Errors in Estimating Unexpected Accruals in the Presence of Large Changes in Net External Financing

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ABSTRACT

We demonstrate that the articulation among accruals, cash flows and revenues which is typically assumed in tests of earnings management does not hold when large (positive or negative) external financing activities are present. Our study provides evidence that managers' "normal" operating decisions associated with net external financing activities are likely to lead to economically and statistically significant measurement errors in unexpected accruals. This is a serious concern given the frequency with which the partitioning variable used to identify instances of alleged earnings management is correlated with significant movements in net external financing. Simulation tests show that even at modest levels of net external financing changes, rejection frequencies for the null hypothesis of no earnings management rise dramatically. This result underscores the importance of additional specification tests being conducted to control for estimation biases in unexpected accruals associated with external financing. We suggest the use of a matched-firm approach using industry and external financing matches. Using this method, we demonstrate that prior conclusions about the existence of earnings management around open market repurchases (Gong et al. 2008) do not appear robust when attempts are made to control for the effect on unexpected accruals of large changes in net external financing.

1. Introduction

Earnings management has been the focus of extensive research in accounting. In order to measure the extent of managed earnings, researchers typically rely on estimates of unexpected accruals which are based on a presumed articulation between accruals and a firm's current period cash flows and/or near-term changes in revenues. While this research effort has provided numerous insights into the causes and consequences of earnings management, it is also widely accepted that the existing accruals expectation models do not work well in identifying instances of earnings management (Ball 2009).[1] Our paper adds significantly to these concerns by demonstrating analytically and empirically that the presumed articulation among accruals, cash flows and revenues does not hold in the event of significant net external financing changes. In such circumstances, commonly-used unexpected accruals measures contain economically and statistically significant measurement errors. Given the frequency with which material net external financing changes occur (Leary and Roberts 2005), our results also call into question conclusions where the alleged "stimulus" for earnings management is commonly associated with external financing activity.

A specific example of how measurement errors in unexpected accruals can be induced by external financing activity is provided by Ball and Shivakumar (2008), who examine the extent of earnings management around initial public offerings (IPOs). They suggest two fundamental concerns with prior evidence claiming that IPO firms manage earnings upwards around the IPO. First, they argue that researchers typically pay insufficient attention to reasons as to why such firms may not want to engage in earnings management and/or why earnings management is likely to be expected and hence, detected.[2] Second, and of more direct relevance to our analysis, Ball and

[1] Ball (2009 p. 281) argues that the burden of proof for establishing earnings management in academic research is extremely weak. He argues that models of expected accruals "are not built on credible economic models of why firms hold working capital. They thus are so poorly specified that they explain only a minor proportion of accruals".

[2] One exception is Shivakumar (2000), who argues that investors rationally undo the effects of earnings management occurring prior to a seasoned equity offering (SEO).

Shivakumar argue that a firm experiencing a large external financing inflow tends to use the received cash proceeds to increase its inventory and accounts receivable as a consequence of expanding its operations. These activities result in a dramatic increase in working capital, with the rate of change for working capital significantly exceeding that for revenues. Although current accruals of this type have nothing to do with earnings management (i.e., they reflect the rational investment of IPO proceeds in operating activities), these transactions would likely be identified by existing models of unexpected accruals as giving rise to income-increasing earnings management, even after controlling for the change in sales.[3] This is true irrespective of whether accruals are estimated from changes in successive balance sheets or from statements of cash flow.[4]

While specifically questioning prior evidence of IPO earnings management, the analysis of Ball and Shivakumar (2008) hints at a substantially wider issue, namely the effect of significant net financing changes on unexpected accrual measurement. For example, applying similar reasoning as Ball and Shivakumar, unexpected accruals models would likely categorize firms with large external financing cash outflows as engaging in income-decreasing earnings management. Many of the circumstances which give rise to expectations of possible earnings management are related to significant changes in net external financing, such as the sale of equity or debt, or significant adjustments by means of stock buybacks or debt reductions.[5] Moreover, significant changes in net external financing, whether debt or equity-related, are likely to be correlated with many other circumstances alleged to give rise to an incentive to manage earnings.

We therefore conduct a comprehensive investigation of the general effect of external

[3] Similarly, any attempt to pay-off pre-IPO operating liabilities is likely to be interpreted as income-increasing earnings management.

[4] This helps explain the finding in Ball and Shivakumar that the data underlying prior evidence of IPO earnings management (Teoh et al. 1998) show a 600.39% average increase in accounts receivable for the quartile of firms with the most overstated earnings.

[5] Fields et al. (2001) provide an extensive overview of much of this research. Studies with implications for capital market behaviour are also reviewed by Kothari (2001).

financing changes, where external financing refers to both debt and equity. Large net external financing events are reasonably common for Compustat firms. For example, in their analysis of firms' capital structures between 1984 and 2001, Leary and Roberts (2005) show that in 35,149 out of 127,308 firm quarters there is a large debt issue (16,021 cases), debt retirement (10,920 cases), equity issue (6,867 cases) or equity repurchase (5,723 cases). Moreover, these financing events are large, with the median value of the financing event to firm market capitalization in the four groups being 12%, 15%, 9% and 2% respectively. They are also frequent, representing 27.6% of all quarters, or just over once per calendar year on average.

We begin our analysis by examining the relationship between accounting accruals and a firm's net external financing. Accounting identities suggest that external financing and firm performance are two major contributors to the firm's change in net operating assets, which provide a comprehensive measure of total accruals (Dechow et al. 2008; Richardson et al. 2005). Because the change in non-cash working capital, which is a part of the change in net operating assets, forms the core of the most commonly used accruals measures (Dechow and Dichev 2002; Hribar and Collins 2002), both external financing **and** firm performance are positively associated with accounting accruals, regardless of the extent of any earnings management. If accounting accruals are correctly decomposed into their unexpected and expected components and if external financing is not associated with the identified stimulus of earnings management, the positive relation between external financing and accounting accruals would not produce measurement errors in unexpected accruals. However, we show that there is a significant positive correlation between estimates of unexpected accruals and external financing, indicating that the measurement error in unexpected accruals is positively associated with external financing.

By assuming that a firm's expected (i.e., normal) accruals are predicted by current period cash flows and near term changes in sales, commonly-used unexpected accruals models are likely to erroneously classify firms with large external financing cash inflows (outflows) as reporting positive (negative) unexpected accruals. To show these biases, we sort firms into quartiles each year based on net external financing, and compare the unexpected accruals measures across quartiles. We consider several of the most popular unexpected accruals models, namely the modified Jones model (Dechow et al. 1995), the Dechow-Dichev model (Dechow and Dichev 2002), the modification to the Dechow-Dichev model suggested by McNichols (2002), and the modified Jones model with a control for firm performance (Kothari et al. 2005).

We apply the framework outlined by McNichols and Wilson (1988) to estimate the bias induced by failing to control for external financing. The results suggest that the bias induced by external financing is economically significant, ranging from 0.2% to 3.5% of average total assets for different unexpected accruals measures. We then examine the efficiency of the following two approaches to mitigate the bias: (1) a regression-based approach that includes net external financing as an additional regressor in the unexpected accruals model; and (2) a matched-firm approach using industry and net external financing for the matching. We find that the unexpected accruals models are correctly specified when a control for external financing is introduced by the matched-firm approach, but not by the regression-based approach.

We then examine the potential impact of external financing on statistical inferences in tests of earnings management. First, we regress unexpected accruals on two indicator variables for large external financing. For unexpected accruals measures estimated without a control for external financing, the estimated coefficients on the indicator variables are all significant at the 1% level. We then conduct simulations to examine the type I errors for different unexpected accruals measures with 0%-100% of the sample contaminated by firms with large net external financing. We report the percentage of time in 250 simulated samples that the null hypotheses of non-negative and non-positive unexpected accruals are rejected. The rejection rate frequencies rise dramatically for unexpected accruals when there is no control for net external financing, even at low levels of contamination. Abnormal rejection rates persist even when net external financing is used as an additional regressor in the unexpected accruals models. In contrast, when an industry and net external-financing matched-firm approach is used, all unexpected accruals models are well specified. All of our results are qualitatively similar when we further decompose (overall) external financing into debt financing and equity financing.

External financing, especially external equity financing, is frequently argued to be a major stimulus for earnings manipulation (Graham et al. 2005). Accordingly, we recognize that an alternative interpretation of our results is that *current* period earnings of firms with large external financing cash inflows are systematically managed upwards, while *current* period earnings of firms with large external financing cash outflows are managed downwards (the financing-year EM hypothesis, hereafter). We therefore explicitly consider the likelihood that actual earnings management is a valid alternative explanation for our results.

To distinguish our estimation bias explanation from the financing-year EM hypothesis, we conduct a number of tests. Specifically, we find that predictions as suggested by the financing-year EM hypothesis are inconsistent with: (1) survey evidence in Graham et al. (2005) that managers are hesitant to employ within-GAAP accounting adjustments to manipulate earnings; (2) similar probabilities of meeting or just beating earnings benchmark in the financing year for firms with significant net financing cash inflows and outflows; (3) similar and even lower rates of mean reversion in operating performance measures for firms with large net external financing; (4) insignificant abnormal returns around earnings announcement dates for firms with significant net external financing. Collectively, this evidence suggests that our results are not a manifestation of earnings management in the *current* period of net external financing. We also conduct a battery of robustness checks to confirm our findings are not affected by the effect of changes in the cash balance and different cutoff points used to identify the partitions with high external financing cash inflows and outflows.

As a final step, we revisit a recent study that reports evidence of income-decreasing earnings management around share repurchases (Gong et al. 2008). Our evidence suggests that prior conclusions about the existence of earnings management in this context are not robust to controlling for the problem we have identified. Indeed, when using the matched-firm approach after controlling for the effect on expected accruals of significant net external (debt) financing movements, or the modification to the Dechow-Dichev model suggested by McNichols (2002), we find no statistically significant evidence of earnings management around open-market repurchases over a similar period to that examined by Gong et al.

In combination, our findings provide evidence that managers' "normal" operating decisions associated with net external financing lead to biased estimates of unexpected accruals and potentially erroneous statistical inferences identifying earnings management, even if earnings management is not present. Our research therefore complements recent studies that endeavour to improve the specification of tests of earnings management through the use of statement of cash flow data (Hribar and Collins 2002) and a control for firm performance (Kothari et al. 2005). Our study is also related to prior research that reports a significant relationship between unexpected accruals and several other firm characteristics, such as growth in long-term earnings (McNichols 2000), fixed asset structure (Young 1999) and changes in the operating environment over firms' life cycles (Liu 2008).

We demonstrate empirically how tests of earnings management can be biased due to net external financing changes, an event which is by definition associated with changes in net operating assets and expected accruals. Given the pervasiveness of external financing activities, our results suggest that caution should prevail in interpreting evidence of earnings management when the identified stimulus is supposed to be uncorrelated (or weakly correlated) with external financing, but the sample contains a significant portion of firms with large net external financing changes. In such cases, "evidence of earnings management" might simply be due to managers' "normal" operating decisions.

The remainder of this paper is organized as follows. Section 2 explores the relationship between net external financing and accounting accruals through accounting identities, and identifies the importance of controlling for external financing. Sample construction, descriptive statistics and correlation analysis are discussed in Section 3. Section 4 presents the results for tests of bias in earnings management associated with external financing, using simulations to evaluate external financing's influence on statistical inferences of earnings management. Section 5 employs additional tests to confirm our results are not a manifestation of earnings management in the *current* period of net external financing. A battery of robustness checks are reviewed in Section 6. Section 7 re-examines prior evidence of income-decreasing accruals management around share repurchases, and Section 8 concludes.

2. Motivation

2.1. Bias in the estimation of unexpected accruals

McNichols and Wilson (1988) and Dechow et al. (1995) suggest that an accrual-based test of earnings management can be interpreted as:

$$UEXAC^{*} = \beta * PART + \varepsilon \tag{1}$$

where $UEXAC^{*}$ is the true managed (unexpected) accruals, *PART* is a dummy variable that partitions the sample into two groups for which earnings management predictions are specified by the researcher, and ε is a random accruals error unrelated to the specific earnings management hypothesis.[6] The true unmanaged (i.e., expected) accruals, $EXAC^{*}$, can be interpreted as:

$$EXAC^{*} = EXAC + \eta \tag{2}$$

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[6] Note that the intercept term is omitted for notational convenience. In most research contexts, *PART* will be set equal to one in firm-years during which systematic earnings management is hypothesized (i.e., the event window) and zero during firm-years in which no systematic earnings management is hypothesized (i.e., the estimation window).

where *EXAC* is an estimate of $EXAC^*$ obtained by regressing observed accruals on a vector of variables (*X*) that are hypothesized to influence $EXAC^*$, and η is the measurement error reflecting the effect of omitted variables in the estimation of $EXAC^*$ as well as idiosyncratic variation. Given the fact that *UEXAC*, the estimate of $UEXAC^*$, is equal to accounting accruals minus *EXAC*, the correctly specified model for testing earnings management can be expressed as:

$$UEXAC = \beta * PART + \eta + \varepsilon \tag{3}$$

As the true unexpected accruals ($UEXAC^*$) and η are unobservable, tests of earnings management are normally characterized by the following regression for *UEXAC* with η omitted:

$$UEXAC = \hat{\gamma} * PART + \varepsilon \tag{4}$$

where

$$\hat{\gamma} = \beta + bias = \beta + \rho(PART, \eta) * \frac{\sigma_\eta}{\sigma_{PART}} \tag{5}$$

Equation (5) suggests that tests of earnings management can be biased owing to the omission of η, which captures the effect of omitted variables on the estimation of expected accruals. The direction of the bias depends on the sign of the correlation between *PART* and η, while the magnitude of bias depends on (1) the correlation between η and *PART*; (2) the standard deviation of η; and (3) the standard deviation of *PART*.

2.2. The relation between external financing and unexpected accruals

We explore the relation between external financing and accounting accruals through accounting identities using the framework proposed by Richardson et al. (2005) and Dechow et al. (2008). We start with the balance sheet identity:

$$\text{Total Assets} = \text{Total Liabilities} + \text{Owners Equity} \tag{6}$$

The most common financial liability is debt (D), while the most common financial asset is the balance of cash and short-term investments ($CASH$). Distinguishing financial assets and liabilities from operating assets and liabilities gives:

$$CASH + \text{Operating Assets} = D + \text{Operating Liabilities} + \text{Owners Equity} \quad (7)$$

We define net operating assets (NOA) as the difference between operating assets and operating liabilities, and denote owners' equity as E. Grouping the operating accounts on the left and the financial accounts on the right yields:

$$NOA = D + E - CASH \quad (8)$$

Note that the NOA expression on the left is the accrual accounting system's estimate of the net value of the firm's operations. Taking the first difference of equation (8) (with first difference denoted by Δ) yields:

$$\Delta NOA = \Delta D + \Delta E - \Delta CASH \quad (9)$$

We incorporate standard clean surplus assumptions for changes in equity and changes in debt:

$$\Delta E = NI + \Delta EQUITY, \quad (10a)$$

$$\Delta D = \text{Interest Expense} - \text{Interest Paid} + \Delta DEBT \quad (10b)$$

where NI represents net income, $\Delta EQUITY$ is net cash proceeds received from equity holders (equity issuances less dividends and repurchases), $\Delta DEBT$ is net noninterest cash inflow received from or paid to debt holders (debt issuances less debt repayments).

Assuming that interest expense is equal to interest paid, rearrangement gives a simplified representation of equation (9) and (10):

$$\Delta NOA = \Delta DEBT + NI + \Delta EQUITY - \Delta CASH \quad (11)$$

Our measure of net external financing ($\Delta XFIN$) is the sum of $\Delta DEBT$ and $\Delta EQUITY$.

Substituting yields:

$$\Delta NOA = \Delta XFIN + NI - \Delta CASH \qquad (12)$$

The expression ΔNOA on the left can be considered as a comprehensive measure of total accruals (see e.g. Dechow et al. 2008; Richardson et al. 2005), and decomposed into changes in current net operating assets (ΔCO) and changes in non-current net operating assets (ΔNCO). Commonly used measures of current accruals (*CACC*) and total accruals (*TACC*) are thus both part of ΔNOA. Equation (12) also suggests that external financing ($\Delta XFIN$) and firm performance (*NI*) are two main contributors to changes in net operating assets (ΔNOA), consistent with the correlations reported in Dechow et al. (2008, Table 2, p.550) of ΔNOA with $\Delta XFIN$ (0.545) and *NI* (0.261). Both are substantially higher than the correlation with $\Delta CASH$ (0.003).

Suppose that accruals are decomposed using a well-specified accruals expectation model. We then have:

$$UEXAC^{*} + EXAC^{*} + REST\_\Delta NOA = \Delta XFIN + NI - \Delta CASH \qquad (13)$$

where $REST\_\Delta NOA$ represents the remainder of ΔNOA, net of accounting accruals (*CACC* or *TACC*). In tests of earnings management where the identified stimulus is not supposed to be associated with external financing, we would not expect to observe significant correlation between the estimates of $UEXAC^{*}$ and $\Delta XFIN$.

However, our correlation analysis (see section 3) suggests that even if there is no systematic earnings management in the sample, we still observe a correlation between the estimated unexpected accruals (*UEXAC*) and $\Delta XFIN$ (correlation coefficients ranging from 0.05 to 0.21 for different measures of unexpected accruals). Recall that $UEXAC^{*}$ is equal to estimated *UEXAC* less the measurement error in the estimated expected accruals (η). Substantial correlation between *UEXAC* and $\Delta XFIN$ indicates that some portion of expected accruals is captured by η, which will bias tests of earnings management.[7]

Although unexpected accruals proxies (e.g., the Jones model or the modified Jones model) are widely-used in the literature, the potential bias induced by external financing has attracted little attention. One exception is Ball and Shivakumar (2008) who argue that prior evidence of earnings management in IPOs (e.g., Teoh et al. 1998) is unreliable and biased in favour of apparent upward earnings management due to the use of the IPO proceeds. Their analysis sheds light on the channel through which external financing influences *current* period accruals and its unexpected component.

Similarly, firms with large external financing cash inflows (whether from equity financing, debt financing or both) tend to expand their operations and investments in fixed assets, accompanied by investments in working capital to support growth. For example, designing, launching, and selling a new product requires a firm to not only build productive capacity through the purchase of fixed assets, but also to manufacture large quantities of inventory to reduce the probability of inventory shortage. Thus, the use of external financing for investments in working capital results in a faster rate of change in working capital than in revenues. As commonly used models typically assume expected accruals are a function of cash flows from operations and/or changes in revenues, estimates of unexpected accruals from these models can be biased due to external financing and the subsequent investment in net operating assets.

2.3. Controlling for external financing

Our analysis suggests the need to control for current period external financing in tests of earnings management. One approach is to expand the set of independent variables in widely-used regression models of expected accruals. In this spirit, we augment common accruals expectation models to include current period net external financing

[7] A similar analysis is applicable to the relation between unexpected accruals and firm performance (Kothari et al. 2005). Our paper adds to this literature.

as an additional regressor. An alternative method is to adjust a firm's unexpected accruals using an industry and Δ*XFIN*-matched firm approach. The matched-firm approach adjusts a firm's estimated unexpected accruals by subtracting the corresponding unexpected accruals of a firm matched on the basis of industry and current period Δ*XFIN*. This mitigates the likelihood that the estimated unexpected accruals are systematically non-zero (Kothari et al. 2005).

The relative efficacy of the matched-firm approach versus the regression-based approach is ultimately an empirical issue. Regression-based approaches assume stationarity of the relation through time or in the cross-section, and more importantly, impose linearity on the relation between external financing and expected accruals. On the other hand, the matched-firm approach does not impose any particular functional form on the relation between external financing and accruals, but simply assumes homogeneity in the relation between external financing and accruals for the sample and matched firm (i.e., the sample and matched firm, on average, have similar estimated unexpected accruals that are not attributable to the identified stimulus of earnings management).[8] Thus, the efficiency of these two approaches depends on how their corresponding assumptions are satisfied in the data.[9] As a result, we examine both approaches and compare their relative efficiency empirically.

3. Data and descriptive statistics

3.1. Sample composition

The data for this study are obtained from the COMPUSTAT Industrial Annual database for the period 1987-2006, as data from the cash flow statement are only

[8] An important issue associated with the matched-firm approach is whether it removes, in part, unexpected accruals motivated from the identified stimulus of earnings management, and thus reduces the power of tests of earnings management. It is true that matching on external financing by design can and will remove unexpected accruals that are motivated by external financing, thereby generating "abnormal" unexpected accruals rather than "total" unexpected accruals. However, the matching approach is designed to capture the earnings management effect that is beyond that attributable to external financing. If the incentive for earnings management of interest is not supposed to be associated with external financing, the use of Δ*XFIN*-matched unexpected accruals is an appropriate method to control for the misspecification of the unexpected accruals models associated with external financing.

[9] See Kothari et al. (2005) for a more detailed discussion on this issue.

available from 1987. Observations are deleted if any of the following conditions are met: (1) the primary industry classification is from the banking, life insurance, or property and casualty insurance industries; (2) book value of assets is less than $1 million dollars or missing;[10] (3) missing values for sales, or net income before extraordinary items. These restrictions reduce the sample to 136,095 firm-years.

Following Bradshaw et al. (2006), we measure the net amount received from external financing activities (Δ*XFIN*) as the sum of Δ*EQUITY* and Δ*DEBT*.[11] Δ*EQUITY* represents net cash received from the sale (and/or purchase) of common and preferred stock less cash dividends paid (COMPUSTAT annual data #108 less #115 less #127).[12] Δ*DEBT* represents net cash received from the issuance (and/or reduction) of debt (COMPUSTAT annual data #111 less #114 plus #301). We require the availability of COMPUSTAT data for each of the above variables, with the exception of Change in Current Debt (COMPUSTAT annual data #301), which is set to 0 if it is missing.[13] Bradshaw et al. (2006) find that COMPUSTAT typically backfills data for newly-listed public companies. As a result, Δ*EQUITY* primarily reflects both initial public offerings (IPO) and seasoned equity offerings (SEO), while Δ*DEBT* includes convertible debt, subordinated debt, notes payable, debentures and capitalized lease obligations. We scale Δ*XFIN*, Δ*EQUITY* and Δ*DEBT* by average total assets (COMPUSTAT item #6) so as to measure the amount of new financing activity relative to the existing asset base.

The distributions of our scaled financial variables are characterized by a small number of outliers (2,853 out of 136,095 firm-years), and so we follow the same procedure as Bradshaw et al. (2006) and eliminate observations with an absolute value greater than

[10] This ensures that average total assets are greater than $1 million to avoid small denominator problems.
[11] We use the statement of cash flow data to measure external financing variables, because the statement of cash flow data does not suffer from the limitations described for the balance sheet data (Hribar and Collins, 2002).
[12] We are unable to decompose common and preferred equity from the statement of cash flows, since Compustat does not provide this level of detail.
[13] This is consistent with Bradshaw et al. (2006), who also find that the availability of COMPUSTAT annual data #301 is very limited, in contrast to other variables.

one.[14] As a robustness check, we also employ an alternative measure of net external financing after controlling for change in cash (*i.e.,* Δ*XFIN2*), defined as Δ*XFIN* less the changes in cash and cash equivalents (COMPUSTAT annual data #274). As the results are generally similar, in the following we only report the main findings for Δ*XFIN*.

Finally, following Kothari et al. (2005), we exclude observations if the absolute value of total or current accruals scaled by average total assets exceeds one. Our final sample consists of 131,778 firm-year observations. For these firms we compute total and current unexpected accruals using the modified Jones model (with intercept) (hereafter, denoted *UEXAC_MJT* and *UEXAC_MJC,* respectively), unexpected current accruals from the Dechow–Dichev (2002) model and the modification thereof suggested by McNichols (2002) (denoted *UEXAC_DD* and *UEXAC_DDM*, respectively), total and current unexpected accruals from the modified Jones model with the intercept and *ROA* as an additional regressor (denoted *UEXAC_MJT_ROA* and *UEXAC_MJC_ROA,* respectively), and performance-matched total and current unexpected accruals as in Kothari et al. (2005) (denoted *UEXAC_PMJT* and *UEXAC_PMJC,* respectively). Following Hribar and Collins (2002), we use statement of cash flow data to construct total accruals (*TACC*) and current accruals (*CACC*).[15]

To mitigate the effect of outliers, we eliminate the top and bottom percentile of variables required as inputs to accruals expectation models, namely total accruals (*TACC*), current accruals (*CACC*), cash flows from operations (*CFO*), changes in revenues (Δ*REV*), gross property, plant, and equipment (*PPE*), and return-on-asset (*ROA*). The Appendix summarizes estimation of the different unexpected accruals measures. Table 1 reconciles the number of observations in the final sample with the

[14] This procedure makes sense on a priori grounds, because situations where individual financing components change by more than 100% of average total assets are clearly unusual cases that we do not want to weight excessively in our analysis. Our results are qualitatively similar if we winsorize the observations, or if we leave them in the analysis.

[15] Our results remain qualitatively and quantitatively similar when using balance sheet data in the same manner as Kothari et al. (2005).

data sources noting the effects of the various filters, and Table 2 summarizes the COMPUSTAT items used in constructing the variables.

Table 1 and Table 2 about here

3.2. Descriptive statistics

Table 3 reports descriptive statistics for the unexpected accrual measures and the external financing variables, as well as other firm characteristics. Note that all variables are scaled by average total assets to reflect their changes relative to the existing asset base, and are reported as percentages. As expected, the mean and median of the distributions of unexpected accruals are close to zero (by construction), except those for the performance-matched and Δ*XFIN*-matched unexpected accruals.

The positive mean values for Δ*XFIN*, Δ*DEBT* and Δ*EQUITY* of 4.34%, 1.37% and 2.97% respectively, suggests an overall tendency towards raising additional external financing. The medians, however, are all close to zero, indicating that the distributions of the three external financing variables are skewed to the right.

When decomposing Δ*NOA* into Δ*XFIN*, net income (*NI*) and Δ*CASH*, we find that changes in net operating assets are on average funded by external financing rather than retained earnings, as evidence by a positive mean of Δ*XFIN* (4.34%) and a negative mean of net income (-2.52%). However, Δ*XFIN*, net income and Δ*NOA* have similar variability, with standard deviations ranging from a low of 16.55% for Δ*XFIN* to a high of 20.05% for Δ*NOA*. Thus, changes in net operating assets are dominated by both Δ*XFIN* and net income (or *ROA* as in Kothari et al. 2005).

Table 3 about here

3.3. Correlation analysis and sorting on ΔXFIN

We initially compute Pearson and Spearman correlations among our sample variables.[16] As a natural consequence of utilizing a large dataset, most of the correlations are statistically significant. There is a positive correlation between Δ*XFIN* and unexpected accruals, indicating that firms with positive net external financing tend to have relatively high unexpected accruals. As expected, we observe a substantial difference between the correlation of unexpected accruals measures (with and without a control for external financing) and Δ*XFIN*. The Pearson (Spearman) correlations range from 0.05 to 0.21 (from 0.10 to 0.25). In contrast, the corresponding Pearson and Spearman correlations for unexpected accrual measures matched on Δ*XFIN* are close to zero.

The correlations of Δ*XFIN* and net income with different components of Δ*NOA* reveal additional insights on how external financing influences accounting accruals and estimates of unexpected accruals. The Pearson (Spearman) correlation of Δ*XFIN* with Δ*NOA* is 0.41 (0.43), higher than that of net income. However, when decomposing Δ*NOA* into Δ*CO* and Δ*NCO*, we find that the correlation between Δ*XFIN* and Δ*NCO* is substantially higher than the correlation between Δ*XFIN* and Δ*CO* (0.37 compared to 0.18 for Pearson correlation, and 0.35 compared to 0.23 for Spearman correlation). These correlations are indicative of financing and operating activities, whereby capital investments in net non-current operating assets are more likely to be funded by external financing than retained earnings.

To provide more direct evidence on how the relation between net external financing and comprehensive accruals affects estimates of unexpected accruals, we incorporate Δ*XFIN*, Δ*CASH* and *NI* into the surveyed unexpected accrual models. To control for the effect of change in cash, we also employ a different specification that includes Δ*XFIN2* (i.e., Δ*XFIN* minus Δ*CASH*) and *NI* as additional regressors. The unexpected accrual models reported include the modified Jones model for both total and current accruals, the Dechow–Dichev (2002) model and the McNichols (2002) modification

[16] For brevity, correlation results are not presented here, but are available upon request.

thereof.[17] If the unexpected accruals model fully captures accruals variation across different levels of net external financing, net income and change in cash, then the additional variables Δ*XFIN* (Δ*XFIN2*), Δ*CASH* and *NI* should not exhibit additional explanatory power when included in the regression. However, from equation (12), we expect that coefficients associated with Δ*XFIN* (Δ*XFIN2*) and *NI* to be significantly positive, and the coefficient associated with Δ*CASH* to be significantly negative.

Table 4 reports the mean estimated coefficients and associated *t*-statistics for each two-digit SIC industry-year accrual regression model. For all models, the adjusted R^2 increases substantially when additional variables are added to capture the characteristics which are associated with variation in expected accruals (e.g. the adjusted R^2 increase from 12.5% to 51.2% for the modified Jones model in Panel A). As predicted, total accruals and current accruals are positively related to Δ*XFIN* (Δ*XFIN2*) and *NI*, and negatively related to Δ*CASH*. For example, the mean coefficient on Δ*XFIN* in column (2) is 0.259, while the mean coefficients on *NI* and Δ*CASH* are 0.551 and -0.359, respectively. After controlling for change in cash, the mean coefficient on Δ*XFIN2* in column (3) is 0.276, and for *NI* it is 0.546. However, the mean coefficient on Δ*XFIN* reduces substantially after controlling for past, current and future operating cash flow (e.g., 0.060 and 0.032 in column (8) and column (11), respectively). Based on the distribution of the industry-specific coefficients, all of these mean coefficients are statistically significant, with t-statistics ranging in absolute value from 5.95 to 71.24.

Table 4 about here

Taken together, the results in Table 4 reveal several major findings. First, measures of unexpected accruals are biased in the presence of large changes in external financing in the manner we predict. Second, after controlling for change in cash, a bias continues to exist. Third, when accounting for the relation between working capital

[17] The results remain similar for other unexpected accrual models, and thus are not reported here.

accruals and cash flow, coefficients on net external financing reduce but remain statistically significant. The estimation bias is economically significant. Using the modified Jones model, take column (2) as an example. After controlling for other accrual determinants, a change in external financing of 1% of total assets on average leads to a change in accruals equivalent to 0.26% of total assets. Recall the summary statistics of Δ*XFIN* in Table 3. The difference in Δ*XFIN* between firms at the median and the upper quartile is 7.02%, implying a difference in accruals equivalent to 1.82% of total assets.

To further enhance our understanding of the relation between Δ*XFIN* and unexpected accruals, we first sort firms into quartiles each year based on Δ*XFIN*, and then report the sample average of all variables for each quartile in Table 5. The results in Table 5 confirm a positive correlation between Δ*XFIN* and unexpected accruals. In particular, moving from the lower quartile to the upper quartile, we find that estimates of unexpected accruals (that fail to control for external financing) increase monotonically. For example, UEX*AC_MJT_ROA* without controls for Δ*XFIN* increases in value from -1.40% of total assets for Quartile 1 to 2.69% for Quartile 4, while *UEXAC_DDM* rises from -0.34% to 0.45%. When comparing the efficacy of the two methods used to control for external financing, the matched-firm approach seems to be more efficient because there is no apparent pattern for unexpected accruals across quartiles. *UEXAC_MJT_ROA* matched on Δ*XFIN* is -0.04% of total assets for Quartile 1 and -0.03% for Quartile 4, while *UEXAC_DDM* is -0.06% and -0.05%, respectively.

Table 5 about here

Overall, the above analysis provides evidence of a consistent positive relation between Δ*XFIN* and unexpected accruals, suggesting that some portion of expected accruals are incorrectly classified as unexpected accruals, leading to bias in tests of earnings management. The following analysis shows that even a modest correlation can lead to significant biases in estimates of unexpected accruals and a high likelihood of erroneous statistical inference in tests of earnings management.

4. Estimating unexpected accruals and external financing

4.1. Estimating the bias in the calculation of unexpected accruals

By applying the framework in equations (1) through (5), we directly estimate the potential bias arising from a failure to control for Δ*XFIN*. We create two partitions that are potentially correlated with this measurement error, $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$. We define $PART_{\Delta XFIN>Q3}$ as a dummy variable taking a value of 1 when the firm's Δ*XFIN* is higher than the 75th percentile of the distribution in the corresponding year, and zero otherwise. Similarly, $PART_{\Delta XFIN<Q1}$ is a dummy variable set equal to 1 if the firm's Δ*XFIN* is lower than the 25th percentile of the distribution on a yearly basis, and zero otherwise. Our focus on upper and lower quartiles is based on the sorting analysis reported in Table 5, although additional tests show that our results are robust to alternate cut-offs.

Table 6 provides evidence of the bias in tests of earnings management when the test variable coincides with either of these two partitions. The measurement error, η, is the difference between the unexpected accruals measures with and without a control for external financing. Take *UEXAC_MJT* as an example. Under the assumption that the modified Jones model with Δ*XFIN* as an additional regressor is correctly specified, η is measured as the difference between *UEXAC_MJT* estimated from the original modified Jones model and the estimate from the modified Jones model with Δ*XFIN* as an additional regressor.

Panel A of Table 6 shows the estimated bias if the unexpected accruals matched on Δ*XFIN* are expected to be correctly specified. As shown in the second column of Panel A, the bias associated with $PART_{\Delta XFIN>Q3}$ ranges from 0.53% of total assets for *UEXAC_DDM* to 3.53% for *UEXAC_MJT_ROA*. This is economically significant given that the median accounting earnings of the sample is 1.7% of total assets. The bias associated with $PART_{\Delta XFIN<Q1}$ is generally smaller in magnitude and in the opposite direction, ranging from -0.51% of total assets for *UEXAC_DDM* to -3.14% for *UEXAC_MJT_ROA*. Panel B reports the estimation bias if the unexpected accruals models that include Δ*XFIN* as a control procedure are well-specified. In general, the estimated biases associated with both $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ are smaller in magnitude than those in Panel A.

Table 6 about here

While the evidence in Table 6 indicates a significant bias in unexpected accruals estimation, it does not provide direct evidence of the potential impact on statistical inferences. To address this issue, we examine if statistical inferences change due to measurement error attributable to Δ*XFIN*. Table 7 reports the results of regressing unexpected accruals on each of the two partitioning variables on a yearly basis. We report the sample average of the 20 individual-year parameter estimates and their significance across all years. If the unexpected accruals models are correctly specified, we would expect the coefficients on PART to be insignificantly different from zero, given that there is no obvious reason for the existence of significant earnings management associated with either of the two partitions for such a large sample.[18]

The results in Table 7 confirm that statistical inference in tests of earnings management hinge on whether or not a control for Δ*XFIN* is included. Specifically, Panel A demonstrates that firms with large external financing cash inflows tend to exhibit evidence of significant income increasing earnings management, while firms with large external financing cash outflows tend to be classified as income decreasing earnings managers, even if earnings management does not actually exist. The estimated coefficients on $PART_{\Delta XFIN>Q3}$ range from 0.63% to 3.70%, with all having significant t-statistics at the 1% level. The estimated coefficients on $PART_{\Delta XFIN<Q1}$ are

[18] In section 5 we consider the validity of an alternative conclusion that these partitions are, in fact, associated with earnings management.

similar in magnitude but of the opposite direction, and once again all coefficients have significant t-statistics.

When we control for Δ*XFIN* by using either the regression-based approach or the matched-firm approach, the same partition shows less significant (or even insignificant) bias in testing earnings management. The results in Panel C of Table 7 for the regression-based approach demonstrate that the estimated coefficients on both $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ are substantially lower in magnitude, but still statistically significant. In contrast, when unexpected accruals are estimated after matching on Δ*XFIN*, the results in Panel B show that the estimated coefficients on both $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ are all statistically insignificant.

Table 7 about here

4.2. Simulation analysis

The results in Table 7 assume a 100% overlap between the partitioning variable used in tests of earnings management and large net external financing (either $PART_{\Delta XFIN>Q3}$ or $PART_{\Delta XFIN<Q1}$). However, the partitioning variable investigated by the researcher would be unlikely to overlap so perfectly. The sample is more likely to be only partially contaminated by firms with large net external financing, with the degree of contamination varying according to the identified stimulus for earnings management. Accordingly, we conduct simulations to estimate the potential bias in tests of earnings management where the partitioning variable is imperfectly correlated with net external financing.

Our simulation procedure parallels Dechow et al. (1995) and Hribar and Collins (2002), with results based on 250 samples each of 1,000 firms. We start by drawing a random sample of 1,000 firms without replacement from the full dataset of firm-years. This is referred to as our 0% contamination sample. Using 250 iterations of this procedure, we calculate the probability of committing a type I error if there is no earnings management present. Based on 250 trials, we compute the rejection frequencies (i.e., type I error rates) at the 5% and 1% significance levels for a one tailed t-test, together with the sample average of the estimated biases and differences.

Next, we increase the percentage of contaminated observations to 10% by taking a random sample of 100 firms without replacement from the stratified subset of firms with large net external financing (i.e., firms with $PART_{\Delta XFIN>Q3}$ =1 for tests of $PART_{\Delta XFIN>Q3}$, and firms with $PART_{\Delta XFIN<Q1}$ = 1 for tests of $PART_{\Delta XFIN<Q1}$) and a random sample of 900 firms without replacement from the full dataset which, *a priori*, is not expected to have systematic earnings management.[19] We repeat this procedure 250 times, and measure rejection frequency at the 10% level of contamination. We continue this procedure until the percentage of the sample contaminated by firms with large external financing cash inflows or outflows reaches 100%.[20] Results indicating the probability of committing a type I error for $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ are summarized in Table 8. Because the results for the 1% significance level are generally similar to those for the 5% significant level, we only report and discuss the latter.[21]

[19] We also perform a different simulation procedure, where, for the contamination percentage of X% (e.g. 10%), we draw a random sample of 10X (e.g. 100) firms without replacement from the stratified subset of firms with large net external financing (i.e., firms with $PART_{\Delta XFIN>Q3}$ =1 for tests of $PART_{\Delta XFIN>Q3}$, and firms with $PART_{\Delta XFIN<Q1}$ = 1 for tests of $PART_{\Delta XFIN<Q1}$) and a random sample of (1000-10X) (e.g. 900) firms without replacement from the subsample of firms that are not involved in large net external financing (i.e., firms with both $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ equal to 0). The results are qualitatively similar. For brevity, the results are not reported here but are available upon request.

[20] We have also computed the estimation bias associated with $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ at different contamination levels. Generally, the biases are found to be smaller in magnitude for the contaminated sample, relative to the biases for the whole sample in Table 6. For example, when the unexpected accruals with Δ*XFIN* as an additional regressor are expected to be well-specified, the biases associated with $PART_{\Delta XFIN>Q3}$ average about 0.86% for *UEXAC_MJT*, 2.89% for *UEXAC_MJT_ROA*, 0.69% for *UEXAC_PMJT*, 1.24% for *UEXAC_DD* and 0.27% for *UEXAC_DDM*, with low fluctuation across different contamination levels. However, the estimation biases associated with both $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ are still economically significant for those contaminated samples. On the other hand, as the contamination level increases, the differences between unexpected accruals with and without a control for Δ*XFIN* increase monotonically for $PART_{\Delta XFIN>Q3}$ and decrease for $PART_{\Delta XFIN<Q1}$. For example, the difference of UEXAC_MJT assuming unexpected accruals matched on Δ*XFIN* is the true model increases from 0.47% of total assets for the 10% contamination level to 1.16% for the 90% contaminated sample, when testing the simulated sample with net external financing inflows (i.e., testing $PART_{\Delta XFIN>Q3}$). However, for UEXAC_MJT, the difference reduces from 0.21% for 10% contamination to -1.12% at the 90% contamination level, when the simulated sample is contaminated by firms with net external financing outflows. Given the results are consistent with those reported above, they are not tabulated but are available upon request.

[21] The results for the 1% significance level are available upon request.

We first consider the results for $PART_{\Delta XFIN>Q3}$ without a control for Δ*XFIN* (Panel A of Table 8). At the 0% contamination level, all unexpected accruals models are relatively well-specified, with the empirical rejection frequencies ranging from 2.0% to 8.0%. However, as the contaminated percentage of the sample rises, the probability of committing a type I error increases dramatically for all models, except the McNichols (2002) modification of the Dechow-Dichev model. For example, even when the sample is only 20% contaminated, the probabilities of committing type I errors in the absence of earnings management exceed 30%, in contrast to the expected rejection level under the null of 5%. Moreover, when the percentage of the sample contaminated by firms with large Δ*XFIN* rises to 40%, the type I error rates increase to 50% for *UEXAC_MJT*, 96% for *UEXAC_MJT_ROA*, 80% for *UEXAC_PMJT*, 92% for *UEXAC_MJC*, 98% for *UEXAC_MJC_ROA*, 86% for *UEXAC_PMJC*, and 72% for *UEXAC_DD*, respectively. Thus, at contamination levels of 40% and greater, one would be likely to conclude that earnings had indeed been manipulated, even if earnings management is not present.

The lower rejection frequencies reported for the McNichols (2002) modification of the Dechow-Dichev model is consistent with some of the bias being addressed by controlling for the mapping function between working capital accruals and cash flow. For example, when the sample is 40% contaminated, the probability of a type I error is 26%. Even if there is a 100% overlap between the partitioning variable and $PART_{\Delta XFIN>Q3}$, the type I error rate is 64%, in contrast to nearly 100% for other models. Of course, the rejection rates are still well above the well-specified level at lower levels of contamination.

The results for $PART_{\Delta XFIN<Q1}$ presented in Panel D of Table 8 are qualitatively similar to those in Panel A. At the 0% contamination level, the probabilities of committing type I errors ranges from 2% to 8%, indicating that all the models are relatively well-specified. As the level of contamination in the sample increases, the rejection

frequencies increase. For example, at the 30% contamination level, the type I error rates for most unexpected accruals models (except *UEXAC_MJT* and *UEXAC_DDM*) exceed 50%, in contrast to the expected 5% rate. Consistent with results for $PART_{\Delta XFIN>Q3}$, the McNichols (2002) modification to the Dechow-Dichev performs best, with a type I error rate of 9.2% at the 30% contamination level. Overall, these results for unexpected accruals models without a control for Δ*XFIN* suggest that even a modest level of contamination by firms with large net external financing can have a potentially large impact on the statistical inferences that are drawn on the existence of earnings management.

When we control for Δ*XFIN* by using a matched-firm procedure, all unexpected accruals models become well-specified at any contamination level (see Panel B and Panel E of Table 8). For example, the type I error rates range from 2.2% to 5.6% for $PART_{\Delta XFIN>Q3}$, and from 4.8% to 8.0% for $PART_{\Delta XFIN<Q1}$, even when the sample is 100% contaminated. This contrasts with the regression-based approach that includes Δ*XFIN* as an additional regressor in unexpected accruals models. Results for $PART_{\Delta XFIN>Q3}$ in Panel C of Table 8 show that, once the contamination level exceeds 20%, most models (except *UEXAC_MJT_ROA* and *UEXAC_DDM*) have significantly higher type I errors than the expected level of 5%. For example, at the 30% contamination level, the type I error rates are 11% for *UEXAC_MJT*, 38% for *UEXAC_PMJT*, 11% for *UEXAC_MJC*, 10% for *UEXAC_MJC_ROA*, 23% for *UEXAC_PMJC*, and 11% for *UEXAC_DD*. Although the results for $PART_{\Delta XFIN<Q1}$ are less dramatic, the rejection frequencies still indicate a likelihood of wrongly rejecting the null hypothesis of no earnings management.

Table 8 about here

While it is clear that the presence of large net (overall) external financing (Δ*XFIN*) tends to induce measurement errors in unexpected accruals and bias tests of earnings management, it is unclear whether such measurement errors are more likely caused by net debt financing (Δ*DEBT*) or net equity financing (Δ*EQUITY*). Recent evidence (Eckbo et al. 2007) shows that debt offerings are significantly more frequent than equity offerings, and that public debt offerings are, on average, around three times the size of equity offerings.[22] To investigate whether the results we report for Δ*XFIN* are sensitive to the extent that it is comprised of Δ*DEBT* versus Δ*EQUITY*, we repeat the analysis in Table 7 but regress unexpected accruals on partitioning variables based solely on either Δ*DEBT* or Δ*EQUITY*. The results still support our findings that firms with large external financing cash inflows (outflows) tend to be classified as income increasing (decreasing) earnings managers, regardless of whether their financing is via debt or equity.[23]

5. Estimation bias or earnings management?

External financing, especially external equity financing, is frequently argued to be one of the major incentives for earnings manipulation (Graham et al. 2005). Accordingly, an alternative explanation of our results is that *current* period earnings of firms with large external financing cash inflows are systematically managed upwards, while *current* period earnings of firms with large external financing cash outflows are managed downwards (the financing-year EM hypothesis). This explanation seems unlikely for a number of reasons.

First of all, our previous analysis suggests that when sorting the available Compustat firms into quartiles based on net external financing every year, firms in the upper quartile tend to have economically positive unexpected accruals, while firms in the bottom quartile have negative unexpected accruals. If the financing-year EM hypothesis holds, it suggests that, for every single year, about 25% of Compustat sample firms engage in income-increasing earnings management (ranging from 0.45% to 2.69% of total assets) and similarly, 25% of Compustat firms are involved in

[22] See also earlier evidence reported by Mikkelson and Partch (1986).
[23] Full details are available on request from the authors.

income-decreasing earnings management (ranging from -0.34% to -1.40% of total assets). However, such pervasive and economically significant "earnings management" across the Compustat sample as implied by the financing-year EM hypothesis is inconsistent with the survey evidence in Graham et al. (2005) suggesting that managers are hesitant to employ within-GAAP accounting adjustments to manage earnings.[24]

Recent studies of earnings management suggest that the disproportionate likelihood of meeting or just beating earnings benchmarks such as analysts' forecasts is an important manifestation of earnings management. Meeting or just beating analysts' forecasts is thus considered as an alternative proxy for earnings manipulation which has more direct market consequences relative to unexpected accruals (see e.g. Cheng and Warfield 2005; Graham et al. 2005). If the financing-year earnings management hypothesis is valid, we would expect to observe a similar pattern of earnings management for the likelihood of meeting or just beating analysts' forecasts. In particular, we expect to observe that firms in the upper quartile are more likely to beat or just meet analysts' forecasts, while firms in the bottom quartile have a lower probability. To examine this, we define the probability of meeting or just beating analysts' forecasts as a dummy variable equal to 1 if earnings surprises are zero or one cent, and 0 otherwise. Earnings surprises are calculated as the difference between actual earnings and the most recent consensus forecast before earnings announcement, both of which are measured on a per-share basis and are rounded to the nearest cent.[25] Both actual earnings and analysts' forecasts are sourced from I/B/E/S.

Table 9 (Panel A) reports the probability of meeting or just beating analysts' forecasts in the financing year for quartiles sorted on ΔXFIN within each year. For firms with

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[24] Graham et al. (2005) find that managers would rather take economic actions that could sacrifice long-term value of the firm than make within-GAAP accounting choices to manage earnings. Although 78% of survey respondents admit to taking real economic actions to achieve accounting outcomes, the actual use of accounting manipulation to achieve these same outcomes gets notably little support.

[25] Our results remain similar if we use the median rather than the mean of analysts' forecasts to measure consensus forecasts.

large net financing cash inflow (i.e., the upper quartile), 7.6% of firms meet or just beat analysts' forecast by one cent. This is quite similar to firms with a large net financing cash outflow (7.7%). To further corroborate our results, we estimate a logit regression of the probability of meeting or just beating analysts' forecasts on two partitioning variables ($PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$) as well as year controls. If meeting or just beating analysts' forecasts is a valid proxy for earnings management, the financing-year EM hypothesis predicts a positive coefficient on $PART_{\Delta XFIN>Q3}$ and a negative coefficient on $PART_{\Delta XFIN<Q1}$. Panel B of Table 9 reports the logit regression results. We find that the coefficients on $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ are both positive and similar in magnitude, but statistically insignificant. This result is inconsistent with the predictions of the financing-year EM hypothesis.

Our next test examines the extent of mean-reversion in operating performance for firms with large net external financing. The financing-year EM hypothesis implies that reversion in operating performance is driven by unexpected accruals, and thus predicts that companies with high financing-year unexpected accruals, either positive or negative (i.e., firms in the upper and bottom quartile respectively), should display greater mean reversion in operating performance than companies that are not involved in large net external financing (i.e., firms with both $PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$ equal to 0), *ceteris paribus*. We follow Armstrong et al. (2008) and estimate the rate of mean reversion over the three years following the financing year using a first-order autoregressive (AR1) model:

$$NI_{t+i} = \beta_0 + \beta_1 NI_t + \beta_2 NI_t * PART_{\Delta XFIN>Q3} + \beta_3 NI_t * PART_{\Delta XFIN<Q1} + \varepsilon_{t+i} \quad (14)$$

where NI_{t+i} is net income at time t+*i* (*i* = 1, 2, 3 respectively). The speed of mean revision for firms without significant net external financing is represented by $1-\beta_1$ and the speed of mean revision for firms with large net external financing cash inflow (outflow) is represented by $1-\beta_1-\beta_2$ ($1-\beta_1-\beta_3$). In other words, β_2 and β_3 can be used to test for differences in the rate of mean reversion across net external financing quartiles. If the reversion in operating performance is driven by unexpected accruals as suggested by the financing-year EM hypothesis, then both the upper and lower quartiles should have a significantly higher rate of mean reversion (i.e., negative β_2 and β_3).

Panel C of Table 9 reports the results from estimating the rate of mean reversion in post-financing operating performance. Specially, we estimate equation (14) every year, and report the sample average and significance of the individual-year parameter estimates. The results show that the rate of mean reversion in post-financing operating performance for firms in the upper quartile is higher than other quartiles (negative β_2 of -0.032, -0.016 and -0.042 for NI_{t+1}, NI_{t+2}, and NI_{t+3}, respectively), but the differences are not statistically significant (*t*-statistics of -1.37, -0.67 and -1.35, respectively). More importantly, the rate of mean reversion for firms with large net external financing cash outflow is significantly lower than other groups, with a positive β_3 (e.g. 0.071 for NI_{t+1}) and a significant *t*-statistics (e.g. 4.47 for NI_{t+1}). This is inconsistent with the financing-year EM hypothesis which implies that unexpected accruals drive the reversal in post-financing operating performance.[26]

Finally, we examine abnormal returns around quarterly earnings announcements across external-financing quartiles. Bradshaw et al. (2005) document a negative relation between net external financing and future stock returns. In particular, the annual mean future size-adjusted stock returns for the lowest decile (cash outflow) are 4.1%, while the stock returns for the highest decile (cash inflow) are -11.4%. Bradshaw et al. (2005) further suggest that one explanation for their evidence is that management could opportunistically manage earnings upwards during periods in which they are raising external financing.

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[26] Kothari (2001) and Pastor et al. (2009) provide some evidence that reversion in performance is expected even absent earnings management. Kothari (2001, p. 167) notes that "high growth is mean reverting. One reason is that a portion of high growth often results from transitory earnings due to a non-discretionary (or neutral) application of GAAP. Thus, a portion of the subsequent performance reversal is expected and may not be due to discretionary accruals". Pastor et al. (2009) develop an analytical model of management's decision to go public and suggest that a performance reversal would be observed regardless of the existence of management opportunistic reporting behaviours.

Given the negative relation between net external financing and future stock returns, the financing-year EM hypothesis suggests that investors fail to fully understand the information contained in unexpected accruals (i.e., earnings management) at the time of external financing and they are therefore likely to be surprised by earnings announcements in the future when earnings management reverses. Thus, if the financing-year EM hypothesis is valid and announcement returns capture the effect of earnings surprises, then in quarters after external financing we would expect to observe positive abnormal returns around the earnings announcement date for firms in the bottom quartile (net external cash outflow) and negative abnormal returns for firms in the upper quartile (net external cash inflow).

Panel D of Table 9 presents the median quarterly market-adjusted abnormal earnings-announcement returns. We use a three-day (-1, +1) window to measure the stock market reaction to quarterly earnings announcements.[27] The results show that abnormal returns are frequently statistically significant (positive and negative) around earnings-announcements for most quartile-quarters. However, the mean abnormal returns over the 12 quarters after the financing year are insignificantly different from zero for firms in both the top and bottom quartiles (-0.10% for the bottom quartile and 0.01% for the upper). Among 12 quarters following net external financing, there are 5 quarters for the bottom quartile and 7 quarters for the upper quartile with positive abnormal earnings-announcement returns. These results are inconsistent with the financing-year EM hypothesis that management opportunistically manipulate earnings during the year of net external financing.

Table 9 about here

6. Robustness

In this section, we confirm our previous findings through a battery of robustness

[27] The results are similar when we use a six-day window (-1, +4).

checks. We first provide some further evidence that our results are robust to the effect of changes in the cash balance. Equation (12) suggests that external financing (Δ*XFIN*), change in cash balance (Δ*CASH*) and firm performance (*NI*) are three contributors to changes in net operating assets (Δ*NOA*), which comprises the commonly used measure of current accruals and total accruals. We illustrate above that net external financing, along with firm performance as in Kothari et al. (2005), introduces estimation bias in unexpected accrual estimates. However, there might be some concern about the effect of changes in the cash balance which might offset the estimation errors introduced by net external financing, given the opposite signs of Δ*XFIN* and Δ*CASH* in equation (12). Results in Table 4 provide some supportive evidence that the estimation bias continues to exist even after controlling for change in cash.

To further corroborate and enrich our results, we re-run our previous analysis for Δ*XFIN2* and find consistent results. Due to space constraints, we only report the estimation bias sourced from Δ*XFIN2* in Panel A of Table 10. For example, results in the first column of Panel A suggest that the bias associated with $PART_{\Delta XFIN2>Q3}$ ranges from 0.32% of total assets for *UEXAC_DDM* to 4.59% for *UEXAC_MJT_ROA*. In contrast, the bias associated with $PART_{\Delta XFIN2<Q1}$ ranges from -0.51% for *UEXAC_DDM* to -3.14% for *UEXAC_MJT_ROA*. Consistent with the results for Δ*XFIN*, the estimated biases associated with both $PART_{\Delta XFIN2>Q3}$ and $PART_{\Delta XFIN2<Q1}$ are economically significant given that the median accounting earnings of the sample is 1.7% of total assets.

Table 10 about here

Another issue that might be of concern is our definition of the two partitioning variables. Using cutoffs corresponding to the top and bottom quartiles to identify the partitions with high external financing cash inflow and outflow is based on our sorting analysis in Table 5, but is somewhat arbitrary. We therefore examine the sensitivity of our results to different cutoff points. In particular, we sort firms into thirds and quintiles respectively, based on annual $\Delta XFIN$, and report the sample average of all variables for each group in Panel B of Table 10.

The results in Panel B of Table 10 are consistent with those in Table 5, confirming unexpected accruals (that fail to control for external financing) increase monotonically when moving from the lower group to the upper group. When sorting into quintiles, UEX*AC_MJT_ROA* without controls for $\Delta XFIN$ increases from -3.08% of total assets for Quintile 1 to 2.81% for Quintile 5, while *UEXAC_DD* rises from -1.18% to 1.34%. In contrast to the regression-based approach, the matched-firm approach again is found to be a more efficient means of controlling for external financing, as there is no apparent pattern for unexpected accruals across groups.

7. Unexpected accruals around share repurchases

The results of the previous section suggest that estimated unexpected accruals exhibit a bias that is related to a firm's external financing behaviour, and this bias could lead the researcher to conclude that significant earnings management exists, when in fact there is none. To provide further insights on how controlling for external financing is likely to change empirical inferences, we re-examine prior evidence of income-decreasing earnings management around share repurchases. Gong et al. (2008) report significant negative unexpected accruals around open-market repurchases. However, managers' "normal" operating and financing decisions associated with the reduction of debt levels (i.e., net debt financing cash outflows) could also lead to negatively biased estimates of unexpected accruals, and these firms can exhibit a pattern of unexpected accruals that is likely to be similar to firms making share repurchases.

We identify open-market repurchases for 1988-2002 from the SDC Mergers and Acquisitions database. Following Gong et al. (2008), we utilize a conditional procedure to identify repurchase announcements. In particular, conditional on a share repurchase announcement appearing in SDC, we require the dollar value of actual repurchases in a given fiscal year based on Compustat annual data item #115 (Purchases of Common and Preferred Stock) to exceed 1% of the firm's market value.[28] We also exclude block-repurchases and self-tender offers. The final sample has 1,050 open-market repurchase announcements that are followed by actual repurchases during the year of the repurchase announcement.[29] We re-examine tests of income-decreasing earnings management for firms making open-market repurchases, and then we show how controlling for the firm's external financing is likely to change inferences.

We begin our re-examination by first calculating mean unexpected accruals around open-market repurchases without considering external financing. We calculate the several different unexpected accruals estimates as used in our tests above, and present the results in Panel A of Table 11. We find that on average, repurchase firms report significantly negative unexpected accruals for *UEXAC_MJT* and *UEXAC_PMJT*, representing 0.57% and 1.08% of total assets respectively xxx(with a robust *t*-statistic of -2.24 and -3.35 respectively). These results are consistent with those reported in Gong et al. (2008).[30]

Table 11 about here

[28] We combine the two data sources (SDC and Compustat) because, on the one hand, SDC generally codes a repurchase as complete only after the firm essentially repurchases all the shares that it intended to repurchase. Therefore, partial repurchases are generally coded as pending and the number of shares repurchased is not reported. On the other hand, Compustat annual data item #115 is an aggregation of many other types of transactions besides open-market repurchases, including conversions of other classes of stock into common stock, purchases of treasury stock, retirements of common or preferred stock, and redemptions of redeemable preferred stock. Thus, Compustat data item #115 may have a positive value even when no open-market repurchase occurs. Our conditional procedure is utilized to reduce the noise associated with using Compustat data item #115 to estimate actual repurchases.

[29] We find our results for unexpected accruals on a yearly basis are qualitatively and quantitatively comparable to those reported in Gong et al. (2008) who use quarterly data.

[30] Gong et al. (2008) report negative unexpected accruals consisting of -0.57% of total assets for unexpected accruals based on the modified Jones model (see p.960 of Gong et al. (2008) in Panel A of Table II).

Grullon and Michaely (2004) document that a typical repurchasing firm has ample cash reserves prior to open-market repurchases, suggesting that managerial decisions regarding the extent of net debt financing is not associated with the decision on share repurchases. We sort the repurchase sample according to net external debt financing (ΔDebt) based on the quartile breakpoints of the whole Compustat sample, and re-calculate the average unexpected accruals within each group. The pattern of unexpected accruals for repurchase firms shows that negative unexpected accruals are concentrated among firms in quartiles 1 and 2, which are characterized as firms with net debt financing cash outflows. Take *UEXAC_MJT* as an example. The 1,050 repurchase firms are equally distributed across quartiles, indicating the contamination level of net debt financing outflow is about 25%. There are 232 and 268 observations in quartile 1 and quartile 2 respectively, representing about 50% of the whole sample. Repurchase firms in quartile 1 and quartile 2 report significantly negative unexpected accruals of -1.85% and -1.17%, with robust *t*-statistics of -3.01 and -2.50 respectively. In contrast, firms in quartile 4 with large external debt financing cash inflows are found to exhibit income-increasing earnings management. These findings indicate that managers of repurchase firms with net debt financing inflow do not appear to engage in income-decreasing earnings management concurrent with the repurchase announcement.

To further investigate this issue, we estimate *UEXAC_ΔDebt* (*UEXAC_ΔXFIN*) by using a matching procedure based on industry and net external debt (overall) financing for *UEXAC_MJT*. After controlling for external financing, the unexpected accruals for *UEXAC_DDM*, *UEXAC_ΔDebt* and *UEXAC_ΔXFIN* are not significantly different from zero for the whole sample and across quartiles. In particular, average unexpected accruals for *UEXAC_ΔDebt* is 0.57% of total assets, with values ranging from -0.28% to 1.11% across quartiles, all of which have insignificant *t*-statistics.

From the first two columns of Panel A of Table 11 the reader might conclude that the average firm records negative unexpected accruals concurrent with open-market repurchases. However, Panel B reveals that these findings hold only for firms with net external debt financing cash outflows. The overall results in Table 11 show that managers' "normal" operating and financing operations, not necessarily the share repurchase event itself, can lead to a negative bias in unexpected accruals.

8. Conclusion

Most research in the earnings management literature requires a proxy for managed earnings. This paper explores the notion that widely-used unexpected accruals measures suffer from substantial specification errors when the sample contains a material proportion of firms with large net external financing changes. We document a substantial bias caused both by the definition of accruals as well as the method normally used to specify accrual expectations (i.e., the measure of unexpected accruals). These results give cause for concern at the number of published studies which purport to find evidence of earnings management where the test (i.e., partitioning) variable is likely correlated with net external financing changes in one direction or the other. Of course, in some circumstances the direction of any bias attributable to this effect is against rejecting the null hypothesis, although it is notable that very few studies are published which fail to reject the null hypothesis of no earnings management.

After exploring the positive relation between accounting accruals and external financing through accounting identities, we first provide evidence on the correlation between estimates of unexpected accruals and external financing, suggesting the existence of measurement errors in unexpected accruals sourced from external financing. We then demonstrate that unexpected accruals from different accruals expectation models are biased upwards for firms with large external financing cash inflows, and biased downwards for firms with large cash outflows. The simulations that we conduct show that even a modest proportion of firms with large net external financing in the sample will result in dramatically inflated rejection rates for tests at the 5% and 1% significance level. The regression-based approach that includes the external financing variable as an additional regressor does not improve the test specification, while the use of the matched-firm procedure based upon industry and external financing generates well-specified type I error rates. Overall, our results show that failure to control for external financing causes biased estimates of unexpected accruals, and could lead to the erroneous conclusion that significant earnings management exists when in fact there is none. We further highlight this concern by conducting similar analysis to a published study examining whether firms engaging in share repurchases (Gong et al. 2008). Our results indicate that the authors' conclusion of downwards earnings management is not robust.

We recognize that a competing hypothesis for our results is that significant net external financing changes are, on average, associated with systematic earnings management (i.e., the financing-year EM hypothesis). However, we identify a number of empirical implications from this hypothesis and are consistently unable to find corroborative evidence. Our results are also robust to a battery of robustness tests.

Our findings have implications for studies designed to detect earnings management and the estimation of unexpected and expected accruals. This is especially pertinent in cases where the partitioning variable used to identify instances of earnings management is supposed to be uncorrelated with external financing, when in fact the two are correlated. Our results suggest that it would be prudent for researchers to consider the relation between the partitioning variable and external financing, and underscore the importance of additional tests to control for possible errors in unexpected accruals measurement introduced by external financing. This can be achieved by examining the robustness of results for a sub-sample of firms that are not involved in net external financing activities or using the matched-firm approach based on industry and external financing.

Appendix: Unexpected accruals models

A.1 The Modified-Jones Model

Jones (1991) assumes that expected accruals depend on accounting (economic) fundamentals like the change in revenues and the level of property, plant, and equipment. The Jones model for expected accruals can be stated as:

$$\frac{TACC_{it}}{ATA_{i,t-1}} = k_{1t}\frac{1}{ATA_{i,t-1}} + k_2\frac{\Delta REV_{it}}{ATA_{i,t-1}} + k_3\frac{PPE_{it}}{ATA_{i,t-1}} + \varepsilon_{it} \qquad \text{(A1)}$$

where $TACC_{i,t\text{-}1}$, $ATA_{i,t\text{-}1}$ are firm *i*'s total accruals and average total assets for year *t*-1, $\Delta REV_{i,t}$ is the change in firm *i*'s revenues between year *t*-1 and t and PPE_{it} is the gross value of property, plant and equipment for firm *i* in year *t*. Once the model is estimated (either in time-series or cross-sectionally), the fitted values constitute expected accruals, and the residual is taken as a measure of unexpected accruals.

The original Jones model implicitly assumes that discretion is not exercised over revenue in either the estimation period or the event period, so the resulting measure of unexpected accruals does not reflect the impact of sales-based manipulation. In an attempt to capture earnings manipulation over revenue recognition, Dechow et al. (1995) modify the Jones procedure by subtracting the change in receivables (ΔREC) from ΔREV for each sample firm. The modified Jones model for expected accruals is:

$$EXAC_{it} = \hat{k}_{1t}\frac{1}{ATA_{i,t-1}} + \hat{k}_2\frac{(\Delta REV_{it} - \Delta REC_{it})}{ATA_{i,t-1}} + \hat{k}_3\frac{PPE_{it}}{ATA_{i,t-1}} \qquad \text{(A2)}$$

where ΔREC_{it} is the change in accounts receivable between year t-1 and t for firm i. The coefficient estimates from equation (A1) are used as inputs to estimate the expected accruals ($EXAC_{it}$) from (A2). Unexpected accruals (*UEXAC*) are thus defined as the difference between total accruals and the estimated expected accruals from (A2).

A.2 The Dechow-Dichev (2002) model and the McNichols (2002)'s modifications

The approach outlined by Dechow and Dichev (2002) is based on the intuition that accruals are temporary adjustments that resolve timing problems in the underlying cash flows at the cost of making assumptions and estimates. Precise estimates imply a good match between current accruals and past, present, and future cash flow realizations. Thus, Dechow and Dichev define accruals quality as the extent to which accruals map into cash flow realizations, and enumerate this notion of accruals quality as the standard deviation of the residuals from firm-specific regressions of working capital accruals on lagged, current, and one-year-ahead cash flow from operations. They estimate the following firm-level time-series regression:

$$\Delta WC_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \varepsilon_{i,t} \quad \text{(A3)}$$

where ΔWC is the change in working capital from year *t-1* to year *t*. All variables in the model are deflated by average total assets. The residuals from equation (A3) can be considered as unexpected accruals.

An important feature of this approach is that the notion of accruals estimation errors includes both intentional and unintentional errors. Intentional estimation error arises from incentives to manage earnings, while unintentional error arises from management lapses and environmental uncertainty. However, the Dechow and Dichev (2002) measure of unexpected accruals is affected by any measurement error in accruals, regardless of management intent. McNichols (2002) links the approach suggested by Dechow and Dichev (2002) to the Jones-type approach, by modelling intentional estimation error arising from incentives to manage earnings. The model suggested by McNichols (2002) is as follows:

$$\Delta WC_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \beta_4 \Delta REV_{i,t} + \beta_5 PPE_{i,t} + \varepsilon_{i,t} \quad \text{(A4)}$$

All variables are deflated by average total assets, and the residuals from the estimated model are used as a measure of unexpected accrual.

A.3 Controlling for firm performance

Kothari et al. (2005) argue that accruals of firms that have experienced unusual performance are expected to be systematically non-zero and therefore, firm performance is correlated with total and unexpected accruals. They propose two ways to control for firm performance in estimating unexpected accruals. The first approach uses performance variables, such as return-on-asset (*ROA*), as an additional independent variable in the modified Jones model. Therefore, the modified Jones model with *ROA* for expected accruals is:

$$\frac{TA_{it}}{ATA_{i,t-1}} = k_{1t}\frac{1}{ATA_{i,t-1}} + k_2\frac{(\Delta REV_{it} - \Delta REC_{it})}{ATA_{i,t-1}} + k_3\frac{PPE_{it}}{ATA_{i,t-1}} + k_4\frac{ROA_{it}}{ATA_{i,t-1}} + \varepsilon_{it} \quad \text{(A5)}$$

where all variables are as previously defined.

The alternative approach Kothari et al. (2005) propose is based on a performance-matched procedure. Unexpected accruals matched on firm performance are calculated by first matching the firm-year observation of the sample firm with a firm-year observation for the control firm with the closest *ROA* and from the same industry group. Then, unexpected current accruals for each of the sample firms are estimated as well as the matched firms. Abnormal current accruals are thus defined as the difference between the unexpected current accruals of the sample firm and the unexpected current accruals of its matched firm. Performance-matched unexpected accruals can be written as:

$$UEXAC'_{it} = UEXAC_{it} - \mathrm{UEXAC}_{\mathrm{jt}}\,. \quad \text{(A6)}$$

where $UEXAC_i$ and $UEXAC_j$ are unexpected accruals of the sample firm *i* and the control firm *j* estimated from the modified Jones model. *UEXAC'* is the measure of performance-matched unexpected accruals. Kothari et al. (2005) find that matching based on the current year *ROA* performs better than matching on the prior year *ROA* and the performance-matched approach is superior to the inclusion of ROA in unexpected accruals models.

References

Armstrong, C., Foster, G., and Taylor, D.J., 2008, Earnings management around initial public offerings: A re-examination, Working paper, Stanford University.

Ball, R., 2009, Market and political/regulatory perspectives on the recent accounting scandals, *Journal of Accounting Research* 47, 277-323.

Ball, R., and Shivakumar, L., 2008, Earnings quality at initial public offerings, *Journal of Accounting and Economics* 45, 324-349.

Bradshaw, M., Richardson, S., and Sloan, R., 2006, The relation between corporate financing activities, analysts' forecasts and stock returns, *Journal of Accounting and Economics* 42, 53-85.

Cheng, Q., and Warfield, T.D., 2005, Equity incentives and earnings management, *The Accounting Review* 80, 441-476.

Dechow, P., and Dichev, I., 2002, The quality of accruals and earnings: The role of accrual estimation errors, *The Accounting Review* 77, 35-59.

Dechow, P., Richardson, S.A., and Sloan, R., 2008, The persistence and pricing of the cash component of earnings, *Journal of Accounting Research* 46, 537-566.

Dechow, P., Sloan, R., and Sweeney, A., 1995, Detecting earnings management, *The Accounting Review* 70, 193-225.

Eckbo, B.S., Masulis, R.W., and Norli, O., 2007, Security offerings, *Handbook of Corporate Finance: Empirical Corporate Finance*, Volume 1 Chapter 6, *North-Holland/Elsevier*.

Fields, T., Lys, T., and Vincent, L., 2001, Empirical research on accounting choice, *Journal of Accounting and Economics* 31, 255-307.

Graham, J., Harvey, C., and Rajgopal, S., 2005, The economic implications of corporate financial reporting, *Journal of Accounting and Economics* 40, 3-73.

Gong, G., Louis, H., and Sun, A.X., 2008, Earnings management and firm performance following open-market repurchases, *The Journal of Finance* 63, 947-986.

Grullon, G., and Michaely, R., 2004, The information content of share repurchase programs, *The Journal of Finance* 59, 651-680.

Hribar, P., and Collins, D., 2002, Errors in estimating accruals: Implications for empirical research, *Journal of Accounting Research* 40, 105-134.

Jones, J., 1991, Earnings management during import relief investigations, *Journal of Accounting Research* 29, 193-228.

Kothari, S.P., 2001, Capital markets research in accounting, *Journal of Accounting and Economics* 31, 105-231.

Kothari, S.P., Leone, A., and Wasley, C., 2005, Performance matched discretionary accrual measures, *Journal of Accounting and Economics* 39, 163–197.

Leary, M.T., and Roberts, M.R., 2005, Do firms rebalance their capital structures? *The Journal of Finance* 60, 2575-2619.

Liu, M., 2008, Accruals and managerial operating decisions over the firm life cycle, Working paper, Pennsylvania State University.

McNichols, M., 2000, Research design issues in earnings management studies, *Journal of Accounting and Public Policy* 19, 313-345.

McNichols, M., 2002, Discussion of the quality of accruals and earnings: The role of accrual estimation errors, *The Accounting Review* 77, 61-69.

McNichols, M., and Wilson, G., 1988, Evidence of earnings management from the provision of bad debts, *Journal of Accounting Research* 26, 1-31.

Mikkelson, W.H., and Partch, M.M., 1986, Valuation effects of security offerings and the issuance process, *Journal of Financial Economics* 15, 30–60.

Pastor, L., Taylor, L., and Veronesi, P., 2009, Entrepreneurial learning, the IPO decision, and the post-IPO drop in firm profitability, *Review of Financing Studies*, forthcoming.

Richardson, S.A., Sloan, S., Soliman, M., and Tuna, I., 2005, Accrual reliability, earnings persistence and stock prices, *Journal of Accounting and Economics* 39, 437-485.

Shivakumar, L., 2000, Do firms mislead investors by overstating earnings before seasoned equity offerings, *Journal of Accounting and Economics* 29, 339-371.

Teoh, S.H., Welch, I., and Wong, T.J., 1998, Earnings management and the long-term market performance of initial public offerings, *The Journal of Finance* 53, 1935-1974.

Young, S., 1999, Systematic measurement error in the estimation of discretionary accruals: An evaluation of alternative modelling procedures, *Journal of Business Finance & Accounting* 26, 833-862.

Table 1: Sample selection

This table reconciles the number of observations in the final sample with the data sources and the various filters.

Step	Filters	Number of observations
1	Firm-year observations on COMPUSTAT for 1987 to 2006	456,944
2	Firm-year observations after deleting primary industry classification from the banking, life insurance, or property and casualty insurance industries	349,377
3	Firm-year observations with non-missing book value of assets greater than or equal to $1 million dollars	141,121
4	Firm-year observations after deleting observations with missing values for sales, total assets, or net income before extraordinary items	136,095
5	Firm-year observations after eliminating observations with an absolute value of external financing, external equity financing, or external debt financing greater than 1	133,242
6	Firm-year observations after eliminating observations with an absolute value of total accruals or current accruals greater than 1	131,778

Table 2: Variable definition

Variable	Measurement (#Compustat item numbers)
Panel A: Accruals and other variables	
Total accruals (TACC)	Total accruals / average total assets (#6). Total accruals are defined as income before extraordinary items (#123) minus cash from operations (CFO, data 308) divided by average total assets.
Current accruals (CACC)	Current accruals / average total assets. Current accruals are defined as the increase in account receivables (#302) plus the increase in inventory (#303) minus the increase in account payable (#304) minus the increase in tax payable (#305) minus the net change in other current assets (#307). That is, CACC = - (#302 + #303 + #304 + #305 + #307) / average total assets.
Net debt financing (ΔDebt)	Cash proceeds from the issuance of long-term debt (#111) less cash payments for long-term debt reduction (#114) less the net changes in current debt (#301) divided by average total assets.
Net equity financing (ΔEquity)	Proceeds from the sale of common and preferred stock (#108) less cash payments for the purchase of common and preferred stock (#115) less cash payments for dividends (#127) divided by average total assets.
Net external financing (ΔXFIN)	The sum of net debt financing and net equity financing.
Change in cash balance (ΔCASH)	The change in the balance of cash and short-term investments (#274) divided by average total assets.
Net income (NI)	Income before extraordinary items (#123) divided by average total assets.
Net external financing after controlling for change in cash balance (ΔXFIN2)	The sum of net debt financing and net equity financing, minus the change in the balance of cash and short-term investment, scaled by average total assets.
Change in net operating assets (DNOA)	The change in net operating assets (NOA) divided by average total assets. Net operating asset (NOA) = noncash assets (#6 - #1) minus noncash liabilities (#181 - #9 - #34).
Change in net current operating assets (DCO)	The change in net current operating assets divided by average total assets. Net current operating assets = current operating assets (COA) – current operating liabilities (COL), where COA = current assets (#4) – cash and shot term investment (#1). COL = current liabilities (#5) – debt in current liabilities (#34).
Change in net non-current operating	The change in net non-current operating assets divided by average

assets (DNCO)	total assets. Net non-current operating assets = non-current operating assets (NCOA) – non-current operating liabilities (NCOL), where NCOA = total assets (#6) – current assets (#4) – investments and advances (#32). NCOL = total liabilities (#181) – current liabilities (#5) – long-term debt (#9).
$PART_{\Delta XFIN>Q3}$	A dummy variable taking the value of 1 when the firm's ΔXFIN is higher than the 75th percentile of the distribution in the corresponding year, and zero otherwise.
$PART_{\Delta XFIN<Q1}$	A dummy variable taking the value of 1 when the firm's ΔXFIN is lower than the 25th percentile of the distribution in the corresponding year, and zero otherwise

Panel B: Determinants of fundamental accruals variability

UEXAC_MJT	Unexpected accruals from the modified Jones model for total accruals (TACC).
UEXAC_MJT_ROA	Unexpected accruals from the modified Jones model with ROA as an additional regressor for total accruals (TACC).
UEXAC_PMJT	Performance-matched unexpected accruals based on the modified Jones model for total accruals (TACC), as in Kothari et al. (2005).
UEXAC_MJC	Unexpected accruals from the modified Jones model for current accruals (CACC).
UEXAC_MJC_ROA	Unexpected accruals from the modified Jones model with ROA as an additional regressor for current accruals (CACC).
UEXAC_PMJC	Performance-matched unexpected accruals based on the modified Jones model for current accruals (CACC), as in Kothari et al. (2005).
UEXAC_DD	Unexpected accruals from the Dechow and Dichev (2002) model.
UEXAC_DDM	Unexpected accruals from the modification of the Dechow-Dichev model suggested by McNichols (2002).

Table 3: Summary statistics

This table presents summary statistics for the accruals measures, external financing variables and other variables used in the analysis. All variables are deflated by average total assets and reported as percentages. The number of observations is 131,778.

Variables	MEAN	STD	Lower Quartile	MEDIAN	Upper Quartile
Panel A: Accruals, external financing and decomposition					
TACC	-6.61	11.95	-10.79	-5.28	-0.80
CACC	1.38	8.73	-2.35	0.88	5.06
ΔXFIN	4.34	16.55	-4.03	0.00	7.02
ΔDEBT	1.37	10.30	-2.58	0.00	3.75
ΔEQUITY	2.97	12.63	-1.54	0.00	0.85
ΔCASH	0.69	10.22	-1.99	0.07	2.87
NI	-2.52	18.62	-4.88	2.81	7.07
DNOA	4.89	20.05	-4.18	3.22	13.14
DCO	0.87	9.16	-2.83	0.56	4.67
DNCO	4.02	15.30	-2.40	1.58	7.97
Panel B: Unexpected accruals without control for ΔXFIN					
UEXAC_MJT	0.00	10.52	-3.74	0.80	5.15
UEXAC_MJT_ROA	0.00	8.76	-3.91	0.22	4.22
UEXAC_PMJT	-0.02	12.85	-6.29	0.00	6.29
UEXAC_MJC	0.00	7.87	-3.52	-0.09	3.50
UEXAC_MJC_ROA	0.00	7.44	-3.49	-0.21	3.34
UEXAC_PMJC	0.00	10.72	-5.39	0.00	5.43
UEXAC_DD	0.00	6.93	-2.94	-0.05	3.02
UEXAC_DDM	0.00	6.05	-2.55	0.06	2.74
Panel C: Unexpected accruals matched on ΔXFIN					
UEXAC_MJT	-0.02	14.33	-6.66	0.00	6.63
UEXAC_MJT_ROA	-0.03	11.54	-5.84	0.00	5.77
UEXAC_MJC	-0.01	10.62	-5.28	0.00	5.28
UEXAC_MJC_ROA	-0.01	9.88	-5.00	0.00	4.99
UEXAC_DD	-0.05	9.51	-4.52	-0.01	4.45
UEXAC_DDM	-0.05	8.40	-4.07	0.00	4.00
Panel D: Unexpected accruals with ΔXFIN as an additional regressor					
UEXAC_MJT	0.00	10.04	-3.57	0.76	4.92
UEXAC_MJT_ROA	0.00	8.00	-3.63	0.27	3.99
UEXAC_PMJT	-0.07	12.19	-6.03	0.00	5.92
UEXAC_MJC	0.00	7.41	-3.27	0.01	3.38
UEXAC_MJC_ROA	0.00	6.84	-3.21	-0.06	3.17
UEXAC_PMJC	0.00	10.03	-5.05	0.00	5.11
UEXAC_DD	0.00	6.61	-2.79	0.01	2.89
UEXAC_DDM	0.00	5.80	-2.44	0.06	2.61

TACC is total accruals, defined as income before extraordinary items (#123) minus cash from operations (CFO, data 308). CACC is current accruals, defined as the increase in account receivables (#302) plus the increase in inventory (#303) minus the increase in account payable (#304) minus the increase in tax payable (#305) minus the net change in other current assets (#307). ΔDEBT is net debt financing measured as the cash proceeds from the issuance of long-term debt (#111) less cash payments for long-term debt reduction (#114) less the net changes in current debt (#301). ΔEQUITY is net equity financing measured as the proceeds from the sale of common and preferred stock (#108) less cash payments for the purchase of common and preferred stock (#115) less cash payments for dividends (#127). ΔXFIN is net external financing, defined as the sum of net debt financing and net equity financing. ΔCASH is the change in the balance of cash and short-term investment (#274). NI is income before extraordinary items (#123). DNOA is the change in net operating assets (NOA), defined as noncash assets (#6 - #1) minus noncash liabilities (#181 - #9 - #34). DCO is the change in net current operating assets, where net current operating assets are equal to current operating assets (COA) minus current operating liabilities (COL). COA = current assets (#4) – cash and shot term investment (#1). COL = current liabilities (#5) – debt in current liabilities (#34). DNCO is the change in net non-current operating assets, where net non-current operating assets are defined as non-current operating assets (NCOA) minus non-current operating liabilities (NCOL). NCOA = total assets (#6) – current assets (#4) – investments and advances (#32). NCOL = total liabilities (#181) – current liabilities (#5) – long-term debt (#9). UEXAC_MJT is unexpected accruals from the modified Jones model for total accruals (TACC). UEXAC_MJT_ROA is unexpected accruals from the modified Jones model with ROA as an additional regressor for total accruals (TACC). UEXAC_PMJT is performance-matched unexpected accruals based on the modified Jones model for total accruals (TACC), as in Kothari et al. (2005). UEXAC_MJC is unexpected accruals from the modified Jones model for current accruals (CACC). UEXAC_MJC_ROA is unexpected accruals from the modified Jones model with ROA as an additional regressor for current accruals (CACC). UEXAC_PMJC is performance-matched unexpected accruals based on the modified Jones model for current accruals (CACC), as in Kothari et al. (2005). UEXAC_DD is unexpected accruals from the Dechow-Dichev model. UEXAC_DDM is unexpected accruals from the modification of the Dechow-Dichev model suggested by McNichols (2002).

Table 4: Unexpected accrual estimation coefficients

This table presents results from regressing total accruals (or current accruals) on external financing, net income, change in cash as well as other accrual determinants. Variables are defined in Table 2. All variables are deflated by average total assets and reported as percentages. The number of observations is 131,778. Figures in parentheses are *t*-statistics, based on the distribution of the coefficients obtained from the industry-specific regressions requiring a minimum of twenty observations per industry-year.

Variable	Panel A Modified Jones model Total accruals			Panel B Modified Jones model Current accruals			Panel C Dechow-Dichev model Current accruals			Panel D McNichols' modification Current accruals		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-3.517	-3.056	-3.139	0.636	0.519	0.498	1.914	3.669	3.663	1.579	2.844	2.833
	(-21.30)	(-26.49)	(-27.24)	(9.60)	(7.90)	(7.74)	(18.60)	(42.21)	(42.91)	(13.05)	(25.77)	(26.40)
1/ATA	-0.227	0.221	0.215	-0.040	0.002	0.014						
	(-4.80)	(5.76)	(5.76)	(-1.51)	(0.09)	(0.57)						
ΔREV	0.063	0.027	0.028	0.071	0.032	0.030				0.085	0.041	0.042
	(19.20)	(10.18)	(11.25)	(25.86)	(12.01)	(11.42)				(28.46)	(17.99)	(18.04)
PPE	-0.047	-0.058	-0.057							-0.011	-0.010	-0.010
	(-23.62)	(-37.50)	(-37.51)							(-6.39)	(7.93)	(7.73)
ΔXFIN		0.259			0.206			0.060			0.032	
		(36.09)			(26.65)			(13.35)			(6.71)	
ΔCASH		-0.359			-0.288			-0.053			-0.041	
		(-37.71)			(-27.13)			(-7.60)			(-5.95)	
ΔXFIN2			0.276			0.218			0.055			0.030
			(39.20)			(29.41)			(12.88)			(6.88)
NI		0.551	0.546		0.225	0.220		0.464	0.465		0.440	0.441
		(71.24)	(69.57)		(28.61)	(28.91)		(43.18)	(43.59)		(40.84)	(41.15)
CFO_{t-1}							0.192	0.079	0.079	0.235	0.103	0.104
							(24.90)	(13.70)	(13.95)	(28.84)	(16.47)	(16.80)
CFO_t							-0.429	-0.640	-0.639	-0.449	-0.660	-0.659
							(-46.30)	(-70.52)	(-71.47)	(-51.90)	(-69.82)	(-70.44)
CFO_{t+1}							0.155	0.091	0.090	0.141	0.084	0.084
							(23.76)	(16.28)	(16.79)	(22.69)	(15.04)	(15.66)
Adj. R^2	12.5%	51.2%	50.0%	10.9%	32.9%	31.6%	30.2%	63.6%	63.2%	41.0%	66.0%	65.6%

Table 5: Unexpected accruals sorted by ΔXFIN

This table reports averages for unexpected accruals measures, external financing variables and other variables for quartiles sorted on ΔXFIN within each year, where quartile 1 (quartile 4) represents the lowest (highest) quartile. Variable are defined in Table 2. All variables are deflated by average total assets and reported as percentages. The number of observations is 131,778.

Variables	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Panel A: Accruals, external financing and decomposition				
TACC	-7.94	-6.34	-5.73	-5.30
CACC	0.05	0.64	1.87	3.86
ΔXFIN	-9.66	-1.75	2.77	25.99
ΔDEBT	-3.51	-0.91	2.10	10.43
ΔEQUITY	-1.45	-0.74	0.86	13.46
ΔCASH	0.59	-0.21	-0.33	2.83
NI	-1.31	-0.12	-2.10	-7.50
DNOA	0.78	1.18	4.80	17.27
DCO	-0.56	0.27	1.39	3.65
DNCO	1.51	1.04	3.31	12.31
Panel B: Unexpected accruals without control for ΔXFIN				
UEXAC_MJT	-1.08	0.17	0.62	1.21
UEXAC_MJT_ROA	-1.40	-0.48	0.46	2.69
UEXAC_PMJT	-1.36	-0.58	0.34	2.72
UEXAC_MJC	-1.13	-0.48	0.46	1.91
UEXAC_MJC_ROA	-1.26	-0.70	0.39	2.42
UEXAC_PMJC	-1.30	-0.60	0.47	2.34
UEXAC_DD	-0.62	-0.55	0.28	1.33
UEXAC_DDM	-0.34	-0.12	0.25	0.45
Panel C: Unexpected accruals matched on ΔXFIN				
UEXAC_MJT	-0.02	-0.02	0.03	-0.06
UEXAC_MJT_ROA	-0.04	-0.03	-0.01	-0.03
UEXAC_MJC	-0.07	-0.03	0.08	-0.02
UEXAC_MJC_ROA	-0.07	0.01	0.03	-0.01
UEXAC_DD	-0.05	-0.07	-0.05	-0.02
UEXAC_DDM	-0.06	-0.06	-0.03	-0.05
Panel D: Unexpected accruals with ΔXFIN as an additional regressor				
UEXAC_MJT	-0.86	0.19	0.41	0.26
UEXAC_MJT_ROA	-0.98	0.17	0.64	0.18
UEXAC_PMJT	-2.02	-0.44	0.27	2.04
UEXAC_MJC	-0.80	-0.10	0.47	0.36
UEXAC_MJC_ROA	-0.82	-0.11	0.54	0.33
UEXAC_PMJC	-1.32	-0.27	0.51	0.99
UEXAC_DD	-0.44	-0.25	0.37	0.30
UEXAC_DDM	-0.29	-0.10	0.22	0.17

Table 6: Measurement of the bias in tests of earnings management in the presence of external financing

This table empirically estimates the bias in tests of earnings management (i.e., the bias in regression coefficients, $\rho_{PART,\eta} * \sigma_{\eta} / \sigma_{PART}$) in the presence of large external financing, by applying the framework as suggested by McNichols and Wilson (1988). Variables are defined in Table 2. All variables are deflated by average total assets and reported as percentages. The number of observations is 131,778. $PART_{\Delta XFIN>Q3}$ is an indicator variable equal to 1 when the firm's ΔXFIN is higher than the 75th percentile of the distribution in the corresponding year, and zero otherwise. $PART_{\Delta XFIN<Q1}$ is an indicator variable equal to 1 if when the firm's ΔXFIN is lower than the 25th percentile of the distribution in the corresponding year, and zero otherwise. Bias (η) is measured as the difference between unexpected accruals estimated from models without and with controlling for ΔXFIN.

Unexpected accruals	Bias($PART_{\Delta XFIN>Q3}$)	Bias($PART_{\Delta XFIN<Q1}$)
Panel A: Unexpected accruals matched on ΔXFIN as the true model		
UEXAC_MJT	1.41	-1.73
UEXAC_MJT_ROA	3.53	-3.14
UEXAC_MJC	2.58	-2.15
UEXAC_MJC_ROA	3.30	-2.60
UEXAC_DD	1.74	-1.23
UEXAC_DDM	0.53	-0.51
Panel B: Unexpected accruals with ΔXFIN as an additional regressor as the true model		
UEXAC_MJT	1.03	-0.73
UEXAC_MJT_ROA	3.31	-2.00
UEXAC_PMJT	0.89	-0.67
UEXAC_MJC	2.07	-1.32
UEXAC_MJC_ROA	2.88	-1.75
UEXAC_PMJC	1.83	-1.20
UEXAC_DD	1.39	-0.74
UEXAC_DDM	0.32	-0.20

Table 7: Regression of unexpected accruals on external financing indicators

This table reports results from the regression of unexpected accruals on external financing indicators: UEXAC = $\alpha + \beta$ * PART + ε. Variables are defined in Table 2. All variables are deflated by average total assets and reported as percentages. The number of observations is 131,778. $PART_{\Delta XFIN>Q3}$ is an indicator variable equal to 1 when the firm's ΔXFIN is higher than the 75^{th} percentile of the distribution in the corresponding year, and zero otherwise. $PART_{\Delta XFIN<Q1}$ is an indicator variable equal to 1 when the firm's ΔXFIN is lower than the 25^{th} percentile of the distribution in the corresponding year, and zero otherwise. ** (*) indicates significant at the 1% (5%) level for two tailed test.

Dependent variables	$PART_{\Delta XFIN>Q3}$	T-stat	$PART_{\Delta XFIN<Q1}$	T-stat
Panel A: Unexpected accruals without control for ΔXFIN				
UEXAC_MJT	1.68	4.82**	-2.17	-10.26**
UEXAC_MJT_ROA	3.62	13.94**	-3.61	-21.77**
UEXAC_PMJT	3.70	10.79**	-3.50	-15.56**
UEXAC_MJC	2.66	11.07**	-2.56	-12.73**
UEXAC_MJC_ROA	3.17	12.30**	-2.97	-14.61**
UEXAC_PMJC	3.24	10.32**	-3.08	-13.93**
UEXAC_DD	1.71	9.29**	-1.31	-9.37**
UEXAC_DDM	0.63	4.71**	-0.62	-6.70**
Panel B: Unexpected accruals matched on ΔXFIN				
UEXAC_MJT	0.08	0.32	-0.21	-1.66
UEXAC_MJT_ROA	-0.04	-0.19	-0.05	-0.34
UEXAC_MJC	0.27	1.50	-0.12	-1.10
UEXAC_MJC_ROA	0.06	0.51	-0.02	-0.12
UEXAC_DD	-0.05	-0.45	0.18	1.39
UEXAC_DDM	0.10	1.23	0.01	0.07
Panel C: Unexpected accruals with ΔXFIN as an additional regressor				
UEXAC_MJT	0.66	3.00**	-1.35	-10.11**
UEXAC_MJT_ROA	0.33	2.33*	-1.39	-8.70**
UEXAC_PMJT	2.95	12.15**	-2.75	-8.71**
UEXAC_MJC	0.79	6.92**	-1.19	-11.55**
UEXAC_MJC_ROA	0.51	5.56**	-1.10	-11.56**
UEXAC_PMJC	1.78	5.98**	-1.82	-12.97**
UEXAC_DD	0.53	5.93**	-0.55	-6.71**
UEXAC_DDM	0.37	4.03**	-0.44	-7.84**

Table 8: Rejection frequencies as a function of the extent of sample contamination from net external financing (5% significance level)

This table reports rejection frequencies for samples contaminated by external financing. The sample is contaminated at the X% level by taking a random sample of 1,000*X% without replacement from the subsample of firm-years with large external financing ($PART_{\Delta XFIN>Q3}$=1 or $PART_{\Delta XFIN<Q1}$=1) and a random sample of 1,000*(100%–X%) without replacement from the full dataset that presumably does not evidence systematic earnings management. $PART_{\Delta XFIN>Q3}$ is an indicator variable equal to 1 when the firm's ΔXFIN is higher than the 75th percentile of the distribution in the corresponding year, and zero otherwise. $PART_{\Delta XFIN<Q1}$ is an indicator variable equal to 1 when the firm's ΔXFIN is lower than the 25th percentile of the distribution in the corresponding year, and zero otherwise. The rejection frequencies thus represent the percentage of 250 trials where the null hypothesis of no earnings management is rejected at the 5% level (i.e., the probability of committing a type I error).

Contamination level (X)	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Panel A: Unexpected accruals without control for ΔXFIN ($PART_{\Delta XFIN>Q3}$)											
UEXAC_MJT	8.0%	21.2%	32.4%	42.4%	49.6%	59.2%	67.6%	74.0%	82.8%	86.8%	90.4%
UEXAC_MJT_ROA	2.4%	19.6%	59.2%	83.6%	96.4%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
UEXAC_PMJT	2.0%	12.0%	34.8%	60.4%	79.6%	91.6%	97.6%	100.0%	100.0%	100.0%	100.0%
UEXAC_MJC	6.6%	22.8%	46.4%	72.0%	92.4%	97.6%	99.6%	100.0%	100.0%	100.0%	100.0%
UEXAC_MJC_ROA	2.4%	22.8%	60.8%	88.4%	98.0%	99.6%	100.0%	100.0%	100.0%	100.0%	100.0%
UEXAC_PMJC	2.8%	15.6%	34.4%	66.8%	85.6%	96.0%	98.4%	100.0%	100.0%	100.0%	100.0%
UEXAC_DD	4.8%	14.4%	31.2%	51.2%	72.0%	85.2%	93.2%	98.4%	99.6%	99.6%	99.6%
UEXAC_DDM	7.6%	12.4%	16.0%	20.0%	25.6%	30.0%	36.8%	46.4%	49.2%	58.8%	64.4%
Panel B: Unexpected accruals matched on ΔXFIN ($PART_{\Delta XFIN>Q3}$)											
UEXAC_MJT	6.0%	5.2%	4.4%	4.8%	4.0%	3.2%	3.2%	4.0%	4.0%	4.4%	3.6%
UEXAC_MJT_ROA	4.0%	4.4%	3.6%	4.8%	5.6%	5.6%	6.4%	5.2%	4.8%	4.0%	5.6%
UEXAC_MJC	6.0%	5.6%	5.2%	2.0%	2.8%	2.4%	3.6%	2.4%	2.0%	2.0%	2.4%
UEXAC_MJC_ROA	4.4%	4.4%	5.2%	4.4%	4.8%	5.2%	5.6%	5.2%	4.8%	4.0%	4.4%
UEXAC_DD	2.0%	4.0%	2.0%	2.2%	2.4%	2.6%	2.4%	3.2%	2.8%	2.8%	2.4%
UEXAC_DDM	3.2%	2.8%	2.6%	2.6%	2.4%	2.2%	2.6%	2.4%	2.4%	2.0%	2.2%
Panel C: Unexpected accruals with ΔXFIN as an additional regressor ($PART_{\Delta XFIN>Q3}$)											
UEXAC_MJT	7.6%	7.6%	11.2%	11.2%	10.4%	11.6%	12.4%	11.6%	10.4%	10.8%	12.4%
UEXAC_MJT_ROA	3.6%	4.4%	5.6%	4.4%	5.6%	6.0%	6.4%	10.8%	7.6%	8.8%	12.4%
UEXAC_PMJT	2.8%	6.0%	21.2%	37.6%	54.0%	74.0%	88.4%	96.0%	98.8%	99.2%	100.0%
UEXAC_MJC	4.0%	7.2%	9.2%	10.8%	15.6%	13.6%	17.2%	19.2%	24.0%	28.4%	33.2%
UEXAC_MJC_ROA	5.6%	5.6%	6.4%	10.4%	12.0%	18.0%	20.0%	24.4%	26.8%	32.0%	32.0%
UEXAC_PMJC	3.2%	8.0%	12.8%	22.8%	32.0%	42.4%	51.6%	62.0%	69.2%	78.0%	86.0%
UEXAC_DD	6.4%	5.6%	9.6%	10.8%	12.8%	15.2%	17.6%	20.8%	28.0%	29.2%	28.8%
UEXAC_DDM	4.0%	5.2%	7.2%	7.6%	10.0%	10.4%	13.6%	14.0%	15.6%	21.2%	22.0%

Panel D: Unexpected accruals without control for ΔXFIN ($PART_{\Delta XFIN<Q1}$)

UEXAC_MJT	2.0%	6.4%	12.8%	21.2%	37.2%	58.4%	80.0%	91.2%	98.0%	99.2%	100.0%
UEXAC_MJT_ROA	7.6%	31.6%	73.2%	96.4%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
UEXAC_PMJT	8.0%	22.0%	42.8%	66.8%	87.6%	98.4%	100.0%	100.0%	100.0%	100.0%	100.0%
UEXAC_MJC	4.0%	16.8%	41.6%	74.8%	94.4%	99.2%	100.0%	100.0%	100.0%	100.0%	100.0%
UEXAC_MJC_ROA	4.4%	30.0%	72.8%	94.0%	99.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
UEXAC_PMJC	4.4%	19.6%	46.0%	75.6%	90.8%	98.0%	100.0%	100.0%	100.0%	100.0%	100.0%
UEXAC_DD	5.6%	11.6%	28.8%	50.4%	70.0%	85.6%	94.8%	99.2%	100.0%	100.0%	100.0%
UEXAC_DDM	3.2%	4.8%	6.4%	9.2%	17.6%	26.4%	34.8%	49.2%	59.6%	68.0%	79.6%

Panel E: Unexpected accruals matched on ΔXFIN ($PART_{\Delta XFIN<Q1}$)

UEXAC_MJT	6.8%	5.6%	5.6%	4.8%	5.2%	5.2%	4.4%	4.0%	4.0%	3.6%	4.8%
UEXAC_MJT_ROA	2.8%	4.8%	6.4%	6.4%	5.6%	6.8%	5.2%	6.8%	6.4%	6.0%	5.2%
UEXAC_MJC	6.0%	5.2%	4.0%	5.2%	6.0%	6.0%	6.8%	6.8%	7.2%	5.6%	5.6%
UEXAC_MJC_ROA	3.6%	5.6%	5.2%	6.0%	5.6%	6.8%	5.6%	7.2%	6.4%	6.4%	5.6%
UEXAC_DD	7.2%	6.4%	6.4%	5.2%	7.4%	7.6%	7.4%	7.2%	6.0%	6.0%	8.0%
UEXAC_DDM	5.2%	7.2%	8.4%	5.6%	5.6%	6.4%	6.8%	6.4%	6.0%	6.4%	6.4%

Panel F: Unexpected accruals with ΔXFIN as an additional regressor ($PART_{\Delta XFIN<Q1}$)

UEXAC_MJT	4.8%	6.0%	11.2%	16.8%	23.6%	37.6%	50.8%	63.2%	77.2%	82.4%	90.0%
UEXAC_MJT_ROA	6.4%	13.2%	19.6%	32.8%	50.4%	67.6%	82.4%	92.4%	95.6%	98.4%	99.6%
UEXAC_PMJT	7.6%	17.6%	36.0%	56.4%	78.0%	88.4%	96.4%	99.2%	100.0%	100.0%	100.0%
UEXAC_MJC	3.2%	8.0%	15.2%	28.4%	41.6%	55.2%	68.4%	83.6%	94.0%	98.8%	100.0%
UEXAC_MJC_ROA	5.6%	10.8%	22.4%	37.6%	51.2%	64.4%	84.4%	90.8%	96.4%	99.2%	100.0%
UEXAC_PMJC	4.8%	14.4%	26.4%	42.0%	53.6%	73.2%	86.8%	95.2%	98.0%	100.0%	100.0%
UEXAC_DD	4.0%	9.2%	11.2%	15.6%	20.0%	26.0%	36.8%	50.8%	56.4%	70.4%	84.0%
UEXAC_DDM	3.2%	6.0%	7.6%	12.4%	14.0%	21.6%	29.6%	37.2%	41.2%	51.6%	58.8%

Table 9: Tests of earnings management in the year of net external financing

Panel A: This panel reports the probability of meeting or just beating earnings benchmarks in the financing year for quartiles sorted on ΔXFIN within each year, where quartile 1 (quartile 4) represents the lowest (highest) quartile. The probability of meeting or just beating an earnings benchmark is defined as a dummy variable equal to 1 if earnings surprises are zero or one cent, and 0 otherwise. Earnings surprises are calculated as the difference between actual earnings and the most recent consensus forecast before the earnings announcement, both of which are measured on a per-share basis and are rounded to the nearest cent.

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Probability(meet or just beat)	7.7%	7.0%	7.8%	7.6%

Panel B: This panel reports the results of a logit regression of the probability of meeting or just beating an earnings benchmark on two partitioning variables ($PART_{\Delta XFIN>Q3}$ and $PART_{\Delta XFIN<Q1}$) as well as year controls. $PART_{\Delta XFIN>Q3}$ is an indicator variable equal to 1 when the firm's ΔXFIN is higher than the 75th percentile of the distribution in the corresponding year, and zero otherwise. $PART_{\Delta XFIN<Q1}$ is an indicator variable equal to 1 when the firm's ΔXFIN is lower than the 25th percentile of the distribution in the corresponding year, and zero otherwise. The p-value of the corresponding coefficient in the logit regression is reported in parentheses. ** (*) indicates significant at the 1% (5%) level for two tailed test.

	Predicted signs	Coefficient	p-value
Intercept		-1.907**	(0.000)
$PART_{\Delta XFIN>Q3}$	+	0.017	(0.447)
$PART_{\Delta XFIN<Q1}$	-	0.017	(0.436)
Year controls		Yes	

Panel C: This panel reports the results from estimating the rate of mean reversion in earnings over the three years following external financing using a first-order autoregressive (AR1) model:

$$NI_{t+i} = \beta_0 + \beta_1 NI_t + \beta_2 NI_t * PART_{\Delta XFIN>Q3} + \beta_3 NI_t * PART_{\Delta XFIN<Q1} + \varepsilon_{t+i}$$

NI_{t+i} is net income at time t+*i* (*i* = 1, 2, 3 respectively). $PART_{\Delta XFIN>Q3}$ is an indicator variable equal to 1 when the firm's ΔXFIN is higher than the 75th percentile of the distribution in the corresponding year, and zero otherwise. $PART_{\Delta XFIN<Q1}$ is an indicator variable equal to 1 when the firm's ΔXFIN is lower than the 25th percentile of the distribution in the corresponding year, and zero otherwise. The AR1 model is estimated every year, and the sample average and significance of the individual-year parameter estimates are reported. Figures in parentheses are *t*-statistics. ** (*) indicates significant at the 1% (5%) level for two tailed test.

	Intercept	NI_t	NI_{t+1}* $PART_{\Delta XFIN>Q3}$	NI_{t+1}* $PART_{\Delta XFIN<Q1}$	Avg. N	Avg. Adj. R^2
NI_{t+1}	-0.615*	0.672**	-0.032	0.071**	4431	41.59%
	(-2.12)	(63.17)	(-1.37)	(4.47)		
NI_{t+2}	-0.543	0.517**	-0.016	0.076**	4096	25.89%
	(-1.19)	(33.99)	(-0.67)	(6.14)		
NI_{t+3}	-0.387	0.450**	-0.042	0.064**	3806	19.00%
	(-0.66)	(28.90)	(-1.35)	(5.33)		

Panel D: This panel reports the median market-adjusted abnormal return for quarterly earnings announcements using a three-day (-1, +1) event window. The year of net external financing is defined as Y(0). All other years are indexed accordingly. Means for Y(1) to Y(3) represents the mean of median abnormal earnings-announcement returns for the 12 quarters after the year of net external financing. Number positive for Y(1) to Y(3)/Number available represents the ratio of the number of quarters with positive abnormal returns relative to the number of quarters for the period from Y(1) to Y(3) (i.e., 12 quarters in total). Figures in parentheses are *t*-statistics. ** (*) indicates significant at the 1% (5%) level for two tailed test.

Quartile	1 (Lowest)		2		3		4 (Highest)	
Period	Median (%)	Wilcoxon p-value	Median (%)	Wilcoxon p-value	Median (%)	Wilcoxon p-value	Median (%)	Wilcoxon p-value
Y(-2)Q1	0.20%	0.00	0.15%	0.00	0.24%	0.00	0.17%	0.00
Y(-2)Q2	0.11%	0.00	0.08%	0.03	0.03%	0.01	-0.07%	0.37
Y(-2)Q3	-0.05%	0.97	-0.05%	0.33	-0.01%	0.15	-0.37%	0.00
Y(-2)Q4	0.22%	0.00	0.25%	0.00	0.37%	0.00	-1.93%	0.00
Y(-1)Q1	0.16%	0.00	0.18%	0.00	0.26%	0.00	0.21%	0.00
Y(-1)Q2	0.12%	0.00	0.01%	0.04	0.08%	0.00	0.06%	0.00
Y(-1)Q3	-0.08%	0.14	-0.13%	0.09	-0.16%	0.30	-0.03%	0.02
Y(-1)Q4	0.28%	0.00	-0.05%	0.00	-0.02%	0.10	0.51%	0.00
Y(0)Q1	0.27%	0.00	-0.70%	0.00	0.04%	0.00	1.32%	0.00
Y(0)Q2	0.21%	0.00	-0.91%	0.00	0.05%	0.63	-0.21%	0.35
Y(0)Q3	-0.01%	0.09	-0.84%	0.00	-0.32%	0.00	-1.84%	0.00
Y(0)Q4	0.18%	0.00	1.37%	0.00	0.18%	0.03	1.12%	0.00
Y(1)Q1	-0.71%	0.00	0.89%	0.00	0.40%	0.00	1.01%	0.00
Y(1)Q2	-0.77%	0.00	-0.03%	0.16	-0.06%	0.00	-1.41%	0.00
Y(1)Q3	-0.96%	0.00	-1.03%	0.00	0.51%	0.00	0.72%	0.67
Y(1)Q4	-2.53%	0.00	1.12%	0.00	1.04%	0.00	-2.23%	0.00
Y(2)Q1	1.32%	0.00	1.10%	0.00	-0.05%	0.00	1.66%	0.00
Y(2)Q2	0.31%	0.00	-0.39%	0.00	-0.11%	0.05	-1.57%	0.00
Y(2)Q3	-0.17%	0.00	0.72%	0.00	0.75%	0.00	-1.51%	0.00
Y(2)Q4	2.20%	0.00	1.24%	0.00	1.15%	0.00	0.19%	0.01
Y(3)Q1	1.49%	0.00	1.15%	0.00	-0.06%	0.00	0.99%	0.00
Y(3)Q2	-1.25%	0.00	-0.68%	0.00	0.04%	0.39	1.87%	0.00
Y(3)Q3	-0.26%	0.00	0.58%	0.00	0.24%	0.00	-2.24%	0.00
Y(3)Q4	0.12%	0.00	1.75%	0.00	1.15%	0.00	2.67%	0.00
Mean for Y(1) to Y(3)	-0.10%		0.54%*		0.42%*		0.01%	
t-statistics	(-0.27)		(2.14)		(2.91)		(0.03)	
Number positive for Y(1) to Y(3)/ Number available	5/12		8/12		8/12		7/12	

Table 10: Robustness tests

Panel A: This panel estimates the bias in tests of earnings management (i.e., the bias in regression coefficients, $\rho_{PART,\eta} * \sigma_\eta / \sigma_{PART}$) in the presence of large external financing, by applying the framework suggested by McNichols and Wilson (1988). Variable definitions can be found in Table 2. All variables are deflated by average total assets and reported as percentages. The number of observations is 131,778. $PART_{\Delta XFIN2>Q3}$ is an indicator variable equal to 1 when the firm's ΔXFIN2 is higher than the 75th percentile of the distribution in the corresponding year, and zero otherwise. $PART_{\Delta XFIN2<Q1}$ is an indicator variable equal to 1 when the firm's ΔXFIN2 is lower than the 25th percentile of the distribution in the corresponding year, and zero otherwise. Bias (η) is measured as the difference between unexpected accruals estimated from models without and with controlling for ΔXFIN2.

Unexpected accruals	Bias($PART_{\Delta XFIN2>Q3}$)	Bias($PART_{\Delta XFIN2<Q1}$)
Panel A: Unexpected accruals matched on ΔXFIN2 as the true model		
UEXAC_MJT	1.31	-2.41
UEXAC_MJT_ROA	4.59	-4.55
UEXAC_MJC	3.09	-3.15
UEXAC_MJC_ROA	4.15	-3.82
UEXAC_DD	1.21	-1.28
UEXAC_DDM	0.32	-0.76
Panel B: Unexpected accruals with ΔXFIN2 as an additional regressor as the true model		
UEXAC_MJT	1.59	-1.23
UEXAC_MJT_ROA	4.61	-3.47
UEXAC_PMJT	1.06	-0.92
UEXAC_MJC	2.88	-2.16
UEXAC_MJC_ROA	3.93	-2.97
UEXAC_PMJC	1.88	-1.34
UEXAC_DD	0.99	-0.68
UEXAC_DDM	0.22	-0.17

Panel B: This panel reports the averages of unexpected accruals measures, external financing variables and other variables for groups sorted on ΔXFIN within each year, where group L (group H) represents the lowest (highest) group. Definitions of all variables can be found in Table 2. All variables are deflated by average total assets and reported as percentages. The number of observations is 131,778.

Variables	Sorting into thirds			Sorting into quintiles				
	L	2	H	L	2	3	4	H
Panel B1: Unexpected accruals without control for ΔXFIN								
UEXAC_MJT	-0.95	0.25	1.21	-1.63	0.04	0.24	1.09	1.07
UEXAC_MJT_ROA	-2.18	-0.13	2.25	-3.08	-0.78	-0.14	1.10	2.81
UEXAC_PMJT	-2.12	-0.20	2.22	-2.92	-0.90	-0.06	0.85	2.88
UEXAC_MJC	-1.52	-0.12	1.66	-2.03	-0.73	-0.10	0.99	1.93
UEXAC_MJC_ROA	-1.92	-0.26	2.02	-2.48	-1.00	-0.25	0.98	2.51
UEXAC_PMJC	-1.88	-0.19	2.04	-2.40	-1.01	-0.11	1.11	2.40
UEXAC_DD	-0.84	-0.30	1.17	-1.18	-0.44	-0.38	0.68	1.34
UEXAC_DDM	-0.29	-0.02	0.45	-0.43	-0.10	-0.05	0.47	0.33
Panel B2: Unexpected accruals matched on ΔXFIN								
UEXAC_MJT	0.00	-0.03	-0.02	-0.04	-0.01	-0.02	0.03	-0.06
UEXAC_MJT_ROA	-0.02	-0.03	-0.02	-0.05	-0.01	-0.06	0.02	-0.03
UEXAC_MJC	-0.03	0.03	0.07	0.03	-0.09	0.06	0.09	0.04
UEXAC_MJC_ROA	-0.01	0.03	0.06	0.05	-0.06	0.02	0.09	0.04
UEXAC_DD	-0.09	-0.09	-0.03	-0.03	-0.13	-0.09	0.06	-0.15
UEXAC_DDM	-0.09	-0.06	-0.04	-0.04	-0.12	-0.07	0.01	-0.10
Panel B3: Unexpected accruals with ΔXFIN as an additional regressor								
UEXAC_MJT	-0.56	0.18	0.39	-1.09	0.18	0.17	0.75	-0.04
UEXAC_MJT_ROA	-0.70	0.34	0.38	-1.13	-0.05	0.40	0.88	-0.12
UEXAC_PMJT	-1.61	-0.17	1.67	-2.23	-0.72	-0.01	0.66	2.13
UEXAC_MJC	-0.58	0.08	0.47	-0.82	-0.25	0.11	0.76	0.17
UEXAC_MJC_ROA	-0.61	0.14	0.45	-0.81	-0.33	0.20	0.78	0.12
UEXAC_PMJC	-1.00	-0.01	0.95	-1.26	-0.59	0.06	0.80	0.90
UEXAC_DD	-0.31	-0.10	0.40	-0.48	-0.14	-0.17	0.64	0.12
UEXAC_DDM	-0.20	-0.05	0.25	-0.30	-0.08	-0.10	0.44	0.03

Table 11: A test for unexpected accruals concurrent with share repurchases

This table reports estimated unexpected accruals across quartiles of net external debt financing (ΔDebt). The repurchase sample begins in 1988, the year in which the statement of cash flow data became available, and ends in 2002 consistent with Gong et al. (2008). UEXAC_ΔXFIN is unexpected accruals estimated in the same manner as UEXAC_MJT but using the matching procedure based on industry and ΔXFIN. UEXAC_ΔDebt is unexpected accruals estimated in the same manner as UEXAC_MJT but using the matching procedure based on industry and ΔDebt. All other variables are defined in Table 2. All variables are deflated by average total assets and reported as percentages. Quartile N for ΔDebt represents firms whose net external debt financing falls in the N^{th} quartile of the whole Compustat sample sorted on ΔDebt within each year, where quartile 1 (quartile 4) represents the lowest (highest) quartile. Robust t-statistics (in parentheses) use a Huber-White correction for general heteroskedasticity in the standard errors. ** (*) indicates significant at the 1% (5%) level for a two tailed test.

	UEXAC_MJT	UEXAC_PMJT	UEXAC_DDM	UEXAC_ΔXFIN	UEXAC_ ΔDebt
Panel A: Unexpected accruals for full sample of firms making share repurchase					
Mean	-0.57	-1.08	0.22	0.74	0.57
T-stat	(-2.24)*	(-3.35)**	(0.96)	(1.85)	(1.35)
No. of Firms	1050	1048	440	1005	1047
Panel B: Unexpected accruals for firms making share repurchase across quartiles of net external debt financing (ΔDebt)					
Quartile 1 for ΔDebt					
Mean	-1.85	-1.56	-0.02	0.45	1.11
T-stat	(-3.01)**	(-2.08)*	(-0.04)	(0.51)	(1.03)
No. of Firms	235	235	103	225	232
Quartile 2 for ΔDebt					
Mean	-1.17	-2.11	-0.28	2.01	1.09
T-stat	(-2.50)*	(-3.21)**	(-0.74)	(2.51)*	(1.38)
No. of Firms	269	268	122	252	269
Quartile 3 for ΔDebt					
Mean	-0.88	-1.07	0.13	0.06	-0.28
T-stat	(-1.89)	(-2.18)*	(0.25)	(0.09)	(-0.37)
No. of Firms	281	281	101	270	281
Quartile 4 for ΔDebt					
Mean	1.47	0.66	1.04	0.45	0.47
T-stat	(2.96)**	(0.92)	(2.87)**	(0.53)	(0.60)
No. of Firms	265	264	114	258	265