evidence is consistent with managers myopically cutting investment in R&D to achieve various income objectives.

The timing of asset sales is a manager's choice, and because gains are reported on the income statement at the time of the sale (the difference between the net book value and the current market value), the timing of asset sales could be used as a way to manage reported earnings. Bartov (1993) provides evidence consistent with managers selling fixed assets to avoid negative earnings growth and debt covenant violations. Herrmann, Inoue, and Thomas (2003) investigate Japanese managers' use of income from the sale of assets to manage earnings. They find that earnings increase (decrease) through the sale of fixed assets and marketable securities when current operating income falls below (above) management's forecast of operating income.

Sales manipulation refers to the behavior of managers that try to increase sales during the current year in an effort to increase reported earnings. By cutting prices (or extending more lenient credit terms) toward the end of the year in an effort to accelerate sales from the next fiscal year into the current year, some managers may be willing to sacrifice future profits to book additional sales this period. The potential costs of sales manipulation include loss in future profitability once the firm reestablishes old prices. Managers can manipulate COGS expense in any period by overproducing to spread fixed overhead costs over a larger number of units as long as the reduction in per-unit cost is not offset by inventory holding costs or any increase in marginal cost in the current period. Thomas and Zhang (2002) provide evidence consistent with managers overproducing to decrease reported COGS. Roychowdhury (2006) finds evidence that managers use sales manipulation and overproduction in an effort to avoid reporting losses.

3. Hypothesis development

I examine the relationship between earnings management using RM and future performance in situations where managers are more likely to engage in RM. Specifically, I focus on a sample of firms for which earnings management incentives are high. Prior research documents a discontinuity around zero earnings and last year's earnings (Hayn 1995; Burgstahler and Dichev 1997; Degeorge, Patel, and Zeckhauser 1999; Jacob and Jorgensen 2007) and interprets this as evidence of earnings management by firms to just meet or slightly beat earnings benchmarks. I examine RM in relation to firms just meeting two earnings benchmarks (zero earnings and last year's earnings). This leads to the following hypothesis:

> HYPOTHESIS 1. *Firms that just meet/beat earnings benchmarks (zero earnings and last year's earnings) exhibit evidence of real activities manipulation.*

Given the existence of RM, I examine whether there are costs associated with engaging in various types of RM. Prior literature provides limited evidence on whether RM affects future operating performance.[4] I examine the subsequent performance of firms that use RM to just meet earnings benchmarks (zero or last year's earnings).[5] A negative association between just meeting earnings benchmarks by using RM and subsequent performance supports prior research that suggests opportunistic managers use accounting or operational discretion to the detriment of shareholders.[6] For example, managers could engage in RM to just meet an earnings benchmark to increase stock prices, job security, or bonuses (Matsunaga and Park 2001).

A positive association between just meeting earnings benchmarks by using RM and subsequent performance is consistent with two distinct explanations. First, the act of just meeting the benchmark by engaging in RM may provide benefits to the firm that enables better performance in the future. For example, Bartov (1993) provides evidence consistent with managers selling fixed assets to avoid debt covenant violations. Trueman and Titman (1988) find managers use RM to smooth reported income to decrease the cost of debt. Bartov et al. (2002) suggest that benefits to meeting earnings expectations may include maximizing stock price, increasing management's credibility for meeting the expectations of stakeholders,

4. Bens et al. (2002) find future performance is relatively lower for firms that cut R&D expenditures to repurchase shares.
5. When examining the relation between future performance and RM, I assume RM is an exogenous variable. If RM is endogenously determined such that there is a factor that affects RM and also affects firms' future performance (e.g., RM firm-years being representative of poor performance), then this study suffers from a potential correlated omitted variable problem. However, I focus on RM conditional on an earnings management incentive to mitigate the effects of alternative explanations and potential correlated omitted variables.
6. For example, a manager has the opportunity to undertake a positive net present value R&D project that requires an initial investment of \$100M in period t to generate cash flows of \$80M in both $t + 1$ and $t + 2$. In period t, the manager is worried about job security and/or the stock price reaction to missing zero earnings, so he rejects the positive net present value R&D project. In this case, period t earnings are \$100M higher; however, earnings in the subsequent two periods are \$80M lower compared to an identical firm that would have undertaken the R&D project. With respect to production RM, aggressive price discounts could be used to increase sales volume and allow the manager to meet zero earnings in the current period; however, cash flows in future periods could be affected because customers now expect such price discounts.

and avoiding litigation. Graham et al. (2005, 27) find that 86.3 percent of executives "believe that meeting benchmarks builds credibility with the capital market". Shareholders benefit from managers undertaking RM to just meet earnings benchmarks to the extent that the benefits exceed the costs.

Second, the positive association between just meeting earnings benchmarks by engaging in RM and future performance is also consistent with signaling managerial competence or future firm performance (Bartov et al. 2002; Lev 2003).[7] Burgstahler and Dichev (1997) suggest that meeting earnings benchmarks may enhance firms' credibility and reputation with stakeholders such as creditors, suppliers, and customers. Prior literature reports that firms use discretionary accruals to signal firm value (Subramanyam 1996). Graham et al. (2005) find that 74.1 percent of executives try to meet earnings benchmarks because it helps to convey future growth prospects to investors. Managers may use the joint signal — engaging in RM and just meeting the earnings benchmark — to convey future growth prospects. For example, a manager could choose to meet a benchmark by engaging in RM or miss the benchmark by not engaging in RM. Consistent with the signaling explanation, only managers confident in superior future performance will use the joint signal because they expect future earnings growth to outweigh the adverse impact of using RM and meeting the benchmark. Firms with relatively worse future performance are not likely to use the joint signal because investors will be disappointed when the firm experiences an impact on earnings from the costs of RM (i.e., forfeited future cash flows) and the cost of setting earnings expectations higher by meeting the benchmark in the prior period. Earnings disappointments could lead to impaired management credibility and a higher likelihood of litigation.

Alternatively, finding no association between just meeting earnings benchmarks by engaging in RM and subsequent performance is consistent with the research design failing to capture RM and/or three other explanations. First, no association is consistent with the operational activity labeled as RM being the optimal choice. For example, it could be optimal for the manager to cut a positive net present value R&D project if the benefits from just meeting the earnings benchmark equal the costs of forfeiting the R&D project. In this case, subsequent performance may be insignificantly different from a peer firm. A second alternative explanation could be

7. This explanation does not necessarily imply that shareholders benefit from signaling. There are potentially less costly alternatives to signaling other than engaging in RM and just meeting earnings benchmarks. For example, the manager could miss the benchmark, but issue a management forecast indicating superior future performance. For most firms, this may be less costly and therefore a less credible signal of future firm performance. However, for some firms with reputations for providing credible management forecasts, this could be a costly and effective signal of future performance.

that the consequences of RM are so small that they are undetectable. For example, Graham et al. (2005, 40) document chief financial officers admitting a willingness to engage in RM "as long as the real sacrifices are not too large". Lastly, it may be that managers engage in RM for several reasons (e.g., opportunistic, signaling) and the combined effects on future performance offset on average. These competing arguments lead to the following hypothesis (stated in null form):

Hypothesis 2. *There is no association between using RM to just meet/beat earnings benchmarks and future performance.*

4. Data and methodology

The sample consists of all firms with available financial data from COMPUSTAT industrial, full-coverage, and research files and stock and size portfolio returns from the Center for Research in Security Prices (CRSP). Firms in the financial industry (SIC 6000–7000) and utility industry (SIC 4400–5000) are excluded because they operate in highly regulated industries with accounting rules that differ from other industries. The sample includes annual data for firms covering the years from 1988 to 2002. The sample is restricted to pre-2003 data, so there are several years of subsequent earnings to examine. The sample is restricted to post-1987 data because data on income from asset sales are not available on COMPUSTAT before 1987.

The R&D RM sample contains all firm-years with nonzero R&D expense data and the COMPUSTAT variables necessary to estimate abnormal R&D expense (28,308 observations and 4,028 firms). The SG&A RM sample contains all firm-years with nonzero SG&A expense data and the COMPUSTAT variables necessary to estimate abnormal SG&A expense (46,156 observations and 6,021 firms). The asset RM sample consists of all firm-years with the COMPUSTAT variables necessary to estimate abnormal gain on asset sales (33,528 observations and 5,452 firms). The production RM sample consists of all firm-years with nonzero inventory and COGS data, and the COMPUSTAT variables necessary to estimate abnormal production costs (39,432 observations and 5,526 firms).

Identification of RM

Given the inherent difficulty in identifying earnings management without knowing the manager's true intention, one criticism of the literature is that any earnings management identified may be a result of an omitted variable or may be capturing behavior other than intentional manipulation. This criticism applies to my study; however, I try to mitigate these concerns in several ways. First, I draw on prior literature to develop models to estimate the expected (i.e., "normal") level of the operational activities associated with RM. Second, to distinguish between the two scenarios described above, I examine a setting where the manager is more likely to engage in RM. Specifically, I focus on firms just meeting zero and last year's net income.[8]

Measurement of RM

The normal level of R&D expense is estimated using the following model:

$$\frac{RD_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{RD_{t-1}}{A_{t-1}} + \varepsilon_t^{R\&D} \quad (1),$$

where (COMPUSTAT data items in brackets):

RD = R&D expense [Data46],
A = total assets [Data6],
MV = the natural log of market value [Data199*Data25],
Q = Tobin's Q [((Data199*Data25) + Data130 + Data9 + Data34)/Data6], and
INT = internal funds [Data18 + Data46 + Data14].

Equation (1) is based on prior research (Berger 1993; Roychowdhury 2006) that develops an expectations model for the level of R&D intensity. The model is estimated for every year (1988–2000) and industry (two-digit SIC). The independent variables are designed to control for factors that influence the level of R&D spending. I use the natural logarithm of the market value of equity (*MV*) to control for size. Tobin's Q is a proxy for the marginal benefit to marginal cost of installing an additional unit of a new investment. Internal funds (*INT*) are a proxy for reduced funds available for investment. The prior year's R&D (RD_{t-1}) serves as a proxy for the firm's R&D opportunity set and the coefficient would be expected to be positive.

The normal level of SG&A is estimated using the following model:

$$\frac{SGA_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{\Delta S_t}{A_{t-1}} + \beta_5 \frac{\Delta S_t}{A_{t-1}} * DD + \varepsilon_t^{SG\&A} \quad (2),$$

where (COMPUSTAT data items in brackets):

SGA = SG&A [Data189],
A = total assets [Data6],
MV = the natural logarithm of market value [Data199*Data25],

8. I do not focus on analysts' forecasts for two reasons: (1) RM must take place before the end of the year and managers are unlikely to know what the analysts' forecast of earnings will be prior to the earnings announcement and (2) Matsumoto (2002) examines the mechanisms managers use to avoid missing analysts' forecasts and finds evidence consistent with forecast guidance dominating accruals manipulation as a mechanism for avoiding negative surprises. Therefore, it is unclear whether using firms that just meet the analysts' forecast would increase the power of correctly identifying RM.

Q = Tobin's Q [((Data199*Data25) + Data130 + Data9 + Data34)/ Data6],
INT = internal funds [Data18 + Data46 + Data14],
S = total sales [Data12], and
DD = indicator variable equal to 1 when total sales decrease between $t-1$ and t, zero otherwise.

Equation (2) is similarly estimated by year and industry. In addition to market value, Tobin's Q, and internal funds, I incorporate controls for "sticky" cost behavior (Anderson, Banker, and Janakiraman 2003). Costs are sticky if the magnitude of a cost increase associated with increased sales is greater than the magnitude of a cost decrease associated with an equal decrease in sales. The general theory is that managers trade off the expected costs of maintaining unutilized resources during periods of weak demand with the expected adjustment costs of replacing these resources if demand is restored. As a result, I use change in sales times an indicator variable equal to one when sales revenue decreases between $t-1$ and t ($\Delta S_t * DD_t$). Not including this element in the SG&A expectations model may lead to underestimating (overestimating) the response of costs to increases (decreases) in sales.[9]

The normal level of gain on asset sales is estimated using the following model:

$$\frac{GainA_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{ASales_t}{A_{t-1}} + \beta_5 \frac{ISales_t}{A_{t-1}} + \varepsilon_t^{Asset} \qquad (3),$$

where (COMPUSTAT data items in brackets):

$GainA$ = income from asset sales [Data213*(−1); note: Data213 is coded negative for gains and positive for losses by COMPUSTAT],
A = total assets [Data6],
MV = the natural logarithm of market value [Data199*Data25],
Q = Tobin's Q [((Data199*Data25) + Data130 + Data9 + Data34)/ Data6],
INT = internal funds [Data18 + Data46 + Data14],
$ASales$ = long-lived assets sales [Data107], and
$ISales$ = long-lived investment sales [Data109].

Equation (3), estimated by year and industry, is based on Bartov 1993 and augmented by variables in Herrmann et al. 2003 shown to influence the level of gain on asset sales. Market value is included to control for size effects. Internal funds control for reduced funds available for investment and Tobin's Q is a proxy for the marginal benefit to marginal cost of installing an additional unit of a new investment, both of which may

9. This sticky cost behavior has only been shown with respect to SG&A; therefore, I only include change in sales and change in sales times a decrease dummy in model 2.

influence the decision to sell fixed assets. Introducing asset sales as an explanatory variable in (3) requires that the relation between income from asset sales (*GainA*) and asset sales (*ASales*) and investment sales (*ISales*) be monotonic. Therefore, the variables are transformed to make the relationship monotonic, so when income from asset sales is negative, asset sales and investment sales enter the regression with negative signs. Thus, a positive coefficient is expected. Consistent with prior literature (Bartov 1993; Herrmann et al. 2003), I interpret high residuals from model 3 as indicative of asset sales manipulation.[10]

The normal level of production cost is estimated using the following model:

$$\frac{PROD_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{S_t}{A_{t-1}} + \beta_4 \frac{\Delta S_t}{A_{t-1}} + \beta_5 \frac{\Delta S_{t-1}}{A_{t-1}} + \varepsilon_t^{Production} \qquad (4),$$

where (COMPUSTAT data items in brackets):

PROD = COGS plus change in inventory [Data41 + Data303],
A = total assets [Data6],
MV = the natural log of market value [Data199*Data25],
Q = Tobin's *Q* [((Data199*Data25) + Data130 + Data9 + Data34)/Data6], and
S = sales [Data12].

Model 4 is estimated by year and industry. The model is based on Dechow et al. 1998 and Roychowdhury 2006 to estimate the normal level of production. I augment their regression by including market value and Tobin's *Q*.[11] Sales, change in sales, and lagged change in sales are included to control for any product demand changes that might directly influence the level of production. Abnormally high production costs for a given sales level are indicative of either sales manipulation due to abnormal price discounts or COGS expense manipulation by overproduction (Roychowdhury

10. I employ alternative expectations models for R&D expense, SG&A expense, and gain (loss) on asset sales. First, R&D and SG&A expense (divided by assets) are modeled solely as a function of sales, as described by Dechow, Kothari, and Watts 1998. Second, the normal level of income from asset sales is estimated as income from asset sales minus the median for the corresponding industry and year. The results for these relatively simpler models are qualitatively similar.

11. Production costs have not shown the same sensitivity to internal funds as discretionary expense and asset sales. For example, if the firm is cash constrained, decreasing discretionary investment will increase cash flow from operations and selling fixed assets will increase cash flow from investing. Engaging in production RM will lead to relatively lower cash flow in the current period, but higher cash flow in the next period because sales in $t + 1$ were moved to t (in the case of Sales RM) and firms can use excess production from t in $t + 1$ (in the case of COGS RM). Therefore, I do not include *INT* in the model.

2006). Therefore, I use abnormal production costs as one proxy for sales manipulation and/or COGS manipulation.[12]

Firms suspected of RM have abnormal levels (i.e., residuals) from models 1–4 in the quintile consistent with RM. Firms suspected of R&D (SG&A) RM are firms in the lowest quintile of abnormal R&D (SG&A) expense. Firms suspected of Asset (Production) RM are firms in the highest quintile of abnormal gain on asset sales (production costs).

Incentive to engage in earnings management

To identify firms that just meet zero earnings, I group firm-years into intervals based on net income (Data172) divided by total assets (Data6) at the beginning of the year.[13] Then, I construct categories of scaled earnings for widths of 0.01. I identify firms that just meet zero earnings by concentrating on firm-years in the interval to the immediate right of zero. The firms to the immediate right of zero have net income scaled by total assets that is greater than or equal to zero, but less than 0.01 (MEET_ZERO). Similarly, to identify firms that just meet zero earnings growth, I group firm-years into intervals based on the change in net income divided by total assets at the beginning of the year. Then, I construct categories of scaled changes in earnings for widths of 0.01. The firms to the immediate right of zero have earnings scaled by total assets that are greater than or equal to zero, but less than 0.01 (MEET_LAST). I identify firms that are suspected of engaging in earnings management to just meet zero earnings or last year's earnings as firm-years that fall within either interval (*BENCH*).[14,15]

I construct additional classifications based on the scaled earnings (and change in earnings) intervals to facilitate the comparison of *BENCH* firms to non-*BENCH* firms. From the sample of firms not classified as *BENCH*, I classify firms where scaled net income (or change in net income) is greater than or equal to 0.01 as *BEAT* firms, greater than or equal to −0.01 but less than zero (and not classified as *BEAT*) as *JUSTMISS*

12. To mitigate the confounding influence of accruals management, I analyze production costs instead of COGS expense (or change in accounts receivable). For example, if a manager decided to postpone the write-down of obsolete inventory in an effort to decrease reported COGS, this action would manifest as abnormally low COGS expense. Using COGS as the RM proxy would misclassify accruals management as RM. By examining production costs (COGS + ΔINV), the manager's action would not affect production costs because the change in inventories would be correspondingly higher to offset lower COGS. Similarly, it would be difficult to parse out the effects of RM versus accruals management when using change in accounts receivable as an RM proxy.
13. The results are qualitatively similar using net income before special items and pre-tax income.
14. The inferences do not change using MEET_ZERO and MEET_LAST separately.
15. Using the *Z*-statistic described in footnote 6 of Burgstahler and Dichev 1997, the frequency of firms in the bins just to the right of zero (MEET_ZERO and MEET_LAST) are statistically different from the expected frequency.

firms, and less than −0.01 (and not classified as *BEAT* or *JUSTMISS*) as *MISS* firms.

Descriptive statistics

Table 1 reports the estimation results for (1) through (4). For every industry-year with more than 15 firms, the equations are estimated cross-sectionally over the period from 1988 to 2002. All variables are winsorized at the top and bottom 1 percent of their distributions to avoid the influence of outliers. The reported coefficients are the mean value of the coefficients across industry-years. *p*-values are calculated using the standard error of the mean coefficients across industry-years (Fama and Macbeth 1973). The reported observations and adjusted R^2 are means across industry-years. The coefficient estimates are significant and with predicted signs. One exception is that SG&A in (2) does not exhibit sticky cost behavior as predicted by Anderson et al. 2003. The R&D expense equation has the highest average adjusted R^2, 0.86 across industry-years. The gain on asset equation has the lowest average adjusted R^2, 0.28 across industry-years. The equations seem to have reasonable explanatory power and the adjusted R^2s are consistent with prior literature.

Table 2, panel A shows descriptive statistics related to the residuals from (1) through (4). To limit the influence of outliers, all continuous variables are winsorized at the top and bottom 1 percent of their distribution for presentation in Table 2 and implementation of model 5. The mean (median) residual from the R&D model is 0.00 (−.001). The mean total assets and R&D expense for the sample are 1,338 and 65 million, respectively (untabulated). Therefore, on average, the median level of abnormal R&D is 1.2 million below normal levels for firms in comparable industries, which is about 1.5 percent of average total assets. The distributions of the residuals tend to exhibit properties consistent with the normal distribution. The skewness data for all the distributions are relatively close to zero, suggesting that the distributions are symmetrically distributed. The kurtosis data for model 3 suggests that the tails of the distribution are heavier than for a normal distribution, which is consistent with firms engaging in asset RM (and moving into the tails).

Table 2, panel B reports Pearson correlations between the RM residuals and other firm characteristics. The correlation matrix reveals that the R&D residuals are negatively correlated with *SIZE*, *ROA*, and *CFO*. The SG&A residuals are significantly related to *SIZE* (negative) and *ROA* (positive). The asset residuals are not significantly related to any of the control variables. The production residuals are significantly related to *SIZE* (positive) and *ROA* (negative). The R&D residuals are positively correlated with the SG&A and Production residuals. This suggests that, while managers may engage in R&D and SG&A RM simultaneously, they do not engage in R&D and Production RM simultaneously. The overlap in the number of firms suspected of engaging in R&D and SG&A RM is 28.4 percent, and R&D and production RM is 20.4 percent (untabulated). The correlation

TABLE 1

Estimation of the normal level of R&D expense, SG&A expense, gain on assets sales, and production costs

Model 1: R&D RD_t/A_{t-1}		Model 2: SG&A SGA_t/A_{t-1}		Model 3: Asset Gain $GainA_t/A_{t-1}$		Model 4: Production $PROD_t/A_{t-1}$	
Intercept	−0.006 (0.00)***	Intercept	0.297 (0.00)***	Intercept	0.000 (0.60)	Intercept	−0.174 (0.00)***
$\frac{1}{A_{t-1}}$	0.071 (0.00)***	$\frac{1}{A_{t-1}}$	2.364 (0.00)***	$\frac{1}{A_{t-1}}$	0.013 (0.34)	$\frac{1}{A_{t-1}}$	0.907 (0.17)
MV_t	0.001 (0.01)***	MV_t	−0.015 (0.00)***	MV_t	0.000 (0.24)	MV_t	0.019 (0.00)***
Q_t	0.002 (0.00)***	Q_t	0.033 (0.00)***	Q_t	−0.001 (0.00)***	Q_t	−0.070 (0.00)***
$\frac{INT_t}{A_{t-1}}$	0.019 (0.00)***	$\frac{INT_t}{A_{t-1}}$	0.125 (0.00)***	$\frac{INT_t}{A_{t-1}}$	0.005 (0.00)***	$\frac{S_t}{A_{t-1}}$	0.799 (0.00)***
$\frac{RD_{t-1}}{A_{t-1}}$	0.897 (0.00)***	$\frac{\Delta S_t}{A_{t-1}}$	0.165 (0.00)***	$\frac{ASales_t}{A_{t-1}}$	0.250 (0.00)***	$\frac{\Delta S_t}{A_{t-1}}$	0.132 (0.00)***
		$\frac{\Delta S_t}{A_{t-1}} * DD$	0.000 (0.16)	$\frac{ISales_t}{A_{t-1}}$	0.012 (0.83)	$\frac{\Delta S_{t-1}}{A_{t-1}}$	−0.046 (0.00)***
No. of industry −year	342		550		457		510
Avg. no. of obs.	83		84		74		77
Adj. R^2	0.86		0.40		0.28		0.82

Notes:

The following ordinary least squares regressions are estimated cross-sectionally within each industry (two-digit SIC) and year from 1988 to 2002 with at least 15 observations. The reported coefficients are the mean value of the coefficients across the industry-years. Two-tailed *p*-values (in parentheses) are calculated using the standard error of the mean coefficients across the industry-years. The adjusted R^2 and the number of observations is the mean across the industry-years. The variables are defined as follows (COMPUSTAT data items in brackets):

RD = R&D expense [Data46]

(The table is continued on the next page.)

TABLE 1 (Continued)

A	=	total assets [Data6]
MV	=	the natural log of market value [Data199*Data25]
Q	=	Tobin's Q [((Data199*Data25) + Data130 + Data9 + Data34)/Data6]
INT	=	internal funds divided by lagged total assets [Data18 + Data46 + Data14]
SGA	=	SG&A expense [Data189]
S	=	total sales [Data12]
DD	=	indicator variable equal to 1 when sales [Data12] decreases between $t - 1$ and t, zero otherwise
$GainA$	=	income from asset sales [Data213*(-1); note: Data213 is coded negative for gains and positive for losses]
$ASales$	=	long-lived asset sales [Data107]
$ISales$	=	long-lived investment sales [Data109]
$PROD$	=	COGS plus change in inventory [Data41 + ΔData303]

TABLE 2
Descriptive statistics

Panel A: Descriptive statistics of residuals from models 1–4

	Mean	Median	Std.dev.	1st quartile	3rd quartile	Skewness	Kurtosis
R&D residuals	0.000	−0.001	0.07	−0.02	0.01	1.53	8.66
SG&A residuals	0.000	−0.018	0.26	−0.13	0.10	0.75	2.82
Gain Asset residuals	0.000	−0.001	0.01	0.00	0.00	3.61	20.95
Production residuals	0.000	−0.006	0.25	−0.14	0.11	0.34	1.93

Panel B: Pearson correlation matrix

	SIZE	MTB	ROA	CFO	R&D Residual	SG&A Residual	Asset Residual
MTB	−0.027***						
ROA	0.012***	−0.002					
CFO	0.003	0.000	0.042***				
R&D residual	−0.013**	−0.008	−0.042***	−0.039***			
SG&A residual	−0.021***	−0.001	0.009**	0.003	0.1135***		
Asset residual	0.004	0.000	0.000	0.000	−0.0357***	−0.0059	
Production residual	0.052***	0.006	−0.008*	−0.003	0.0241***	−0.5405***	0.0171***

Notes:

*/**/*** represent statistical significance at 10 percent/5 percent/1 percent levels, two-tailed. Firm-years from 1988 to 2002. RM residuals are estimated from models 1–4. See Table 1 for estimation and variable definitions. The variables are defined as follows:

SIZE = the natural logarithm of total assets

MTB = the market value of equity divided by the book value of equity

ROA = income before extraordinary items divided lagged total assets

CFO = cash flow from operations divided by lagged total assets

between the SG&A residual and the production residual is very high (−0.5405). Interestingly, 52.1 percent of firms in the lowest SG&A residual quintile are also in the highest production residual quintile (untabulated).

Thus, it appears many firms simultaneously engage in both SG&A and production RM, which may explain the high correlation.

5. Results

Abnormal RM and just meeting zero earnings and last year's earnings

To test the association between firms just meeting benchmarks and RM (Hypothesis 1), I estimate the following equation:

$$Abnormal\ RM_t = \gamma_0 + \gamma_1 BENCH_t + \gamma_2 SIZE_t + \gamma_3 MTB_t + \gamma_4 ROA_t + \varepsilon_t \qquad (5),$$

where:

BENCH = an indicator variable that is set equal to one if (a) net income divided by total assets is between 0 and 0.01 or (b) the change in net income divided by total assets between $t - 1$ and t is between 0 and 0.01, zero otherwise,
SIZE = the natural logarithm of total assets,
MTB = the market value of equity divided by the book value of equity, and
ROA = income before extraordinary items divided by lagged total assets.

Equation (5) is estimated using four measures of Abnormal RM as the dependent variable: abnormal R&D expense (*Abnormal R&D*), abnormal SG&A expense (*Abnormal SG&A*), abnormal gain on asset sales (*Abnormal GainAsset*), and abnormal production costs (*Abnormal Production*).[16] Both *Abnormal GainAsset* and *Abnormal Production* are multiplied by (−1) so that lower values are consistent with RM. *SIZE* controls for size effects and *MTB* controls for growth opportunities. *ROA* is included to address concerns that RM is correlated with performance. Because the error terms are likely to exhibit cross-sectional correlation and auto correlation, I estimate pooled regressions and compute the *t*-tests using Roger's robust standard errors, correcting for firm clusters (Petersen 2009).

Table 3 reports the results from the estimation of (5). *Abnormal R&D* is negatively associated with firms that just meet zero or last year's earnings (coefficient −0.0035, p-value < 0.05). The coefficient on *BENCH* when *Abnormal SG&A* is the dependent variable is −0.0099 and significant at a 5 percent level. The results for discretionary expense suggest firms engage in RM of R&D and SG&A expense to just meet zero and last year's earnings. The coefficient on *BENCH* when *Abnormal GainAsset* is the dependent variable is not significantly different from zero. It appears firms that just

16. One criticism of this model could be that the independent variables (*SIZE*, *MTB*, and *ROA*) control for the same variations controlled for in models 1 through 4; therefore, a univariate analysis may be appropriate. I keep the control variables used in Roychowdhury 2006 to facilitate comparison between the studies. The univariate results are qualitatively similar.

TABLE 3
Cross-sectional regressions relating abnormal residuals to firms just meeting zero or last years earnings

$$Abnormal\ RM_t = \gamma_0 + \gamma_1 BENCH_t + \gamma_2 SIZE_t + \gamma_3 MTB_t + \gamma_4 ROA_t + \varepsilon_{t+1} \quad (5)$$

Variable	Abnormal $R\&D_t$	Abnormal $SG\&A_t$	Abnormal $GainAsset_t$ *(−1)	Abnormal $Production_t$ *(−1)	Abnormal Aggregate RM_t(R&D + SG&A + Production)
Intercept	0.0041	0.0123	0.000	0.038	0.109
	(2.45)**	(1.48)	(1.39)	(2.44)***	(4.34)***
$BENCH_t$	**−0.0035**	**−0.0099**	**0.00001**	**−0.048**	**−0.044**
	(−2.14)**	**(−1.98)****	**(0.04)**	**(−1.97)****	**(−2.64)*****
$SIZE_t$	−0.0007	−0.0034	−0.00003	−0.006	−0.014
	(−2.32)**	(−2.54)**	(−0.83)	(−1.87)*	(−2.95)***
MTB_t	−0.0002	0.0011	0.000	−0.001	0.001
	(−1.46)	(1.93)**	(−2.00)**	(−1.64)	(0.39)
ROA_t	−0.0004	0.0000	0.000	0.000	0.103
	(−3.06)***	(0.45)	(−0.08)	(1.28)	(4.53)***
# Obs.	27,613	44,960	32,715	38,394	24,402
# Firms	4,003	5,985	5,412	5,489	3,744
Adj. R^2	0.0029	0.0013	0.0003	0.0029	0.0141

Notes:

*/**/*** represent statistical significance at 10 percent/5 percent/1 percent levels, two-tailed. Sample consists of firm-years from 1988 to 2002. The *t*-tests are computed using Roger's robust standard errors correcting for firm clusters. The coefficient estimates are from ordinary least squares regressions relating the residuals from models 1–4 to an indicator variable for whether the firm just meets zero earnings or last year's earnings and control variables. Both *Abnormal GainAsset* and *Abnormal Production* are multiplied by (-1) so that lower values are consistent with RM. The variables are defined as follows:

BENCH = an indicator variable equal to one if(a) net income divided by total assets is greater than or equal to 0 but less than 0.01, or(b) the change in net income divided by total assets between $t-1$ and t is greater than or equal to 0 but less than 0.01, zero otherwise

SIZE = the natural logarithm of total assets

MTB = the market value of equity divided by the book value of equity

ROA = income before extraordinary items divided lagged total assets meet the earnings benchmarks are not associated with abnormally high gain on asset sales.[17] The coefficient on *BENCH* when *Abnormal Production* is the dependent variable is −0.048 and is significant at a 5 percent level. Therefore, firms just meeting earnings benchmarks exhibit higher production costs, which is consistent with these firms engaging in production RM.[18]

Because firms might engage in more than one type of RM simultaneously, I aggregate the three RM measures shown to be associated with just meeting zero and last year's earnings (*Abnormal R&D*, *Abnormal SG&A*, and *Abnormal Production*). *Abnormal Aggregate RM* is the sum of the residuals from the R&D model 1, SG&A model 2, and production model 3 multiplied by −1. The last column in Table 3 shows the results from the estimation of (5) using the *Abnormal Aggregate RM* measure as the dependent variable. The coefficient on *BENCH* is −0.044 and is significant at a 1 percent level. Consistent with prior literature, the results reported in Table 3 indicate that managers engage in R&D, SG&A, and production RM to just meet earnings benchmarks.

Abnormal RM and future performance

While it appears that managers engage in RM to just meet the earnings benchmarks, ex ante it is unclear whether this behavior will have an economically significant association with future performance. In this section, I examine the extent to which RM affects subsequent performance. Table 4 provides descriptive statistics of industry-adjusted *ROA* (*AdjROA*) preceding, including and subsequent to year t by earnings and RM categories.[19] *AdjROA* equals the difference between firm-specific *ROA* and the median *ROA* for the same year and industry (two-digit SIC). *AdjROA* and assets are winsorized at the top and bottom 1 percent of their distributions for presentation in Table 4. For the R&D, SG&A, and Production samples, about 4 percent of all firm-years just meet an earnings benchmark (1,118,

17. One issue with identifying asset sales manipulation in this way is that it is difficult to argue that firms making abnormally high profit from selling assets are engaging in RM. Therefore, as a robustness check, like Zang 2007, I estimate asset RM firm-years as (a) firms with positive income from asset sales (*GainA*) and (b) firms with small residuals from model 3. I find qualitatively similar results when defining asset RM this way — an insignificant association between asset RM residuals and just meeting the earnings benchmark (coefficient 0.001, $t = 0.92$).
18. Because production RM reflects two types of RM and COGS RM should only be available to firms in the manufacturing industry, I estimate model 5 excluding all nonmanufacturing firms. For this subsample, the coefficient on *BENCH* is 0.003 (untabulated) and significantly negative ($p < 0.01$). Therefore, the results are robust to the manufacturing sample.
19. I use industry-adjusted performance measures to control for differences in industry concentration that may affect the performance measure. I examine the robustness of the results to using net income plus interest expense (to isolate the effects of financing) as the performance measure. The association between RM and future performance are qualitatively similar using this measure.

TABLE 4
Descriptive statistics of firms by earnings (change in earnings) category and RM

		Mean					
	#	Assets (millions)	$AdjROA_{t-2}$	$AdjROA_{t-1}$	$AdjROA_{t}$	$AdjROA_{t+1}$	$AdjROA_{t+2}$
R&D sample							
All firms	27,613	1,833	−6.2	−6.8	−6.5	−3.3	−2.7
BEAT	17,014	2,240	3.9	5.5	9.1	5.2	4.0
BENCH	1,118	3,606	−0.6	−1.9	−0.6	−2.7	−1.3
JUSTMISS	553	2,786	−2.4	−2.2	−1.5	−2.6	−2.5
MISS	8,928	776	−28.0	−31.7	−37.2	−20.5	−16.6
R&D RM	5,517	3,479	−12.9	−13.6	−5.6	−4.0	−3.6
BENCH * R&D RM	**185**	**6,852**	**−5.2**	**−8.7**	**0.2**	**−1.4**	**−1.2**
BENCH (no *R&D RM*)	933	1,938	0.3	−0.6	−0.7	−2.9	−1.3
SG&A sample							
All firms	44,960	1,655	−3.3	−3.9	−3.9	−1.7	−1.3
BEAT	29,431	1,914	3.8	5.2	8.2	4.8	3.7
BENCH	2,049	3,093	−0.3	−1.7	−1.0	−2.0	−1.4
JUSTMISS	1,008	2,354	−1.5	−1.7	−2.2	−2.7	−2.5
MISS	12,472	751	−21.9	−26.2	−33.1	−17.5	−13.8
SG&A RM	8,987	1,105	−12.6	−12.9	−10.3	−6.2	−5.7
BENCH * SG&A RM	**353**	**1,211**	**−2.8**	**−4.8**	**−0.2**	**−1.0**	**−1.9**
BENCH (no *SG&A RM*)	1,696	3,484	0.2	−1.1	−1.1	−2.3	−1.2
Production sample							
All firms	38,394	1,754	−3.5	−3.9	−2.8	−1.4	−1.0
BEAT	25,099	2,016	3.8	5.2	7.8	4.8	3.8
BENCH	1,756	3,393	−0.4	−1.7	−0.9	−2.0	−1.4

(The table is continued on the next page.)

TABLE 4 (Continued)

		Mean					
	#	Assets (millions)	$AdjROA_{t-2}$	$AdjROA_{t-1}$	$AdjROA_t$	$AdjROA_{t+1}$	$AdjROA_{t+2}$
JUSTMISS	857	2,577	−1.6	−1.8	−1.8	−2.4	−2.0
MISS	10,682	802	−22.5	−26.2	−28.2	−16.7	−13.1
Production RM	7,671	3,260	−11.4	−13.3	−12.3	−7.3	−5.6
BENCH * Production RM	**371**	**9,182**	**−2.8**	**−3.5**	**−1.0**	**−1.4**	**−1.2**
BENCH (no *Production RM*)	1,385	1,842	0.2	−1.3	−0.9	−2.2	−1.5

Notes:

Sample consists of firm-years from 1988 to 2002. RM residuals are estimated from (1) – (4). The variables are defined as follows:

ROA = income before extraordinary items divided lagged total assets

AdjROA = the difference between firm-specific *ROA* and the median *ROA* for the same year and industry (two-digit SIC)

BENCH = an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to 0 but less than 0.01, or (b) the change in net income divided by total assets between $t-1$ and t is greater than or equal to 0 but less than 0.01, zero otherwise

BEAT = an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to 0.01, or (b) the change in net income divided by total assets between $t-1$ and t is greater than or equal to 0.01 and (c) *BENCH* not equal to one, zero otherwise

JUSTMISS = an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to −0.01 but less than 0, or (b) the change in net income divided by total assets between $t-1$ and t is greater than or equal to −0.01 but less than 0 and (c) *BENCH* or *BEAT* is not equal to one, zero otherwise

MISS = an indicator variable that is set equal to one if (a) net income divided by total assets is less than −0.01, or (b) the change in net income divided by total assets between $t-1$ and t is less than −0.01 and (c) *BENCH*, *BEAT* or *JUSTMISS* is not equal to one, zero otherwise

R&D RM = an indicator variable equal to one if the residual from the R&D model 1 is in the lowest quintile, zero otherwise

SG&A RM = an indicator variable equal to one if the residual from the SG&A model 2 is in the lowest quintile, zero otherwise

Production RM = an indicator variable equal to one if the residual from production model 4 is in the highest quintile, zero otherwise

2,049, and 1,756, respectively). On average, firm-years around the benchmark range (*BENCH*, *JUSTMISS*) perform better than *MISS* firms but worse than *BEAT* firms. The last three rows of each panel show the performance of RM firms, RM firms that just meet an earnings benchmark, and non-RM firms (i.e., those firms in the four quintiles not consistent with RM) that just meet an earnings benchmark. For all three samples, firm-years in the residual quintile consistent with RM perform better in $t + 1$ and $t + 2$ than in the previous three years. For the R&D and Production samples, it appears that firms that just meet an earnings benchmark by using RM have higher subsequent *AdjROA* than firms that just meet an earnings benchmark but do not engage in RM. For the SG&A sample, it appears that *BENCH* firms that engage in RM have higher *AdjROA* than non-RM *BENCH* firms in year $t + 1$, but not $t + 2$.

Interpreting the results of the univariate analysis is difficult due to systematic variation in future *ROA* with current performance, size, market-to-book, returns and the probability of bankruptcy. To test whether there is an association between using RM to just meet earnings benchmarks and future performance (Hypothesis 2), I estimate the following equation:

$$\begin{aligned} AdjROA_{t+i} \text{ or } AdjCFO_{t+i} = {} & \gamma_0 + \gamma_1 BEAT_t + \gamma_2 JUSTMISS_t + \gamma_3 BENCH_t \\ & + \gamma_4 RM_t + \gamma_5 BENCH^* RM_t + \gamma_6 AdjROA_t \\ & + \gamma_7 SIZE_t + \gamma_8 MTB_t + \gamma_9 RETURN_t \\ & + \gamma_{10} ZSCORE_{t-1} + \varepsilon_{t+1} \qquad (6), \end{aligned}$$

where:

i	=	1, 2, 3,
ROA	=	income before extraordinary items divided by lagged total assets,
AdjROA	=	industry-adjusted *ROA* equals the difference between firm-specific *ROA* and the median *ROA* for the same year and industry (two-digit SIC),
CFO	=	*CFO* divided by lagged total assets,
AdjCFO	=	industry-adjusted *CFO* equals the difference between firm-specific *CFO* and the median *CFO* for the same year and industry (two-digit SIC),
BENCH	=	an indicator variable that is set equal to one if (a) net income divided by total assets is between 0 and 0.01, or (b) the change in net income divided by total assets between $t - 1$ and t is between 0 and 0.01, zero otherwise,
BEAT	=	an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to 0.01 or (b) the change in net income divided by total assets between $t - 1$ and t is greater than or equal to 0.01 and (c) *BENCH* not equal to one, zero otherwise, and

JUSTMISS = an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to −0.01 but less than 0 or (b) the change in net income divided by total assets between *t − 1* and *t* is greater than or equal to −0.01 but less than 0 and (c) *BENCH* or *BEAT* is not equal to one, zero otherwise;

where RM:

R&D RM = an indicator variable equal to one if the residual from the R&D model 1 is in the lowest quintile, zero otherwise,
SG&A RM = an indicator variable equal to one if the residual from the SG&A model 2 is in the lowest quintile, zero otherwise,
Production RM = an indicator variable equal to one if the residual from the production model 4 is in the highest quintile, zero otherwise,
Aggregate RM = an indicator variable equal to one if the sum of the residuals from the R&D model 1, SG&A model 2 and production model 3*−1 is in the lowest quintile, zero otherwise,
SIZE = the natural logarithm of total assets,
MTB = the market value of equity divided by the book value of equity,
RETURN = size adjusted abnormal returns computed as the monthly buy and hold raw return minus the monthly buy and hold return on a size matched decile portfolio of firms compounded over 12 months of fiscal year *t*, and
ZSCORE = a measure of financial health computed as: 3.3*(Net $\text{income}_t/\text{Assets}_{t-1}$) + 1.0*($\text{Sales}_t/\text{Assets}_{t-1}$) + 1.4*(Retained $\text{Earnings}_t/\text{Assets}_{t-1}$) + 1.2*(Working $\text{Capital}_t/\text{Assets}_{t-1}$)

SIZE controls for size effects and *MTB* controls for growth opportunities. In the context of R&D and SG&A, controlling for the life cycle (i.e., *MTB*) is important given the "maturity hypothesis", which predicts that as firms mature they experience a decline in their investment opportunity set. I include *AdjROA* to control for the time series properties of performance. I also include *RETURN* to control for the association between stock performance and future earnings (Kothari and Sloan 1992). *ZSCORE* is a modified version of Altman's *Z*-score (Mackie-Mason 1990) and is used to control for the financial health of the firm. All continuous variables are winsorized at the top and bottom 1 percent of their distribution to limit the influence of outliers for presentation in Table 5 and implementation of model 6. The intercept (γ_0) represents the average performance of firms that do not use RM and miss the earnings benchmark by more than 0.01.

Hypothesis 2 focuses on firms engaging in RM to just meet earnings benchmarks beyond the broadened focus on all firms engaging in RM.

TABLE 5
Pearson correlation matrix

	R&D sample (N = 23,041)			SG&A sample (N = 36,501)			Production sample (N = 31,855)									
	BENCH	*R&D RM*	*BENCH* RM*	*BENCH*	*SG&A RM*	*BENCH* RM*	*BENCH*	*Production RM*	*BENCH* RM*	*BEAT*	*MISS*	*JUST MISS*	*AdjROA*	*SIZE*	*MTB*	*RETURN*
RM	−0.018			−0.015			0.006									
	(0.003)			(0.001)			(0.217)									
*BENCH * RM*	0.400	0.164		0.407	0.178		0.451	0.198								
	(<.0001)	(<.0001)		(<.0001)	(<.0001)		(<.0001)	(<.0001)								
BEAT	−0.260	−0.023	−0.104	−0.301	−0.069	−0.122	−0.284	−0.027	−0.131							
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)							
MISS	−0.142	0.039	−0.057	−0.135	0.085	−0.055	−0.140	0.022	−0.064	−0.875						
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)						
JUSTMISS	−0.030	−0.024	−0.012	−0.033	−0.015	−0.014	−0.032	0.007	−0.015	−0.184	−0.100					
	(<.0001)	(<.0001)	(0.048)	(<.0001)	(0.001)	(0.004)	(<.0001)	(<.0001)	(0.008)	(<.0001)	(<.0001)					
AdjROA	0.024	−0.115	−0.001	0.019	−0.117	−0.005	0.018	−0.040	0.011	0.287	−0.309	0.001				
	(<.0001)	(<.0001)	(0.878)	(<.0001)	(<.0001)	(0.262)	(0.001)	(<.0001)	(0.028)	(<.0001)	(<.0001)	(0.807)				
SIZE	0.018	−0.137	−0.013	0.020	−0.139	−0.020	0.017	−0.062	0.018	0.256	−0.281	0.024	0.029			
	(0.003)	(<.0001)	(0.031)	(<.0001)	(<.0001)	(<.0001)	(0.001)	(<.0001)	(0.000)	(<.0001)	(<.0001)	(<.0001)	(<.0001)			
MTB	−0.057	0.167	−0.004	−0.059	0.090	−0.015	−0.059	0.076	−0.019	−0.075	0.113	0.037	−0.125	−0.096		
	(<.0001)	(<.0001)	(0.529)	(<.0001)	(<.0001)	(0.002)	(<.0001)	(<.0001)	(0.000)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)		
RETURN	−0.023	0.092	0.009	−0.030	0.038	−0.004	−0.031	0.020	−0.007	0.127	−0.117	−0.032	0.006	0.003	0.272	
	(0.000)	(<.0001)	(0.151)	(<.0001)	(<.0001)	(0.400)	(<.0001)	(0.000)	(0.167)	(<.0001)	(<.0001)	(<.0001)	(0.320)	(0.611)	(<.0001)	
ZSCORE	0.001	−0.009	0.000	−0.001	−0.004	0.000	−0.001	−0.003	0.000	0.037	−0.039	0.00	0.029	0.020	−0.035	0.007
	(0.815)	(0.160)	(0.965)	(0.855)	(0.365)	(0.933)	(0.844)	(0.545)	(0.941)	(<.0001)	(<.0001)	(0.904)	(<.0001)	(0.001)	(<.0001)	(0.279)

Notes:

Sample consists of firm-years from 1988 to 2002. RM residuals are estimated from (1) – (4). Two-tailed p-values presented below the correlation value.

The variables are defined as follows:

(The table is continued on the next page.)

TABLE 5 (Continued)

R&D RM	=	an indicator variable equal to one if the residual from the R&D model 1 is in the lowest quintile, zero otherwise
SG&A RM	=	an indicator variable equal to one if the residual from the SG&A model 2 is in the lowest quintile, zero otherwise
Production RM	=	an indicator variable equal to one if the residual from production model 4 is in the highest quintile, zero otherwise
BENCH	=	an indicator variable equal to one if (a) net income divided by total assets is between 0 and 0.01, or (b) the change in net income divided by total assets between $t - 1$ and t is between 0 and 0.01, zero otherwise
BEAT	=	an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to 0.01, or (b) the change in net income divided by total assets between $t - 1$ and t is greater than or equal to 0.01 and (c) *BENCH* not equal to one, zero otherwise
MISS	=	an indicator variable that is set equal to one if (a) net income divided by total assets is less than −0.01, or (b) the change in net income divided by total assets between $t - 1$ and t is less than −0.01 and (c) *BENCH*, *BEAT* or *JUSTMISS* is not equal to one, zero otherwise
JUSTMISS	=	an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to −0.01 but less than 0, or (b) the change in net income divided by total assets between $t - 1$ and t is greater than or equal to −0.01 but less than 0 and (c) *BENCH* or *BEAT* is not equal to one, zero otherwise
ROA	=	income before extraordinary items divided lagged total assets
AdjROA	=	the difference between firm-specific *ROA* and the median *ROA* for the same year and industry (two-digit SIC)
SIZE	=	the natural logarithm of total assets
MTB	=	the market value of equity divided by the book value of equity
RETURN	=	size adjusted abnormal return computed as the monthly buy and hold raw return minus the monthly buy and hold return on a size matched decile portfolio of firms compounded over 12 months of fiscal year t
ZSCORE	=	a measure of financial health computed as: 3.3*(Net $\text{Income}_t/\text{Assets}_{t-1}$) + 1.0*($\text{Sales}_t/\text{Assets}_{t-1}$) + 1.4*(Retained $\text{Earnings}_t/\text{Assets}_{t-1}$) + 1.2*(Working $\text{Capital}_t/\text{Assets}_{t-1}$)

Therefore, the coefficient of interest γ_5 represents the performance of *BENCH* firms that use RM compared to non-RM *MISS* firms. Focusing on RM conditional on an earnings management incentive helps mitigate the effects of alternative explanations and potential correlated omitted variables. The uninteracted RM coefficient may proxy for managers' attempts to influence the output of the accounting system (i.e., RM) or some other motivation omitted from the RM model. For example, a reduction in R&D relative to other firms in the same year and industry (controlling for other factors) may reflect a manager attempting to influence the output of the accounting system. However, it may also be picking up an omitted variable, such as a manager cutting the R&D budget when faced with decreasing returns to R&D. In this case, decreasing returns to R&D may be negatively associated with future performance and the negative RM coefficient may reflect the underlying economics of the firm and not the relation with real activities manipulation.

Table 5 presents correlations for the variables in the future performance regressions and a few variables appear to be highly correlated. In particular, the correlation between *BENCH* and *BENCH*RM* is around 0.40 for all three RM samples. *AdjROA* is highly correlated with *SIZE*, *MTB*, and *ZSCORE*, indicating the need to control for these variables in model 6. *RETURN* is highly correlated with *MTB* (0.27). The variance inflation factors for the independent variables used in (6), for all three RM measures, are all less than 2.2 suggesting multicollinearity is likely not to be an issue.[20]

Table 6 presents the coefficient estimates for (6). I discuss the untabulated results for $t + 2$ and $t + 3$ concurrent with discussing the $t + 1$ results reported in Table 6. With the exception of *MTB*, the control variables manifest predicted signs. The coefficient estimate on *AdjROA* is significant and positive, indicating that current-period industry-adjusted *ROA* is positively associated with future industry-adjusted *ROA*. *RETURN* is positive and significant consistent with Kothari and Sloan 1992. The first column of Table 6, panel A reports the results for the R&D RM sample using $AdjROA_{t+1}$ as the performance measure. The coefficient on *BEAT* is 0.110, indicating that firms that beat the earnings benchmark by 0.01 or more have incrementally higher $AdjROA_{t+1}$, ceteris paribus, than non-RM firms that miss the earnings benchmark by more than 0.01. On average, $AdjROA_{t+1}$ for *BEAT* firms is −0.050 ($\gamma_0 + \gamma_1$) which is lower than the average reported in Table 4 (0.055) and this difference is mainly due to controlling for *SIZE* and lagged *AdjROA*. The coefficient on *BENCH* is 0.056 (p-value < 0.001) and the coefficient on *BENCH*RM* is 0.031

20. Variance inflation factors (VIFs) are calculated using the R^2 from the regression of that particular independent variable on all the other independent variables. Higher VIFs are indicative of collinearity problems. Greene (2000, 255–56) states, "as a rule of thumb, for standardized data a VIF > 10 indicates harmful collinearity".

TABLE 6
Cross-sectional regression relating future performance in $t + 1$ to RM

$$AdjROA_{t+1}(\text{Panel A}) \text{ or } AdjCFO_{t+1}(\text{Panel B}) = \gamma_0 + \gamma_1 BEAT_t + \gamma_2 JUSTMISS_t + \gamma_3 BENCH_t + \gamma_4 RM_t + \gamma_5 BENCH^* RM_t + \gamma_6 ROA_t + \gamma_7 SIZE_t + \gamma_8 MTB_t + \gamma_9 RETURN_t + \gamma_{10} ZSCORE_{t-1} + \varepsilon_{t+1}$$

Panel A: Industry-adjusted return on assets

	Pred. sign	R&D sample	SG&A sample	Production sample	Aggregate RM sample (R&D, SG&A, and Production)
Intercept	–	−0.160 (−18.00)***	−0.117 (−25.45)***	−0.109 (−16.05)***	−0.132 (−15.13)***
$BEAT_t$	+	0.110 (20.72)***	0.091 (34.89)***	0.075 (14.96)***	0.089 (14.74)***
$JUSTMISS_t$	?	0.051 (6.71)***	0.039 (5.93)***	0.032 (5.33)***	0.045 (5.30)***
$BENCH_t$	?	0.056 (8.28)***	0.042 (7.87)***	0.035 (6.82)***	0.042 (5 99)***
RM_t	?	0.008 (1.60)	−0.023 (−9.24)***	−0.022 (−5.96)***	−0.037 (−7. 51)***
$BENCH_t$ * RM_t	**?**	**0.031 (2.12)****	**0.043 (3.57)*****	**0.031 (3.50)*****	**0.047 (3.25)*****
$AdjROA_t$	+	0.265 (26.10)***	0.278 (83.61)***	0.314 (15.43)***	0.300 (14.09)***
$SIZE_t$		0.016 (13.58)***	0.011 (20.85)***	0.011 (11.89)***	0.014 (11.52)***
MTB_t	+	−0.005 (−5.65)***	−0.003 (−14.03)***	−0.003 (−4.31)***	−0.004 (−4.80)***
$RETURN_t$	+	0.014 (5.42)***	0.010 (9.86)***	0.010 (4.37)***	0.014 (5.19)***
$ZSCORE_t$	+	0.000 (−0.37)	0.000 (−0.12)	0.003 (1.33)	0.003 (1.14)
Industry dummies		Yes	Yes	Yes	Yes
Year dummies		Yes	Yes	Yes	Yes
N		23,041	36,501	31,855	20,701
R^2		0.36	0.35	0.35	0.37

(The table is continued on the next page.)

TABLE 6 (Continued)

Panel B: Industry-adjusted cash flow from operations

	Pred. sign	R&D sample	SG&A sample	Production RM	Aggregate RM (R&D, SG&A, and Production)
Intercept	–	−0.154 (−19.28)***	−0.107 (−17.21)***	−0.099 (−15.46)***	−0.124 (−15.60)***
$BEAT_t$	+	0.078 (17.20)***	0.060 (17.29)***	0.047 (10.83)***	0.061 (11.88)***
$JUSTMISS_t$	?	0.040 (5.54)***	0.026 (5.06)***	0.015 (2.82)***	0.027 (3.50)***
$BENCH_t$	?	0.049 (9.21)***	0.033 (8.13)***	0.022 (4.90)***	0.032 (5.42)***
RM_t	?	0.014 (3.35)***	−0.026 (−7.30)***	−0.025 (−6.83)***	−0.039 (−8.22)***
$BENCH_t$ * RM_t	**?**	**0.029 (2.37)****	**0.025 (3.00)*****	**0.027 (3.39)*****	**0.046 (4.27)*****
$AdjROA_t$	+	0.216 (23.51)***	0.224 (26.49)***	0.256 (14.30)***	0.246 (12.92)***
$SIZE_t$		0.020 (18.04)***	0.015 (17.09)***	0.015 (16.21)***	0.018 (15.46)***
MTB_t	+	−0.003 (−4.49)***	−0.002 (−3.21)***	−0.002 (−3.31)***	−0.003 (−3.79)***
$RETURN_t$	+	0.010 (5.20)***	0.008 (4.48)***	0.007 (3.75)***	0.011 (5.04)***
$ZSCORE_t$	+	0.000 (−0.53)	0.000 (−0.19)	0.002 (1.27)	0.002 (1.09)
Industry dummies		Yes	Yes	Yes	Yes
Year dummies		Yes	Yes	Yes	Yes
N		22,977	36,410	31,778	20,645
R^2		0.37	0.31	0.32	0.36

Notes:

*/**/*** represent statistical significance at 10 percent/5 percent/1 percent levels, two-tailed. *t*-tests in parentheses. Sample consists of firm-years from 1988 to 2002. The *t*-tests are computed using Roger's robust standard errors correcting for firm clusters.

The variables are defined as follows:

ROA = income before extraordinary items divided lagged total assets

(The table is continued on the next page.)

TABLE 6 (Continued)

AdjROA	=	the difference between firm-specific *ROA* and the median *ROA* for the same year and industry (two-digit SIC)
CFO	=	cash flow from operations divided by lagged total assets
AdjCFO	=	the difference between firm-specific *CFO* and the median *CFO* for the same year and industry (two-digit SIC)
BENCH	=	an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to 0 but less than 0.01, or (b) the change in net income divided by total assets between $t - 1$ and t is greater than or equal to 0 but less than 0.01, zero otherwise
BEAT	=	an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to 0.01, or (b) the change in net income divided by total assets between $t - 1$ and t is greater than or equal to 0.01 and (c) *BENCH* not equal to one, zero otherwise
JUSTMISS	=	an indicator variable equal to one if (a) net income divided by total assets is greater than or equal to −0.01 but less than 0, or (b) the change in net income divided by total assets between $t - 1$ and t is greater than or equal to −0.01 but less than 0 and (c) *BENCH* or *BEAT* is not equal to one, zero otherwise
R&D RM	=	an indicator variable equal to one if the residual from the R&D model 1 is in the lowest quintile, zero otherwise
SG&A RM	=	an indicator variable equal to one if the residual from the SG&A model 2 is in the lowest quintile, zero otherwise
Production RM	=	an indicator variable equal to one if the residual from production model 4 is in the highest quintile, zero otherwise
Aggregate RM	=	an indicator variable equal to one if the sum of the residuals from the R&D model 1, SG&A model 2, production model 3 multiplied by −1 is in the lowest quintile, zero otherwise
SIZE	=	the natural logarithm of total assets
MTB	=	the market value of equity divided by the book value of equity
RETURN	=	size adjusted abnormal returns computed as the monthly buy and hold raw return minus the monthly buy and hold return on a size matched decile portfolio of firms compounded over 12 months of fiscal year t
ZSCORE	=	a measure of financial health computed as: 3.3*(Net $\text{Income}_t/\text{Assets}_{t-1}$) + 1.0*($\text{Sales}_t/\text{Assets}_{t-1}$) + 1.4*(Retained $\text{Earnings}_t/\text{Assets}_{t-1}$) + 1.2*(Working $\text{Capital}_t/\text{Assets}_{t-1}$)

(p-value < 0.05), suggesting that firms that just meet earnings benchmarks perform better on average than *MISS* or *JUSTMISS* (coefficient 0.051, p-value < 0.001) firms, but worse than *BEAT* firms (coefficient 0.110, p-value < 0.001), consistent with Bartov et al. 2002.

The coefficient on the interaction term (*BENCH**RM*) of 0.031 suggests that managers who engage in RM to just meet earnings benchmarks have better subsequent performance than non-RM *MISS* firms, which does not support Hypothesis 2. The average performance (ROA_{t+1}) of firms that just meet the benchmark without engaging in RM, ceteris paribus, is −10.40 percent ($\gamma_0 + \gamma_3$) whereas the average performance of firms that just meet the benchmark by engaging in RM is −6.50 percent ($\gamma_0 + \gamma_3 + \gamma_4 + \gamma_5$). The p-value from a F-test of $[(\gamma_4 + \gamma_5) = 0]$ is 0.027, suggesting that firms that just meet the benchmark by engaging in R&D RM have significantly higher industry-adjusted *ROA* in $t + 1$ than non-RM *BENCH* firms. This result is consistent with the joint signal — engaging in RM and just meeting the earnings benchmark — signaling superior future performance. In addition, the average performance of *JUSTMISS* firms is −0.109 ($\gamma_0 + \gamma_2$) indicating that *BENCH* firms that engage in RM exhibit better subsequent performance than firms who just miss the earnings benchmarks. The results are robust to using $AdjROA_{t+2}$ and $AdjROA_{t+3}$ as the future performance measure. The results are similar using $AdjCFO_{t+1}$ (Table 6, panel B); for example, the coefficients on RM and *BENCH**RM* are positive and significant and the p-value from a F-test of $[(\gamma_4 + \gamma_5) = 0]$ is 0.007.

The results for the SG&A sample are reported in the second column of Table 6. The coefficients on the intercept, *BEAT*, and *JUSTMISS* are similar to those of the R&D sample. The coefficient on RM is −0.023 (p-value < 0.001), suggesting that firms that do not just meet the earnings benchmark (i.e., non-*BENCH*) but engage in RM perform worse than non-RM *MISS* firms. However, the coefficient on *BENCH**RM* is 0.043 (p-value < 0.001), suggesting that managers of *BENCH* firms who engage in RM have better subsequent performance compared to non-RM *MISS* firms. The results with respect to *BENCH**RM* are robust to using $AdjROA_{t+2}$ and $AdjROA_{t+3}$ as the future performance measure. The average performance of firms that just meet the benchmark without engaging in RM is −7.50 percent, whereas the average performance of firms that just meet the benchmark by engaging in RM is −5.50 percent. The p-value from a F-test of $[(\gamma_4 + \gamma_5) = 0]$ is 0.083, indicating that *BENCH* firms who engage in SG&A RM have significantly higher industry-adjusted *ROA* in $t + 1$ than non-RM *BENCH* firms. The results are robust using $AdjROA_{t+2}$ and $AdjROA_{t+3}$ as the performance measures. Table 6, panel B reports the results using industry-adjusted *CFO* as the performance measure. The coefficient on *BENCH**RM* is 0.025 (p-value < 0.001), suggesting that managers of *BENCH* firms who engage in RM have higher subsequent *CFO* compared to non-RM *MISS* firms. The average performance of *BENCH* firms that do not engage in RM is −7.40 percent, whereas the average performance of *BENCH* firms that engage in RM is −7.50 percent. The difference is not significant. While *BENCH* firms that engage in RM have higher $AdjCFO_{t+1}$ than non-RM *MISS* firms (coefficient 0.025, *p*-value < 0.001), it is not different from non-RM *BENCH* firms.

The results for production RM are presented in the third column in Table 6. The coefficient on the interaction term *BENCH*RM* is 0.031 (*p*-value < 0.001). Untabulated results reveal that, in years $t + 2$ and $t + 3$, the coefficients on the interaction (*BENCH*production RM*) is 0.022 (*p*-value < 0.02) and 0.019 (*p*-value < 0.08), respectively. The results are similar for future *AdjCFO*; however, year $t + 3$ is insignificant. The average performance of firms that just meet the benchmark without engaging in production RM is −7.40 percent, whereas the average performance of firms that just meet the benchmark by engaging in RM is −6.50 percent. The *p*-value from a *F*-test of $[(\gamma_4 + \gamma_5) = 0]$ is 0.4749. Therefore, the results suggest *BENCH* firms who engage in RM are associated with better performance in the subsequent three years compared to non-RM *MISS* firms but not compared to non-RM *BENCH* firms.[21]

If firms engage in RM, they might engage in one or more types of RM simultaneously; therefore, I aggregate the three RM measures shown to be associated with just meeting zero and last year's earnings. The last column in Table 6 reports the results from the estimation of (6) with the aggregate measure. The results are similar to the individual measures. Overall, it appears that managers engage in RM to just meet earnings benchmarks by cutting discretionary expense and using sales manipulation/overproduction. The evidence presented in this section suggests that using RM to influence the output of the accounting system (i.e., to just meet an earnings benchmark) is not opportunistic, but consistent with attaining benefits that allow the firm to perform better in the future or signaling future performance.[22]

6. Conclusion

This paper contributes to the body of literature examining the resource allocation impact of earnings management. I examine four types of RM: (1)

21. Because production RM reflects two types of RM, overproduction to decrease COGS expense and/or cutting prices or extending more lenient credit terms to boost sales, I reestimate (6), excluding all nonmanufacturing firms. The coefficient on the interaction term *BENCH*RM* is significantly positive in the subsequent three years for the *AdjROA* and *AdjCFO* sample. Therefore, the results are robust to the manufacturing sample.

22. Because survivorship bias may influence the future performance results, I analyze the rate and reason firms drop out of the *BENCH* and non-*BENCH* (*MISS*, *JUSTMISS*, *BEAT*) samples. For each firm that drops out, I examine the delisting codes in CRSP (delisting codes above 400 are classified as liquidation; delisting codes in the 200s are classified as merger; all other codes are classified as other) to determine if there is a significant difference in the firms that drop out of each sample. The firms appear to drop out of the two samples at consistent rates and for consistent reasons; thus, I believe survivorship has a minimal effect on the results.

cutting discretionary investment of R&D to decrease expense, (2) cutting discretionary investment of SG&A to decrease expense, (3) selling fixed assets to report gains, and (4) cutting prices or extending more lenient credit terms to boost sales and/or overproduce to decrease COGS expense. First, I examine whether measures of these RM are associated with firms just meeting two earnings benchmarks (zero and last year's earnings). Second, I assess the extent to which RM to meet earnings benchmarks is associated with future performance. The results indicate that after controlling for size, performance, and market-to-book, RM is positively associated with firms just meeting earnings benchmarks. Next, I find using RM to just meet earnings benchmarks is positively associated with future performance compared to firms that do not use RM and miss the earnings benchmark by more than 0.01. In addition, I find that firms that just meet earnings benchmarks by engaging in R&D or SG&A RM have significantly higher subsequent industry-adjusted *ROA* than firms that do not engage in RM and just meet earnings benchmarks. In this setting, the results suggest earnings management via RM is not opportunistic, but consistent with managers attaining benefits that allow better future performance or signaling.

This paper makes the following contributions. First, it contributes to the literature on earnings management. By undertaking a comprehensive examination of four types of RM, this paper extends extant research investigating the consequences of earnings management. Although there are several studies documenting whether RM occurs in various situations, the existing literature provides little evidence of the effect of RM on firms' subsequent operating performance (with the exception of Bens et al. 2002). Without this type of analysis, it is difficult to determine whether managers use RM, documented in prior literature, opportunistically. Second, this paper contributes to the literature on earnings quality. Persistence of earnings is an important part of the "quality of earnings". In studies of financial statement analysis, researchers are interested in how current or past earnings or earnings components aid in forecasting future earnings or cash flows, both of which are central inputs in valuation models. Examining the implication of RM on performance is important given the significance of future performance to the firm and its stakeholders. This paper shows that using empirical measures to identify firms that engage in RM is incrementally informative about future earnings.

References

Anderson, M., R. D. Banker, and S. N. Janakiraman. 2003. Are selling, general, and administrative costs "sticky?" *Journal of Accounting Research* 41 (1): 47–63.

Baber, W., P. M. Fairfield, and J. A. Haggard. 1991. The effect of concern about reported income on discretionary spending decisions: The case of research and development. *Accounting Review* 66 (4): 818–29.

Barton, J., and P. Simko. 2002. The balance sheet as an earnings management constraint. *Accounting Review* 77 (Supplement): 1–27.

Bartov, E. 1993. The timing of asset sales and earnings manipulation. *Accounting Review* 68 (4): 840–55.

Bartov, E., D. Givoly, and C. Hayn. 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics* 33 (2): 173–204.

Bens, D., V. Nagar, and M. F. H. Wong. 2002. Real investment implications of employee stock option exercises. *Journal of Accounting Research* 40 (2): 359–406.

Berger, P. 1993. Explicit and implicit tax effects of the R&D tax credit. *Journal of Accounting Research* 31 (2): 131–71.

Burgstahler, D., and I. Dichev. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24 (2): 99–126.

Bushee, B. 1998. The influence of institutional investors on myopic R&D investment behavior. *Accounting Review* 73 (3): 305–33.

Cheng, S. 2004. R&D expenditures and CEO compensation. *Accounting Review* 79 (2): 305–27.

Dechow, P., S. Kothari, and R. Watts. 1998. The relation between earnings and cash flows. *Journal of Accounting and Economics* 25 (2): 133–69.

Dechow, P. M., and D. J. Skinner. 2000. Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons* 14 (2): 235–50.

Dechow, P., and R. Sloan. 1991. Executive incentives and the horizon problem. *Journal of Accounting and Economics* 14 (1): 51–89.

Degeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings management to exceed thresholds. *Journal of Business* 72 (1): 1–33.

Ewert, R., and A. Wagenhofer. 2005. Economic effects of tightening accounting standards to restrict earnings management. *Accounting Review* 80 (4): 1101–25.

Fama, E., and J. Macbeth. 1973. Risk, return and equilibrium: Empirical tests. *Journal of Political Economy* 81 (3): 607–36.

Fischer, P., and R. Verrecchia. 2000. Reporting bias. *Accounting Review* 75 (2): 229–45.

Graham, J., R. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40 (1–3): 3–73.

Hayn, C. 1995. The information content of losses. *Journal of Accounting and Economics* 20 (2): 125–49.

Herrmann, T., T. Inoue, and W. B. Thomas. 2003. The sale of assets to manage earnings in Japan. *Journal of Accounting Research* 41 (1): 89–108.

Jacob, J., and B. Jorgensen. 2007. Earnings management and accounting income aggregation. *Journal of Accounting and Economics* 43 (2/3): 369–90.

Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (2): 193–228.

Kothari, S., and R. Sloan. 1992. Information in prices about future earnings: Implications for earnings response coefficients. *Journal of Accounting and Economics* 15 (2): 143–72.

Lev, B. 2003. Corporate earnings: Fact and fiction. *Journal of Economic Perspectives* 17 (2): 27–50.

Mackie-Mason, J. 1990. Do taxes affect corporate financing decisions? *Journal of Finance* 45 (5): 1471–93.

Matsumoto, D. 2002. Management's incentives to avoid negative earnings surprises. *Accounting Review* 77 (3): 483–514.

Matsunaga, S., and C. Park. 2001. The effect of missing a quarterly earnings benchmark on the CEO's annual bonus. *Accounting Review* 76 (3): 313–32.

Perry, S., and T. Williams. 1994. Earnings management preceding management buyout offers. *Accounting Review* 18 (2): 157–80.

Petersen, M. A. 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies* 22 (1): 435–80.

Roychowdhury, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42 (3): 335–70.

Schipper, K. 1989. Earnings management. *Accounting Horizons* 3 (1): 91–102.

Subramanyam, K. R. 1996. The pricing of discretionary accruals. *Journal of Accounting and Economics* 22 (1–3): 249–81.

Thomas, J. K., and H. Zhang. 2002. Inventory changes and future returns. *Review of Accounting Studies* 7 (2–3): 163–87.

Trueman, B., and S. Titman. 1988. An explanation for accounting income smoothing. *Journal of Accounting Research* 26 (Supplement): 127–39.

Watts, R., and J. Zimmerman. 1978. Towards a positive theory of the determination of accounting standards. *Accounting Review* 53 (1): 112–34.

Zang, A 2007. *Evidence on the tradeoff between real manipulation and accruals manipulation*. Working paper, University of Rochester.