Is Earnings Management Systematically Associated with the Use of Stock Payment in Takeovers?*

Raymond da Silva Rosa*
Andrew Sheung**
and
Terry Walter***

* Associate Professor, Department of Accounting and Finance, University of Western Australia
** Research Associate, The University of New South Wales
*** Professor, School of Banking and Finance, The University of New South Wales and Securities Industry Research Center of Asia Pacific.

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Abstract

This paper investigates whether bidding firms that offer shares as consideration engage in earnings management prior to takeover announcements. It is frequently argued that managers of bidding firms have an incentive to manage earnings prior to a stock-based takeover bid to “boost” the share price of the bidder. We test for earnings management by bidders using total accruals, the first difference in total accruals and a cross-sectional pooled time series “modified Jones’ model”. We also examine whether bidding firms make use of abnormal and extraordinary items in managing earnings. Our tests of bidding firms involve 57 share-financed and 112 cash-financed takeovers completed between 1990 and 1998. For the 57 share bidders the total sample shows no evidence of managing earnings upward, however a sub-partition comprising the smallest third of share bidders has evidence of earnings management in the modified Jones’ model results. For the 112 cash bidders we detect no evidence of earnings management in any of our tests. Our findings are robust to controls for the economic determinants of stock payment in a takeover.

JEL Classifications: G34, G14, M41

Keywords: Earnings Management, Takeovers, Method of Payment, Modified Jones’ Model

Corresponding Author: Professor Terry S Walter
School of Banking and Finance
University of New South Wales
NSW 2052 Australia
Phone + 61 2 9385 5858
Fax + 61 2 9385 6730
Email t.walter@unsw.edu.au

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1. Introduction

There are three commonly used methods of payment in takeovers. These are a stock for stock exchange, a cash payment, or a mixture of stock and cash payment. In this paper we examine earnings management by bidding firms who offer shares as consideration in their takeover bids. It is frequently argued that managers of bidding firms have an incentive to manage earnings prior to a stock-based takeover bid to “boost” the share price of the bidder. Target shareholders, presumably being unaware of the earnings management, supposedly accept shares with inflated market values in the takeover. Consequently the takeover is less costly because, the higher the share price of bidder, the fewer the number of shares the bidder must offer.

The question that arises is can managers increase the bidding companies’ share prices by earnings management? In an efficient capital market, shares always exchange at a price that incorporates all available information. However, empirical studies indicate that the market is at best semi-strong form efficient, rather than strong form efficient. Therefore, managers may attempt to send a credible signal to the market, such as better than expected earnings, to increase the firm’s share price. In this case, it is assumed that managers are acting to maximise the wealth of their existing shareholders. Two key questions follow. Are there reasonable grounds to believe that managers engage in earnings management in order to achieve a higher share price around the period they wish to effect a takeover? Are the shareholders of target companies prepared to accept these shares in the competitive processes of takeover negotiations?

Using a sample of Australian Stock Exchange (ASX) listed bidding firms involved in 57 share offers and 112 cash offers between 1990 to 1998, we investigate if the bidding firms managed earnings upward in the period before their takeover announcement. Cash bidders are used as a control in the experiment. We test for earnings management using estimated total accruals computed from the cash flow statement approach (Collins and Hribar, 1999), and also by measuring any difference in the incidence of strategic reporting of abnormal and extraordinary items. In addition, we use the “modified Jones’ model” applying the formulation employed in Erickson and Wang (1999) and a modification in which the dependent variable is converted to first differences. These regressions are also partitioned into three groups based on the size of the bidding firm. Furthermore, we examine the bidding firms’ share price performance in the period surrounding a takeover to observe whether increased total accruals are associated with excess returns.

The results of our paper should enrich our knowledge on the association between earnings management and method of payment, particularly in the case of pure stock payments. Our research is motivated by several factors. First, there is only one empirical paper that tests the association between stock payment in takeover and earnings management, this being Erickson and Wang (1999). Second, the institutional arrangements in Australian takeovers differ quite markedly to those in the US, thus enabling an increased understanding of the
incentives for, and consequences of, earnings management. Third, we believe that the competitive forces that operate at the time of a takeover are such that earnings management will be detected and discounted by the target and its advisers, hence making the costs of earnings management greater than the benefits. Hence, we do not expect to find earnings management by bidding firms whose activities are closely monitored by capital markets, though earnings management might be detected in acquiring companies whose accounting reports are not closely monitored.

This rest of the paper is structured as follows. In section 2, the literature on method of payment and earnings management is reviewed. Testable hypotheses are advanced in section 3. Section 4 reviews some of the weaknesses and limitations of prior accrual models and describes the proposed research methods. Section 5 details the data collection procedures and the experimental samples used on this paper. Results are discussed in section 6. Finally, section 7 provides the conclusions of the study, as well as highlighting its limitations and avenues for future research.

2. Method of Payment and Earnings Management

2.1. Method of payment

All firms involved in a takeover bid must consider how they plan to finance the purchase of the target firm. However, bidding firms should be well informed about the expected market reaction to different methods of payment, because empirical studies on the short- and long-term impact of method of payment in takeovers are common. Some of these are briefly reviewed below.

Travlos (1987) asserts that the method of payment in takeovers is important in explaining differences in bidders’ post-takeover returns. He investigates 167 completed takeover bids between 1972 and 1981, comprising 60 stock offers, 100 cash offers, and seven mixed offers. He finds that the daily abnormal return exhibited by bidding firms on the day of announcement in stock offers is significantly negative. The 100 firms that make cash bids experienced normal returns. Most other studies have found similar results; that is, bidders earn negative abnormal share returns when offering their stock as consideration.

For example, Loughran and Vijh (1997) compare the abnormal return to a portfolio comprising 288 stock bidders with the abnormal return to a portfolio comprising 228 cash bidders between 1970 and 1989. They find that over a period of five years after the date of acquisition, the cash payment portfolio earned a rebalanced abnormal return of, on average, 71.7% (which is significantly different from zero at the 0.01 level) while the stock payment portfolio earned, on average, 15.8% (insignificant). Importantly, Loughran and Vijh’s findings are unlikely to have been influenced by the well-known biases in computing long-run abnormal share returns since they were calculated on a buy-and-hold basis, as suggested by Barber and Lyon (1997).
Furthermore, when Loughran and Vijh’s stock payment samples are partitioned by the relative size of target to bidder firm quartiles, there is a strong linear relationship between the target’s relative size and rebalanced abnormal returns. The quartile with the highest relative size (where the target firm is at least 64.24% of the bidding firm’s size) exhibits the poorest mean abnormal return of −28.3%, five years after the announcement. In contrast, the firms in the corresponding quartile from the cash payment samples experience positive abnormal return of 35.0%, on average.

It is intriguing that the capital market apparently does not react efficiently to the information implicit in the method of payment in takeovers. Two plausible explanations why method of payment is systematically associated with abnormal share price reaction are the asymmetric information hypothesis (Myers and Majluf, 1984) and the market underreaction hypothesis. In essence, the two hypotheses suggest that managers of bidding firms attempt to maximise their shareholders’ wealth by using stock payments when their company’s stock price is likely to be overvalued, and cash payments when their stock price is likely to be undervalued. The subsequent abnormal share price reactions could thus merely reflect the correction of the capital market valuations after a takeover. Thus, managers successfully exploit inefficient market pricing in deciding on which form of payment to use in a takeover. Why the shareholders of targets do not understand these likely incentives of bidding firm managers remains unexplained.

While the empirical evidence shows that share bidders have negative returns following takeovers, it also shows that the distribution of these abnormal returns has considerable variance, and thus may not necessarily discourage bidders from offering stock as payment in their offers. Indeed, in approximately 9% of all takeovers by Australian public listed companies between 1990 and 1998, the bidding firms use stock to the purchase the target firms. This is considerably below the use of stock in US mergers and tender offers, presumably due to the taxation and accounting differences in Australia. Therefore, there may be other reasons that encourage some managers to offer stock rather than cash.

Rather than waiting for the share price of the company to be “overvalued” by the market, some managers may preempt the use of stock offers in takeovers by deliberate earnings management designed to achieve an overvaluation. Martin (1996) is one study that examines the economic determinants on the use of stock payment. Martin reviews results for 846 completed takeovers comprising 250 stock offers, 483 cash offers, and 113 mixed offers during the 1978 to 1988 period. From the binomial logistic regression analysis, Martin finds that managers were more willing to use stock payment than cash payment if firms had valuable investments and

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2 Stock for stock swaps in mergers in the US are usually tax exempt with respect to realised capital gains, whereas they are taxable in Australia for the takeovers we study. The recently released Australian Committee of Enquiry into Business Taxation (the Ralph Committee) recommended that these transactions become exempt, and at the time of writing, the Federal Government has announced that they intend to legislate accordingly. Further, the US allowed pooling of interests in stock for stock mergers, and some argue that this creates favorable incentives for the use of stock. Pooling of interests has recently been eliminated in the US.
growth opportunities. The significantly higher market to book ratio and pre-takeover share price run-ups supported this argument. In addition, stock payment was associated with low managerial ownership, in particular, where the directors’ shareholdings are within the range of 5% to 25%. Furthermore, stock payment samples have lower concentration of institutional shareholdings and blockholdings. This reinforces the outside monitoring hypothesis of Jensen (1991) and is consistent with prior empirical evidence that stock payment takeovers usually reduce the wealth of bidding firm shareholders.

It is clear that most empirical studies from the method of payment have found that stock-financed takeovers are systematically associated with poor abnormal return ex post takeover announcement, in both the short-term and the long-term. However, these findings do not seem to deter managers from offering shares in takeovers.

2.2. Earnings management

An important issue concerning the use of stock payment in a takeover is whether bidding firms offers stock as consideration after experiencing large stock price increases, perhaps partly attributable to earnings management. To manage earnings, managers must either ‘save’ current earnings to achieve higher future earnings or perform better, or boost current earnings by borrowing against future earnings. However, a stock price increase in the pre-takeover period is not necessarily attributable to earnings management per se. Some companies may take advantage of windows of opportunity or market inefficiency that are largely outside of their own control, without intentional earnings management. Nevertheless, there are reasonable grounds to believe that at least there will be some incidence of stock payment in takeovers that is associated with the practice of earnings management.

Recent empirical studies have found evidence of earnings management consistent with attempts by managers to ‘window-dress’ reported earnings prior to certain events. For example, earnings management has been detected in firms either issuing equity through an IPO or SEO (e.g. Teoh, Wong and Rao, 1998; Teoh, Welch and Wong 1998a, 1998b; Loughran and Ritter, 1997). Other motives for earnings management include increasing managers’ compensation and bonus payments (e.g. Gaver, Gaver and Austin, 1995; Guidry, Leone and Rock, 1999; Healy, 1985; Holthausen, Larcker and Sloan, 1995); gaining benefits from regulatory intervention (e.g. Jones, 1991; Lim and Matolcsy, 1999); or creating a ‘good’ signal by smoothing reported earnings (e.g. Burgstahler and Dichev, 1997; DeFond and Park, 1997; Myers and Skinner, 1999). In the following section, the evidence of earnings management in the presence of the above motives is reviewed.

2.2.1. Capital market studies

The use of accounting information by investors to predict stocks price provides an incentive for managers to engage in the practice of earnings management, in an attempt to influence short-term share price performance.

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3 The binomial logistic regression used in Martin (1996) has 16 experimental variables and seven hypotheses. When the dependent variable is a stock payment dummy variable (1 if stock, 0 if cash), only five of the hypotheses were supported. We will discuss some of the hypotheses in more depth in section 4.6.
Ball and Brown (1968) was the first paper to demonstrate the usefulness of accounting earnings in explaining abnormal share returns.

The link between accounting earnings and abnormal share returns is consistent with recent findings that managers opportunistically ‘overstate’ the reported earnings in periods preceding equity offers through some form of income-increasing accrual manipulation (eg. Teoh, Wong and Rao, 1998; Teoh, Welch and Wong 1998a, 1998b; Loughran and Ritter, 1997). This evidence of earnings management is reinforced by the subsequent reversal of earnings due to accrual mean reversion, leading to some instances of negative stock return as documented in studies such as Loughran and Vijh (1997).

Notwithstanding the above, Healy and Wahlen (1998) observe that there is relatively little evidence on the magnitude or frequency of earnings management for capital market purposes. They urge researchers to contribute more empirical studies in order to increase the frequency and generalisability of the evidence of earnings management in areas such as SEOs and the market for corporate control.

Teoh, Welch and Wong (1998b) examine 1,649 US firms that initiate IPOs over the period 1980 to 1992. To examine the presence of earnings management, they use the Jones’ (1991) model to estimate managed accruals, which is the residual of a regression involving estimated total accruals. The Jones’ model (1991) estimates the expected accruals as shown in equation (1):

\[
\frac{TACC_{it}}{TA_{it-1}} = \alpha_i \left[ \frac{1}{TA_{it-1}} \right] + \beta_{1i} \left[ \frac{\Delta REV_{it}}{TA_{it-1}} \right] + \beta_{2i} \left[ \frac{PPE_{it}}{TA_{it-1}} \right] + \epsilon_{it}
\]  

(1)

Where:

- \(TACC_{it}\) = Expected total accruals in year \(t\) for firm \(i\),
- \(\Delta REV_{it}\) = Revenue in year \(t\) less revenues in year \(t-1\) for firm \(i\),
- \(PPE_{it}\) = Gross property, plant and equipment in year \(t\) for firm \(i\),
- \(TA_{it}\) = Total assets in year \(t-1\) for firm \(i\), and
- \(\epsilon_{it}\) = Residual term in year \(t\) for firm \(i\).

In equation (1), changes in revenue are used to control for the economic environment of the firm. Revenues are also included because they are an objective measure of firms’ operations before managers’ manipulation. The inclusion of the variable for gross property, plant and equipment is designed to control for the portion of expected accruals related to depreciation expenses.

Teoh et al. (1998b) hypothesise that managers manage earnings upward in the periods leading to IPOs to attract the attention of investors. In addition, Teoh et al. (1998b) posit that investors do not rationally discount for earnings management in forming expectations about future cash flows. If these assumptions hold, it is expected
that IPO firms who engage in earnings management will experience a negative abnormal return *ex post* offering periods. In line with their hypothesis, Teoh et al. (1998b) find those firms in the quartile of IPO issuing firms that had the most aggressive (i.e., highest) managed accrual experienced, on average, a value-weighted market-adjusted buy-and-hold excess return of –37.9% 40 months after the release of first post-IPO financial statements. The reported earnings before the IPO are not seen as quality earnings improvements, and prices reverse in the post-listing period. In contrast, the firms in the quartile with the most conservative incidence of earnings management experienced, on average, a mean excess return of only –7.2%. In this quartile, the market does not appear to be deceived by earnings management.

Teoh, Welch and Wong (1998a) examine earnings management in a sample of 1,265 firms that initiate SEOs during the 1976 to 1989 period. Teoh et al. (1998a) use the modified Jones’ model (Dechow, Sloan and Sweeney, 1995) to estimate earnings management. The modified Jones’ model includes an additional variable, net receivables (REC), to control for the tendency of the Jones’ model to measure managed accruals with error when discretion is exercised over revenue recognition. Thus, the model is:

\[
TACC_{it} / TA_{it-1} = \alpha_i [1 / TA_{it-1}] + \beta_1 [(\Delta REV_{it} - \Delta REC_{it}) / TA_{it-1}] + \beta_2 [PPE_{it} / TA_{it-1}] + \varepsilon_{it}
\]

Where:

\[
\Delta REC_{it} = \text{receivables in year } t \text{ less receivables in year } t-1 \text{ for firm } i,
\]

and other terms are as previously defined.

Teoh et al. (1998a) find SEO firms exhibited results similar to those recorded in their IPO study (Teoh et al., 1998b). The firms in the quartile with the most aggressive managed accruals experienced a value-weighted market-adjusted buy-and-hold excess return of –43.93% in the 59 months after the offering. Firms in the most conservative quartile of managed earnings earned, on average, –16.98%. These striking results are consistent with their hypothesis that investors are unable to understand or recognize earnings management and are fixated on high earnings. Subsequently, investors are disappointed.

Beside Teoh et al. (1998a), other studies have found that the operating performances of SEO firms deteriorate *ex post* offerings. For example, Loughran and Ritter (1997) examine 1,388 SEOs during the 1979 to 1989 period and find that the sample experienced a negative market-adjusted 5-year buy-and-hold return of, on average, –38.91%. The non-SEO samples experienced a return of, on average, 20.88%. However, Loughran and Ritter (1997) are not convinced by Teoh et al.’s (1998a) argument that all SEO firms are intentionally, and successfully, misleading investors through earnings management. They suggest the results may simply reflect that managers are just as overoptimistic about future cash flows and earnings as are the investors.

Interest in capital market studies regarding earnings management has only recently expanded from the more frequent studies of IPOs and SEOs to takeovers. For example, Erickson and Wang (1999) find that in the *quarter* prior to a stock payment takeover, bidding firms engaged in managing earnings upward. Their test of
earnings management used the modified Jones’ model and was conducted on a sample comprising 55 bidding firms offering shares matched with 64 bidding firms offering cash during the period 1985 to 1990. They find the extent of earnings management observed is positively and significantly related to the relative size of the takeover deal⁴.

Erickson and Wang’s results suggest that managers may prefer to offer stock in takeovers when there has been an opportunistic manipulation of reported earnings. However, there are issues in Erickson and Wang’s (1999) research methodology and sample characteristics which limit the generalizability of the findings. First, Dechow, Sloan and Sweeney (1995) argue that researchers must be aware of the misspecification of the modified Jones’ model when applied to sample firms with extreme financial performance and to firms that undergo major changes, such as takeover, during the event periods. In particular in Erickson and Wang, the model is estimated using a pooled time-series and cross-section of observations. If there are abnormal accruals following a takeover (perhaps related to the takeover costs) the assumptions of OLS will force accruals prior to the takeover to be biased upward. Indeed Erickson and Wang note this possibility, and conduct a series of sensitivity tests (see pp. 165-167) to show that the abnormal negative accruals following a takeover are insufficient to eliminate the significantly positive accruals prior (i.e., earnings management) to the takeover.

Second, there is a huge range in the size distribution of the share and cash bidders in the sample studied by Erickson and Wang (1999). The largest share bidder is 2,828 times as large as the smallest, while the comparative number for the cash bidders is 650. Yet each company enters the analysis with an equal weight. It is possible that the earnings management detected in this paper might be associated with the smaller share bidders whose shareholder base are expected to be less sophisticated. Accordingly Erickson and Wang’s statistically significant earnings management might not be economically significant earnings management. We specifically test for this possibility in our experiments below.

Third, other estimated accrual models⁵ used in past studies are also estimated with error. Researchers are aware of the low power and misspecification of current accruals’ models (eg. Bernard and Skinner, 1996; Dechow, Sloan and Sweeney, 1995; Dechow, Sabino and Sloan, 1997; Guay, Kothari and Watts, 1996; Hansen, 1997; Healy and Wahlen, 1998). Nevertheless, most studies still adopt the modified Jones’ model because it is considered to be the best accrual model available on conceptual grounds. However, as noted above, the empirical application of the model, relying as it does on stability of time-series or cross-sectional estimations, is far more problematic.

⁴ The relative size of the takeover value is proxied by the ratio of the consideration paid for the target to the market value of the bidding firm.

⁵ So far, the modified Jones’ model (Dechow et al., 1995) is the most frequently used accrual model for estimating expected accruals. However, there are other models such as the Healy model (1985), the DeAngelo model (1986) and the Jones’ model (1991).
Finally, while Erickson and Wang (1999) find evidence of earnings management in the accounting reports of share-based bidders prior to bid announcements, this does not necessarily mean that this earnings management is simply ignored or discounted by the market in the price setting process for bidder shares. Nor is the detection of earnings management evidence that the target and its advisers accept overvalued shares in takeover bids.

Overall, there are a limited number of robust studies on earnings management in capital market studies. Additional research in this area should provide wider and more robust evidence as to whether earnings management is systematically associated with the use of stock payment in takeovers.

2.3. Summary

Much of the evidence in the earnings management literature indicates that investors are typically not misled by earnings management *ex post*, but investors may temporarily be fooled *ex ante*. For example, Shivakumar (1999) studies 859 SEOs between 1989 and 1992. Shivakumar (1999) finds that the unusually positive managed accruals surrounding the periods of SEO announcements are consistent with managers intentionally overstating their accounting earnings. This is evidenced from the unusual level of managed accruals in the year before offerings. Although the observed results are similar to those in Teoh, Welch and Wong (1998a), Shivakumar concludes that investors are not ‘fooled’ by pre-SEOs earnings management.

In justifying his interpretation, Shimakumar (1999) argues that pre-SEO earnings management is a rational response by managers to the expected market reaction at an offering announcement. In other words, if investors expect earnings management to persist prior to the offer, managers’ best strategy is to manipulate earnings. This argument diverges from that presented by Teoh et al. (1998a) and Rangan (1998), who argue that the stock market does not correctly value the implications of managed accruals through earnings management prior to a public equity offering, and this is reflected in abnormally poor share returns following the offers.

Overall, there is a paucity of study on the use of stock offers in takeovers and earnings management. Although many studies in earnings management have found evidence of abnormal discretionary accruals, the results in Erickson and Wang (1999) are not necessarily economically significant. We, therefore, investigate whether Australian stock-financed takeovers are associated with earnings management. By adopting the Australian market for this study, we add to the literature by investigating the issue in a setting where the regulatory and accounting standards are quite different to those in the US. Specifically it has been argued that a strong incentive for the use of stock in merger negotiations in the US is the ability of firms to account for the merger as a pooling. Pooling is not used in Australia. Another major reason for using stock as the method of payment in the US is the tax exemption afforded such mergers. Again, this tax exemption is not available for the Australian takeovers we study.

3. Hypotheses
Bidding firms must select the type of payment to be offered in takeovers. These payments range from the most common form of payment such as cash, stock, or a mixture of both to payment like asset swaps and debt swaps. For the purpose of this paper, we focus on the cash- and stock-financed takeovers only. If cash is the form of payment, any attempt to manage earnings should have no effect on the consideration offered.

In contrast, if stock is the form of payment there is an opportunity to manipulate the value of the shares. We conjecture that managers might attempt to manage earnings upward to inflate share prices prior to takeover announcements. However, managers will rationally consider the benefits of earnings management and costs of being detected.

The most obvious benefit is to inflate the reported accounting earnings in a hope that the market will impound the earnings as higher share prices. If this is the case, it reduces the cost of buying target firms when stock is offered as form of payment, because bidding firms give up fewer shares than required before a share price increase.

However, an important difference in the study of earnings management in takeover bids, compared with other studies of earnings management, is that in a takeover we have two well-informed companies dealing with each other. First, there are bidding firms who might attempt to fool targets by offering shares with inflated prices, perhaps attributable to earnings management. On the other hand, target firms and expert advisers who understand the financial statements of bidding firms (and therefore the value of the consideration offered) are suspicious of earnings management. They are likely to detect any earnings management that bidding firms use to inflate share prices. Furthermore, target firms will frequently negotiate a higher exchange ratio. This is merely part of a rational bargaining process during a competitive takeover process. If bidding firms rationally anticipate such a response, the benefits of managing earnings upward, even accepting that this results in higher bidder share prices (which is again quite debatable), would seem to evaporate. Accordingly, the amount paid in a takeover is the equilibrium outcome of fair, competitive and informed bargaining process in the capital market.

Nevertheless, we cannot entirely rule out that earnings management is not related to stock-financed takeover. Erickson and Wang (1999) find evidence in support of earnings management in stock for stock mergers. However, bidding firms can rationally anticipate that targets expect them to engage in earnings management prior to a takeover. Targets will discount stock as a method of payment, rendering the management of earnings problematic.

However, managers of bidding firms may still be willing to practice earnings management for other reasons, for instance the economic determinants as articulated in Martin (1996). Moreover, they might not be deterred by the empirical evidence of poor abnormal performance of bidding firms that offer stock as consideration. So, there are grounds for a belief that earnings management may be associated with the stock-financed takeovers.
Thus, the main hypothesis is:

**H1:** *Ceteris paribus, earnings management is systematically associated with the use of stock payment in takeovers.*

To investigate the evidence of earnings management for this paper, we investigate bidding firms that offer stock as consideration against a control sample of bidding firms that offer cash. We hypothesise that stock payment firms are more likely to engage in earnings management prior to the takeover announcement than those in the cash payment sample. We also investigate the economic determinants of the method of payment (Martin, 1996) as control variables. We discuss our research methods to detect earnings management in more depth in the following section.

### 4. Research Methods

#### 4.1. Accrual accounting and accruals model

Accrual accounting is used to overcome problems with measuring firm performance when firms are in continuous operation (Dechow, 1994). Accrual accounting is associated with the traditional matching principle whereby revenues can be matched with the expenses for a period, according to the benefits derived from resources in that period.

For example, where a firm has only one source of revenue and one expense item, net income (ignoring taxes) is equal to net cash flows from operating activities (CFO), if cash accounting is used. Hence, total accruals are zero:

\[
\text{Total Accruals} = \text{Net Income}_t \times \text{CFO}_t
\] (3)

On the other hand, if accrual accounting is used to recognize revenue and expense, and all revenue and expense remains in accounts receivable and accounts payable respectively, then the net cash flow from operating activities would be zero. Total income would be the same as in cash accounting. Hence, total accruals are equal to the net income. If the accrued revenue is greater than accrued expense, the result is positive total accruals, while the opposing situation would result in the negative total accruals. The approach in equation (3) is known as the statement of cash flows approach, which contrasts with measuring accruals as the change in successive balance sheet accounts.

Conventionally, the majority of studies in earnings management use an indirect balance sheet approach to estimate total accruals. Specifically, estimated total accruals are calculated as:

\[
TACC_{BS,t} = (\Delta CA_t - \Delta CL_t + \Delta CASH_t + \Delta STD_t - \Delta DEP_t)
\] (4)
Where:

\[ TACC_{BS,t} = \text{Estimated total accruals using a balance sheet approach in period } t, \]
\[ \Delta CA_t = \text{Change in current assets between period } t \text{ and } t-1, \]
\[ \Delta CL_t = \text{Change in current liabilities between period } t \text{ and } t-1, \]
\[ \Delta CASH_t = \text{Change in cash and cash equivalents between period } t \text{ and } t-1, \]
\[ \Delta STD_t = \text{Change in debt included in current liabilities between period } t \text{ and } t-1, \]
\[ DEP_t = \text{Depreciation and amortization expense in period } t. \]

Subsequently, cash flow from operating activities are estimated as:

\[ CFO_{it} = OPAT_{it} - TACC_{BS, it} \]  (5)

Where:

\[ CFO_{it} = \text{Cash flow from operating activities for firm } i \text{ in period } t, \text{ and} \]
\[ OPAT_{it} = \text{Operating profit after tax for firm } i \text{ in period } t. \]

Collins and Hribar (1999) empirically re-examine some of the prior earnings management literature that adopts the balance sheet approach in estimating total accruals, and compares the evidence by using the statement of cash flows approach. They find that prior studies using a balance sheet approach to test for earnings management are potentially biased. These biases are statistically significant and researchers are likely to spuriously conclude that earnings management exists when there is none. Collins and Hribar (1999) estimate total accruals using both the balance sheet approach and statement of cash flows approach for all NYSE/AMEX firms on the Compustat Primary, Supplementary and Tertiary Annual Industrial File and Research File during the period 1988 to 1997. This yields a massive sample of 14,266 firm-years.

They find that, using a balance sheet approach, estimated total accruals scaled by lagged total assets on average are 3.29% (median 1.82%) larger than estimated total accruals using a statement of cash flows approach. To observe the economic significance of these positive biases, Collins and Hribar (1999) benchmark the estimated total accruals against earnings before special items and TACC\text{BS}. In terms of the median, these positive biases are 37.19% of earnings before special items and 39.15% of TACC\text{BS}. Furthermore, the direction and magnitude of the biases are systematically associated with the presence of takeovers, discontinued operations, and foreign currency translations. The results reported by Collins and Hribar (1999) strongly support the cash flow approach in the method of computing total accruals, this being far more reliable than the balance sheet approach.
In light of Collins and Hribar (1999), we use the statement of cash flows approach to estimate total accruals, rather than the balance sheet approach. In order to recognize real earnings management, unexpected or managed accruals must be separated from total accruals, as illustrated in equation (6).

\[ \text{Total Accruals} = \text{Managed Accruals} + \text{Unmanaged Accruals} \]  

(6)

Accruals are normally studied in tests of earnings management as they offer the richest avenue for detecting earnings management. However, the empirical detection of earnings management is quite problematic. The modified Jones’ model seems to be “losing its gloss” in the late 1990s’ research, where its failure to capture managed accruals is frequently noted. Researchers are aware of the low power and misspecification of current accrual models. Hansen (1997) finds that when managed accruals are used to predict future earnings, the contribution of managed accruals is only 19.2%, suggesting that managed accruals have a relatively small role to play in predicting future earnings.

Nevertheless, the manipulation of earnings through accruals is still the most frequently utilized avenue for detecting earnings management. Accordingly we employ the model in this paper in an analogous way to Erickson and Wang (1999). However, we also report total accruals and first differences in total accruals as alternative measures in our tests to detect earnings management. We also investigate whether firms involved in takeovers make use of strategic reporting of special items (abnormal and extraordinary gains and losses) in their reporting processes. These tests provide a benchmark to evaluate the subsequent use of the modified Jones’ model.

4.2. Test of estimated total accruals

This paper first investigates earnings management using total accruals, without attempting to split the accruals into managed and unmanaged components. In rearranging equation (3), it is evident that net income is the sum of total accruals (TACC) and cash flows from operating activities (CFO). Hence, in order to manipulate net income, managers of the bidding firm must select income-increasing accruals to increase TACC.

To reduce the effect of heteroscedasticity, TACC is scaled by three total assets (TA).⁶ Four-year time series tests, starting from year -1 to year +2 and cross-sectional analysis are conducted. Year 0 is defined as the fiscal year-end prior to the takeover announcement. It is expected that the TACC of stock sample would be positive and/or greater than cash sample and statistically significant in year -1 and 0. Significance is assessed using a t-statistic of the mean difference and a Wilcoxon signed-rank test to discover if the medians differ between the two samples. Subsequently, it is expected the TACC in year +1 and +2 of stock sample would be smaller than cash sample due to the reversal of the income-increasing accruals in year -1 and 0.

⁶ We also scaled using total assets in the year prior to the takeover and the average of total assets for the year of the takeover and the year prior to the takeover. These alternative deflators produce similar results to the reported results. They are available on request to the corresponding author.
Besides examining total accruals, we also report the first differences in total accruals ($\Delta TACC_t$) in year 0, +1 and +2. It is expected the changes in TACC in year 0 for stock sample should be positive, as opposed to negative changes in TACC in year +1 and +2. Similarly, we measure significance using $t$-test and Wilcoxon signed-rank test.

4.3. Strategic reporting through special items

Next, an investigation is conducted to observe whether the strategic reporting of special items, such as abnormal and extraordinary items\(^7\), is associated with earnings management (e.g. Abarbanell and Lehavy, 1999; Gaver and Gaver, 1998; Myers and Skinner, 1999; Wells, 1999). For example, in Wells’ examination of whether there is any evidence of earnings management surrounding CEO changes, one test reports that abnormal and extraordinary items have a material impact on reported accounting earnings. Wells (1999) is able to provide some support for earnings management in that incoming CEOs take “an earnings bath” by reporting a greater number of negative special items.

We scale the special items by total assets ($TA_t$)\(^8\). After scaling, we compare the scaled special items across the cash and stock samples in the four one-year periods using the $t$-test and the Wilcoxon signed-rank test. It is expected the stock sample should report significantly more positive special items in year –1 and 0 than the cash sample.

4.4. Measuring excess returns

The goal of bidding firms that manage earnings in the period leading up to a takeover announcement is to accomplish a higher share price. Therefore, we should expect to observe abnormal share prices returns for the stock sample in the period prior to takeover announcements. However, we must separate the abnormal share prices returns that result from managed earnings and a “window of opportunity” afforded by a temporary market overvaluation.

If there is no evidence of pre-takeover share run-ups, the managers who had attempted to manage earnings upward either failed to inflate share prices, or there is no earnings management in the first place. However, if there is evidence of pre-takeover share run-ups for the stock sample, we need to determine whether these abnormal returns are associated with earnings management.

---

\(^7\) AASB 1018 ‘Profit and Loss Accounts’, which is effective for accounting periods on or after 31 December 1989 required the reporting entity to disclose any abnormal or extraordinary items as notes to the financial accounts. AASB 1018 para 9 provides the following statutory definitions. ‘Abnormal items’ means items of revenue or expense included in the operating profit or loss after income tax for the financial year, which are considered abnormal by reason of their size and effect on the operating profit or loss after tax for the financial year. ‘Extraordinary items’ means an item of revenue or expense which are attributable to transactions or other events of a type that are outside the ordinary operations of the company or economic entity and are not of a recurring nature.

\(^8\) Similar results are produced when scaling is by lagged total assets or the averaged of lagged and current total assets.
We investigate the short-term window of the excess returns surrounding the takeover announcement. The investigation period is from trading day –180 through trading day +180, with respect to a takeover announcement on day 0. We compute the market-adjusted 361-day buy-and-hold returns, using equal-weighted and value-weighted techniques for the share and cash offers portfolios. Hence, the excess return model is:

\[
ExcessReturn_{it} = \prod_{t=-180}^{180} Rtn_{it} - Rtn_{mt}
\]  

(7)

Where:

\(ExcessReturn_{it}\) = Market-adjusted 361-day buy-and-hold return for firm \(i\) on day \(t\),

\(Rtn_{it}\) = Buy-and-hold share return for firm \(i\) in day \(t\), and

\(Rtn_{mt}\) = Buy-and-hold market return in day \(t\) using the All Ordinaries Accumulation Index.

The statistical significance of the average and median excess returns is evaluated by computing the relevant \(t\)-statistic assuming unequal variances and the Wilcoxon signed-rank test, respectively. In order to identify whether the share prices run-ups resulted from earnings management, we report the relationship between the level of total accruals in year 0 deflated by lagged total assets with the value-weighted excess returns for the 180 trading day before takeover announcement [-180,-1]. If higher total accruals are related with high earnings, the relationship between the TACC and excess returns should be significantly positive.

4.5 Test of earning management using the modified Jones’ model

We also estimate the modified Jones’ model after pooling observations in time series and in cross section for the share bidders and the cash bidders, using approaches similar to those in Erickson and Wang (1999). The following multiple regressions are estimated:

Model A

\[
TACC_{it} / TA_{it} = \alpha_i [1 / TA_{it}] + \beta_1 [(\Delta REV_{it} - \Delta REC_{it}) / TA_{it}] + \beta_2 [PPE_{it} / TA_{it}] + \beta_3 T_0 + \beta_4 D_1 + \epsilon_{it}
\]  

(8)

Model B

\[
TACC_{it} / TA_{it} = \alpha_i [1 / TA_{it}] + \beta_1 [(\Delta REV_{it} - \Delta REC_{it}) / TA_{it}] + \beta_2 [PPE_{it} / TA_{it}] + \beta_3 Dum_{Year-1} + \beta_4 Dum_{Year0} + \beta_5 Dum_{Year+1} + \beta_6 Dum_{Year+2} + \epsilon_{it}
\]  

(9)

Where:

\(T_0\) = an indicator variable taking on the value one in years –1 and 0, and zero otherwise,
$D_1$ = a dummy variable taking the value one in the first year of an earnings announcement following a takeover bid, and zero otherwise, 

$Dum_{Year-1}$ = a dummy variable with the value 1 if the observation for firm $i$ is drawn from year $-1$ and zero otherwise, with analogous definitions for year $0$, $+1$ and $+2$, and all other terms are as previously defined.

A significant positive value of $T_0$ is consistent with earnings management in the period prior to a takeover, while a significant negative value for $D_1$ indicates reversal of earnings management following a takeover. Similarly the estimated coefficients on $Dum_{Year-1}$ can be used to assess earnings management in the years prior to or after takeover announcements.

In a robustness test we also estimate Model A and B using $\Delta TACC_{it}/TA_{it}$ as the dependent variable, though we note that Erickson and Wang used total accruals rather than first differences in accruals. We also partition our sample into three groups based on the size of the bidder. If earnings management exists, it is more likely to be discovered in smaller firms whose accounting choices are less closely monitored by the capital market.

5 Data Collection and Sample

5.1 Data sources

The sample of takeovers used in this study is derived from a number of primary sources. Firstly, an initial sample was identified in the Australian Mergers and Acquisitions database provided by Securities Data Corporation (SDC Platinum) for the period 1 January 1990 to 31 December 1998. The SDC databases are used in many recent studies (eg. Erickson and Wang, 1999; Shivakumar, 1999; Teoh, Welch and Wong, 1998a and 1998b).

All bidding firms are public companies listed on ASX involved in a takeover that was completed. This results in 1,324 potential bids. Takeovers with a consideration less than A$1.5m were eliminated, reducing the number of bids to 841. Next, the takeovers must be either categorised as friendly or hostile (110 takeovers with indeterminate attitudes are excluded), leaving 731 bids. Further, the consideration offered must be either stock or cash, leaving 683 observations. Finally, the deal must involve either the acquisition of a majority interest or a merger, thus eliminating 338 bids that involved acquisition of assets and 125 bids that were bids for a minority interest or a remaining interest. These criteria identified an initial gross sample of 220 potential takeovers. We systematically read the synopsis accompanied with each observation to remove takeovers that involved mixed payment.9 All banks and financial institutions were excluded due to their highly regulated operating environment, making it more difficult for them to engage in (and for researchers to detect) earnings

9 The Australian Mergers and Acquisitions database from SDC does not have a stock only search function, therefore, some observations derived from the stock sample search function consisted of mixed payments.
management. After excluding the mixed payment and financial institutions, this left a final sample size of 169 observations with 112 cash payments and 57 stock payments.

We manually collected the necessary accounting information directly from the annually financial reports. The more recent annual reports were retrieved electronically from information service providers, such as Connect4 and ASX “tif” image databases held by Securities Industry Research Center of Asia-Pacific (SIRCA). The ASX Collection houses an extensive hardcopy collection of annual reports for most ASX listed companies, covering their first annual reports to annual reports with fiscal year-end 1996/97.

Daily share prices [day –180, +180] of bidding firms were obtained from SIRCA’s Core Research Database (CRD) and/or directly from the Sequencer Database provided by Financial Times.

5.2. Data definitions

For all the observations, year 0 is the fiscal year-end prior to the takeover announcement and day 0 is the day of takeover announcement. CFOₜ is defined as the net cash flow from operating activities as reported on the Cash Flows Statement.¹⁰ For the earnings figure, we used operating profit after tax and before special items (OPAT-BSI).

Special items are usually reported on the face of the profit and loss statement as abnormal items and extraordinary items. In addition, firms are required by the AASB 1018 to disclose special items in the notes to the financial statements.

Sales revenue is classified as the main source of operating revenue relating to the principal activities of the firm. For example, the sales revenue of a gold firm would be found in gold revenue. The total operating revenue is the sum of sales revenue plus all other revenues.

5.3. Estimation of total accruals

Before taking special items into account, operating profit after tax is separated into an accrual income component and a cash income component. Rearranging equation (11) produces equation (12) as follows:

\[
OPAT_{\text{before}SI} = TACC_{CF,t} + CFO_
\]

\[
TACC_{CF,t} = OPAT_{\text{before}SI} - CFO_
\]

¹⁰ Given AASB 1026 ‘Cash Flows Statement’ became effective for accounting periods ending on or after 30 June 1992, we could compute the CFO for firms prior to AASB 1026 by using the indirect method (eg. Eddey and Taylor, 1999).
Therefore, total accruals are estimated to be the difference between OPAT-BSI and CFO, using the statement of cash flow approach [equation (12)]. Operating profit after tax is preferred to operating profit before tax because income tax expense forms part of the cash outflow in CFO. If operating profit before tax is used, the CFO would be lower because of the cash component of income tax expense, while profit would be higher, providing of course that income tax is positive, that is, future income tax benefits do not force a negative tax expense.

TACC can be positive or negative, and is unlikely to be zero unless by chance or if the firm follows cash accounting. If the OPAT-BSI is greater than the CFO, the result is positive total accruals. If the OPAT-BIS is less than the CFO, negative total accruals result. A significantly positive TACC would suggest that the firm is adopting income-increasing accruals and/or reversing previous income-decreasing accruals. In order to test for significant level of total accruals, we scale the TACC by the contemporaneous total assets.

Clearly, managers cannot systematically manipulate earnings through accruals indefinitely, because accruals must sum to zero in the long run. Empirical evidence suggests that managed accruals should display signs of reversion within two to three years following manipulation (eg. Bradshaw, Richardson and Sloan, 1999, Sloan, 1996).

5.4. Characteristics of the samples

Table 1 provides the characteristics of the final sample retrieved from the SDC database after adjustment for misclassification, but before any missing accounting information. There are 112 and 57 observations for the cash and stock samples respectively.

Panel A of Table 1 reports the sample distribution between 1990 and 1998. Both samples show an upward trend in activity since the initial year in 1990. In the period 1990 to 1992, both samples have low takeover values, probably due to relatively low capture of takeovers in the SDC Australian database in this period. Since 1992, both samples experience greatly increased takeover activity, with most years having transactions valued at more than $1 billion.

Panel B and C of Table 1 presents the attitude of takeover and frequency of multiple bids, respectively. In panel B, the value of hostile and friendly takeovers in the cash sample is fairly evenly distributed, although there are more friendly takeovers (n = 98) than hostile takeovers (n = 14).11 Correspondingly, there are only four observations of hostile takeovers in the stock sample. However, the value of friendly takeovers in the stock sample is 93% of the total value of stock bids. This indicates that stock is used more frequently in friendly takeovers.
Panel C shows that the 169 takeovers were made by only 141 individual firms. Within the sample, 120 firms reported only one takeover, 17 reported two takeovers, two reported three takeovers, and one reported four, while one other firm reported five takeovers.\textsuperscript{12}

6. Results

6.1. Tests of earnings management

Our first test of earnings management uses total accruals, highlighted earlier in equation (1), after deflating by contemporaneous total assets ($TA_t$). We also investigate the change in total accruals, again deflated by total assets, from one year to the next, and expect this amount to be a reasonable proxy for the extent of accrual management. Providing the accounting polices that give rise to unmanaged accruals are applied consistently, we expect the deflated changes in total accruals to be a reasonable proxy for managed accruals. We also a version of the modified Jones’ model, similar to that use in Erickson and Wang (1999). However, recent tests of the modified Jones’ model in Australia (i.e., Wells, 1999) suggest that the model does not provide reliable estimates of managed accruals, so we resort initially to tests that are less restrictive in assumptions about parameter stability.

In summary, we test for earnings management in the levels and changes of total accruals between the cash and stock samples, after deflating by total assets. In addition, we examine whether the managers of stock payment firms strategically report special items to influence the level of accounting earnings in the period before a takeover announcement. Finally, the modified Jones’ model is applied.

6.1.1. Earnings management using total accruals

Table 2 reports the results of the analysis of TACC using both parametric (two-sample $t$-test assuming unequal variances) and non-parametric (Wilcoxon signed-rank two-sample test with normal approximation) tests of differences in means and medians among the samples. The results are graphically illustrated in Figure 1.

\textsuperscript{11} The SDC database classifies takeover attitude by the final recommendation of managers to shareholders. Thus a bid that was originally rejected (i.e., hostile), but later recommended, would be classified as friendly.

\textsuperscript{12} If a bidder is a multiple stock bidder in a short timeframe, earnings management would be less significant because firms cannot persistently manipulate the accrual accounts. Empirical evidence suggests that accruals should reverse within two to three years after manipulation. In the sample, Austrim Ltd has five takeovers between 1990 and 1998 though all were cash payments. General Property Trust has four takeovers during the same period, two of these used cash and other two used stocks.
To be consistent with hypothesis 1, the expected total accruals of the stock sample should have been significantly positive in the fiscal year of or before the takeover announcement date. The results indicate they are negative, and are insignificantly different to the cash sample in year -1 and 0. Specifically, the mean total deflated accruals in the two financial years before a takeover announcement for the cash bidders (-0.0311 and -0.0354 for years -1 and 0 respectively) is not significantly different to the share bidders total deflated accruals (-0.0253 and -0.0376). Therefore, there is no evidence that suggests managers from the stock sample attempt to manage earnings upward using accruals in the two years before takeover announcement.

Turning to the post-bid period, Figure 1 illustrates that the total accruals of the stock sample decrease sharply after year 0, whereas the total accruals of the cash sample experiences steady growth. The differences between the two samples are however statistically insignificant.

The difference in year +1 for the mean TACC is somewhat of a puzzle, albeit not being present in the median results. However, if managers opportunistically manage accruals at time \( t \), accruals reversion will take place at some future time \( t + n \). Usually, most managed accruals are current accruals; therefore, inevitably these should reverse within the next few years after the initial manipulation. Bradshaw, Richardson and Sloan (1999) examine the expected earnings quality, which is proxied by accruals and cash flows, and show that mean reversion of earnings for portfolios of firms formed on highest accruals portfolio is almost complete after two years.

If the managers of bidding firms engage in income-increasing accruals before the takeover announcement, it is expected the total accruals are more likely to be income-decreasing after the bid. However, the evidence in Figure 1 only partially supports this notion of accrual reversion. Since there is no evidence of income-increasing accruals in year -1 and 0, we cannot assume the income-decreasing accruals observed in year +1 are evidence of accrual reversion.\(^\text{13} \)

One other result in table 2 seems worth of comment. The median differences in TACC for the cash and stock samples is significant at the 10% level for year -1. However, the median TACC for the cash sample (-0.0142) is lower than for the share sample (-0.0377). It appears that managers of share bidders adopt more income decreasing accruals prior to a takeover than do the cash sample counterparts, opposite to that expected in hypothesis 1.

6.1.2. Earnings management using first differences in total accruals

Besides examining the levels of TACC, we also report the first differences in total accruals in Table 3.

\(^{13} \) Most studies used lagged total assets as their primary deflator (eg. Eddey and Taylor, 1999; Erickson and Wang, 1999; Wells, 1999). As a check of robustness, we repeated our tests using lagged total assets and find that the results are very similar to those reported.
A review these first differences in TACC scaled by total assets shows that the mean $\Delta TACC$ in year 0 is quite consistent between the cash and share samples, -0.0036 and -0.0153 respectively. This difference is insignificant. However, in year +1, the share sample reveals a large negative $\Delta TACC$ with mean of -4.30% of total assets. In contrast, the cash sample experiences a positive $\Delta TACC$ with mean of 0.95% of total assets. The mean difference is statistically significant at the 0.10 level with a $t$-statistic equal to 1.8125 in panel A of Table 3.

[INSERT TABLE 3 ABOUT HERE]

The value of this $t$-statistic is larger than the one reported in Table 2 for levels of total accrual. However, none of the median variables in panel B of Table 3 provides any significant results. Hence this result seems to be driven by the presence of outliers that affect the mean results. In any event, there is no evidence of earnings management of the type suggested by hypothesis 1 in the pre-takeover period, so it is difficult to attribute the observed difference in the post-takeover period to a reversal. Overall, we again conclude that there is no evidence that suggests the share sample experiences abnormal $\Delta TACC$ relative to the cash sample.

Overall these tests of estimated total accruals and first differences in total accruals produce no evidence that suggests share-financed takeovers are more likely to engage in accrual manipulation in the period before a takeover announcement than cash bidders. These results are thus inconsistent with Erickson and Wang (1999).

6.1.3. Earnings management using special items

Another test of earnings management is the strategic reporting of special items. By definition, abnormal and extraordinary items have a material effect on reported earnings, and must be disclosed separately in income statements and in the notes to financial statements. We therefore investigate whether managers of the stock sample strategically report special items to boost reported earnings, avoiding poor financial performance. The results are presented in Table 4 and Figure 2.

[INSERT TABLE 4 ABOUT HERE]

Special items scaled by total assets are statistically similar for the cash and share samples in year -1 and 0. The mean value for the cash sample is (-0.07% and 0.92% for years -1 and 0 respectively) of total assets compared to 0.03% and -1.42% for the share sample. These differences are not significant. During year -1 and year 0, the median deflated special items is always zero in both the cash and stock samples, as expected because many firms do not report special items in a year. However, in year +2, the stock sample produces a negative median for special items of –1.33% of total assets. The mean value in panel A is greatly escalated, with a value of –31.64%, clearly associated with some very large observations. The mean and median results for the share
The sample shows evidence of escalation in income decreasing special items in year +1 and year +2, with year +2 special items significantly different to the cash sample at the 5% level. These large negative abnormal or extraordinary losses might reflect the costs of asset restructuring and other takeover related costs. If this conjecture is correct, it appears that some stock bidders experience considerably more difficulty in assimilating the target than do cash bidders. Indeed the mean abnormal losses for stock bidders in the two years following a takeover are approximately 39% of the bidders total assets at the time of the bid. If these losses were not anticipated by the capital market at the time of the bid announcement, they might provide a partial explanation for subsequent poor sharemarket performance.

Overall, Table 4 provides no evidence that firms that stock-finance takeovers strategically report special items in the two years before takeover announcement. Indeed, stock bidding firms take an earnings bath by reporting negative special items in year +1 and especially +2 following the takeover announcement.

We provide further details of these special items in Table 5. We searched the financial statements for each firm in our experiment (both share and cash bidders) with an abnormal or extraordinary gain or loss in each year –1, 0, +1 and +2 and read the notes to the financial statements to establish a description of that gain or loss. Each abnormal item was classified into one of the following categories (i) takeover related expenses, (ii) abnormal write-down or devaluation, (iii) abnormal write-off, (iv) other abnormal losses, (v) abnormal provision and (vi) all abnormal gains, irrespective of the nature of these gains. The dollar value of these gains and losses was then summed within the cash and share bidders groups for each year, and these total were then deflated by the total value of the assets of the cash and share bidders as at the takeover date. The information presented in Table 5 is thus value weighted, and this was done because there is evidence in Table 4 of skewness in the distribution of these special items.

Table 5 reveals that share based bidders have substantially greater takeover related expenses in year +1 and +2 than do cash based bidders. Specifically takeover related expenses for the cash bidders are -0.27 and -0.28% of assets in year +1 and +2, whereas they are –1.91 and –1.55% of assets for the share bidders. Abnormal write downs and devaluations are similarly escalated for the share bidders, being –0.60 and –4.28% of assets compared to –0.44 and –2.51% for the cash bidders. These abnormal write downs and devaluations are also likely to be related to takeover activity. The total for all abnormal losses in year +1 and +2 for cash bidders is – 5.41% (i.e., –1.54 plus –3.87%) of assets, which is approximately half of the abnormal losses of share bidders (i.e., -10.56%). Abnormal losses of these magnitudes indicate bidders in general have considerable problems in assimilating their acquisitions, though the problems seem especially magnified in the case of share bidders.

### 6.1.4 Earnings management and the modified Jones' model
We also estimated the modified Jones’ model using a pooled time-series and cross-section approach as described in equations (8) and (9). The results for share bidders and cash bidders are contained in Tables 6 and 7. Table 6 uses \( TACC_{it} / TA_{it} \) as the dependent variable, while Table 7 uses \( \Delta TACC_{it} / TA_{it} \) as the dependent variable.

[INSERT TABLE 6 ABOUT HERE]

[INSERT TABLE 7 ABOUT HERE]

Looking first at Model A in Table 6 the estimated coefficients on \( T0 \) indicates that cash bidders have significant income decreasing accruals prior to a takeover, while share bidders have insignificant income decreasing accruals. Further the \( D_t \) coefficients are insignificant. In Model B none of the estimated coefficients for the dummy variables prior to (or after) a takeover bid are significant. Further, the explanatory power of the regressions is in both cases quite modest, and only one of the four F statistics are significant (at 0.05%). These results again indicate no significant upward management of earnings by share based bidders prior to a takeover, and are inconsistent with the Erickson and Wang (1999) analysis.

We also split the cash and share bidders into three groups based on the size of the bidding company and re-ran the regressions reported in Table 6. We do not report these results in detail. In summary none of these partitions reveal any evidence of significant earnings management by either cash or share bidders. The only significant result (for Model A and Model B for the largest share bidders) suggests significant income decreasing total accruals prior to takeovers.

When the scaled first difference in total accruals is used as the dependent variable in Table 7, cash bidders in both Model A and Model B have insignificant coefficients on the dummy variables designed to capture earnings management. Share bidders however reveal evidence of significantly positive earnings management (at the 0.05 level) prior to the takeover in Model B. Further in Model A, the coefficient on \( T0 \) is significant at the 0.10 level. To determine if this evidence is sensitive to size, we again partitioned the cash and share bidders into three groups based on size. In unreported results we find that the estimated coefficient for the smallest group of share bidders is significantly positive at the 0.05 level in Model B (the estimated coefficient on of 0.1988 has a t-statistic of 2.2347), while in the middle group (coefficient of 0.0271 and associated t-statistic of 0.4455) and large group (coefficient of 0.0083 and t-statistic of 0.4494) insignificant results are found. The sub-partitioned Model A results are consistent except that the significance level for the small group of bidders is reduced to the 0.10 level. Our limited evidence of earnings management by share bidders prior to takeover announcements is thus confined to the smallest group of bidders using first differences in scaled total accruals and the modified Jones’ model.
6.1.5 Summary

From the above tests on earnings management using estimated total accruals, first differences in total accruals, the reporting of special items and the modified Jones’ model as applied by Erickson and Wang (1999) we find no evidence of earnings management by bidders in the stock payment group. One our subdivisions for the smallest share bidders (when the modified Jones’ model is used) has significant income increasing accruals prior to takeover announcements. In larger firms, we conjecture that the chances of earnings management being successful in the competitive bidding process of a takeover are sufficiently small to render its attempted use self-defeating.

We now turn our investigation to whether there is any evidence of excess share price returns associated with cash and stock based takeovers, and the economic determinants of the use of stock payment. These tests of earnings management reinforce the robustness on our evidence of earnings management in the takeover market. Erickson and Wang (1999) do not report whether bidding firms that engage in earnings management in their sample actually experience pre-takeover share price run-ups. Accordingly the reader is left wondering whether the detected earnings management had the desired outcome of increased share prices for stock bidders. Thus, the evidence in the following sensitivity analysis will enrich our understanding of whether earnings management is systematically associated with the use of stock payments.

6.2. Sensitivity analysis

6.2.1. Excess share price returns

Given the weak evidence of earnings management detected by our tests so far, we examine share returns to detect whether the pre-takeover share price run-up experienced by the stock samples result from a high level of accruals.

Table 8 provides the results for bidding firms’ excess share price returns surrounding the takeover periods.

We report the excess share price returns using value-weighted techniques because they smooth the large abnormal returns sometimes observed due to large returns of some small companies. We report the mean and median market-adjusted excess share returns and their associated t-statistics and z-statistics between the cash and share samples over six event windows: (1) the long window period [-180,+180]; (2) the medium window period [-60,+60]; (3) the pre-takeover run-up period [-180,-41]; (4) the run-up period [-40,-2]; (5) the 3-day announcement period [-1,+1]; (6) and post-takeover period [+2,+180]. The results are graphically illustrated in Figure 3, which shows the 361-day window.

14 Equal weighting gives essentially the same results.
In the long window period \([-180,+180]\), there are only 79 observations in the cash sample and 40 observations in the stock sample. The reason for the large differences in the number of observations across the table is due to missing share prices in the Core Research Database (CRD) and Sequencer. Before the computation of excess returns, we exclude firms with irregular trading patterns due to market suspension. We make appropriate adjustments for firms that undergo changes in the basis of quotation, i.e., share splits, consolidations and dividends.

Table 8 shows that the mean abnormal return for the share sample outperforms the cash samples by an average of 1.192\% in the 361-day buy-and-hold excess returns. The medians are however in favour of the cash bidders. The margin for the means gets bigger for the window \([-60,+60]\) with mean excess returns of 2.406\% for stock sample, while the cash sample has an average, \(-1.073\%). Nonetheless, neither the mean nor the median differences between the cash and stock samples are significant. The \(t\)-statistic on mean returns for the long window is \(-0.0627\) and for the \([-60,+60]\) window, it is only \(-0.5873\).

To investigate the direction and magnitude of excess returns within the 361-day window, we decompose the long window into four periods, which are shown in the last four columns of Table 8. First, we investigate pre-takeover share prices run-ups, thus we separate the pre-takeover periods into three windows, \([-180,-41]\), \([-40,-1]\) and \([-1,+1]\). In the pre-takeover run-up \([-180,-41]\), the share sample has an average excess return of 6.376\%, while the cash sample has an average of 2.362\%. Subsequently, in the run-up period \([-40,-2]\), the share sample reports an average excess return of 9.622\%, while the cash sample’s excess return is \(-1.071\%). This difference in the mean excess returns in the run-up period \([-40,-2]\) is the only significant result in the six different windows. The reported \(t\)-statistic is \(-2.4752\). In other words, this evidence that suggests the stock-financed sample does experience abnormal pre-takeover share prices run-ups in the 8-week period immediately prior to a takeover announcement. It is difficult to attribute this price behaviour to earnings management because it is unlikely that earnings announcements would be made in this period. It is more likely associated with some better-than-expected firm announcement, though other forms of price manipulation are perhaps possible. Arbitration of these issues must however await subsequent research.

To highlight the market reaction to the takeover announcement, the 3-day announcement window \([-1,+1]\) provides results consistent with much of the prior evidence. Most studies find bidding firms experience small negative abnormal returns during the announcement window. For example, Hand and Lynch (1999) find the median excess share price return in the window \([-1,+1]\) is \(-0.6\%). The median excess return in our cash samples, is \(-0.158\%), while in the stock sample the median excess return is \(-3.219\%). Neither the mean nor median returns for the stock and cash samples are significantly different. Indeed, the results in Table 7 are consistent with the prior literature that bidding firms seldom experience any large abnormal returns on the day of announcement, as opposed to target firms who usually experienced a large takeover premia.
In the post-takeover period [+2,+180], the excess returns for the cash sample is 2.796%, on average. The excess return for the stock sample is –8.747%, on average. Although these excess returns are not significantly different, the results for the 180 day post-takeover period are in the direction predicted by asymmetric information and market underreaction hypotheses. Hence, the results suggest that managers of bidding firms use stock payments when their company’s stock price is likely to be overvalued, and cash payments when their stock price is likely to be undervalued. The poor abnormal excess returns by firms who use share offers are consistent with prior empirical evidence, such as Loughran and Vijh (1997).

Overall, the results show that companies that offer shares as form of takeover consideration experience pre-takeover share price run-ups, but these excess returns do not result from a high level of accruals. Rather the abnormal return is most probably associated with better-than-average profitability, and is consistent with the semi-strong form of an efficient market. Managers take advantage of a window of opportunity when the share price is high following periods of strong profitability and offer stock as takeover consideration.

6.2.2. Logistic regression

In unreported results we also estimated several logistic regressions with the method of payment as the dependent variable, and a series of control variables representing the known determinants of the method of payment choice. We also include scaled total accruals in the year prior to the takeover and first difference in scaled total accruals as independent variables. Our control variables represent various proxies for the bidding firm’s growth opportunities, free cash flow, managerial ownership and ownership concentration, as well as measures of the relative size of the acquisition. While many of the control variables are significant in these regressions, we find no significant association between the method of payment choice and scaled total accruals or scaled first difference in total accruals.

7. Conclusions

7.1. Summary

This paper investigates whether managers of bidding firms that offer shares engage in managing earnings upward prior to a bid. The incentive is to push up the share price of the firm ex ante to the takeover announcement. To achieve this, managers must anticipate the target firms will not detect the earnings management and that they will accept the share offer with inflated share prices. Such a strategy, if successful, would reduce the cost of buying the target.

To test whether earnings management is systematically associated with the use of stock payment in takeovers, this paper provides five tests of earnings management. These are: (1) a test of estimated total accruals and first
differences in total accruals using the cash flow approach (Collins and Hribar, 1999); (2) strategic reporting of special items; (3) a version of the modified Jones’ model as used in Erickson and Wang (1999), (4) the relationship between estimated total accruals and excess returns and; (5) logistic regression on the use of stock payment.

The tests of earnings management find no evidence consistent with the hypothesis that stock bidders engage in managing earnings upward, except for the smallest third of share bidders when we use a modified Jones’ model and scaled first differences in total accruals as the dependent variable. The results contrast those of Erickson and Wang (1999) who conclude that stock bidders manage earnings upward in the period prior to a takeover. It is possible that, as in our test, the earnings management reported in Erickson and Wang is confined to the smaller firms whose activities tend to be less closely monitored by the capital market. Our other tests show that in the last fiscal year-end before a takeover announcement, the reported mean estimated total accruals deflated by total assets are negative for the stock sample (-3.76%) and cash samples (-3.54%). Similarly, the relative estimated total accruals in last fiscal year-end before the takeover announcement is negative for stock sample (-2.53%) and cash samples (-3.11%). The results indicate that there is no sign of income-increasing accruals in either sample.

Further, in the test on strategic reporting of special items, there is no evidence that suggests stock-bidders with poor earnings are likely to report positive abnormal or extraordinary items to manage the reported accounting earnings. However, in year +2 after takeover announcement, firms that offer stock have large accruals. Our tests show that these abnormal losses are associated with the costs of the takeover being written off or asset restructuring costs being incurred. For the cash sample, the observed deflated special items are reasonably consistent in each period, with some evidence of increased takeover losses in year +2. Overall it appears that cash bidders experience fewer abnormal losses from their takeover activity than do share bidders.

Sensitivity analysis does not find any robust evidence consistent with earnings management. The pre-takeover share price run-up in stock bidders are not induced by high level of accruals, rather the abnormal share price returns are more likely due to strong operating performance, consistent with several prior studies.

In conclusion, our findings have implications for studies designed to detect earnings management in stock-financed takeovers. The evidence presented in this paper is on balance inconsistent with the belief that earnings management is systematically associated with the use of stock payments in takeovers. In particular, we believe the results of Erickson and Wang (1999) are inconclusive because it is possible that the earnings management results are concentrated in the smaller firms, and because the modified Jones’ model is subject to estimation error. However, there is a need for research to refine the accrual model and introduce a more reliable method for isolating discretionary accruals. This is likely to be an extremely difficult task in the context of major structural changes in a firms’ operations, such as a takeover.
References


Hansen, R.G., 1987, A theory for the choice of exchange medium in mergers and acquisitions, *Journal of Business* 60, 75-95


Myers, S.C. and N.S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221


Table 1
Characteristics of 112 cash-financed and 57 share-financed takeovers made between 1 January 1990 and 31 December 1998


<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Sample</th>
<th>Takeover Value (A$m)</th>
<th>%</th>
<th>Share Sample</th>
<th>Takeover Value (A$m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>4</td>
<td>133.7</td>
<td>1.8</td>
<td>1</td>
<td>475.3</td>
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<tr>
<td>1991</td>
<td>4</td>
<td>411.7</td>
<td>5.4</td>
<td>7.2</td>
<td>22.4</td>
</tr>
<tr>
<td>1992</td>
<td>4</td>
<td>158.4</td>
<td>2.1</td>
<td>9.3</td>
<td>6.0</td>
</tr>
<tr>
<td>1993</td>
<td>12</td>
<td>1,921.9</td>
<td>25.2</td>
<td>34.5</td>
<td>340.5</td>
</tr>
<tr>
<td>1994</td>
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<td>336.2</td>
<td>4.4</td>
<td>38.9</td>
<td>385.3</td>
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<tr>
<td>1995</td>
<td>20</td>
<td>1,792.4</td>
<td>23.5</td>
<td>62.4</td>
<td>1,255.4</td>
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<tr>
<td>1996</td>
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<td>898.4</td>
<td>11.8</td>
<td>74.2</td>
<td>1,413.3</td>
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<td>1997</td>
<td>21</td>
<td>694.6</td>
<td>9.1</td>
<td>83.3</td>
<td>1,704.7</td>
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<td>1998</td>
<td>22</td>
<td>1,276.7</td>
<td>16.7</td>
<td>100.0</td>
<td>591.7</td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>7,624.0</td>
<td>100.0</td>
<td>57</td>
<td>6,194.6</td>
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</tbody>
</table>

Panel B: Attitude of takeover

<table>
<thead>
<tr>
<th>Cash Sample</th>
<th>Takeover Value (A$m)</th>
<th>%</th>
<th>Share Sample</th>
<th>Takeover Value (A$m)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friendly</td>
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<td>4,210.0</td>
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<td>5,817.5</td>
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<td>Hostile</td>
<td>14</td>
<td>3,414.0</td>
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<td>4</td>
<td>377.1</td>
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<tr>
<td>Total</td>
<td>112</td>
<td>7,624.0</td>
<td>100.0</td>
<td>57</td>
<td>6,194.6</td>
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</table>

Panel C: Multiple bids (by firms and number of observations)

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<th>Frequency</th>
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<th>4</th>
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<th>Total</th>
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<td>Number of firms</td>
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<td>17</td>
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<td>1</td>
<td>1</td>
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<tr>
<td>Number of observations</td>
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<td>4</td>
<td>5</td>
<td>169</td>
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</table>
Table 2
Total accruals deflated by total assets for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998: t-test and Wilcoxon signed-rank test

<table>
<thead>
<tr>
<th>Panel A: t-test</th>
<th>Mean (Cash)</th>
<th>Mean (Share)</th>
<th>t-statistic</th>
<th>p-value</th>
<th>n (cash)</th>
<th>n (share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TACC Yr –1/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0311</td>
<td>-0.0253</td>
<td>-0.1933</td>
<td>0.8473</td>
<td>84</td>
<td>50</td>
</tr>
<tr>
<td>TACC Yr 0/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0354</td>
<td>-0.0376</td>
<td>0.1515</td>
<td>0.8799</td>
<td>96</td>
<td>53</td>
</tr>
<tr>
<td>TACC Yr +1/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0300</td>
<td>-0.0787</td>
<td>1.6944</td>
<td>0.0940</td>
<td>90</td>
<td>46</td>
</tr>
<tr>
<td>TACC Yr +2/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0009</td>
<td>-0.0596</td>
<td>1.0967</td>
<td>0.2755</td>
<td>63</td>
<td>36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Wilcoxon signed-rank test</th>
<th>Median (Cash)</th>
<th>Median (Share)</th>
<th>z-statistic</th>
<th>p-value</th>
<th>n (cash)</th>
<th>n (share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TACC Yr –1/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0142</td>
<td>-0.0377</td>
<td>1.8138</td>
<td>0.0697</td>
<td>84</td>
<td>50</td>
</tr>
<tr>
<td>TACC Yr 0/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0147</td>
<td>-0.0380</td>
<td>1.0043</td>
<td>0.3152</td>
<td>96</td>
<td>53</td>
</tr>
<tr>
<td>TACC Yr +1/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0204</td>
<td>-0.0569</td>
<td>1.3955</td>
<td>0.1629</td>
<td>90</td>
<td>46</td>
</tr>
<tr>
<td>TACC Yr +2/TA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>-0.0428</td>
<td>-0.0550</td>
<td>0.7300</td>
<td>0.4654</td>
<td>63</td>
<td>36</td>
</tr>
</tbody>
</table>

Notes: The t-test used is two-sample assuming unequal variances or heteroscedasticity t-test. The z-statistic is calculated from the non-parametric Mann-Whitney test.

* Statistically significant at the 0.05 level, two-tailed test.
Table 3
First difference in total accruals deflated by total assets for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998: t-test and Wilcoxon signed-rank test

Panel A: t-test

<table>
<thead>
<tr>
<th></th>
<th>Mean (Cash)</th>
<th>Mean (Share)</th>
<th>t-statistic</th>
<th>p-value</th>
<th>n (cash)</th>
<th>n (share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔTACC Yr 0/TA_t</td>
<td>-0.0036</td>
<td>-0.0153</td>
<td>0.4500</td>
<td>0.6543</td>
<td>84</td>
<td>50</td>
</tr>
<tr>
<td>ΔTACC Yr +1/TA_t</td>
<td>0.0095</td>
<td>-0.0430</td>
<td>1.8125</td>
<td>0.0735</td>
<td>93</td>
<td>46</td>
</tr>
<tr>
<td>ΔTACC Yr +2/TA_t</td>
<td>0.0317</td>
<td>0.0064</td>
<td>-0.4887</td>
<td>0.6262</td>
<td>63</td>
<td>34</td>
</tr>
</tbody>
</table>

Panel B: Wilcoxon signed-rank test

<table>
<thead>
<tr>
<th></th>
<th>Median (Cash)</th>
<th>Median (Share)</th>
<th>z-statistic</th>
<th>p-value</th>
<th>n (cash)</th>
<th>n (share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔTACC Yr 0/TA_t</td>
<td>0.0000</td>
<td>-0.0047</td>
<td>0.2823</td>
<td>0.7777</td>
<td>84</td>
<td>50</td>
</tr>
<tr>
<td>ΔTACC Yr +1/TA_t</td>
<td>0.0030</td>
<td>-0.0150</td>
<td>0.9071</td>
<td>0.3644</td>
<td>93</td>
<td>46</td>
</tr>
<tr>
<td>ΔTACC Yr +2/TA_t</td>
<td>-0.0145</td>
<td>-0.0160</td>
<td>0.4433</td>
<td>0.6576</td>
<td>63</td>
<td>34</td>
</tr>
</tbody>
</table>

Notes: The t-test used is two-sample assuming unequal variances or heteroscedasticity t-test. The z-statistic is calculated from the non-parametric Mann-Whitney test.

* Statistically significant at the 0.05 level, two-tailed test.
Table 4
Strategic reporting using special items (abnormal and extraordinary items) deflated by total assets for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998

<table>
<thead>
<tr>
<th>Panel A</th>
<th>t-Test: Two-Sample Assuming Unequal Variances</th>
<th>Mean (Cash)</th>
<th>Mean (Share)</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI Yr -1 / TA</td>
<td>-0.0007</td>
<td>0.0003</td>
<td>0.0467</td>
<td>0.9629</td>
<td></td>
</tr>
<tr>
<td>SI Yr 0 / TA</td>
<td>0.0092</td>
<td>-0.0142</td>
<td>-1.0067</td>
<td>0.3173</td>
<td></td>
</tr>
<tr>
<td>SI Yr +1 / TA</td>
<td>-0.0196</td>
<td>-0.0744</td>
<td>-1.6533</td>
<td>0.1022</td>
<td></td>
</tr>
<tr>
<td>SI Yr +2 / TA</td>
<td>-0.0415</td>
<td>-0.3164</td>
<td>-2.1580*</td>
<td>0.0373</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B</th>
<th>Wilcoxon Signed-Ranks Test:</th>
<th>Median (Cash)</th>
<th>Median (Share)</th>
<th>z-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI Yr -1 / TA</td>
<td>0.0000</td>
<td>0.0000</td>
<td>-0.1330</td>
<td>0.8940</td>
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<tr>
<td>SI Yr 0 / TA</td>
<td>0.0000</td>
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<td>-0.3500</td>
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<tr>
<td>SI Yr +1 / TA</td>
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<td>0.0000</td>
<td>-1.9960*</td>
<td>0.0460</td>
<td></td>
</tr>
<tr>
<td>SI Yr +2 / TA</td>
<td>-0.0005</td>
<td>-0.0133</td>
<td>-2.3320*</td>
<td>0.0200</td>
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</table>

Notes: The *test used is two-sample assuming unequal variances or heteroscedasticity *t*-test. The z-statistic is calculated from the non-parametric Mann-Whitney test.

* Statistically significant at the 0.05 level, two-tailed test.
Table 5
Sum of the abnormal and extraordinary gains and losses by 112 cash bidders (Panel A) and 57 share bidders (Panel B) for bids made between 1 January 1990 and 31 December 1998 deflated by total assets and itemised by major category of abnormal and extraordinary expense

<table>
<thead>
<tr>
<th>Itemised Special Items: Cash Bidders (Panel A)</th>
<th>Yr -1</th>
<th>Yr -1</th>
<th>Yr -1</th>
<th>Yr 0</th>
<th>Yr 0</th>
<th>Yr 0</th>
<th>Yr +1</th>
<th>Yr +1</th>
<th>Yr +1</th>
<th>Yr +2</th>
<th>Yr +2</th>
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<tbody>
<tr>
<td>Legend:</td>
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<tr>
<td>Takeover related expenses</td>
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<tr>
<td>Abnormal write-down/devaluation</td>
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<tr>
<td>Abnormal write-off</td>
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<tr>
<td>Total Negative Abnormal:</td>
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<tr>
<td>Total Positive Abnormal:</td>
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</table>

<table>
<thead>
<tr>
<th>Itemised Special Items: Share Bidders (Panel B)</th>
<th>Yr -1</th>
<th>Yr -1</th>
<th>Yr -1</th>
<th>Yr 0</th>
<th>Yr 0</th>
<th>Yr 0</th>
<th>Yr +1</th>
<th>Yr +1</th>
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<tbody>
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<td>Legend:</td>
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<tr>
<td>Takeover related expenses</td>
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<td>Abnormal write-down/devaluation</td>
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<tr>
<td>Other abnormal losses</td>
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<tr>
<td>Abnormal provision</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal gains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total Negative Abnormal:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Positive Abnormal:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6
Regression results for the modified Jones’ model as used in Erickson and Wang (1999) for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cash Bidders</th>
<th>Share Bidders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model A</td>
<td>Model B</td>
</tr>
<tr>
<td>1/TAt</td>
<td>-0.0366</td>
<td>-0.0185</td>
</tr>
<tr>
<td></td>
<td>(-0.2113)</td>
<td>(-0.1058)</td>
</tr>
<tr>
<td>(\Delta REV)/TA(_t)</td>
<td>+0.0450*</td>
<td>0.0457*</td>
</tr>
<tr>
<td></td>
<td>(2.0602)</td>
<td>(2.0856)</td>
</tr>
<tr>
<td>PPE(_t)/TA(_t)</td>
<td>-0.0069</td>
<td>0.0152</td>
</tr>
<tr>
<td></td>
<td>(0.3021)</td>
<td>(0.5977)</td>
</tr>
<tr>
<td>DumYear-1</td>
<td>-0.0382</td>
<td>-0.0095</td>
</tr>
<tr>
<td></td>
<td>(-1.5934)</td>
<td>(-0.3195)</td>
</tr>
<tr>
<td>DumYear 0</td>
<td>-0.0457</td>
<td>-0.0197</td>
</tr>
<tr>
<td></td>
<td>(-1.9620)</td>
<td>(-0.6599)</td>
</tr>
<tr>
<td>DumYear +1</td>
<td>-0.0204</td>
<td>-0.0697</td>
</tr>
<tr>
<td></td>
<td>(-0.7336)</td>
<td>(-1.9499)</td>
</tr>
<tr>
<td>T0</td>
<td>-0.0390*</td>
<td>-0.0043</td>
</tr>
<tr>
<td></td>
<td>(-2.2723)</td>
<td>(-0.1939)</td>
</tr>
<tr>
<td>D1</td>
<td>-0.0401</td>
<td>-0.0304</td>
</tr>
<tr>
<td></td>
<td>(-1.7333)</td>
<td>(-0.9171)</td>
</tr>
<tr>
<td>F Statistic</td>
<td>2.2741*</td>
<td>1.7018</td>
</tr>
<tr>
<td>Adj. R(^2)</td>
<td>0.0181</td>
<td>0.0140</td>
</tr>
<tr>
<td>N</td>
<td>343</td>
<td>343</td>
</tr>
</tbody>
</table>

Notes: The number in parentheses below each of the coefficient estimate is the \(t\)-statistic for a two-tailed \(t\)-test. Estimated total accruals (TACC) using the Statement of Cash Flow approach is the dependent variable of the logistic regression. \(\Delta\)REV is the change in revenue for firm \(i\) in year \(t\). PPE is the plant, property and equipment for firm \(i\) in year \(t\). All variables are deflated by the total assets (TA) for firm \(i\) in year 0. T0 is a dummy variable set equal to one for year \(-1\) and 0, and zero otherwise. D0 is a dummy variable set equal to one for year \(+1\) and zero otherwise. DumYear\(_{t-1}\) is a dummy variable set equal to one for year \(t\) and zero otherwise. Year 0 is the fiscal year-end prior to takeover announcement.

Model A: \[
\frac{TACC_{it}}{TA_{it}} = \alpha_i \left[ \frac{1}{TA_{it}} \right] + \beta_{1i} \left[ \frac{(\Delta\text{REV}_{it} - \Delta\text{RECe}_{it})}{TA_{it}} \right] + \beta_2 \left[ \frac{PPE_{it}}{TA_{it}} \right] + \beta_3 T_0 + \beta_4 D_1 + \epsilon_{it}
\]

Model B: \[
\frac{TACC_{it}}{TA_{it}} = \alpha_i \left[ \frac{1}{TA_{it}} \right] + \beta_{1i} \left[ \frac{(\Delta\text{REV}_{it} - \Delta\text{RECe}_{it})}{TA_{it}} \right] + \beta_2 \left[ \frac{PPE_{it}}{TA_{it}} \right] + \beta_3 \text{DumYear}_{-1} + \beta_4 \text{DumYear}_0 + \beta_5 \text{DumYear}_{+1} + \beta_6 \text{DumYear}_{+2} + \epsilon_{it}
\]

* Statistically significant at the 0.05 level
** Statistically significant at the 0.01 level
### Table 7
Regression results for the modified Jones’ model where the dependent variable is the change in total accruals deflated by total assets for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sign</th>
<th>Cash Bidders</th>
<th>Share Bidders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Model A</td>
<td>Model B</td>
</tr>
<tr>
<td>(1/T_{At})</td>
<td></td>
<td>0.7043***</td>
<td>0.7109***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.4252)</td>
<td>(3.4076)</td>
</tr>
<tr>
<td>(\Delta REV_{it}/TA_{it})</td>
<td>+</td>
<td>0.0281</td>
<td>-0.0441</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.2056)</td>
<td>(1.2100)</td>
</tr>
<tr>
<td>(PPE_{it}/TA_{it})</td>
<td>-</td>
<td>-0.0011</td>
<td>0.0013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-0.0470)</td>
<td>(-0.0486)</td>
</tr>
<tr>
<td>DumYear(0)</td>
<td></td>
<td>-0.0313</td>
<td>0.0720*</td>
</tr>
<tr>
<td>DumYear(+1)</td>
<td></td>
<td>-0.0129</td>
<td>0.0676</td>
</tr>
<tr>
<td>DumYear(+2)</td>
<td></td>
<td>-0.0057</td>
<td>0.0464</td>
</tr>
<tr>
<td>(T_0)</td>
<td></td>
<td>-0.0303</td>
<td>0.0637</td>
</tr>
<tr>
<td>(D_1)</td>
<td></td>
<td>-0.0116</td>
<td>0.0540</td>
</tr>
<tr>
<td>F Statistic</td>
<td></td>
<td>2.9351*</td>
<td>2.4427*</td>
</tr>
<tr>
<td>Adj. R(^2)</td>
<td></td>
<td>0.0383</td>
<td>0.0344</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>241</td>
<td>241</td>
</tr>
</tbody>
</table>

Notes: The number in parentheses below each of the coefficient estimate is the \(t\)-statistic for a two-tailed \(t\)-test. Change in total accruals (\(\Delta TACC\)) is the dependent variable of the logistic regression. \(\Delta REV\) is the change in revenue for firm \(i\) in year \(t\). \(PPE\) is the plant, property and equipment for firm \(i\) in year \(t\). All variables are deflated by the total assets (TA) for firm \(i\) in year \(0\). \(T_0\) is a dummy variable set equal to one for year 0 and zero otherwise. \(D_1\) is a dummy variable set equal to one for year 1 and zero otherwise. DumYear\(t\) is a dummy variable set equal to one for year \(t\) and zero otherwise. Year 0 is the fiscal year-end prior to takeover announcement. Total assets in year 0 partitioned the sample into three groups.

Model A:
\[
\Delta TACC_{it}/TA_{it} = \alpha_i + \beta_{1i} (\Delta REV_{it} - \Delta REV_{it})/TA_{it} + \beta_2 [PPE_{it}/TA_{it}] + \beta_3 T_0 + \beta_4 D_1 + \epsilon_{it}
\]

Model B:
\[
\Delta TACC_{it}/TA_{it} = \alpha_i [1/TA_{it}] + \beta_{1i} [(\Delta REV_{it} - \Delta REV_{it})/TA_{it}] + \beta_2 [PPE_{it}/TA_{it}] + \beta_3 DumYear\(0\) + \beta_4 DumYear\(+1\) + \beta_5 DumYear\(+2\) + \epsilon_{it}
\]

* Statistically significant at the 0.05 level
** Statistically significant at the 0.01 level
*** Statistically significant at the 0.001 level
Table 8

Bidding firms’ excess share price returns surrounding the takeover announcement for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998

<table>
<thead>
<tr>
<th>Form of Payment</th>
<th>Statistic</th>
<th>-180 to +180</th>
<th>-60 to +60</th>
<th>-180 to -41</th>
<th>-40 to -2</th>
<th>-1 to +1</th>
<th>+2 to +180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>Mean returns (%)</td>
<td>4.299</td>
<td>-1.073</td>
<td>2.362</td>
<td>-1.071</td>
<td>0.212</td>
<td>2.796</td>
</tr>
<tr>
<td></td>
<td>Median returns (%)</td>
<td>-7.277</td>
<td>-2.105</td>
<td>-0.318</td>
<td>-1.384</td>
<td>-0.158</td>
<td>-5.416</td>
</tr>
<tr>
<td></td>
<td>No. positive CARs</td>
<td>29</td>
<td>38</td>
<td>48</td>
<td>41</td>
<td>48</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>No. negative CARs</td>
<td>50</td>
<td>51</td>
<td>48</td>
<td>55</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Sample size</td>
<td>79</td>
<td>89</td>
<td>96</td>
<td>96</td>
<td>98</td>
<td>79</td>
</tr>
<tr>
<td>Stock</td>
<td>Mean returns (%)</td>
<td>5.491</td>
<td>2.406</td>
<td>6.376</td>
<td>9.622</td>
<td>-1.760</td>
<td>-8.747</td>
</tr>
<tr>
<td></td>
<td>No. positive CARs</td>
<td>12</td>
<td>22</td>
<td>23</td>
<td>27</td>
<td>26</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>No. negative CARs</td>
<td>28</td>
<td>29</td>
<td>29</td>
<td>25</td>
<td>26</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Sample size</td>
<td>40</td>
<td>51</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>t-statistic on mean returns</td>
<td>-0.0627</td>
<td>-0.5873</td>
<td>-0.4539</td>
<td>-2.4752*</td>
<td>1.1098</td>
<td>1.2470</td>
</tr>
<tr>
<td></td>
<td>z-statistic on median returns</td>
<td>-0.1568</td>
<td>-0.1366</td>
<td>-0.3133</td>
<td>-1.4672</td>
<td>-0.2812</td>
<td>-0.1568</td>
</tr>
<tr>
<td>All</td>
<td>Mean returns (%)</td>
<td>4.700</td>
<td>0.128</td>
<td>3.772</td>
<td>2.617</td>
<td>-0.472</td>
<td>-1.218</td>
</tr>
<tr>
<td></td>
<td>Median returns (%)</td>
<td>-7.277</td>
<td>-2.106</td>
<td>-1.071</td>
<td>-0.191</td>
<td>-0.106</td>
<td>-5.908</td>
</tr>
<tr>
<td></td>
<td>No. positive CARs</td>
<td>41</td>
<td>60</td>
<td>71</td>
<td>68</td>
<td>74</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>No. negative CARs</td>
<td>78</td>
<td>80</td>
<td>77</td>
<td>80</td>
<td>76</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Sample size</td>
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<td>140</td>
<td>148</td>
<td>148</td>
<td>150</td>
<td>119</td>
</tr>
</tbody>
</table>

Notes: Daily excess returns are calculated from the model whose parameters are estimated over the window [-180,+180] using the buy-and-hold excess return model. The market index used for the calculations is the All Ordinary Accumulation Index. All data are obtained from the Core Research Database (CRD) and Sequential database provided by Financial Times. The t-statistic is derived from t-test that used two-sample assuming unequal variances or heteroscedasticity t-test. The z-statistic is derived from the Wilcoxon signed-rank test. The payment terms were either in pure cash or stock.

* Statistically significant at the 0.05 level, two-tailed test.
Figure 1

Mean and median total accruals deflated by lagged total assets for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998

Notes: The figures represent the plots of mean and median total accruals deflated by lagged total assets in the years surrounding takeover announcement for the samples. Year 0 is the fiscal year-end before the takeover announcement date. Total accruals are estimated as the difference between OPAT-BSI and CFO using the Statement of Cash Flow approach.
Figures 2
Mean and median special items deflated by lagged total assets for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998

Notes: The figures represent the plots of mean and median special items deflated by lagged total assets in the years surrounding takeover announcement for the samples. Year 0 is the fiscal year-end before takeover announcement date. Special items are the reported figures from bidding firms’ profit and loss statement in accordance with AASB 1018.
Figure 3

The mean bidding firms’ value-weighted market-adjusted buy-and-hold excess returns for 57 share-financed and 112 cash-financed takeovers completed between 1 January 1990 and 31 December 1998: 361-day window

Notes: The figure represents the plot of bidding firms’ value-weighted market-adjusted buy-and-hold excess returns. Daily excess returns are calculated from the model whose parameters are estimated over the 361-day window using the buy-and-hold excess return model. The market index used for the calculations is the All Ordinary Accumulation Index. All data are obtained from the Core Research Database (CRD) and Sequential database provided by Financial Times.