THE TIMING OF REAL ACTIVITIES-BASED EARNINGS MANAGEMENT[†]

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Abstract

We examine the within-year timing of real activities manipulation by firms to meet financial reporting benchmarks. We find evidence consistent with managers using price discounts to increase sales as well as overproduction to report lower cost of good sold late in the financial year to manage earnings upwards. Evidence is mixed on the use of discretionary expenses as an earnings management device. We also find that sales manipulation is associated with an increase in earnings persistence for a sample of firms likely to be managing earnings to avoid reporting a loss. Overall our results suggest that firms may be using different earnings management techniques to achieve different financial reporting aims.

Key words: Real activities manipulation; income smoothing; earnings persistence; earnings informativeness.

1. Introduction

In this paper, we investigate the timing of real activity manipulation by quarter. Real activity manipulation is defined as a *"departure from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations"* (Roychowdhury 2006, p. 337). Specifically, we compare the magnitude and direction of real activities manipulation in a firm's fourth fiscal quarter compared with other quarters. We also investigate whether real activities manipulation results in smoother reported earnings. Third, we examine the impact real activity manipulation has on properties of earnings. We compare the level of real activities manipulation for two samples of firms more likely to be engaging in earnings management (i.e., those firm that meet or exceed analyst forecasts, and those firms that just avoid reporting an accounting loss) with a full sample of firms. We employ real activity estimation models from Roychowdhury (2006) to estimate the unexpected level of real activity manipulation.

Prior studies provide evidence that managers frequently engage in earnings management and that earnings management is used for the purpose of income smoothing (Healy and Wahlen 1999; Graham et al. 2005). Although prior survey findings indicate that managers prefer real activities manipulation to accrual manipulation (Graham et al. 2005), much of the earnings management research focuses on accounting choices (particularly accruals). This study provides further evidence on the nature and consequences of real activities based earnings management, and in particular focuses on the timing of real activities manipulation.

There is limited evidence on real activities manipulation. This is due to the difficulty in measuring real activities manipulation. Graham et al. (2005) report that managers prefer to manipulate earnings through real economic actions rather than accounting numbers, and also that managers care about quarterly earnings performance. Moreover, Bruns and Merchant (1990) state that managers perceive earnings management through real activities is more ethical than accrual-based earnings management. It is therefore important to study real activities manipulation due to the possibility that managers use it more frequently than accrual manipulation in practice. Cohen et al (2007) examine the use of advertising activities, and find evidence consistent with the reduction of advertising expenditure to meet the goals of avoiding losses, avoiding earnings declines, and meeting security analysts' forecasts. Cohen and Zarowin (2008) examine both accrual and real-transactions based earnings management around seasoned equity offerings, and find that firms use both types of earnings management.

We find the following evidence. For our sample of suspect firm-years that have just avoided reporting a loss, the level of sales manipulation is highest in quarter 4 (and next highest in quarter 1), consistent with our expectations. A similar pattern is observed for earnings management through abnormal production costs; such costs are highest in quarter 4 for our suspect firm-year sample (for firms avoiding a loss), consistent with these firms 'overproducing' in order to achieve desired earnings outcomes. This pattern is not repeated for a sample of firms that are classified as suspect due to just meeting or exceeding analyst forecasts. Our evidence on earnings management through the

manipulation of discretionary expenses is mixed; we do not find consistent evidence that abnormal discretionary expenses are lowest in the latter quarters for our sample of suspect firm-years. Rather, the evidence suggests that firms use real activities and accruals management to achive different financial reporting outcomes.

We also examine whether real activities manipulation is associated with income smoothing. Tests of earnings persistence indicate differences between our full sample and our samples of suspect firm-years. Earnings persistence coefficients for our suspect firm-year sample (of firms that just avoid a loss) are quite different to those for the full sample and the sample of firms meeting beating analyst forecasts. We find that sales manipulation is associated with an increase in earnings persistence, but this result is not robust to controlling for accruals manipulation.

Our paper contributes to the growing evidence of real activities manipulation. We provide evidence on the intra-year properties of real activities manipulation, and demonstrate that accruals management and real activities management are not used as complimentary earnings management tools by managers. Our results also provide evidence on the association between real activities manipulation and earnings persistence.

2. Background and Prior Literature

Earnings management occurs "when managers use judgement in financial reporting and in structuring real economic transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence

contractual outcomes that depend on reported accounting numbers" (Healy and Wahlen 1999, p. 368). Many previous earnings management studies focus on managers' attempts to exercise their discretion with respect to accounting choices and estimates allowed under Generally Accepted Accounting Principles (GAAP) (see for example Healy and Wahlen 1999; Kothari 2001 for a review of this evidence). Despite the possibility that managers attempt to manage earnings by structuring actual transactions, there are a relatively small number of studies examining the aspect of managerial intervention, compared with accruals manipulation.

Real activities manipulation is defined as "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations" (Roychowdhury 2006, p. 337). This particular type of earnings management affects both the cash flow and accrual components of earnings. Real activities manipulation can be conducted through the acceleration of sales, alteration in shipment schedules, delaying research and development, advertising and maintenance expenditures, and overproduction of products, which can either increase revenue or decrease expenses (Dechow and Skinner, 2000; Graham et al., 2005; Roychowdhury 2006).

Accounting earnings are important for valuation as well as for contracting purposes in assessing the performance of underlying business activities and predicting the pattern of future earnings (Palepu and Healy 2007; Watts and Zimmerman 1986). Investors typically rely on earnings more than any other summary measures of firm performance

such as dividends, cash flows, revenue and variants of earnings before interest, tax, depreciation and amortisation (Francis et al. 2004; Graham et al. 2005). Hence, low quality of earnings information impairs the efficient flows of capital between firms and investors, and creates firm-specific information risk (Francis et al. 2004; 2005).[1]

Investors typically prefer smoother income to highly volatile reported income over time as smoother income facilitates the prediction of future earnings of a firm (Graham et al. 2005; Hunt et al. 2000; Lambert 1984; Tucker and Zarowin 2006). To meet investors' preferences, managers may deliberately intervene in the financial reporting process or undertake real activities to manage earnings (Barnea et al. 1976; Beidleman 1973; Copeland 1968; Ronen and Sadan 1981; Trueman and Titman 1988).

Prior studies identify several incentives inherent for earnings management. Dechow and Skinner (2000), Imhoff (2003), and Graham et al. (2005) claim that incentives such as contractual incentives and capital market incentives play an important role in earnings management practice, and the incentives could motivate managers to delay or conceal bad news for their own self-interests.[2] As discussed, managers claim that they prefer real activities management to accrual management and they state that real activities

[1] Firm-specific information risk is defined as a risk that firm-specific information including accounting information (i.e. the accrual component of earnings) that is critical to investor pricing decisions is of poor quality (Francis et al. 2005). Typically, investors evaluate the value of a firm on the basis of the level of current and future cash flow from operations. Additionally, the accrual component of earnings typically provides the 'ballpark' information of how much a firm will convert the accruals into cash in the future time to investors. Hence, the poor quality of accruals provides systematic risk to uninformed investors, which consequently creates firm-specific information risk.

[2] Graham et al. (2005) specifically identify several types of management incentives in meeting earnings benchmarks: (1) building credibility with the capital market; (2) maintaining or increasing the stock price; (3) the external reputation of the management team; (4) conveying the future growth prospects to investors; (5) maintaining or reducing stock price volatility; (6) assuring customers and suppliers that the business is stable; (7) helping employees to achieve bonuses; (8) achieving or preserving a desired credit rating; and (9) avoiding violation of debt-covenants.

management is more ethical than accruals management (Bruns and Merchant 1990; Graham et al. 2006). Accrual-based earnings management may also be more likely to be subject to auditor scrutiny.

2.1. Real Activities-Based Earnings Management

This study investigates three types of real activity manipulation: (i) sales manipulation, (ii) production cost manipulation, and (iii) discretionary expense manipulation, consistent with Roychowdhury (2006). Sales manipulation is defined as managers' attempts to temporarily increase sales during the year by, for example, offering more favourable conditions and terms than usual. This is likely to increase sales volume, but cash flow from operations would be lower than expected (given the level of sales), as the additional sales are at a lower profit margin.

Discretionary expense manipulation is defined as managers' attempts to reduce discretionary expenditures such as Research and Development (R&D) and Selling, General and Administrative Expenses (SG&A) to increase the cash flow component of earnings (Roychowdhury 2006). For instance, a firm may attempt to manipulate discretionary expenses by reducing expenditures on R&D and SG&A to increase earnings. However, it is also possible that managers utilise discretionary expense manipulation to manage earnings downwards. Cohen et al (2007) find evidence that firms decrease their advertising expenditure to meet financial reporting benchmarks.

Roychowdhury (2006) defines production cost manipulation as managers' attempts to overproduce products or services rather than to meet expected demand of products or services to decrease cost of good sold or cost of service expense (operating margins). Specifically, firms attempt to abnormally increase production levels to spread more fixed overhead costs over a large number of units produced, thus achieving lower fixed costs per unit. This leads to lower reported cost of goods sold or service expense and thus higher reported income due to the improvement of operating margins.

Many prior studies focus on accrual-based earnings manipulation, possibly as it is easier to detect than real activity manipulation. Accrual manipulation (compared to fraudulent financial reporting) is limited to the 'flexibility' in GAAP, whereas the extent of real activity manipulation can be much broader and can vary significantly depending on the complexity of a firm's business and the size of a firm. Graham et al. (2005) investigates factors that motivate decisions concerning reported earnings and corporate disclosures by conducting surveys and interviews. They show that managers are inclined to take real economic actions rather than exploiting the given flexibility in GAAP to beat earnings targets.[3] More specifically, 80% of survey participants respond that they would decrease discretionary expenditure on R&D, advertising, and maintenance to meet earnings targets. Some 55.3% of the participants respond that they would delay starting a new project to meet an earnings target, even though such actions may cause a small reduction

[3] In Graham et al. (2005), survey participants report that they particularly use real transaction manipulation to manage earnings because auditors cannot readily challenge real transaction manipulation relative to accrual manipulation. Moreover, since the accounting scandals such as Enron and WorldCom firms tend to assure stakeholders that there is no accrual-based earnings management.

in long-term firm value.[4] This suggests that earnings management is also driven by real activities manipulation.

Roychowdhury (2006) attempts to develop empirical models to estimate "normal" levels of cash flows from operations (CFO), production cost, and discretionary expenses. He investigates whether real activities-based earnings management is used to meet or exceed common earnings benchmarks, and attempts to determine whether factors such as institutional ownership, leverage, short-term creditors and analyst forecasts affect the nature and extent of real activities manipulation. Roychowdhury finds that the real activities-based earnings management devices are used in improving reported margins, meeting or beating earnings benchmarks, and to avoid reporting losses. Additionally, he also finds that institutional ownership, industry membership, and short-term suppliers are negatively related to the extent of real activity manipulation.

Our primary tests concern the timing of real activities management. Prior research on real activities manipulation uses annual data. We expect that the intensity of activities manipulation will occur in the fourth quarter of a financial year, as managers are likely to have more precise information about "pre-managed" earnings than earlier in the year. Givoly and Ronen (1981) observe that the absolute value of earnings per share (EPS) and sales figures in the fourth fiscal quarters deviate significantly from the 'normal' level of the figures, estimated as the mean of the absolute value of the figures in the first three

[4] This is consistent with an argument from Myer et al. (2007) who note that CEOs and CFOs are more likely to focus on short-term goals and do not ponder on the long-term implication of current-period decisions, possibly due to the relatively short tenures (i.e. 2 to 5 years), increasing capital market pressures, and equity-based compensation arrangements.

quarters. They conclude that managers attempt to manipulate EPS and sales figures in the fourth quarter to smooth earnings. Likewise, Zang (2005) provides evidence that managers tend to use real activity manipulation to manage earnings upward in the fourth quarters.[5] Additionally, quarterly financial data is important as managers focus on a series of quarterly reported financial results as well as the annual results (Givoly and Ronen 1981; Graham et al. 2005; Myers et al. 2007).

We frame our predictions by way of the following research questions:

RQ1: *Do real activity manipulations occur more in the fourth quarter than other quarters?*

RQ2: *Do firms use real activity manipulations to smooth the stream of reported earnings?*

3. Sample and Data

We obtain quarterly financial data for sample firms from the Compustat combined industrial quarterly file from 1992-2006. Quarterly data from 1988 to 2006 are used to estimate expected real activities and expected accruals and therefore to measure unexpected real activities and accruals. We exclude financial service, transportation, and utility industries from the sample. Financial services firms present difficulties in estimating both expected accruals and real activities.

[5] Zang (2005) uses R&D expense manipulation, SG&A expense manipulation, production cost manipulation, and gains on asset sales manipulation as proxies for real transaction manipulation.

The time-series of reported income can be smooth due to stable economic conditions in the business rather than managerial intervention. To mitigate this effect, we exclude transportation and utility industries as these industries are highly regulated by government. We estimate real activities management by industry-quarter and exclude any industry that has less than 10 observations in a quarter. To minimise the effect of outliers, we winsorise the top and bottom one percent of the distribution of variables used in our regression analysis. Our final sample consists of 26,183 firm-year-quarter observations from 1992 to 2006.

3.2. Estimation Models

3.2.1. Estimation Models for Unexpected Real Activities

Following Roychowdhury (2006), we use time-series data to estimate expected levels of cash flows, production costs and discretionary expenses. This then allows us to estimate three main types of real activity manipulation, sales manipulation ($UXCFO_{qt}$), discretionary expenditures manipulation ($UXDEX_{qt}$), and production cost manipulation ($UXPROD_{qt}$).

We estimate $UXCFO_{qt}$ assuming normal cash flow is a linear function of sales and change in sales in the current quarter (see Roychowdhury 2006 and Dechow et al. 1998). $UXCFO_{qt}$ captures sales manipulation through managers' real economic actions. Roychowdhury (2006, p. 340) gives an example of this manipulation as "managers' attempts to temporarily increase sales during the year by offering price discounts or more

lenient credit terms." Sales manipulation (e.g., accelerating sales from the next financial year into the current year by offering 'limited-time' price discounts) temporarily distorts the true condition of a firm's operational activities even though sales improve the current-period earnings level. Consistent with Roychowdhury (2006), we argue that the temporary additional sales through, for example, channel stuffing or price discounts or more lenient credit terms increase profits. However, it would eventually lower cash flow relative to profits due to the lower profit margins on the 'additional' sales. Following Dechow et al. (1998) the following model is used to estimate expected cash flow from operations:

$$CFO_{qt}/A_{qt-1} = \beta_0 + \beta_1(1/A_{qt-1}) + \beta_2(S_{qt}/A_{qt-1}) + \beta_3(\Delta S_{qt}/A_{qt-1}) + \varepsilon_{qt}. \qquad (1)$$

where CFO_{qt} is cash flow from operations in the current quarter, A_{qt-1} is total assets at the end of the previous quarter; S_{qt} is sales during the current quarter; and ΔS_{qt} is current quarter sales less previous quarter sales. For every industry-quarter, unexpected cash flow from operations at the end of current quarter ($UXCFO_{qt}$) is the difference between the actual CFO and expected CFO estimated from equation (1).[6] Consistent with Roychowdhury (2006), as discussed above, we expect negative unexpected cash flows from operations ($UXCFO_{qt}$) for firms engaging in upward earnings management.

The expected level of production costs are estimated assuming a linear function of contemporaneous sales and expenses (Dechow et al. 1998; Roychowdhury 2006). Production costs are calculated as the sum of cost of goods sold (COGS) and the change

[6] Consistent with Roychowdhury (2006) we include both an unscaled and scaled intercept.

in the level of inventory. Excessive production costs would eventually lower cash flow from operations relative to sales. To estimate the unexpected level of production cost, we first estimate the expected level of COGS and inventory growth:

$$COGS_{qt}/A_{qt-1} = \beta_0 + \beta_1(1/A_{qt-1}) + \beta_2(S_{qt}/A_{qt-1}) + \varepsilon_{qt}. \quad (2)$$

$$\Delta INV_{qt}/A_{qt-1} = \beta_0 + \beta_1(1/A_{qt-1}) + \beta_2(\Delta S_{qt}/A_{qt-1}) + \beta_3(\Delta S_{qt-1}/A_{qt-1}) + \varepsilon_{qt}. \quad (3)$$

We define normal production costs as $PROD_{qt}/A_{qt-1} = COGS_{qt}/A_{qt-1} + \Delta INV_{qt}/A_{qt-1}$, using equations (2) and (3), and estimate the expected level of production costs. We combine equations (2) and (3) and estimate expected production costs from the following industry-quarter model:

$$PROD_{qt}/A_{qt-1} = \beta_0 + \beta_1(1/A_{qt-1}) + \beta_2(S_{qt}/A_{qt-1}) + \beta_2(\Delta S_{qt}/A_{qt-1}) + \beta_3(\Delta S_{qt-1}/A_{qt-1}) + \varepsilon_{qt} \quad (4)$$

where $COGS_{qt}$ is cost of goods sold at the end of the current quarter, deflated by lagged total assets; ΔINV_{qt} is the change in inventory at the end of the current quarter, deflated by lagged total assets; $PROD_{qt}$ is the sum of $COGS_{qt}$ and ΔINV_{qt}, deflated by lagged total assets; ΔS_{qt} (ΔS_{qt-1}) is the change of sales level in the current (previous) quarter.

For each industry-quarter, unexpected production costs ($UXPROD_{qt}$) is the difference between the normal production costs and the expected level of production cost using estimated coefficients from the corresponding industry-quarter model and the industry-

quarter's sales, change in sales, change in lagged sales and lagged total assets (equation (4)). Again, in line with the abnormal production costs argument of Roychowdhury (2006), firms engaging in upwards earnings management would be expected to display positive unexpected production costs ($UXPROD_{qt}$).

Discretionary expenses are calculated as the sum of R&D and SG&A expenses. In the U.S., R&D expenditures are required to be expensed as incurred, even if they may give rise to future economic benefit. SG&A expenses typically include discretionary items such as employee training, repair and maintenance, and travel. These discretionary expenditures are easily targeted by managers for earnings management purposes (Roychowdhury 2006; Graham et al. 2005). Reducing these expenses can also improve current period cash flows and thus yield higher than expected cash flow from operations (for a given level of sales). The following model is estimated for every industry-quarter:

$$DISEXP_{qt}/A_{qt-1} = \beta_0 + \beta_1(1/A_{qt-1}) + \beta_2(S_{qt-1}/A_{qt-1}) + \varepsilon_{qt}. \qquad (5)$$

where $DISEXP_{qt}$ is the sum of R&D and SG&A expenses in the current quarter and other variables are explained as above. For each industry-quarter, unexpected discretionary expense ($UXDEX_{qt}$) is the difference between the actual discretionary expense and the expected level of discretionary expense using coefficients estimated by the corresponding industry-quarter model and the industry-quarter's lagged sales and lagged total assets (equation (5)). We expect firms engaging in upwards earnings management to exhibit negative unexpected discretionary expenses ($UXDEX_{qt}$).

3.2.2 Estimation Model for Unexpected Accruals

We use the performance-adjusted forward-looking modified Jones model (following Kothari et al. 2005) to estimate the expected level of accruals, which is then used to calculate unexpected accruals ($UXTACC_{qt}$). We estimate the following model for each industry-quarter:

$$TACC_{qt}/A_{qt-1} = \beta_{0} + \beta_{1}((\Delta S_{qt} - \Delta REC_{qt})/A_{qt-1})) + \beta_{2}(PPE_{qt}/A_{qt-1}) + \beta_{3}(TACC_{qt-1}/A_{qt-2}) + \beta_{4}(ROA_{qt-1}/A_{qt-2}) + \beta_{5}(GROWTH_{qt}/A_{qt-1}) + \varepsilon_{qt}. \quad (6)$$

where $TACC_{qt}$ is total accruals in the end of the current quarter, measured as income before extraordinary items less cash flow from operations; $UXTACC_{qt}$ represents unexpected accruals at the end of the current quarter; ΔS_{qt} is the change in sales at the end of the current quarter, ΔREC_{qt} is the change in accounts receivable during the current quarter, and PPE_{qt} is gross property, plant and equipment at the end of the current quarter. Furthermore, $TACC_{qt-1}$, ROA_{qt-1}, and $GROWTH_{qt}$ represent total accruals at the end of the previous quarter, operating income in q_{t-1} divided by total assets in q_{t-1}, and growth in sales revenue for the following quarter ($Sales_{qt+1}/Sales_{qt}$), respectively.

For each industry-quarter, $UXTACC_{qt}$ is measured as the difference between $TACC_{qt}$ and expected $TACC_{qt,}$ estimated from equation (6). We expect to find positive unexpected total accruals ($UXTACC_{qt}$) for firms likely to be engaging in income increasing earnings management.

3.2.3 Income smoothing measures

We are interested in assessing the impact of any real activities manipulation on properties of accounting earnings. In particular, managers claim that they prefer a smooth pattern of earnings than an earnings stream with high variability (Graham et al. 2005). We adopt the income smoothing measure used in Tucker and Zarowin (2006), and estimate the correlation between the change in pre-managed income and the change in unexpected real activities using the five most recent quarters' earnings ($Corr(\Delta PMI, \Delta UXRAM)$. Unexpected real activities manipulations (*UXRAM*) is proxied by $UXCFO_{qt}$, $UXDEX_{qt}$, and $UXPROD_{qt}$. Pre-managed income (*PMI*) is the difference between income before extraordinary items and the sum of $UXCFO_{qt}$, $UXDISEXP_{qt}$, and $UXPROD_{qt}$.[7] We measure income smoothing by the positive correlation between the change in *PMI* and the change in the unexpected component of real activities. In particular, a firm with high positive correlation coefficient indicates that the firm has smoother reported income. Our income smoothing measure (*IS*) is computed by using a firm's reverse fractional ranking for real activity manipulation for each industry-quarter (two-digit SIC).[8] This procedure controls for industry and time effects. As suggested by Tucker and Zarowin (2006), the underlying assumption of this measure is that there is a series of underlying pre-managed income and managers use accrual and real activity manipulation to smooth the series of reported income. To test the impact of real activity manipulation on smoothing reported income we estimate the following models:

[7] Tucker and Zarowin (2006) use net income figures instead of income before extraordinary items. We use income before extraordinary items figures as Barnea (1976) documents that firms use extraordinary items to smooth earnings. Thus we control for this effect by using income before extraordinary items rather than net income.

[8] A fractional ranking is the raw rank divided by the number of observations. For instance, in the case of a fractional ranking procedure the fractional rankings of 1 and 5 among the numbers 1 to 5 are 0.2 and 1, respectively.

Benchmark Model (Model 1):

$$EPS_{qt+1} = \alpha_0 + \alpha_1(EPS_{qt}) + \varepsilon_{qt}. \quad (7)$$

Primary Model:

$$EPS_{qt+1} = \alpha_0 + \alpha_1(EPS_{qt}) + \alpha_2(IS(UXRAM_{qt})) + \alpha_3(IS(UXRAM_{qt})*EPS_{qt}) + \varepsilon_{qt}. \quad (8)$$

where EPS_{qt} is the earnings per share (adjusted for stock splits and stock dividends) for fiscal quarter *qt*; and EPS_{qt+1} is the earnings per share (adjusted for stock splits and stock dividends) for fiscal quarter *qt+1*.

The benchmark model (equation (7)) is the primary model (equation (8)) assuming zero real activity manipulation. The benchmark model shows the extent to which current quarter earnings persist in the following quarter, absent a consideration of the effect of real activities manipulation, whereas the remaining models show the persistence of earnings considering the effect of real activity-based earnings manipulation.

The coefficient of interest in equation (8) is α_3 (the coefficient on the interaction term $IS(UXRAM_{qt})*EPS_{qt}$). If α_3 is not statistically different from zero it suggests that real activities-based earnings management is not associated with earnings persistence. More specifically, if α_3 is positive (negative) and statistically significant, we can conclude that real activity-based income smoothing devices strengthen (lower) the persistence of earnings.

3.3 Suspect firm years

We use two common financial reporting benchmarks to identify firms most likely to engage in real activities manipulation. Our first benchmark relates to security analyst forecasts, and our sample of suspect firms includes all firms with earnings per share equal to or one cent greater than the last consensus analyst forecast prior to an earnings announcement ("analyst suspect firms"). There are 5,350 analyst suspect firms. Our second benchmark relates to firms avoiding reporting a loss. We group firms into intervals based on income scaled by total assets. "Earnings suspect" firm-years are those in the interval with annual income scaled by assets greater than zero, but less than 0.005, consistent with Roychowdhury (2006).[9] There are 570 earnings suspect firm years in our sample. Firms which fall into both the earnings and analyst suspect groups are excluded from our analysis.

Some firms will naturally fall into the 'suspect' grouping; for example, their income will fall just above zero absent any manipulation. Similarly, firms with earnings substantially above zero may have incentives to manage earnings down to create earnings 'slack' for subsequent reporting periods. However, we believe that the earnings interval just above zero is that most likely to contain firms that have managed earnings. As Roychowdhury (2006) notes, this approach lowers the power of our tests due to the small number of firms captured in our earnings interval, along with the firms in the interval who do not manage earnings upwards in order to beat the zero earnings threshold. However, in contrast to Roychowdhury (2006), we also include those firms whose earnings per share

[9] To test the quarterly pattern of real activity manipulation we need to identify the suspect firms on the basis of annual earnings as opposed to quarterly earnings. In other words we are interested in examining the quarterly pattern of manipulations for suspect firm-years.

meet or just beat analyst forecasts as another group who are also likely to manage earnings. We feel that this approach is the most appropriate in identifying the firms who are most likely engaging in real activity manipulation.

3.4 Descriptive statistics

Table 1 presents descriptive statistics for the full sample (Panel A) as well as for non-suspect (Panel B) and our two suspect sub-samples (Panels C and D for analyst suspect and earnings suspect firms respectively). Consistent with Roychowdhury (2006), market capitalisation and total assets are smaller for earnings suspect firm-year quarters than non-suspect quarters, but are larger for analyst suspect firms (larger firms are more likely to have an analyst following). Mean annual cash flow (scaled by total assets) is lower for earnings suspect firm-year quarters (3.3% of total assets for suspect firm-year quarters compared with 4.6% for non-suspect firm-years, and 5.9% for analyst suspect firm-years).

Table 1 also presents descriptive statistics of our real activities manipulation proxies. Mean and median sales manipulation ($UXCFO_{qt}$) is lower, in line with expectations for earnings suspect firms (mean $UXCFO_{qt}$ -1.0% of total assets), than non-suspect firm–year quarters (mean $UXCFO_{qt}$ 0.2% of total assets). However, the sales manipulation is larger for our analyst suspect firms (mean $UXCFO_{qt}$ 1.5% of total assets). Abnormal production costs ($UXPROD_{qt}$) are lower for analyst -suspect firms (mean $UXPROD_{qt}$ is 0.6% of total assets) than non-suspect firm-year quarters (mean $UXPROD_{qt}$ is 0.1% of total assets), but are highest for earnings suspect firms (0.9% of total assets). Mean unexpected

discretionary expenses ($UXDEX_{qt}$), however, are highest for earnings suspect firm-year quarters (0.3% of total assets) than non-suspect firm-year quarters (0.1% of total assets) and analyst suspect firms (-0.2% of total assets).

- - - INSERT TABLE 1 ABOUT HERE - - -

Table 2 presents the correlations between our variables (using both Pearson and Spearman correlations). Consistent with prior studies, accruals and cash flows from operations exhibit a strong negative correlation. The correlation between unexpected accruals and unexpected CFO is negative. As noted by Roychowdhury (2006), this is probably due to the fact that managers engage in accrual manipulation and real activity manipulation simultaneously, along with the bookkeeping aspect that some manipulation methods will have a positive effect on accruals and a negative effect on cash flows. Also consistent with Roychowdhury (2006), we find that the correlations between the total and abnormal levels of our four variables to measure real activity manipulation are positive.

- - - INSERT TABLE 2 ABOUT HERE - - -

4. Results

4.1 Timing of real activities manipulation by quarter

Our primary analysis involves the timing of real activities manipulation throughout the course of a year. Descriptive statistics by quarter are presented in Table 3. We provide

descriptive statistics for our full sample (Panel A), and our samples of suspect firm-years (Panel B and C for analyst and earnings suspect firms respectively).

- - - INSERT TABLE 3 ABOUT HERE - - -

We predict that the level of earnings management via real activities manipulation will be greatest in the fourth quarter, as managers will have more precise information about expected 'non-managed' earnings as the end of financial year approaches. Recall that greater earnings management implies lower $UXCFO_{qt}$ and $UXDEX_{qt}$, but a higher level of $UXPROD_{qt}$ and $UXTACC_{qt}$.

For our full sample (Panel A), sales manipulation ($UXCFO_{qt}$) is highest in quarter 1 (i.e., $UXCFO_{qt}$ has the lowest value in quarter 1), and sales manipulation is lowest in quarter 3 (i.e., both mean and median $UXCFO_{qt}$ is highest in quarter 3), with quarter 2 the next highest level of sales manipulation. For our sample of analyst suspect firm-year quarters, the mean and median values of our sales manipulation proxy is also highest in the first two quarters, which is not consistent with our predictions. For our sample of earnings suspect firms, the level of sales manipulation is highest in the fourth quarter, and differences in the mean and median level of sales manipulation between quarter 4 and other quarters is statistically significant. This is consistent with firms using sales manipulation to avoid reporting a loss.

Higher abnormal production costs ($UXPROD_{qt}$) are associated with income increasing earnings management. For the full sample, $UXPROD_{qt}$ is lowest in quarter 3 (i.e., most negative) (Table 3, panel A). This is consistent with managers not waiting until the final quarter of the year before 'overproducing' inventory for an expected level of demand in order in impact on earnings. For our sample of analyst suspect firm-year quarters (Panel B), mean and median abnormal production is lowest in quarter 4, and highest in quarter 1, which is not consistent with our income increasing earnings management hypothesis. However, the difference in the level of $UXPROD_{qt}$ between the fourth quarter and the other quarters is not statistically significantly. Once again, however, a different pattern emerges for our sample of earnings suspect sample, where mean and median $UXPROD_{qt}$ is highest in the further quarter. This is consistent with firms 'overproducing' in the final quarter to avoid reporting a loss.

Our final proxy for real activities-based earnings management is abnormal discretionary expenses ($UXDEX_{qt}$), our results are inconsistent with expectations. For the full sample, which includes those firms that are not likely to be engaging in earnings management behaviour, the mean value of $UXDEX_{qt}$ are lowest in quarter 4 (Panel A of Table 3). For our sample of analyst suspect firm-year quarters, i.e., those firms most likely to be engaging in earnings management behaviour, abnormal discretionary expenses are the lowest in quarter 3 and 2 (Panel B of Table 3). For our earnings suspect firms (i.e. those firms reporting a small profit), the mean and median $UXDEX_{qt}$ is lowest quarter 4, consistent with expectations.

Finally, for comparison purposes, we present results of estimating unexpected total accruals for our sample. $UXTACC_{qt}$ is not higher for our suspect firm-years than for the overall sample. Once again, this is consistent with firms using their discretion in reporting accounting accruals to increase earnings in order to meet or exceed a simple earnings benchmark (i.e. avoiding reporting a loss).

Our results show that firms use real activities for different purposes. Contrary to our expectations, we find that two suspect firm groupings use real activities to manipulate earnings in different directions, for differing purposes. Our earnings suspect firms use income increasing real activity manipulations to just meet the zero earnings threshold, whereas our analyst suspect firms, on average, use income decreasing real activity manipulations to walk their earnings down to the consensus analyst forecast. The implication of this result is that firms appear to have different motivations depending on what earnings target they are aspiring to, and therefore will use real activities to manage earnings in different directions.

4.2 Earnings persistence

Results of tests of the impact of real activities manipulation on income smoothing are presented in Table 4. Model 1 is our 'benchmark' model showing earnings persistence without controlling for any earnings management. For our full sample (Panel A), the earnings persistence coefficient is 0.28 (p <0.01). When we include additional variables in our estimation (models 2 through 7, Panel A), the coefficient on EPS consistently remains around 0.27 to 0.28. We repeat the analysis on our analyst suspect sample (Panel

B). The coefficient on *EPS* remains around 0.26, for both our benchmark model, and also when we include income smoothing variables.

For our sample of earnings suspect firms (Panel C) earnings persistence firm-year sample is -.122, suggesting that the earnings suspect firm year sample is different to the full sample and also the analyst suspect sample with respect to earnings persistence. When we include additional variables in our estimation (models 2 through 7, Panel C) the coefficient on *EPS* drops to a constant level of around -0.14 to -0.16, suggesting that the level of earnings for firms engaging in earnings management are transient and are likely to revert in the next period. This suggests that firms in the earnings suspect sample recognising revenues earlier, and expenses later, to meet the zero earnings threshold in one period, which then reverts in the following period.

Model 2 includes the impact of sales manipulation on earnings persistence. For the full sample and both suspect samples, the coefficient on *IS(UXCFO)*EPS* is not statistically different from zero. This suggests that sales manipulation does not affect the persistence of earnings. The effects of abnormal production are included in Model 3; for the full sample the coefficient on *IS(UXPROD)*EPS* is positive and significant (p <0.01); consistent with abnormal production costs having the effect of increasing the persistence of earnings. This evidence is consistent with firms using channel stuffing in order to provide a smooth stream of earnings. However the coefficient on *IS(UXPROD)*EPS* in the two suspect samples is not statistically significant. This result is not consistent with

suspect firms having different earnings persistence due to the effect of adjusting production costs.

- - - INSERT TABLE 4 ABOUT HERE - - -

The impact of abnormal discretionary expenses is presented as Model 4 in Table 4. For the full sample the coefficient in *IS(UXDEX)*EPS* is positive and statistically significant ($p<0.05$). Using the analyst suspect firm-quarter samples, the coefficient on *IS(UXDEX)*EPS* is also positive and significant ($p<0.05$), suggesting that higher abnormal discretionary expenses are associated with higher earnings persistence. The coefficient on *IS(UXDEX)*EPS* is not statistically significant for the earnings suspect sample. Overall our results suggest that firms may be using different earnings management techniques to achieve different financial reporting aims. Non suspect firms appear to use production costs to report a smooth stream of income figures; analyst suspect firms appear to use discretionary expenses to manage earnings *down* to meet, or just beat, analyst forecasts; and the earnings suspect firms appear to manage earnings *upwards* in order to meet the zero earnings threshold, but with a negative impact on the following years earnings.

The effect of accruals-based earnings management is also presented in Table 4 for comparison purposes. The coefficient of interest in Model 5 is on *IS(UXTACC)*EPS*, i.e. the incremental impact of unexpected accruals on earnings persistence. The coefficient on *IS(UXTACC)*EPS* is not statistically significant for any of our samples. This suggests

that the level of unexpected accruals does not alter the persistence of earnings for our sample firms (and for the suspect sub-samples). When we incorporate all of our real activity earnings management proxies (excluding unexpected total accruals) into our estimation (Model 6), only the coefficient on the unexpected production costs $IS(UXPROD_{qt})*EPS$ is significantly different from zero for the full sample (Panel A). For our analyst suspect sample, coefficients on unexpected expenses $IS(UXDEX)*EPS$ is positive and significant ($p<0.05$). None of the coefficients of interest are statistically significant in our earnings suspect sample (Panel C). When we include unexpected total accruals ($UXTACC_{qt}$) into our estimation (Model 7) to capture all our earnings management proxies, the coefficient on the incremental impact of unexpected production costs $IS(UXPROD)*EPS$ is positive and statistically significant ($p<0.05$). However, for our analyst suspect firms (Panel B), the coefficient on the incremental effect of unexpected discretionary expenses on earnings persistence $IS(UXDEX)*EPS$ is positive and significant ($p<0.05$), consistent with earnings management through discretionary expenses increases the persistence of earnings. None of the coefficients of interest for our earnings sample of firms are statistically significant when we estimate Model 7. Overall our results are mixed, in that there is no consistent evidence that firms are using real activities manipulation to smooth earnings, and that this earnings smoothing impacts on the persistence of earnings.

5. Conclusion

In this paper we examine the timing during a financial year of earnings management through real activities manipulation. For two samples of firms most likely to have engaged in earnings management, we are unable to provide consistent evidence that sales manipulation (measured by unexpected cash flow from operations) is highest in quarter 4. For a sample of firms just beating security analyst forecasts, sales manipulation is highest in quarter 3, suggesting that managers do not wait until the final fiscal quarter to implement actions consistent with their financial reporting aims. Similarly earnings management via abnormal production costs (consistent with overproduction or 'channel stuffing') is highest in the final quarter of the year for a sample of firms that just avoid reporting an accounting loss. Results are mixed for our final measure of real activities manipulation; abnormal discretionary expenses. For our sample of firms avoiding an accounting loss, abnormal discretionary expenses are lowest (i.e. the highest level of income increasing earnings management) in the final fiscal quarter. For the sample of firms just meeting analyst forecasts, discretionary expense earnings management peaks in the third quarter. Overall the evidence is consistent with real activities manipulation occurring in the final two quarters of a financial year, as this is likely when managers have a more precise understanding of what unmanaged earnings would be.

We also examine the association between real activities manipulation and income smoothing, as managers claim that they (i) undertake such manipulation and (ii) desire a pattern of earnings with low (rather than high) variability. Our evidence here is mixed. We show that the level of earnings persistence is different for our samples of suspect firm-years than for our full sample. There is also some evidence that firms engaging in

sales manipulation have higher earnings persistence, but that this effect is subsumed when we control for earnings management occurring via accrual decisions and estimations.

Overall, we find that firms engage in real activities manipulations in different ways depending on their financial reporting aims. Specifically, we find (i) non suspect firms use production costs in order to report a smooth stream of income over different periods; (ii) analyst suspect firms use real activities to manage earnings downwards to just meet analyst consensus forecasts, and to provide a smoother stream of income; and (iii) earnings suspect firms use upward real activities manipulations in order to meet or beat the zero earnings threshold, even though their reported income does not persist, and they fail to meet the zero earnings threshold, on average, in the following period. These results have implications for future research designs when examining the incentives firms have in engaging in earnings management practices.

Our findings should be interpreted with caution for two reasons as follows. First, the study assumes that there is market efficiency for tests of the association between income smoothing through real activities manipulation and the informativeness of earnings. If the capital market is inefficient, then the interpretation of findings from the tests of informativeness of earnings subject to income smoothing through real activities manipulation is unclear. Second, it is difficult to observe managers' discretionary behaviour in real activities management and accruals management; hence the estimation

models for real activities manipulation and accrual manipulation suffer from possible measurement errors.

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Table 1: Descriptive Statistics

Panel A: Full Sample

Variable	N	Mean	Std Dev	Minimum	Q1	Median	Q3	Maximum
LMVE	31852	5.997	1.608	2.258	4.822	5.916	7.065	10.806
LTA	33142	5.664	1.591	2.330	4.431	5.493	6.752	10.112
Sales	30721	0.270	0.139	0.044	0.173	0.245	0.337	0.842
IBEI	30719	0.007	0.034	-0.207	-0.001	0.012	0.025	0.088
CFO	29995	0.046	0.084	-0.334	0.003	0.045	0.097	0.275
UXCFO	29995	0.004	0.069	-0.295	-0.032	0.005	0.044	0.211
UXPROD	29208	0.000	0.046	-0.148	-0.028	0.002	0.028	0.150
UXDEX	30452	-0.003	0.051	-0.125	-0.038	-0.010	0.025	0.202
UXTACC	19245	0.001	0.042	-0.156	-0.023	0.000	0.022	0.164
SUSA	33145	0.161	0.368	0.000	0.000	0.000	0.000	1.000
SUSE	33145	0.017	0.130	0.000	0.000	0.000	0.000	1.000

Panel B: Non-suspect Firms

LMVE	26113	5.952	1.608	2.258	4.757	5.879	7.033	10.806
LTA	27222	5.656	1.595	2.330	4.411	5.487	6.747	10.112
Sales	25137	0.269	0.139	0.044	0.172	0.243	0.336	0.842
IBEI	25137	0.005	0.035	-0.207	-0.003	0.012	0.024	0.088
CFO	24530	0.043	0.085	-0.334	0.001	0.043	0.096	0.275
UXCFO	24530	0.002	0.070	-0.295	-0.034	0.004	0.042	0.210
UXPROD	23902	0.001	0.045	-0.148	-0.026	0.003	0.028	0.150
UXDEX	24933	-0.003	0.052	-0.125	-0.038	-0.010	0.025	0.202
UXTACC	15609	0.001	0.043	-0.156	-0.022	0.000	0.023	0.164

Panel C: Analyst Suspect Firms

LMVE	5192	6.280	1.590	2.289	5.155	6.144	7.294	10.794
LTA	5350	5.712	1.586	2.357	4.499	5.519	6.792	10.107
Sales	5057	0.277	0.140	0.044	0.177	0.253	0.345	0.840
IBEI	5056	0.014	0.028	-0.201	0.005	0.016	0.028	0.085
CFO	4955	0.059	0.079	-0.324	0.012	0.054	0.109	0.274
UXCFO	4955	0.015	0.065	-0.292	-0.021	0.012	0.053	0.211
UXPROD	4813	-0.006	0.046	-0.148	-0.034	-0.005	0.022	0.148
UXDEX	4996	-0.003	0.051	-0.124	-0.037	-0.009	0.027	0.195
UXTACC	3292	-0.002	0.041	-0.156	-0.026	-0.002	0.019	0.161

Panel D: Earnings Suspect Firms

LMVE	547	5.458	1.435	2.284	4.266	5.505	6.362	9.992
LTA	570	5.642	1.458	2.588	4.571	5.488	6.575	10.101
Sales	527	0.258	0.129	0.046	0.168	0.239	0.327	0.816
IBEI	526	0.000	0.019	-0.116	-0.006	0.002	0.009	0.075
CFO	510	0.033	0.058	-0.227	0.004	0.031	0.068	0.222
UXCFO	510	-0.010	0.062	-0.226	-0.045	-0.007	0.024	0.193
UXPROD	493	0.009	0.046	-0.147	-0.018	0.010	0.036	0.146
UXDEX	523	-0.006	0.051	-0.125	-0.040	-0.009	0.020	0.201
UXTACC	344	0.003	0.041	-0.124	-0.015	0.003	0.026	0.154

The sample period spans from 1992 – 2006. Analyst suspect firms (*SUSA*) are those firms whose EPS are the same as, or 1 cent higher than the latest analyst consensus forecast. Earnings suspect firms (*SUSE*) are those firms whose annual earnings are between 0% and 0.5% of total assets. All data is quarterly data sourced from Compustat. *LMVE* is the natural log of the market value of equity at the end of the quarter, *LTA* is the log of total assets, *Sales* is the level of sales, *IBEI* is the income before extraordinary items in the quarter, *CFO* is the cash flows from operations during the quarter, *UXCFO* is the level of unexpected cash flows from operations estimated from equation 1, *UXPROD* is the level of unexpected production costs estimated from equation 4, *UXDEX* is the level of unexpected discretionary expenses estimated from equation 5, *UXTACC* is the level of unexpected total accruals estimated from equation 6.

Table 2: Correlation Matrix

	Sales	IBEI	CFO	PROD	DISEXP	TACC	UXCFO	UXPROD	UXDEX	UXTACC
Sales		0.324	0.163	0.217	0.304	-0.045	-0.039	-0.033	0.073	-0.022
IBEI	0.397		0.533	0.078	-0.074	-0.172	0.430	-0.271	-0.115	**-0.009**
CFO	0.185	0.512		0.071	-0.102	-0.925	0.808	-0.268	-0.088	-0.457
PROD	0.330	0.174	0.191		-0.178	-0.048	-0.040	0.138	-0.132	**-0.009**
DISEXP	0.326	0.030	-0.076	-0.341		0.087	-0.090	-0.535	0.829	*-0.020*
TACC	-0.049	-0.193	-0.917	-0.133	0.081		-0.748	0.191	0.051	0.518
UXCFO	-0.036	0.417	0.774	-0.054	-0.054	-0.708		-0.326	-0.103	-0.489
UXPROD	-0.064	-0.306	-0.261	0.190	-0.527	0.180	-0.338		-0.635	0.216
UXDEX	0.095	-0.033	-0.067	-0.184	0.804	0.047	-0.066	-0.629		*-0.017*
UXTACC	-0.024	-0.085	-0.465	-0.031	-0.028	0.516	-0.509	0.227	-0.025	

This table reports pooled Pearson (Spearman) correlations above (below) the diagonal. Correlations significant at the 1% level are marked in normal typeface, correlations significant at the 5% level are marked in italics, and correlations not significant are marked in bold. Please see Table 1 for variable descriptions.

Table 3: Descriptive statistics for measures of real activities management

Panel A: Full Sample Unexpected levels of real activity manipulation by quarter

	UXCFO		UXPROD		UXDEX		UXTACC	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
Q1	0.0008	0.0015	-0.0002	0.0013	-0.0020	-0.0080	0.0006	0.0000
Q2	0.0036	0.0066	-0.0001	0.0021	-0.0027	-0.0103	0.0008	0.0000
Q3	0.0061	0.0105	-0.0007	0.0019	-0.0029	-0.0095	0.0017	0.0000
Q4	0.0037	0.0055	-0.0004	0.0019	-0.0035	-0.0102	0.0001	-0.0008
Pooled first three quarters	0.0035	0.0052	-0.0003	0.0018	-0.0026	-0.0092	0.0010	0.0000
Difference in mean and median of:								
Q4 and Q1	0.0030***	0.0040***	-0.0002	0.0006	-0.0015**	-0.0022**	-0.0005**	-0.0008***
Q4 and Q2	0.0002	-0.0011	-0.0003	-0.0002	-0.0008	0.0001	-0.0007*	-0.0008***
Q4 and Q3	-0.0024***	-0.0050***	0.0003	0.0000	-0.0005	-0.0006	-0.0016**	-0.0008**
Q4 and pooled first three quarters	0.0002	0.0003	-0.0001	0.0001	-0.0009	-0.0009	-0.0009***	-0.0008**

Panel B: Analyst Suspect Firm Sample Unexpected levels of real activity manipulation by quarter

	UXCFO		UXPROD		UXDEX		UXTACC	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
Q1	0.0050	0.0040	-0.0054	-0.0037	-0.0004	-0.0071	0.0035	0.0020
Q2	0.0140	0.0134	-0.0060	-0.0033	-0.0039	-0.0102	-0.0018	-0.0012
Q3	0.0203	0.0219	-0.0062	-0.0049	-0.0044	-0.0104	-0.0038	-0.0009
Q4	0.0165	0.0157	-0.0068	-0.0056	-0.0020	-0.0087	-0.0030	-0.0048
Pooled first three quarters	0.0134	0.0110	-0.0059	-0.0041	-0.0030	-0.0095	-0.0008	0.0000
Difference in mean and median of:								
Q4 and Q1	0.0115***	0.0117***	-0.0013	-0.0019	-0.0017	-0.0015	-0.0065***	-0.0067***
Q4 and Q2	0.0025*	0.0023	-0.0008	-0.0023	0.0019	0.0015	-0.0012*	-0.0036***
Q4 and Q3	-0.0038*	-0.0062**	-0.0006	-0.0006	0.0024*	0.0018	0.0008	-0.0039*
Q4 and pooled first three quarters	0.0031***	0.0047***	-0.0009	-0.0015	0.0009	0.0008	-0.0022***	-0.0048***

Panel C: Earnings Suspect Firm Sample Unexpected levels of real activity manipulation by quarter

	UXCFO		UXPROD		UXDEX		UXTACC	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
Q1	-0.0045	0.0002	0.0067	0.0096	-0.0067	-0.0069	-0.0007	-0.0010
Q2	-0.0015	-0.0046	0.0052	0.0056	-0.0018	-0.0098	-0.0032	0.0030
Q3	-0.0034	0.0033	0.0069	0.0061	-0.0024	-0.0063	0.0037	0.0001
Q4	-0.0203	-0.0177	0.0124	0.0129	-0.0097	-0.0113	0.0062	0.0055
Pooled first three quarters	-0.0031	-0.0001	0.0063	0.0075	-0.0035	-0.0077	-0.0001	0.0000
Difference in mean and median of:								
Q4 and Q1	-0.0157***	-0.0179***	0.0057	0.0033	-0.0030	-0.0044	0.0069*	0.0065*
Q4 and Q2	-0.0188***	-0.0131*	0.0072	0.0073*	-0.0078	-0.0014	0.0094*	0.0025
Q4 and Q3	-0.0169***	-0.0210**	0.0054	0.0068*	-0.0072	-0.0050	0.0025	0.0054
Q4 and pooled first three quarters	-0.0172***	-0.0176***	0.0061*	0.0054*	-0.0061	-0.0036	0.0063*	0.0055*

***/**/* significant at the 1%/5%/10% levels. This table reports the signed (*UXCFO*, *UXPROD*, *UXDEX* and *UXTACC*) mean and median values of real activity and accrual manipulation in each of the four quarters along with the pooled first three quarters. Differences in the mean (median) values are reported with the level of significance measured using a Kruskal-Wallis test. Untabulated results indicate that the variances of the observations are not equal, so the standard *t*- (*z*-) statistics are not appropriate. Analyst suspect firms are those firms whose EPS are the same as, or 1 cent higher than the latest analyst consensus forecast. Earnings suspect firms are those firms whose annual earnings are between 0% and 0.5% of total assets.

Table 4: Earnings Response Coefficients

Panel A: Full Sample							
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Intercept	-0.0007	0.0028	-0.0011	0.0020	0.0021	0.0086	0.0128
	(0.2993)	(0.0373)	(0.4360)	(0.1508)	(0.1268)	(0.0020)	(<.0001)
EPS	0.2805	0.2770	0.2763	0.2773	0.2776	0.2751	0.2737
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
IS(UXCFO)		-0.0072				-0.0081	-0.0101
		(0.0020)				(0.0013)	(0.0001)
IS(UXCFO)*EPS		0.0005				-0.0007	-0.0003
		(0.3397)				(0.3838)	(0.6839)
IS(UXPROD)			-0.0002			-0.0044	-0.0032
			(0.9444)			(0.0924)	(0.2325)
IS(UXPROD)*EPS			0.0016			0.0019	0.0023
			(0.0069)			(0.0807)	(0.0391)
IS(UXDEX)				-0.0058		-0.0067	-0.0067
				(0.0134)		(0.0067)	(0.0064)
IS(UXDEX)*EPS				0.0012		0.0002	0.0005
				(0.0311)		(0.8467)	(0.5772)
IS(UXTACC)					-0.0058		-0.0075
					(0.0138)		(0.0026)
IS(UXTACC)*EPS					0.0007		-0.0010
					(0.1683)		(0.2829)
Adjusted R-square	0.0782	0.0788	0.0786	0.0787	0.0786	0.0795	0.0801
N	13638	13638	13638	13638	13638	13638	13638

Panel B: Analyst Suspect Firms							
Intercept	0.0042	0.0053	0.0045	0.0059	0.0038	0.0089	0.0090
	(<.0001)	(0.0019)	(0.0219)	(0.0010)	(0.0426)	(0.0165)	(0.0302)
EPS	0.2757	0.2762	0.2642	0.2550	0.2762	0.2662	0.2615
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
IS(UXCFO)		-0.0023				-0.0029	-0.0038
		(0.4459)				(0.905)	(0.2849)
IS(UXCFO)*EPS		-0.0001				-0.0007	0.0005
		(0.8408)				(0.3536)	(0.6996)
IS(UXPROD)			-0.0010			-0.0012	-0.0017
			(0.7624)			(0.7296)	(0.6420)
IS(UXPROD)*EPS			0.0008			-0.0015	-0.0006
			(0.2563)			(0.2476)	(0.6821)
IS(UXDEX)				-0.0047		-0.0064	-0.0064
				(0.1447)		(0.0582)	(0.0582)
IS(UXDEX)*EPS				0.0019		0.0037	0.0038
				(0.0247)		(0.0165)	(0.0142)
IS(UXTACC)					0.0007		0.0008
					(0.8062)		(0.8246)
IS(UXTACC)*EPS					-0.0000		-0.0015
					(0.9914)		(0.2542)
Adjusted R-square	0.0196	0.0190	0.0193	0.0213	0.0188	0.0211	0.0208
N	2376	2376	2376	2376	2376	2376	2376

Panel C: Earnings Suspect Firms

Intercept	-0.0006	0.0026	-0.0023	-0.0005	0.0024	0.0033	0.0082
	(0.7280)	(0.5265)	(0.5119)	(0.8882)	(0.4954)	(0.7003)	(0.3796)
EPS	-0.1226	-0.1520	-0.1453	-0.1572	-0.1607	-0.1565	-0.1544
	(0.1479)	(0.1278)	(0.1499)	(0.1160)	(0.0917)	(0.1330)	(0.1401)
IS(UXCFO)		-0.0057				-0.0062	-0.0083
		(0.3801)				(0.4122)	(0.2809)
IS(UXCFO)*EPS		0.0016				-0.0000	-0.0028
		(0.6815)				(0.9884)	(0.6888)
IS(UXPROD)			0.0035			0.0011	0.0028
			(0.5830)			(0.8831)	(0.6997)
IS(UXPROD)*EPS			0.0019			-0.0042	-0.0074
			(0.7065)			(0.6521)	(0.4494)
IS(UXDEX)				-0.0004		-0.0019	-0.0016
				(0.9524)		(0.7812)	(0.8116)
IS(UXDEX)*EPS				0.0025		0.0052	0.0044
				(0.4986)		(0.4703)	(0.5486)
IS(UXTACC)					-0.0064		-0.0097
					(0.3127)		(0.1538)
IS(UXTACC)*EPS					0.0022		0.0047
					(0.4607)		(0.4252)
Adjusted R-square	0.0042	0.0003	-0.0019	-0.0017	0.0028	-0.0129	-0.0109
N	261	261	261	261	261	261	261

This table presents the coefficients (*p*-values) for tests on the association between income smoothing through real activity manipulation and earnings persistence. Model 1 assumes no real activity manipulation; models 2 – 5 examine manipulations in isolation, models 6 and 7 examine manipulations occurring simultaneously. Panel A reports results for the full sample, with Panel B reporting the results for firms whose EPS is the same as or 1 cent greater than the latest analyst consensus forecast, and Panel C reporting results for firms whose annual earnings are between 0% and 0.5% of total assets. *IS(RAM)* is the measured as the reverse fractional ranking of a firm's correlation between real activity manipulation and pre-managed income in each industry-quarter. See Table 1 for other variable definitions.