The effect of real earnings management on the information content of earnings

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ABSTRACT

This study investigates the effect of real earnings management (REM) on the earnings information content of stock returns. Prior research has established that accounting-based earnings have information content for stock valuation purposes and that managers use accruals management to influence reported earnings and thus affect the information content of those earnings. Little, however, is known about whether REM harms or enhances the information content of earnings and investors' ability to use those earnings for stock valuation purposes. Using a broad cross-section of firms, this study identifies those with high levels of two common types of REM, abnormal production costs and abnormal discretionary expenses. Results indicate that the information content of earnings is significantly lower for firms which engage in REM. This study contributes to the ongoing streams of literature related to the consequences of REM and how earnings information is impounded in stock prices.

Keywords: Real Earnings Management, Earnings Response Coefficients

INTRODUCTION

This study examines whether real earnings management (REM) affects the earnings information content of stock returns. REM is defined as, "the use of managerial discretion over operational choices with the intent to influence reported accounting numbers" (Wilson 2013). While there is a well-developed line of accounting literature that examines managers' use of accrual-based methods to manage reported earnings and the capital market effects of using those accrual-based methods (see Healy and Wahlen, 1999; Dechow and Skinner, 2000; Beneish, 2001; Fields et al., 2001; Francis et al., 2006; Lo, 2008; Dechow et al., 2010 for survey), there is little research into the capital market effects of using REM to manage reported earnings. Gunny (2010) documents that firms who engage in REM have lower future profitability; and Cohen et al (2008) and Wilson (2013) find that the use of REM has increased following the passage of the Sarbanes Oxley Act of 2002 (SOX). Little, however, is known about the effect of REM on investors' use of reported earnings information when making valuation decisions. This study investigates an important capital markets effect of REM – whether engaging in common forms of REM increases or decreases the amount of earnings information impounded in stock returns. An alternate way of looking at this issue is whether engaging in REM enhances or degrades the usefulness of reported earnings information for investors when making valuation decisions.

If managers use REM in an opportunistic manner in order to boost reported earnings for personal gain (i.e. compensation, job security, etc.), then such actions will likely garble the earnings information due to the transitory nature of the earnings boost from REM and create useless noise for investors looking to use that earnings information for decision-making in the capital markets. Demski and Frimor (1999) provide evidence that non-truthful reporting leads to such garbling of information. On the other hand, if managers use REM as a signal to investors about future firm performance, and thereby smooth earnings and make them more predictable, then the information impounded in earnings is enhanced for investors. Tucker and Zarowin (2006) document that managers can use their discretion over accruals to smooth earnings, and Lundholm and Myers (2002) document that mangers can use their discretion over earnings disclosures to smooth earnings. These smoother earnings, in both cases, increase the usefulness of reported earnings for investors. This study extends this reasoning by considering that managers may use their discretion over REM choices to smooth earnings rather than using REM in an opportunistic manner.

The extant literature has established that reported earnings contain useful information for valuation purposes by documenting that current reported earnings (Ball and Brown 1968), and future earnings (Collins, et al. 1994), map into current stock returns. To test whether REM affects the usefulness of reported earnings for investors, this study examines the association between current and future reported earnings and stock returns using earnings response coefficients (ERC) as an indicator of this association. This study specifically examines the differences in ERCs for firms which appear to have high levels of REM activity. Significant ERC increases are interpreted as an indication of increased usefulness of reported earnings since this suggests a higher amount of earnings information is impounded in the stock return. This would be consistent with the use of REM to smooth earnings and signal investors about future firm

performance. Conversely, significant ERC decreases are interpreted as an indication of decreased usefulness of reported earnings. This would be consistent with opportunistic use of REM resulting in garbled earnings information.

The results indicate that firms which engage in two of the most common types of REM, overproduction (measured as abnormal production costs) and discretionary expense reductions (measured as abnormal discretionary expenses), have lower ERCs than other firms. This is consistent with managers of REM firms behaving in an opportunistic manner and thus reducing the usefulness of reporting earnings for investors. No evidence is found suggesting that managers use REM to smooth earnings.

This study adds to the growing stream of literature surrounding the use of REM and to the well-established stream of literature examining how earnings information is impounded into stock prices. It extends beyond prior studies by giving evidence of how REM is used by managers and documenting that this use decreases the usefulness of reported earnings. These results have an important implication for capital market participants, and should therefore be of particular use to investors as they make valuation decisions.

HYPOTHESIS AND METHODOLOGY

Prior literature has shown that accruals-based earnings management can have a multiple impacts on the earnings information content of stock returns. When managers behave opportunistically with accruals-based methods, the earnings information content impounded in stock returns declines (Demski and Frimor 1999). When managers instead use accruals-based methods to smooth earnings, the earnings information content increases (Tucker and Zarowin 2006). Prior literature, however, gives no indication about whether the earnings information content of stock returns is affected by REM, and if affected, whether earnings information content would be increased or decreased. This leads to the testable hypothesis presented in null form:

Hypothesis 1: The information content of earnings for firms with high levels of REM is not significantly different than the information content of earnings for firms with typical or low levels of REM.

To investigate the association between REM and the information content of earnings, returns and REM measures are estimated for a broad sample of firms from 1989-2009. Two common measures of REM are used, overproduction and discretionary expense manipulation, which are found in prior studies (Roychowdhury 2006, Gunny 2010, Wilson 2013). Managers have discretion over certain expenses such as sales, general, and administrative expense (SG&A), research and development expenses (R&D), and advertising expense should they want to increase earnings. SG&A is not entirely discretionary, however, many component of SG&A can be reduced at the discretion of management. Cutting these discretionary portions of SG&A leads directly to increases in reported income. Following prior literature (Roychowdhury 2006, Wilson 2013), expected discretionary expenses are modeled for each industry and year as:

$$DISEXP_t/A_{t-1} = \alpha_0 + \alpha_1*(1/A_{t-1}) + \beta_1*(S_{t-1}/A_{t-1}) + \varepsilon_t \quad (1)$$

Where:

$DISEXP_t$ is discretionary expenses for period t,

A_{t-1} is total assets at the end of period t-1, and

S_{t-1} is sales revenue for time period t-1.

Abnormal discretionary expenses are then computed as the difference between each firm's actual discretionary expenses (SG&A) and the expected discretionary expenses as determined by model 1.

Besides reducing discretionary expenses, managers may choose to overproduce to manage earnings upward. Higher levels of production spread fixed costs across more units, resulting in a lower cost of goods sold. That lower cost of goods sold translated into a higher gross margin and reported income. While reported income increases in the current period because of overproduction, cash flows from operations decrease since the firm incurs increased production and holding costs for the additional units produced. This results in lower than normal cash flows from operations at a given level of sales and higher production costs relative to sales. As before, Roychowdhury (2006) and Wilson (2013) are followed to estimate expected production costs by industry and year using the following model:

$$PROD_t/A_{t-1} = \alpha_0 + \alpha_1*(1/A_{t-1}) + \beta_1*(S_t/A_{t-1}) + \beta_2*(\Delta S_t/A_{t-1}) + \beta_3*(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t \quad (2)$$

Where:

$PROD_t$ is total production costs for period t, and

A_{t-1} is total assets at the end of period t-1, and

S_t is sales revenue for time period t, and

ΔS_t is the change in sales from period t-1 to period t, and

ΔS_{t-1} is the change is sales revenue from period t-2 to period t-1.

Abnormal production costs are then computed as the difference between each firm's actual production costs and the estimated production costs as determined by model 2.

In order to determine firms that are most likely to be engaging in REM, firms are ranked into deciles based on their abnormal production costs and abnormal discretionary expenses. Firms in the top two deciles for abnormal production costs and bottom two deciles for abnormal discretionary expenses are classified as firms with high levels of REM. An indicator variable, *High*, is then created based on whether a firm falls into the high REM classification. That indicator variable is used in the following model to test hypothesis 1, running the model once using abnormal production costs as the basis for the *High* indicator variable and once using abnormal discretionary costs as the basis for the *High* variable:

$$R_t = a_0 + a_1*X_{t-1} + a_2*X_t + a_3*X_{t3} + a_4*High_t + a_5*(High_t*X_{t-1}) + a_6*(High_t*X_t) + a_7*(High_t*X_{t3}) + a_8*AFoll_t + a_9*INST_t + \varepsilon_t \quad (3)$$

Where:

R_t = the ex-dividend stock return for fiscal year t, starting three months after fiscal year t begins and ending three months it ends,
X_{t-1} = earnings before extraordinary items for fiscal year t-1, deflated by market value of common equity at the end of the third month of Fiscal year t,
X_t = earnings before extraordinary items for fiscal year t, deflated by market value of common equity at the end of the third month of fiscal year t,
X_{t3} = sum of earnings before extraordinary items for Fiscal years t+1 through t+3, deflated by market value of equity at the end of the third month of Fiscal year t,
$High_t$ = dummy variable indicating if firm year is in the 9th or 10th decile of abnormal production cost measure or 1st or 2nd decile of abnormal discretionary cost measure
$AFoll_t$ = number of analysts following each firm for fiscal year t,
$INST_t$ = each firm's level of institutional ownership for fiscal year t.

While the coefficient a_2 denotes the ERC for current period reported earnings, it is the coefficient a_6 that indicates whether a firm's high REM activity affects its ERC. If a_6 is statistically insignificant, then that would be evidence that high REM activity has no effect on ERCs. If a_6 is positive and significant, that would be evidence that high REM affects ERCs and that it adds value relevant information for investors. If a_6 is negative and significant, that would be evidence that high REM affects ERCs and that it degrades the amount of value relevant information available to investors in reported earnings. Following prior literature, measures of prior period earnings, X_{t-1}, and future earnings, X_{t3}, are included since current earnings are affected by both prior earnings and expectations of future earnings. Two variables designed to control for a firm's ability to engage in REM are also included. $AFoll_t$ is a measure of analyst following, and $INST_t$ is a measure of institutional ownership. REM represents a more costly form of earnings management since it involves the actual use of cash in the form of either increased production costs or decreases in discretionary expenses. Such choices represent deviations from the normal, optimal levels from production costs and discretionary expenses, thus investors may want to constrain management's ability to engage in REM. Analysts and institutional investors proxy for the level of sophisticated investors. Higher analysts following and institutional ownership would likely constrain management's ability to engage in REM.

SAMPLE AND RESULTS

A total sample of 19,356 observations spanning from 1989-2009 is drawn using Compustat and CRSP data. Of the 19,356 observations, a total of 6,389 fall into either the high abnormal production or discretionary expenses deciles. 1,353 observations fall into both high REM categories. All 19,356 observations are available to run the model using abnormal production costs as the determinate of the High indicator variable, but

only 16,230 observations had the necessary data to run the model with abnormal discretionary costs as the determinate of the High indicator variable.

Table 1 presents descriptive statistics for the sample parsed into high and non-high REM sub-samples. There are no statistically significant differences between the high and non-high samples in terms of returns, R_t, prior period reported earnings, X_{t-1}, or current period reported earnings, X_t. The difference in means for future earnings, X_{t3}, is lower for the high REM observations by a marginally significant amount (-0.043, p=0.087). Analyst Following, $AFoll_t$, (-3.128, p=0.018) and Institutional Ownership, $INST_t$, (-0.054, p=0.029) are both significantly lower for the high REM observations.

Table 2 presents the results of OLS regressions designed to test hypothesis 1. The main reported earnings variables for prior (X_{t-1}), current (X_t), and future earnings (X_{t3}) all show the predicted direction and high levels of significance as expected. Similarly, the control variables $AFoll_t$ and $INST_t$ also show the predicted direction and high levels of significance. It is the interaction of the high REM indicator variable, High and current period reported earnings, X_t, which is of most interest. This coefficient on this interaction, $High_t*X_t$, represents the incremental effect of REM on ERC. The model is first run with abnormal production costs as the determinate of the High indicator variable. Results indicate that firms with abnormally high production costs have significantly lower ERCs than firms with normal or low levels of abnormal production costs (-0.344, p=0.041). This is consistent with managers using this form of REM in an opportunistic manner which adds noise to reported earnings. The model is then run again using abnormal discretionary expenses as the determinate of the High indicator variable. Results are similar, but slightly weaker, than when using abnormal production costs. ERCs in this case are lower at a marginally significant level (-0.161, p=0.076). This is also consistent with managers using this form of REM in an opportunistic manner. These results lead to the rejection of hypothesis 1 since they indicate that firms with high levels of REM do have significantly different ERCs. Further, the ERCs for high REM firms are significantly negative indicating that the information content of reporting earnings has been degraded through the use of REM.

CONCLUSIONS

Prior literature has thoroughly investigated the capital markets effects of firms engaging in accruals-based earnings management (see Healy and Wahlen, 1999; Dechow and Skinner, 2000; Beneish, 2001; Fields et al., 2001; Francis et al., 2006; Lo, 2008; Dechow et al., 2010 for survey). Scant evidence, however, exists about the capital markets effects of firms engaging in REM. This study investigates one important capital market effect of REM – whether firms with high levels of REM have lower ERCs than firms with normal or low levels of REM.

The question of whether engaging in REM impacts ERCs is important to investors because managers who use REM to influence reporting earnings numbers could be adversely impacting the information being conveyed to investors as they make value-related decisions if they behave in an opportunistic manner. Conversely, managers may use REM to influence reported earnings as signal to investors about future performance. In this case, the information being conveyed to investors through reported earnings would have enhanced usefulness.

To provide evidence on whether firms who engage in REM affect the information content of their earnings, this study uses a large sample of 19,356 firm year observations from 1989-2009. These observations are ranked into deciles based on two types of common REM – abnormal production costs and abnormal discretionary expenses. Firms which display abnormally high levels of production costs or abnormally low discretionary expenses relative to other firms in their industries are considered to have high levels of REM. OLS regression of current period returns on multiple measures of earnings, an indicator variable based on high levels of REM, and interactions of the indicator variable and the various earnings variables, as well as control variables is then used to compute ERCs. This is specifically designed to examine the marginal effect of REM on the ERCs of high REM firms. The model is run once with abnormal production costs as the basis for the high REM indicator variable and once with abnormal discretionary expenses as the basis for the indicator variable. Results for both iterations of the model suggest that firms which engage in REM do impact the information content of their reported earnings. Furthermore, results suggest that these high REM firms are adding noise to their reported earnings and, therefore, degrading the information content of those earnings.

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Table 1
Sample descriptive statistics

	Firms not categorized as High REM (Deciles 1 – 8)				*Firms categorized as High REM (Deciles 9 – 10)*			
Variable	Mean	Median	Standard Deviation		Mean	Median	Standard Deviation	Diff. in Means
R_t	0.165	0.041	0.712		0.158	0.038	0.851	-0.007
X_{t-1}	0.004	0.047	0.192		-0.001	0.043	.0246	-0.005
X_t	0.016	0.042	0.140		0.019	0.033	0.166	0.003
X_{t3}	0.074	0.125	0.362		0.031	0.010	0.411	-0.043*
$AFoll_t$	15.384	13.368	10.673		12.256	10.190	11.121	-3.128**
$INST_t$	0.576	0.464	0.185		0.522	0.440	0.218	-0.054**
N	12,967				6,389			

***significance at 10% level, **significance at 5% level**

Table 2

Regression of fiscal year stock returns on various reported earnings, high REM indicator variable, and control variables

Variable	Predicted Sign	AbProd Cost Model	AbDisc Exp Model
Intercept	?	0.126***	0.237***
X_{t-1}	-	-0.265***	-0.298***
X_t	+	0.784***	0.712***
X_{t3}	-	-0.175***	-0.166***
$High_t$	?	-0.087**	-0.059*
$High_t*X_{t-1}$	?	-0.108	-0.094
$High_t*X_t$	?	-0.344**	-0.161*
$High_t*X_{t3}$	?	-0.052*	-0.043
AFoll	+	0.186***	0.148***
INST	+	0.244***	0.215***
N		19,356	16,230
ADJ RSq		0.195	0.177

***significance at 10% level, **significance at 5% level, ***significance at 1% level**