2-1-2008

Discontinued SEC Required Disclosures: the Value of Repairs and Maintenance Expenditures using a Variance Decomposition Approach

Bruce K. Behn
The University of Tennessee

Richard Riley
West Virginia University

Giorgio Gotti
University of Massachusetts Boston, giorgio.gotti@umb.edu

Richard C. Brooks
West Virginia University

Discontinued SEC Required Disclosures: the Value of Repairs and Maintenance Expenditures using a Variance Decomposition Approach

Bruce K. Behn*
Ergen Professor of Business and CBER Faculty Fellow
The University of Tennessee
Department of Accounting and Information Management
Knoxville, TN 37996-0560

Richard Riley
Louis F. Tanner Distinguished Professor of Public Accounting
West Virginia University
Morgantown, WV 26506-6025

Giorgio Gotti
Assistant Professor
University of Massachusetts Boston
Accounting and Finance Dept.
Boston, MA 02125-3393

Richard C. Brooks
Dean's Professor of Accounting
West Virginia University
Morgantown, WV 26506-6025

UMBCMWP 1044

February 2008

UMASS BOSTON COLLEGE OF Management
Financial Services Forum

Discontinued SEC Required Disclosures: the Value of Repairs and Maintenance Expenditures using a Variance Decomposition Approach

By

Bruce K. Behn*
Ergen Professor of Business and CBER Faculty Fellow
The University of Tennessee
Department of Accounting and Information Management
Knoxville, TN 37996-0560

Richard Riley
Louis F. Tanner Distinguished Professor of Public Accounting
West Virginia University
Morgantown, WV 26506-6025

Giorgio Gotti
Assistant Professor
University of Massachusetts Boston
Accounting and Finance Dept.
Boston, MA 02125-3393

Richard C. Brooks
Dean's Professor of Accounting
West Virginia University
Morgantown, WV 26506-6025

First Draft: October 19, 2005
Second Draft: May 1, 2006
Latest Draft: November 26, 2007

*** Corresponding Author**

Abstract

On December 13, 1994, the Securities and Exchange Commission (SEC) eliminated certain schedules that included repairs and maintenance (R&M) disclosures previously required in annual reports and registration statements filed with the SEC. The purpose of this research is to determine if market participants utilized R&M information when making investment decisions. Resulting from a variance decomposition approach, the findings indicate that market participants did use R&M disclosures in their investment decisions. Thus, as a possible policy implication of this research, the SEC may want to reconsider the decision to eliminate the required R&M expenditure disclosures.

Keywords: Repairs and Maintenance Expenses, SEC, Mandatory Disclosures, Value Relevance, Variance Decomposition.

Data Availability: All data are available from public sources.

I. Introduction

On December 13, 1994, the Securities and Exchange Commission (SEC) issued rulings 33-718, 34-35094, and IC-20766, which eliminated certain supplemental financial schedules that all foreign and domestic issuers had to include in annual reports and registration statements filed with the SEC. One of the schedules eliminated included repairs and maintenance (R&M) expenditure information. The purpose of the current study is to determine if market participants utilize R&M information when assessing the market value of a company. To date, we are aware of no research that documents the use, by market participants, of this discontinued R&M information. This lack of research represents a void in the literature that the current study seeks to fill. If the current research shows that market participants utilize R&M information, it could suggest that the SEC may want to reconsider the decision to eliminate the R&M disclosures.

Some managers consider R&M expenditures to be semi-discretionary expenditures. For example, Perry and Grinaker (1995) find evidence to suggest that managers use R & M expenditures to manage earnings. More specifically, Perry and Grinaker (1995) find that R&M expenditures decrease when earnings expectations are not met and R&M expenditures increase when earnings are expected to exceed earnings estimates. Therefore, the elimination of R&M expenditure information by the SEC could reduce the transparency of financial statements and make it easier for management to manage earnings and decrease the quality of reported earnings numbers.

To test whether market participants utilized required R&M disclosures, we use a variance decomposition approach (VAR) similar to Callen and Segal (2004) to assess the contribution of the variance of each independent variable in explaining the variance of the dependent variable, without the risk of scale effects that occur when measuring the value relevance only with the explanatory power of regressions (adjusted R square). Brown et al. (1999) present evidence that scale effects in level regressions increase the adjusted R square, making between-sample comparisons problematic. In this research, we use both VAR and Campbell's (1991) framework. As a result, we are able to decompose the firm-level stock return into expected return news, operating earnings without R&M expenses, R&M expenses, and operating cash flow information, thus allowing us to assess the importance of each one of these sources of stock return variation for the sample firms.

Using both a variance decomposition model as well as a simple conditional regression model in which we compare the adjusted R square of models with and without the R&M information, we find evidence that R&M disclosures are indeed value relevant. Consistent with our hypothesis, our results indicate R&M information explains a portion of the variance of the market value of the firm, therefore we can assert that the SEC rulings eliminate information that investors use in evaluating and assessing a firm's future cash flows. In addition, we find that in 1995, the first year after the elimination of R&M disclosures, only 14 out of 352 firms (i.e., 4%) in our sample decided to voluntarily continue disclosing R&M expenses. Therefore it appears that, unless

firms are required to disclose R&M expenditure information, many firms will deprive market participants of information they would use to make their investment decisions.

The remainder of the paper is organized as following. In the next section, we present the motivation for the current study, the formulation of a variance decomposition model and the hypothesis. Section III describes the research design. Section IV explains the data source and the sample selection procedure. Section V provides descriptive statistics of the variables used in testing the hypothesis and presents empirical results. Section VI presents the conclusions of the study.

II. Background

Accounting scandals such as Enron and WorldCom caused the public to demand increased accountability and transparency in financial reporting. In response, Congress passed and President George W. Bush signed into law the Sarbanes-Oxley Act of 2002. The Sarbanes-Oxley Act mandated the creation of the Public Company Accounting Oversight Board (O'Sullivan 2007). The primary purpose of the Public Company Accounting Oversight Board (PCAOB) is to improve the quality of audits performed by public accounting firms (O'Sullivan 2007). Audits provide assurance that publicly traded firms present their financial statements in accordance with generally accepted accounting principles (GAAP). In addition, the SEC relies on the external auditors of publicly traded companies to ensure that the financial statements and schedules furnished by those

companies in their filings with the SEC contain all the information required by SEC regulations.

Prior to the issuance of SEC rulings 33-718, 34-35094, and IC-20766, publicly traded companies were required to disclose information regarding R&M expenses in their filings with the SEC. During the comment period prior to adoption, preparers (e.g., registrants, accounting firms, and related professional membership associations) generally supported the elimination of the disclosures (SEC 1994). However, users (e.g., financial analysts) of financial information generally were critical of eliminating such disclosures (SEC 1994). More specifically, some financial analysts believed that the cost of providing the eliminated disclosures was small and therefore the benefits of disclosure exceeded the cost. Furthermore, they suggested that the elimination of such disclosures could result in an increase in the cost of capital due to increased investor uncertainty (SEC 1994). In spite of the comments by some financial information users, and in the interest of reducing the costs incurred by registrants, the SEC adopted rules that eliminated disclosure of R&M expenditure information. While the SEC considered comments from both preparers and users of financial information before deciding to eliminate these disclosures, they did not undertake any formal research to determine whether these disclosures were used by financial statement readers. The current study seeks to empirically determine if R&M expenditure information is used by market participants when making investments decisions.

A potential problem with eliminating R&M disclosures is that R&M expenditures may be used to manage earnings. That is, some managers may consider R&M expenditures to be semi-discretionary and therefore use R&M expenditure decisions as a way to manage earnings. For example, managers can defer R&M expenditures in years when earnings might fall short of expectations. Conversely, management can increase R&M expenditures in years when earnings may exceed expectations. Without requirements to disclose R&M expenditures, it is difficult to assess if managers engage in this type of earnings management behavior.

Earnings Management: Manipulation of Accruals and Operating Decisions

Literature related to earnings management is plentiful. Roychowdhury (2004) draws a distinction between two methods of managing earnings: pure accrual manipulation and real activities manipulation. *Pure accrual manipulation* is the use of end of period accruals (e.g., bad debt expense), the delay of writing-off assets and the selection of particular accounting methods to achieve a desired impact on earnings. Roychowdhury (2004) notes that pure accrual manipulations are a convenient way to manage earnings because they (1) have no direct cash flow implications, (2) can be done at the end of the period when managers are more informed about "pre-managed earnings," and (3) can be done after "earnings targets" are known. *Real activities manipulation* is when earnings are managed by changes made to operational activities. Real activities manipulation must be done during the year before pre-managed earnings are

known and before earnings targets are known. In a commentary on earnings management, Schipper (1989) notes the difficulty of determining the extent of earnings management via real activities manipulation. Real activities manipulations that are undertaken to maximize share value are difficult to discern from those undertaken to manage earnings (Schipper 1989).

Several studies examine the use of specific accruals or specific accounting methods to manage earnings (Healy and Wahlen 1999). For example, Tech, Wong and Rao (1998) find that firms engaged in initial public offerings are more likely to use income-increasing depreciation policies and bad debt provisions. Beaver et al. (1989), Moyer (1990), Scholes et al. (1990), Wahlen (1994), Beatty et al. (1995), Collins et al. (1995) Beaver and Engel (1996), Liu and Ryan (1995) and Liu et al. (1997) all investigate bank loan loss provisions. According to Healy and Wahlen (1999), these studies find evidence of earnings management among banks. Petroni (1992) finds evidence of earnings management among insurers via property-casualty insurance claim loss reserves. Together, the foregoing studies provide convincing evidence that pure accrual manipulations are used to manage earnings.

Whereas pure accrual manipulations can be done at the end of the accounting period and do not affect cash flows, real activities manipulations must be done during the year and typically impact both cash flows and accruals (Roychowdhury 2004). In an investigation of earnings management via real activities manipulations, Roychowdhury (2006) concentrates on (1) the management of sales via “limited-time” price discounts,, (2) the reduction of

discretionary expenses including advertising expenses, research and development expenses, and selling and administrative expenses, and (3) the overproduction of inventory by manufacturing firms to reduce the cost per unit of inventory. Roychowdhury (2006) finds evidence consistent with the supposition that managers manipulate sales, discretionary expenses and production levels to avoid reporting annual loses. Roychowdhury (2006) also finds evidence (although less robust) that managers manipulate real activities to meet analyst forecasts.

Using R&M expenditures to manage earnings is real operating decision and Perry and Grinaker (1995) find evidence that managers make R&M decisions in light of earnings expectations. Perry and Grinaker (1995) manually gather R&M expenditure data from Schedule X, Supplemental Income Statement Information, Form 10-K filed with the SEC from 196 U.S. firms for the period 1975-1990. Using a random walk model applied to reported earnings before income taxes and R&M expense, the authors model unexpected earnings and use a contingency table to analyze adjustments to R&M in response to positive and negative unexpected earnings. To examine the linear relationship between earnings expectations and R&M expenditures, they use Ordinary Least Squares regression.

Consequently, they find that R&M expenditures decrease when earnings expectations are not met and R&M expenditures increase when earnings exceed earnings estimates, suggesting that managers use R&M expenditures to manipulate earnings. In light of the findings by Perry and Grinaker (1995), the

elimination of R&M expenditure information by the SEC may allow managers to manipulate earnings more easily via R&M expenditures – resulting in less financial reporting transparency.

Earnings Management and Financial Reporting Transparency

With demands for more transparency in financial reporting, the SEC's decision to eliminate R&M disclosures is curious. Do managers adjust their earnings management behavior based on the level of financial reporting transparency? Hunton, Libby and Mazza (2006) conduct an experiment to determine whether greater transparency in financial reporting reduces the likelihood of earnings management. They ask 62 financial executives and chief executive officers to decide which "available-for-sale" securities to sell from a portfolio. The authors utilize a 2 X 2 between subjects design manipulating the transparency of comprehensive income reporting and the relationship of projected earnings to the consensus forecast.

Hunton et al. (2006) find that comprehensive income information provided in a more transparent format (i.e., separate statement of comprehensive income) significantly reduced both income-increasing and income-decreasing earnings management behavior relative to comprehensive income information provided in a less transparent format (i.e., as part of the statement of stockholders' equity). Furthermore, in a debriefing questionnaire, participants indicated that earnings management (1) is much more obvious when transparent reporting methods are used compared to less transparent reporting methods, (2) is likely to result in a

positive effect on stock price under less transparent reporting conditions and a negative effect under more transparent reporting, and (3) will not have an impact on reporting reputation under less transparent reporting but will have a negative effect under more transparent reporting.

The results of the Hunton et al. (2006) study suggest that financial reporting transparency influences both earnings management behavior and the perceived benefits of earnings management. Their findings further suggest that the elimination of R&M type expenditure disclosures will reduce financial reporting transparency and possibly result in an increase in earnings management via manipulation of R&M expenditures. Therefore, the elimination of R&M disclosures will make it more difficult for users of financial statements to assess the level of earnings management and will reduce the quality of reported earnings.

These studies by Roychowdhury (2004 and 2006) and Perry and Grinaker (1995) are important because they illustrate that managers can and sometimes do manage earnings via operational decisions. Furthermore, Perry and Grinaker (1995) find evidence that managers specifically use R&M expenditures to manage earnings. The research of Hunton et al. (2006) indicates that the level of financial reporting transparency impacts both earnings management behavior and the perceived benefits of earnings management. The elimination of R&M type expenditure disclosures may enable managers to manage earnings because the users of the financial statements will not able to assess the extent to

which earnings may have been manipulated by R&M expenditures. That is, the elimination of R&M disclosures makes the financial statements less transparent.

However, prior research has not determined if investors actually use R&M expenditure information when making investment decisions. This lack of research represents a void in the literature that the current study seeks to fill. If investors do not use R&M expenditure information when making investment decisions, the elimination of these disclosures should not matter. However, if investors do use R&M expenditure information when making investment decisions, prior research suggests that managers will use the non-disclosure of R&M information to their advantage and manage earnings via R&M. expenditures. The investing public, unaware of the presence of earnings management, may make sub-optimal investment decisions - potentially resulting in an inefficient allocation of resources in the capital markets.

Earnings Usefulness

Similar to Loudder and Behn (1995), to infer earnings usefulness we first define a model relating investor valuation to contemporaneous accounting information. Using a Bayesian framework, Lev (1989) demonstrates that the correlation between stock price revisions around earnings announcements and unexpected reported earnings is inversely related to the perceived deficiencies in

reported earnings that are adjusted for market participants.[1] The following model is adapted from Lev (1989, 187):

$$r_B = \frac{cov\left(P_1 - P_0, ERN_1 - E(ERN_1)\right)}{\sigma(P_1 - P_0)\sigma(ERN_1 - E(ERN_1))} = \frac{\sigma ERN_1}{\left(\sigma^2(ERN_1) + \sigma^2(\varepsilon_{PD})\right)^{1/2}} \qquad (3)$$

where

r_B = correlation between unexpected earnings and changes in price;
P = price of the firm at time t;
ERN = earnings of the firm at time t;
E = expectations operator;
$\sigma^2(ERN_1)$ = variance of "ungarbled" earnings;
$\sigma^2(\varepsilon_{PD})$ = variance of the adjustments made by investors for the perceived deficiencies (PD) in earnings.

The model demonstrates that if earnings management increases the perceived deficiencies in reported earnings, there should be, *ceteris paribus*, an inverse relation between the variance of the adjustments made to accounting earnings by investors and the strength of the correlation with stock returns.

$$\frac{\partial r_B}{\partial \sigma^2_{PD}} < 0. \qquad (4)$$

As the result demonstrates, the correlation between price changes and unexpected earnings will be a decreasing function of the amount of accounting error induced by methods which recognize accruals in time periods other than that in which the expected cash flows occur. Thus, usefulness is a decreasing function of the perceived amount of accounting error in reported earnings. Since it is difficult, if not impossible, to directly measure the market's perception of the

[1] Lev's model assumes that the market can completely correct for these deficiencies. If the market does not adequately adjust for the error induced by earnings manipulation, the correlation between returns and earnings should be even weaker than that forwarded by Lev.

accounting error in a firm's reported earnings, the second step in inferring usefulness empirically is to derive an appropriate operational proxy for the market's responsiveness to the reported earnings.

VAR Formulation

To develop an operational definition, we adapt the formulation employed by Callen and Segal (2004), which is based on the clean surplus relation from Feltham and Ohlson (1995 and 1996). They start with the definition of cum dividends equity return:

$\mathrm{Re}t_t = \left(\frac{P_t + D_t}{P_{t-1}}\right)$, hence

$\log \mathrm{Re}t_t = \log\left(\frac{P_t + D_t}{P_{t-1}}\right)$ or

$$r_t^c = \log\left(\frac{P_t + D_t}{P_{t-1}}\right)$$

$$= \log\left(P_t + D_t\right) - \log\left(P_{t-1}\right)$$

$$= p_t - p_{t-1} + \log\left(1 + \exp\left(d_t - p_t\right)\right), \quad (1)$$

where

r_t^c [2] = log cum dividend stock return at time t,
P_t = market value of equity at time t,
D_t = dividends at time t,
p_t = log market value of equity at time t,
d_t = log dividends at time t.

Campbell and Shiller (1988 and 1998) use a Taylor expansion to linearize the above equation to generate a log linear valuation equation:

[2] Lowercase denotes the log of uppercase letters

$$r_t^c \cong h + \rho p_t + (1-\rho) d_t - p_{t-1} \quad (2)$$

where

h is a constant
ρ is a constant error approximation term.

From here, substituting (2) into (1), replacing the approximation sign with an equality, and solving forward for price, we have

$$p_t = \frac{h}{1-\rho} + E_t\left[\sum_{j=o}^{\infty} \rho^j (1-\rho) d_{t+1+j} r^c{}_{t+1+j}\right] \quad (3)$$

Finally, the substitution of (3) into (2) yields the Campbell (1991) equation for unexpected change in current returns:

$$r_t^c - E_{t-1}\left(r_t^c\right) = \Delta E_t \sum_{j=0}^{\infty} \rho^j \left(\Delta d_{t+j}\right) - \Delta E_t \sum_{j=1}^{\infty} \rho^j r_{t+j}^c \quad (4)$$

Hypothesis Development

Adopting the Feltham Ohlson (1995 and 1996) clean surplus relation can transform the original Campbell (1991) model to an accounting based model. The clean surplus relation is defined as:

$BV_t = BV_{t-1} + X_t - D_t$,

where:

BV_t = book value of equity at time t
X_t = net income during time t
D_t =dividends at time t

In order to adapt the Callen and Segal (2004) proof of proposition 3 to our situation, we change the definition of acc_t to $acc_t = \log\left[1+\frac{(OX_t - C_t)}{OA_{t-1}}\right]$. Thus, our representation is defined as

$$acc_t = \log\left[1+\left(OX_t^{-RM} - RM_t - C_t\right)/OA_{t-1}\right]$$

where

OA_{t-1} = net operating assets at time t-1

C_t = free cash flow (cash flow from operations less cash investments) during time t

OX_t^{-RM} = operating earnings plus repairs and maintenance expenses during time t

RM_t = repairs and maintenance expenses during time t.

Hence, the change in expected returns can be expressed as:

$$r_t - E_{t-1}(r_t) = \Delta E_t \sum_{j=0}^{\infty}\left(ox_{t+j}^{-RM} - f_{t+j}\right) - \Delta E_t \sum_{j=0}^{\infty}\left(rm_{t+j}\right) - \Delta E_t \sum_{j=0}^{\infty}\left(ocf_{t+j}^{A}\right) - \Delta E_t \sum_{j=1}^{\infty}\left(r_{t+j}\right) \quad (5)$$

where

f_t = log risk free rate in period t
= log(1 + F_t)

F_t = the risk-free rate of interest in period t.

ocf_{t+j}^{A} = C_t / OA_{t-1}

ox_{t+j}^{-RM} = OX_t^{-RM} / OA_{t-1}

rm_{t+j} = RM_t / OA_{t-1}

r_t = the ex dividend log stock return at period t
= log(1 + $R_t + F_t$) − f_t

R_t = the simple ex dividend excess stock return in period t

Δ denotes the first difference operator, E_t is the expectations operator, and ΔE_t = $E_t(\cdot) - E_{t-1}(\cdot)$.

We can simplify the notation of equation (5):

$$r_t - E_{t-1}(r_t) = \Delta E_t \sum_{j=0}^{\infty}\left(ox_{t+j}^{-RM} - f_{t+j}\right) - \Delta E_t \sum_{j=0}^{\infty}\left(rm_{t+j}\right) - \Delta E_t \sum_{j=0}^{\infty}\left(ocf_{t+j}^{A}\right) - \Delta E_t \sum_{j=1}^{\infty}\left(r_{t+j}\right)$$

$$N_{r,t} = \Delta E_t \sum_{j=1}^{\infty}\left(r_{t+j}\right)$$

$$N_{ox,t} = \Delta E_t \sum_{j=0}^{\infty}\left(ox_{t+j}^{-RM} - f_{t+j}\right)$$

$$N_{rm,t} = \Delta E_t \sum_{j=0}^{\infty}\left(rm_{t+j}\right)$$

$$N_{ocf,t} = \Delta E_t \sum_{j=0}^{\infty}\left(ocf_{t+j}^{A}\right)$$

hence

$$r_t - E_{t-1}(r_t) = N_{ox,t} - N_{rm,t} - N_{ocf,t} - N_{r,t} \qquad (6)$$

Equation (6) can be used to implement a variance decomposition of the unexpected part of the change in market returns. If we take the variance on both sides of the equation, we find:

$$\text{Var}(N_{total}) = \text{Var}(N_{r,t}) + \text{Var}(N_{ox,t}) + \text{Var}(N_{rm,t}) + \text{Var}(N_{ocf,t}) -$$

$$2\text{Cov}(N_{ox,t}, N_{rm,t}) + 2\text{Cov}(N_{rm,t}, N_{ocf,t}) + 2\text{Cov}(N_{ocf,t}, N_{r,t}) - 2\text{Cov}(N_{r,t}, N_{ox,t}) \qquad (7)$$

We use equation (7) to assess the relative importance of the different components in driving equity returns. The higher the value of the variance (covariance) of each factor on the right hand side of equation (7), the more important the factor is in explaining the variance of unexpected returns.

The hypothesis tested (in alternative form) is:

> *H1: R&M expenditures variance explains the variance of unexpected returns (i.e., the R square statistic of a panel regression of returns on accounting data (including R&M) is higher than the R square statistic of a similar panel regression without R&M data).*

III. Research Design

We adopt a VAR model and Campbell's (1991) framework to decompose the firm-level stock return into expected return news, operating earnings without R&M expenses, R&M expenses, and operating cash flow information. This research design allows us to assess the importance of each of those sources of stock return variation for the firms in the sample and avoid the problem of classic value relevance literature of comparing the adjusted R square value of different samples to assess the value relevance of an accounting item. As Brown et al. (1999) show, scale effect problems occur in level regressions, making between-sample comparisons problematic. As a sensitivity check, we compare the

adjusted R squares of OLS regressions with and without R&M. Furthermore, we compare the adjusted R square of the regression for the sample with R&M expenses (1984-1994) with the adjusted R square of the regression including the same companies for a longer period (1984-2004) without R&M as an independent variable.

IV. Data source and sample selection procedure

To perform this analysis, we manually collected R&M data from individual firm 10-K reports dated 1984 to 1994. In addition, we also collected R&M information in 1995 to determine how many companies voluntarily disclosed R&M information after those disclosures were no longer mandated by the SEC. For the other required accounting data (1984-1994) we used the Compustat database and for monthly market value information we used the Center for Research in Security Prices (CRSP) database (1984-2004). We have a total of 6,866 firm-year observations for the period 1984-2004, and 2,653 firm year observations for the limited sample including R&M expenditures (1984-1994).

Following Callen and Segal (2004), we construct the variables for this study using data from Compustat. Furthermore, financial assets, financial liabilities, operating assets, and operating liabilities are computed as in Penman (2000). Net interest income and operating income are computed as in Begley and Feltham (2002). More specifically, we use the following data items from Compustat to construct the variables used in the analysis: cash and cash equivalents (DATA1), current assets (DATA4), current liabilities (DATA5), total

assets (DATA6), long-term debt (DATA9), depreciation and amortization (DATA14), interest expense (DATA15), income tax expense (DATA16), special items (DATA17), income before extraordinary items (DATA18), preferred dividends (DATA19), investments and advancements (DATA32), debt in current liabilities (DATA34), equity earnings (DATA55), stockholders' equity (DATA60), interest income (DATA62), preferred shares (DATA130), pretax income (DATA170), short term investments (DATA193), total liabilities (DATA181), and notes payable (DATA206).

We compute accrual earnings as [(DATA4-lagged DATA4)-(DATA1-lagged DATA1)] - [(DATA5-lagged DATA5)-(DATA34-lagged DATA34)] - DATA14. Cash Earnings as [DATA18 − Accrual Earnings21]. Net Interest Income as [(DATA62 − DATA15) * (1 − TAX) − DATA19 + DATA5522]. Net Operating Earnings (OX_t) as [DATA18 − DATA17 * (1 − TAX) − DATA19 − Net Interest Earned]. Financial Assets as [DATA32 + DATA193 + DATA123]. Financial Liabilities as [DATA9 + DATA34 + DATA130 + DATA20624]. Operating Assets as [DATA6 − Financial Assets]. Operating Liabilities as [DATA181 + DATA130 − Financial Liabilities]. Net Operating Assets as [Operating Assets − Operating Liabilities]. Net Financial Assets as [Financial Assets − Financial Liabilities]. Book Value (BV_t) as [Net Operating Assets + Net Financial Assets]. Free Cash Flow as [Net Operating Earnings − Change in Net Operating Assets]. Effective Tax Rate (TAX) as [DATA16/DATA170]. Return on Equity (ROE) as [(OX_t + net interest income)/BV_{t-1}]. The risk-free rate is set equal to the annualized three months US Treasury Bill rate.

V. Empirical results

To estimate the variance decomposition model highlighted above, it is necessary to specify the dynamics of the variables included in equation (6). Following previous literature (Campbell 1991; Campbell and Ammer 1993; Callen and Segal 2004; Vuolteenaho 2002) we adopt a log-linear vector autoregressive model (VAR).

We define $z_{i,t}$ as a vector of firm-specific state variables. This vector is assumed to follow a multivariate log-linear dynamic:

$$z_{i,t} = \Gamma z_{i,t-1} + \eta_{i,t}$$

where:

Γ, the VAR transition coefficient matrix, is assumed to be constant over time and over firms;

$\eta_{i,t}$, the error terms vectors, are assumed to have a variance-covariance matrix Σ and to be independent of all known variables at t-1.

We estimate a VAR model based on one lag each of the mean-adjusted log ex dividend annual excess return r_t, the mean-adjusted free cash flow ocf_t^A, the mean-adjusted log R&M expenses rm_t, and the mean-adjusted log operating earnings plus R&M expenses ox_t^{-RM}.

The VAR model can be described as a system of equations (variables are mean adjusted):

$$r_t = \alpha_1 r_{t-1} + \alpha_2 ocf^{A}_{t-1} + \alpha_3 rm_{t-1} + \alpha_4 ox^{-RM}_{t-1} + \eta_{1,t}$$

$$ocf^{A}_{t} = \beta_1 r_{t-1} + \beta_2 ocf^{A}_{t-1} + \beta_3 rm_{t-1} + \beta_4 ox^{-RM}_{t-1} + \eta_{2,t}$$

$$rm_t = \gamma_1 r_{t-1} + \gamma_2 ocf^{A}_{t-1} + \gamma_3 rm_{t-1} + \gamma_4 ox^{-RM}_{t-1} + \eta_{3,t}$$

$$ox^{-RM}_{t} = \delta_1 r_{t-1} + \delta_2 ocf^{A}_{t-1} + \delta_3 rm_{t-1} + \delta_4 ox^{-RM}_{t-1} + \eta_{4,t}$$

Table1 shows the distribution of the variables of interest for the model.

[Insert Table 1 about here]

Table 2 shows the results of the estimation of the parameters of the VAR model (one lag). The significant (two tails) parameter estimates for the variable LNRM_MEAN imply that the past one-year log of the mean of adjusted R&M expenses is statistically significant in explaining expected returns, operating earnings plus R&M expenses, actual R&M expenses, and actual operating cash flow. Expected returns and actual cash operating cash flow are low when past R&M expenses are high. Operating earnings plus R&M and actual R&M expenses are high when R&M expenses are high.

[Insert Table 2 about here]

Relative variance decomposition

We can then apply equation (7) to decompose the variance of the dependent variable:

[Insert Table 3 about here]

Var (N_{total}) = 0.974+0.087+0.018+0.036-2(0.025) +2(-0.016) +2(0.000)-2(-0.025)

= 1.116 –0.05-0.032+0.05=1.084

The variance of the R&M expenses news explains 0.0182/1.084, i.e. 1.7%, of the total variance of mean-adjusted returns news. The variance of the operating earnings news explains 0.0874/1.084, i.e. 8.0%, of the total variance of mean-adjusted returns news. The variance of the free cash flow news explains 0.0363/1.084, i.e. 3.3%, of the total variance of mean-adjusted returns news. The variance of the expected-returns news explains 0.974/1.084, i.e. 89.8%, of the total variance of mean-adjusted returns news.

Sensitivity check

To make sure the results are not dependent on the VAR model adopted, we check our findings running a panel regression for observations between 1984 and 1994[3], (the period of time when R&M expense data is available).

The model adopted is:

$$\mathrm{Re}t_i = \alpha + \beta * INCOMBEI_i + \gamma * RM\_YW_i + \delta * VWRETD_i + \eta * MKTVALUE_i + \varepsilon_i, \qquad (a)$$

We regress returns on income before extraordinary items and tax, R&M expenses while controlling for the market returns and the size of the company.

[3] Qualitative similar results are obtained running OLS regressions.

The R square of this model is 0.096 and the coefficient of the R&M variable is statistically significant at 5% level.

[Insert table IV about here]

We run the same panel regression without the R&M expenses on the whole sample (1984-2004), i.e. applying the model:

$$Ret_i = \alpha + \beta * INCOMBEI_i + \delta * VWRETD_i + \eta * MKTVALUE_i + \varepsilon_i, \quad (b)$$

We find a value of the R square equal to 0.043. Finally, we run the same panel regression as under model (b) but on the limited sample (1984-1994), excluding the R&M expenses:

$$Ret_i = \alpha + \beta * INCOMBEI_i + \delta * VWRETD_i + \eta * MKTVALUE_i + \varepsilon_i, \quad (c)$$

We find a value of the R square equal to 0.093. There is a significant, although small, contribution of the R&M expenses number in explaining the variation of the firms' market returns. The R square of the OLS regression for observations between 1984 and 1994 with R&M data is the highest among the three models adopted above; i.e. a loss in explanatory power of the independent variables occurs in the model when the R&M expenses are not available to investors.

What happened after 1994?

Since the introduction of the new regulation that eliminated certain supplemental financial schedules, firms can voluntarily disclose their R&M costs. We analyze 1995's 10K forms for the 352 randomly drawn firms in our sample. Out of 352 firms, only 14 decided to voluntarily disclose this accounting information (less than 4%) after the change in the regulation. Hence, it appears that this SEC change in regulation deprived not only in theory but also in practice the market participants of a value relevant piece of information that investors used when this disclosure was mandatory.

VI. Conclusion

In conclusion, this research provides evidence that SEC rulings 33-718, 34-35094, and IC-20766, which eliminated certain required supplemental financial schedules that all foreign and domestic issuers had to file with the SEC, deprive investors of value relevant information. More specifically, our results provide evidence that that the SEC rulings eliminate information that investors use in evaluating and assessing a firm's future cash flows because R&M information explains a portion of the variance of the market value of the firm. The results of this study suggest that R&M disclosures are value relevant, using both a variance decomposition model as well as a simple conditional regression model. Moreover, in 1995, the first year that the disclosure of R&M expenditures became optional, only 14 out of 352 firms in our sample (4%) decided to voluntarily disclose those expenses. Thus, it appears that most firms will only provide R&M expenditure information when it is required by the SEC. The

overall result is that the elimination of R&M expenditure information by the SEC will likely reduce the transparency of financial statements, make earnings management easier and reduce the quality of reported earnings numbers. To date, no research documents the use of R&M information by market participants. The current research, which fills a void in the literature, may lead the SEC to reconsider the decision to eliminate the R&M disclosures

References

Begley, J., and G. A. Feltham. 2002. The Relation between Market Values, Earnings Forecasts, and Reported Earnings. *Contemporary Accounting Research* 19(1): 1-48.

Beatty, A., S. Chamberlain, and J. Magliolo. 1995. Managing financial reports of commercial banks: the Influence of Taxes, Regulatory Capital and Earnings. *Journal of Accounting Research* 33(2): 231-261.

Beaver, W., C. Eger, S. Ryan, and M. Wolfson. 1989. Financial Reporting, Supplemental Disclosures and Bank Share Prices. *Journal of Accounting Research* (Autumn): 157-178.

Beaver, W., and M. Engle. 1996. Discretionary Behavior with Respect to Allowances for Loan Losses and the Behavior of Security Prices. *Journal of Accounting and Economics* 22: 177-206.

Brown, S., K. Lo, et al. 1999. Use of R square in accounting research: measuring changes in value relevance over the last four decades. *Journal of Accounting and Economics* 28: 83-115.

Callen, J. L., and D. Segal. 2004. Do Accruals Drive Firm-Level Stock Returns? A Variance Decomposition Analysis. *Journal of Accounting Research* 42(3): 527-560.

Campbell, J. Y. (1991). A Variance Decomposition for Stock Returns. *Economic Journal*(101): 157-79.

Campbell, J. Y., and J. Ammer. 1993. What moves the stock and bond markets? A variance decomposition for long-term asset returns. *The Journal of Finance* 48(1): 3.

Campbell, J. Y., and R. J. Shiller. 1988. Stock Prices, Earnings, and Expected Dividends. *Journal of Finance* 43(3): 661.

Campbell, J. Y., and R. J. Shiller 1998. Valuation Ratios and the Long-Run Stock Market Outlook. *Journal of Portfolio Management* 24(2): 11-26.

Collins, J., D. Shackelford, and J. Wahlen. 1995. Bank Differences in the Coordination of Regulatory Capital, Earnings and Taxes. *Journal of Accounting Research* 33(2): 263-291.

Feltham, G. A., and J. A. Ohlson. 1995. Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research* 11(2): 689.

Feltham, G. A., and J. A. Ohlson. 1996. Uncertainty resolution and the theory of depreciation measurement. *Journal of Accounting Research* 34(2): 209.

Healy, P. M., and J. M. Wahlen. 1999. A Review of the Earnings Management Literature and Its Implications for Standard Setting. *Accounting Horizons* 13(4): 365-383.

Hunton, J. E., R. Libby and C. L. Mazza. 2006. Financial Reporting Transparency and Earnings Management. *The Accounting Review* 81(1): 135-157.

Lev, B. 1989. On the usefulness of earnings and earnings research: Lessons and directions from two decades of empirical research. *Journal of Accounting Research* (Supplement): 193-201.

Liu, C., and S. Ryan. 1995. The Effect of Loan Portfolio Composition on the Market Reaction to and Anticipation of Loan Loss Provisions. *Journal of Accounting Research* (Spring): 77-94.

Liu, C., S. Ryan and J. Wahlen. 1997. Differential Valuation Implications of Loan Loss Provisions across Banks and Fiscal Quarters. *The Accounting Review* (January): 133-146.

Loudder **?,** and B. Behn. 1995. Alternative income determination rules and earnings usefulness. *Contemporary Accounting Research* (Fall): 119-159.

Moyer, S. 1990. Capital Adequacy Ratio Regulations and Accounting Choices in Commercial Banks. *Journal of Accounting and Economics* 12: 123-154.

Neter, J., W. Wasserman, and M. Kutner. 1990. *Applied Linear Statistical Models*. 3rd Edition. **City?**: Irwin.

O'Sullivan, K. 2007. The SEC Rules. CFO 23(8): 46-52.

Penman, S. H. 2000. *Financial Statement Analysis and Security Valuation*. New York, NY: McGraw-Hill.

Perry, S., and R. Grinaker. 1995. The Relationship Between Earnings Goals and Expenditures for Repairs and Maintenance. *Journal of Applied Business Research* 11(4).

Petroni, K. R. 1992. Optimistic Reporting in the Property Casualty Insurance Industry. *Journal of Accounting and Economics* 15: 485-508.

Roychowdhury, S. 2004. Management of Earnings through the Manipulation of Real Activities that Affect Cash Flow from Operations. Dissertation, University of Rochester.

Roychowdhury, S. 2006. Earnings Management through Real Activities Manipulation. *Journal of Accounting and Economics* 42: 335-370.

Schipper, K. 1989. Commentary on Earnings Management. *Accounting Horizons* 3(2): 91-102.

Scholes, M., G. P. Wilson, and M. Wolfson. 1990. Tax Planning, Regulatory Capital Planning, and Financial Reporting Strategy for Commercial Banks. *Review of Financial Studies* 3: 625-650.

Securities and Exchange Commission. 1994. Financial Statements of Significant Foreign Equity Investees and Acquired Foreign Businesses of Domestic Issures and Financial Schedules. SEC Release Nos. 33-7118; 34-35094; IC-20766; FR44.

Vuolteenaho, T. 2002. What Drives Firm-Level Stock Returns? *Journal of Finance* 57(1): 233-264.

Wahlen, J. 1994. The Nature of Information in Commercial Bank Loan Loss Disclosures. *The Accounting Review* (July): 455-478.

Table 1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
CASH	3665	157.9333	620.8934	0	13790.5
CA	3513	738.2811	2493.131	.312	41338
CL	3540	522.1607	1804.711	.164	36737
TOTASS	3665	2610.718	9931.44	4.224	198598.7
INCOMEBEI	3663	112.1243	452.0128	-7987	6582
PREFDIV	3663	2.991069	15.8968	0	356.8
DEBTINCL	3664	216.6652	2217.953	0	57123.9
PREFSHARES	3665	26.89495	135.4359	0	2341.7
PRETAXINC	3663	182.9532	670.8984	-9026	11623
TOTLIAB	3665	1659.061	7916.401	.164	185324.9
SHORTINV	3101	62.86788	334.1859	0	8099.875
SHROUT	3668	49738.96	98523.42	463	1309905
PRC	3668	26.96342	24.52621	-186.5	283.375
RET	3655	.0378768	.0948994	-.4565217	.7346939
RETX	3655	.0358003	.0951082	-.4565217	.7346939
VWRETD	3668	.0308304	.0327762	-.0263904	.106782
VWRETX	3668	.028012	.0327228	-.0290602	.1041463
EWRETD	3668	.0090647	.0219028	-.0346093	.0356767
EWRETX	3668	.0070209	.0219343	-.0361175	.0338755
RM__YW_	2916	93.50668	371.099	.04	5858.2
FREERATE	3668	6.036115	1.907507	3.02	9.53
R	3668	-.0274611	.0918975	-.6436838	.4784173
OX	3663	110.7709	466.0638	-16402.61	6582
XPLUSRM	2916	204.564	686.6712	-6116	10425.2
FINASSET	3668	286.0108	958.2721	0	16667.25
FINLIAB	3668	961.6031	5824.398	0	143743.8
NETFINASS	3668	-675.5923	5426.703	-139474.4	8202.25
OPASS	3668	2322.572	9269.704	-37.715	187659.7
OPLIAB	3668	722.9736	3018.839	-7410	87870
NETOPASS	3668	1599.598	7153.52	-1906.875	173320.4
CHANGEOPASS	3315	105.1242	2435.771	-49976.8	117697.9
C	3315	8.238467	2378.861	-114890.8	47163.54
OCF	3313	-.0444278	1.474937	-80.57227	4.049078
RM	2653	.0743654	.2803758	-2.310606	8.993207
LNRM	2624	-3.047756	.8632997	-6.603963	2.19647
LNRM_MEAN	2624	1.000248	.2833278	-.720863	2.167366
OX_RM	2652	.200611	1.41698	-38.78514	51.52731
LNOX_RM	2544	-1.95681	.855205	-9.929016	3.942112
LNOX_RM_MEAN	2544	1.000414	.4372214	-2.015395	5.076184
OXMEAN	2914	1.029937	3.505604	-72.01998	45.74348
RMMEAN	2916	.9815944	3.895643	.0004199	61.49696
RM_MEAN	2653	1.00088	3.773564	-31.09833	121.0391
OX_RMMEAN	2653	.999678	7.062403	-193.3457	256.866
BOOKVALUE	3668	924.0056	2677.443	-519.733	42832

MKTVALUE	3668	2026.668	5541.537	0	95607.16
B_M	3662	.632835	.4923182	-3.58078	6.380766

Where: CASH is the value of cash, CA is current assets, CL is current liabilities, TOTASS is total assets, INCOMBEI is income before extraordinary items and tax, PREFDIV is preferred dividends, DEBTINCL is debt in Current Liabilities, PREFSHARES are preferred shares outstanding, PRETAXINC is pretax income, TOTLIAB is total liabilities, SHORTINV is short term investments, SHROUT is number of common shares outstanding, PRC is closing price of common stock, RET is the holding period return, VWRETD is the value-weighted return of the market (included distributions), RETX is return without dividends, VWRETX is the value-weighted return of the market (excluding dividends), EWRETD is the equal-weighted return of the market (included distribution), EWRETX is the equal-weighted return of the market (excluding dividends), RM_YW_ is the value of R&M expenses, FREERATE is the risk free rate of return, equal to the annualized three months US Treasury Bill rate, R is the ex dividend log stock abnormal return at period t as defined in the paper ($\log(1 + R_t + F_t) - f_t$), OX is operating earnings, XPLUSRM is operating earnings plus R&M expenses, FINASSET is financial assets, FINLIAB is financial liabilities, NETFINASS is net financial assets, OPASS is operating assets, OPLIAB is operating liabilities, NETOPASS is net operating assets, CHANGEOPASS is change in net operating assets, C is cash flow, OCF is operating cash flow, RM is the R&M value divided the net operating assets, LNRM is the natural log of RM, LNRM_MEAN is the mean adjusted natural log of RM, OX_RM is the operating earnings plus R&M expenses divided the net operating assets, LNOX_RM is the natural log of OX_RM, LNOX_RM_MEAN is the mean adjusted natural log of OX_RM, BOOKVALUE is the sum of net operating assets and net financial assets, MKTVALUE is the value of the firm on the market (number of shares outstanding times closing price PRC), B_M is book to market ratio (BOOKVALUE/MKTVALUE)

Table 2 Vector Autoregression for lags 1-1
Sample: 1986 to 1994

Equation	T	k	RMSE	"R-sq"	F	P
R_MEAN	2132	4	.9879082	0.0304	30850.35	0.0000
LNOX_RM_MEAN	2132	4	.2959858	0.9254	6599.767	0.0000
LNRM_MEAN	2132	4	.1351013	0.9830	1.970008	0.0965
OCF_MEAN	2132	4	.190727	0.0037	16.66349	0.0000

R_MEAN	Coef..	Std. Err	t	P>t	[95% Conf. Interval]	
R_MEAN L1	.0222597	.0212563	1.05	0.295	-.0194257	.0639451
LNOX_RM_MEAN L1	-.0302418	.0656729	-0.46	0.645	-.1590317	.0985481
LNRM_MEAN L1	-.1330399	.0684018	-1.94	0.052	-.2671814	.0011016
OCF_MEAN L1	-.0387822	.0990704	-0.39	0.695	-.233067	.1555026

LNOX_RM_MEAN	Coef..	Std. Err	t	P>t	[95% Conf. Interval]	
R_MEAN L1	-.0229144	.0063686	-3.60	0.000	-.0354037	-.0104251
LNOX_RM_MEAN L1	.5975136	.0196762	30.37	0.000	.558927	.6361001
LNRM_MEAN L1	.3883395	.0204938	18.95	0.000	.3481495	.4285294
OCF_MEAN L1	.0252925	.0296823	0.85	0.394	-.032917	.0835019

LNRM_MEAN	Coef..	Std. Err	t	P>t	[95% Conf. Interval]	
R_MEAN L1	-.0014188	.0029069	-0.49	0.626	-.0071195	.0042819
LNOX_RM_MEAN L1	-.0566533	.0089811	-6.31	0.000	-.074266	-.0390407
LNRM_MEAN L1	1.054423	.0093543	112.72	0.000	1.036079	1.072768
OCF_MEAN L1	.0790775	.0135484	5.84	0.000	.0525081	.1056469

OCF_MEAN	Coef..	Std. Err	t	P>t	[95% Conf. Interval]	
R_MEAN L1	-.0038717	.0041038	-0.94	0.346	-.0119195	.0041762
LNOX_RM_MEAN L1	.023786	.0126789	1.88	0.061	-.0010783	.0486504
LNRM_MEAN L1	-.031117	.0132058	-2.36	0.019	-.0570145	-.0052194
OCF_MEAN L1	-.0098359	.0191267	-0.51	0.607	-.0473448	.027673

Where: R_MEAN is the mean adjusted value of the abnormal return of the share of the company at time t, LNOX_RM_MEAN is the mean adjusted natural log of operating earnings plus R&M expenses, LNRM_MEAN is the mean adjusted natural log of R&M expenses, and OCF_MEAN is the mean adjusted value of operating cash flow.

Table 3 Covariance Matrix of Residuals

	R_MEAN	LNOX_RM_MEAN	LNRM_MEAN	OCF_MEAN
R_MEAN	.97413147			
LNOX_RM_MEAN	-.02527207	.08744325		
LNRM_MEAN	-.00584405	.02538268	.01821811	
OCF_MEAN	.00062989	-.03068673	-.01618985	.03630855

Where: R_MEAN is the mean adjusted value of the abnormal return of the share of the company at time t, LNOX_RM_MEAN is the mean adjusted natural log of operating earnings plus R&M expenses, LNRM_MEAN is the mean adjusted natural log of R&M expenses, and OCF_MEAN is the mean adjusted value of operating cash flow.

Table 4 Panel Regression Models

Model a (sample 1984 – 1994):

$Ret_i = \alpha + \beta * INCOMBEI_i + \gamma$*RM__YW_$_i + \delta$*VWRETD$_i + \eta$*MKTVALUE$_i + \varepsilon_i$,

Model b (sample 1984 – 2004):

$Ret_i = \alpha + \beta * INCOMBEI_i +$ δ*VWRETD$_i + \eta$*MKTVALUE$_i + \varepsilon_i$,

Model c (sample 1984 – 1994):

$Ret_i = \alpha + \beta * INCOMBEI_i +$ δ*VWRETD$_i + \eta$*MKTVALUE$_i + \varepsilon_i$

Variable	Model a	Model b	Model c
INCOMEBEI	9.698e-06**	3.118e-06	.0000108**
RM__YW_	-.00001385**		
VWRETD	.84780276***	.59585418***	.8458042***
MKTVALUE	-1.939e-07	-3.195e-07**	-9.03e-07**
R-square overall	0.0956	0.0433	0.0934
N of obs	2908	6825	2908

legend: * p<.1; **p<.05; *** p<.01

where: INCOMBEI is income before extraordinary items and tax, RM_YW_ is the value of R&M expenses, VWRETD is the value weighted market returns with dividends, and MKTVALUE is the value of the firm on the market.