Earnings management in Malaysian IPOs: the East Asian crisis, ownership control and post-IPO performance

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Abstract

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Keywords: initial public offerings, earnings management, ownership structure, long run stock market performance

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1. Introduction

Most prior studies of earnings management in the context of IPOs (e.g., Teoh et al., 1998a; DuCharme et al., 2001, 2004; Roosenboom et al., 2003) suggest that companies opportunistically manage their earnings upwards through income-increasing accruals at the time of IPOs in order to increase offering proceeds.[1] Typically, prior studies also find that issuers with unusually high accruals in the IPO year experience poor post-IPO stock returns (e.g., Teoh et al., 1998a; Teoh et al., 1998; DuCharme et al., 2001, 2004; Roosenboom et al., 2003; Abdul Rahman and Wan Abdullah, 2005). However, more recently, Ball and Shivakumar (2008) have questioned the 'hypothesis of widespread and substantial earnings management by IPO firms'. They argue that this would attract enhanced scrutiny by market monitors and regulators, might lead to increases in companies' costs of capital and to greater risks of litigation and reputation loss; newly listed companies needing external finance are likely to be particularly concerned about such issues. They provide evidence from both the US (based on the sample from Teoh et al., 1998a) and the UK that IPO companies report conservative financial information in the IPO prospectus, inconsistent with opportunistic earnings management.

The majority of IPO earnings management studies focus on cross-sectional average abnormal accruals which are usually observed to be significantly positive (i.e., income-increasing). However, the underlying dispersion of abnormal accruals may be large. For example, Teoh et al. (1998) indicate that 62% of their sample has positive abnormal accruals implying that 38%, with zero or negative abnormal accruals, have *not* engaged in income-increasing earnings management. Further, Teoh et al. (1998a: Table II p.1947) report a high standard deviation for abnormal accruals, graphically illustrated

[1] Exceptions include Aharony et al. (1993) who find no evidence of income-increasing pre-IPO discretionary accruals. Also, Kimbro (2005) finds that managers respond differently to the managerial agency issues in the distinctive institutional environment in China; they engage in income-*decreasing* earnings management prior to A-share IPOs in China to reduce the initial IPO offer price and/or to shift profits to future years.

in the large range of abnormal accruals from a mean of -24% to a mean of 54% for their low and high accrual sub-samples, respectively. These observations suggest two questions: (1) how widespread is the practice of earnings management in IPO companies?; (2) given the wide variation in earnings management practice observed in prior research, what factors affect the likelihood that an IPO company will undertake earnings management around the time of the IPO?

While a small number of prior studies have investigated cross-sectional variation seeking to assess the determinants of IPO earnings management propensity in different contexts (e.g., Aharony et al., 1993; Neill et al., 1995; Zhou and Elder, 2002; Chen et al., 2005; Nagata and Hachiya, 2006; Cormier and Martinez, 2006), these have used data from predominantly developed markets. The present study provides further evidence on earnings management practice by investigating the pervasiveness of earnings management across IPOs and the specific factors which affect decisions to manage earnings, within the context of a developing market, Malaysia. The Malaysian environment is particularly interesting as it has a distinctively high level of ownership concentration, a moderate overall earnings management propensity yet some similar institutional characteristics to the US and UK (Table 2, Panel B, Leuz et al., 2003). Three other distinctive features of the environment include mandatory prospectus earnings forecasts, the requirement for some companies to provide profit guarantees and a period of significant economic stress during the study period.

The distinctive Malaysian environment is used in the present study to investigate the impact of profit guarantees and a period of economic stress on IPO earnings management. It also provides a rich environment to assess the relative impacts of wealth loss and company ownership concerns while controlling for other potential determinants of earnings management (auditor reputation, underwriter prestige, company age, initial returns, leverage and company size). Finally, it provides an opportunity to investigate the relationship between earnings management and post-IPO market-based performance in a different institutional context to prior research.

Consistent with prior research (e.g., Teoh et al., 1998, 1998a; Cormier and Martinez, 2006), we focus on IPO year accruals, which include both pre-IPO and post-IPO months. Two years of data are required to compute the earnings management proxy and these had to be obtained from the first

post-IPO public annual reports as these were typically not available in the pre-IPO prospectus, thereby precluding investigation of pre-IPO earnings management. Teoh et al. (1998, 1998a) argue that owners who "aggressively manage their pre-IPO earnings probably also manage their first post-IPO earnings." The Malaysian regulatory environment concerning mandatory prospectus forecasts and share moratorium (lock-up period) encourage a similar belief here.

The specific contributions of the paper are fourfold. First, it provides evidence on IPO earnings management within a developing market (Malaysia) to complement prior research which focuses on developed markets. Second, it takes advantage of the unique characteristics of the market and the time period to investigate the impact of specific environmental factors on earnings management propensity: a period of severe economic stress; the requirement for IPO companies to provide profit guarantees; and ownership concerns in a market with high ownership concentration. Third, it controls for other factors that have the potential to influence earnings management within a multivariate framework. Finally, it also considers the link between earnings management and long term market-based performance within this environment to provide evidence on a potential explanation of the earnings management phenomenon.

Based on 254 IPOs over the full sample period 1990-2000, the results provide general evidence of IPO year income-increasing earnings management but this occurs primarily during the period of economic stress. The requirement to provide a profit guarantee appears to reduce rather than encourage earnings management. Within the high ownership concentration market of Malaysia, ownership concerns also appear to constrain IPO earnings management. Owners are willing to forego 'opportunistic' earnings management and signalling opportunities to increase their likelihood of retaining control of the company post-IPO. Older companies and those audited by a prestigious audit firm exhibit lower levels of earnings management, consistent with notions of reduced information asymmetry and/or reduced opportunities for managers to manipulate earnings.

While IPO companies engaging in aggressive earnings management had significantly worse market-based performance than their more conservative counterparts (in line with prior research), this only occurred for IPOs issued during the economic crisis period. For other periods, in which there

was less evidence of income-increasing earnings management, market-based performance was not affected by the level of earnings management.

The remainder of the paper proceeds as follows. Section 2 provides a brief description of the Malaysian institutional context for the study, followed by prior literature and hypothesis development in Section 3. Section 4 outlines the research methods adopted with Section 5 describing sample selection and data. Section 6 reports the results of the empirical study and Section 7 concludes the paper.

2. Institutional context

The context for the study, Malaysia, provides a useful environment in which to study the impact of a period of economic stress and of other factors on the level of IPO earnings management. In contrast with other developing countries, Leuz et al. (2003) identify the Malaysian equity market as of high importance relative to population size (of a similar level to the UK and US). They also argue that the equity market has high ownership concentration coupled with relatively high levels of earnings management. IPOs are a significant source of finance in Malaysia, with a total of RM49.9 billion (about £6.8 billion or US$13.1 billion) raised through IPOs over the period from 1973 to 2004 (Bank Negara Malaysia, 2005); this accounted for 36% of all capital raised from the equity market and 11% of total funds raised over the period. The economic crisis in East Asia in 1997 and 1998 profoundly affected Malaysia[2]: after real GDP had grown by 8.7% per annum from 1990 to 1996, it *declined* by 7.4% in 1998, before recovering to achieve growth of 5.6% in 1999. The equity market crashed, declining by 52% during 1997 leading to a major fall in funds raised through equity issues during 1998. Similarly, most companies suffered a decline in profitability: overall, the total earnings after tax of listed non-financial companies declined by RM3 billion and RM14 billion in 1997 and 1998, respectively (Mohd Saleh and Ahmed, 2005). This period of economic stress created a major challenge for managers and advisers seeking to maintain investors' confidence in IPO companies'

[2] Footnote 11 provides further discussion of the timing of the crisis and justification for our treatment of the event.

performance. Indeed, prior research has documented that stressful conditions such as the East Asian crisis have the potential to affect management's accounting choice behaviour (e.g., Smith et al., 2001; Mohd Saleh and Ahmed, 2005). Similarly, the impact of an earlier economic crisis (the 1990 Persian Gulf Crisis) on earnings management propensity was highlighted by Han and Wang (1998). Thus, it can be hypothesised that incentives to manage earnings to compensate for poor trading and reduced confidence about future earnings are greater during crisis periods.

Unlike many other countries, it is mandatory for Malaysian IPOs to provide within the prospectus an earnings forecast for the next financial year. Ironically, at the same time as the economic crisis, many companies were affected by the requirement to provide a three-year profit guarantee, a unique feature of the Malaysian regulatory environment. For this, founders are required to achieve 90% of the profits forecast in the prospectus and 90% of the forecast profits for the two years following official listing. Before November 1994, founders of all companies were subject to three-year share moratorium (lock-up period) regulations, requiring them to hold at least 45% of the issued paid-up shares of the company for one year after the company's admission to the Malaysian Stock Exchange; thereafter they could dispose of 15% of the shares per annum. Between November 1994 and July 1997, companies had to choose between the three-year share moratorium period and a profit guarantee in the form of either the deposit of KLSE-listed shares with an independent third party or a bank guarantee. This requirement applied to companies listed on the Main Board that were involved in construction and services (e.g., Finance, Hotels, Properties, and Trading sectors) or specialised activities (e.g., Mining, Plantation and Trusts sectors) and to *all* companies listed on the Second Board. The profit guarantee requirement was finally withdrawn in April 1999 due to 'widespread non-compliance' and difficulties with enforcement, exacerbated by the East Asian economic crisis (Wan-Hussin and Ripain, 2003). However, the requirement was in place for part of the sample period and so provides an opportunity to investigate its impact on a company's earnings management propensity. The three-year share moratorium remains (in slightly revised form), so founders may wish to support a high stock price following an IPO if they intend to sell their personal holdings after the lock-up period ends (Teoh et al., 1998a); this provides incentives for earnings management in the post-IPO period.

3. Prior literature and hypothesis development

3.1 Prior literature

Managers may engage in earnings management due to the information asymmetry between the issuer and outside investors pertaining to the value of IPOs. In general, earnings management is accomplished when income is shifted from future periods to the present or vice versa. The 'borrowing' of future income leads to increases in earnings during the IPO year and decreases thereafter. Specifically, managers can accelerate revenue recognition and/or defer expense recognition without violating current accounting rules. Teoh et al. (1998) argue that high reported earnings raise stock prices, which is desirable when a company is selling equity. DuCharme et al. (2004) note that the negative relationship between earnings management and post-IPO performance raises serious questions pertaining to market efficiency with respect to widely available accounting information. Teoh et al. (1998a) argue that if the stock market were fully efficient, on average post-IPO stock price underperformance would not be observed.

Early studies on earnings management by IPO companies (e.g., Aharony et al., 1993; Friedlan, 1994; and Neill et al., 1995) focus on earnings management behaviour prior to the IPO. Aharony et al. (1993) find that the practice of increasing reported net income prior to going public is not pervasive but is, on average, more pronounced for smaller companies and for those with large financial leverage. However, they find only weak evidence that earnings management is related to the reputation of the underwriters and the quality of the auditors employed by companies prior to an IPO. They suggest that their results may be conditioned by their sample selection method which was biased towards the selection of relatively large and less risky (lower leverage) IPO companies. On the other hand, Friedlan (1994), who also addresses the issue of the accounting choices of IPO companies, finds evidence that IPO issuers use income-increasing discretionary accruals in the financial statements released in the IPO prospectus. Neill et al. (1995) complement these two studies by examining directly the accounting method choices of IPO companies instead of estimating unexpected accruals. They investigate the depreciation method and the method involving the inventory cost flow

assumption that companies adopt and find evidence that IPO issuers use accounting choices to enhance reported income prior to the IPO.

More recently, Zhou and Elder (2002) and Chen et al. (2005) focus specifically on the impact of audit quality on IPO earnings management in the US and Taiwan, respectively; both find that higher quality auditors constrain earnings management in IPO companies. Nagata and Hachiya (2006) provide evidence that the motive of reducing wealth losses by income-increasing earnings management has priority over the motive of maintaining control of the post-IPO company in Japanese IPOs. Leuz et al. (2003) investigate the impact of broad institutional factors on general (non-IPO) earnings management practice across 31 countries (including Malaysia) and find that strong investor protection regimes reduce incentives to mask performance via earnings management. In a direct comparison between Anglo-American and Euro-Continental socio-economic environments (represented respectively by Canada and France), Othman and Zeghal (2006) consider more specific motives for non-IPO earnings management and provide evidence of different incentives between the two environments.

Several empirical studies focus on the relationship between earnings management and IPO performance (e.g., Teoh et al., 1998a; Teoh et al., 1998; DuCharme et al., 2001, 2004; Roosenboom et al., 2003; Abdul Rahman and Wan Abdullah, 2005). Teoh et al. (1998a) provide evidence that, on average, IPO issuers increase accruals and report earnings in excess of cash flows in the IPO year. They also find that discretionary current accruals (DCA) predict the cross-sectional variation in post-IPO long run stock return performance. 'Aggressive' earnings management companies, with high income-increasing accruals in the IPO year, experience poorer stock return performance in the three years post-IPO than 'conservative' earnings management companies. They argue that investors may be misled by the high earnings numbers reported at the time of IPOs and so put too high a price on the new issues.

Teoh et al. (1998) relate earnings management to both stock return and operating performance. In the IPO year, they find high positive operating performance and abnormal accruals but post-IPO operating performance is significantly below the industry average and is related to the level of

abnormal current accruals in the IPO year. Consistent with Teoh et al. (1998a), they also find that high abnormal accruals in the IPO year predict poorer post-issue stock return performance.

Recently, Ball and Shivakumar (2006) have questioned the reliability of the evidence from Teoh et al. (1998, 1998a) in support of opportunistic earnings management. They find no evidence of earnings management in a sample of UK IPOs and their re-analysis of the Teoh et al. sample identifies issues of endogeneity. In contrast, they provide evidence showing that IPO companies supply higher quality financial reports as demanded by public investors facing higher information asymmetry than the existing private investors. They argue that market mechanisms such as monitoring by auditors, analysts, external agencies, higher regulatory scrutiny and potential litigation are likely to enforce such demands.

In the first earnings management study of European IPOs, Roosenboom et al. (2003) examine the pattern of discretionary accruals for a sample of 64 Dutch IPOs. They find that managers manage their company's earnings in the IPO year but not in the years before the IPO. Their result is consistent with earlier findings of Teoh et al. (1998a) who also report that IPO companies in the US make income-increasing accruals in the IPO year, and Aharony et al. (1993) who find little evidence of earnings management of US IPOs in the years before the IPO. Roosenboom et al. (2003) also find a negative relationship between the size of the DCA in the IPO year and stock returns over the next three years, indicating that shareholders in IPO companies whose managers over-report earnings subsequently suffer poor returns. Pastor-Llorca and Poveda-Fuentes (2006) find similar results for Spanish IPOs. Cormier and Martinez (2006) extend this line of research by focusing on the potential links between voluntary IPO prospectus earnings forecasts and earnings management, within the French market. Forecasting companies appear to engage in a high level of earnings management, especially when earnings deviate from forecasts, but such behaviour is moderated by contractual and governance constraints; what's more, investors do not appear to adjust appropriately for the earnings management.

Yong (2007) provides a useful summary of IPO research in general across Asia, including the limited number of prior Malaysian IPO studies, and brief consideration of the hypothesis that earnings

management may contribute to the observed long-term IPO underperformance. Two known studies have examined the earnings management issue for Malaysian IPOs. Abdul Rahman and Wan Abdullah (2005) find significant positive DCAs in the IPO year but no significant relationship between DCAs in the IPO year and post-IPO stock returns. Wan-Hussin and Ripain (2003) examine the income smoothing behaviour of a sample of 92 IPO companies that provided profit guarantees and find no relationship between income smoothing and ex-post guarantee surplus or shortfall; unfortunately, the paper suffers from some limitations due to the application of the model. Ahmed et al (2008) consider earnings management during the 1997/8 severe economic downturn in Malaysia, as we do in the current paper, but they investigate market valuation of discretionary accruals in distressed (non-IPO) companies. They find that accruals were generally negative during debt negotiation periods and were associated with higher equity values, suggesting that the market believes accruals are managed to achieve lender or government concessions. However, managers did not seem to use discretionary accruals to signal future earnings potential to the market.

In summary, most IPO studies estimate the extent of earnings management around the time of equity offerings and suggest that earnings are managed prior to, or at the time of, IPOs, though Ball and Shivakumar (2006) question the reliability of such studies. Several studies relate earnings management at the time of IPOs to post-issue stock market and/or operating performance. Although different models for estimating earnings management are employed, the evidence is generally consistent across the studies and suggests that earnings management at the time of IPOs is negatively correlated with subsequent stock market and/or operating performance.

The present paper builds on these prior studies by investigating, within a Malaysian context, earnings management from the IPO year up to three years post-IPO under different economic conditions, by analysing the determinants of earnings management in a multivariate setting and by testing the association between earnings management and post-IPO stock market performance.

3.2 Hypothesis development

3.2.1 Earnings management, economic conditions and profit guarantees

Leuz et al. (2003) classify Malaysia within their 'outsider economy' cluster of countries, characterised by 'large stock markets, low ownership concentration, extensive outsider rights, high disclosure and strong legal enforcement'. They show that this cluster generally has lower levels of (non-IPO) earnings management than countries with different institutional regimes. However, they also identify Malaysia as a relatively high earnings management country within the outsider economy cluster and also as having relatively high ownership concentration. Another key institutional feature of Malaysian IPOs is the mandatory requirement for an earnings forecast in the prospectus. Cormier and Martinez (2006) argue that in companies that issue pre-IPO earnings forecasts managers may be pressured to engage in earnings management in the IPO year. They would do so to move company earnings towards the forecast earnings to enhance both their and the company's reputation with external stakeholders, including investors; Cormier and Martinez (2006) and others provide evidence of such actions even when actual earnings exceed the forecast. Thus, the motives for earnings management prior to the IPO (e.g., *inter alia* to increase the offer price to benefit the wealth of the original owners) and in the IPO year are likely to differ. Indeed, it is possible that incentives for pre-IPO earnings manipulation may be constrained by the need to meet the forecast earnings in the IPO year.

Within the Malaysian context it is difficult to anticipate the effect of such constraints, especially given the relative predilection for high ownership concentration. Thus, the first hypothesis considers whether there is any *general* evidence of income-increasing earnings management in the IPO year during the sample period, testable as (in alternative form):

H1: Malaysian IPO companies exhibit positive (i.e., income-increasing) earnings management in the IPO year.

In Malaysia, companies can choose to list on either the Main or Second Board of the Kuala Lumpur Stock Exchange (KLSE), renamed Bursa Malaysia from 1 May 2004. Information

asymmetry is likely to be lower for Main Board companies as they require more paid-up capital, a longer trading history, have greater prospectus requirements and are typically (though not always) larger than those listed on the Second Board. Thus, Second Board IPO companies may be able to retain private information more successfully than larger companies, suggesting a greater potential to engage in earnings management. This issue will be addressed first to identify whether further analysis needs to be undertaken on separate samples based on the board of listing.

As indicated above in the discussion of the Malaysian setting, the sample period covers the East Asian crisis years 1997-1998, during which the unfavourable economic environment may have driven some managers to engage in a higher level of earnings management to maintain investors' confidence in their company's performance. This leads to the second hypothesis (in alternative form):

H2: Malaysian IPO companies exhibit higher earnings management during the 1997-98 period of economic crisis than in the non-crisis period.

For part of the sample period (1995-1998) some Main Board and most Second Board IPOs were required to provide profit guarantees (see Section 2 above), so the pressure to meet a profit guarantee may also have provided an incentive for earnings management. This leads to the third hypothesis:

H3: Malaysian IPO companies that offer profit guarantees exhibit higher earnings management.

3.2.2 Wealth loss and post-IPO control

Prior research suggests that ownership concentration is generally high in Malaysia (Leuz et al., 2003), and this is confirmed for our sample of IPO companies in which over 75% of the shares are retained by the original owners post-IPO (Table 1). In such an environment, it seems likely that retention of post-IPO control may be an important consideration in designing the IPO offering. This may also have an impact on the level of earnings management but may conflict with short-term wealth (offer proceeds) considerations.

An indication of the wealth issues can be seen in Marquardt and Wiedman (2004), who investigate companies in which management sold their shares in seasoned equity offerings (SEOs) and find evidence that such companies have higher discretionary accruals, on average, compared to companies where management does not sell. Their results suggest that insiders who plan to sell shares in SEOs engage in earnings management to obtain a higher offer price, thus increasing their offering proceeds. Similarly, IPO companies in which insiders sell a larger proportion of their ownership interest are expected to engage in income-increasing earnings management. These wealth protection arguments suggest a *negative* relationship between earnings management and the proportion of shares *retained* (*RETOWN*). Likewise, the incentive to manage earnings specifically to meet earnings forecasts is argued to be lower if owners retain a larger percentage of the company (e.g., Cormier and Martinez, 2006, and refs therein). Finally, signalling models also suggest a *negative* relationship, arguing that owners of high quality companies signal quality by underpricing shares sold at the IPO. They retain a large equity stake and then benefit by selling further shares at a higher price in the aftermarket (e.g., Spiess and Pettway, 1997; Espenlaub and Tonks, 1998). However, the fairly stringent Malaysian share moratorium (lock-up period) regulations, discussed earlier in this paper, may reduce the potential benefit from such signalling behaviour.

Alternatively, pre-IPO owners may be concerned about the potential loss of control following the partial transfer of ownership which the IPO entails (Nagata and Hachiya, 2006). One way to alleviate such concerns is to allocate shares to many small investors through underpricing, thereby reducing both the threat of takeover and the monitoring by large block holders (Brennan and Franks, 1997). Companies in which post-IPO retained ownership is relatively low are more likely to be concerned about control and outside monitoring. They are, therefore, more likely to manage earnings conservatively (low DCA) to reduce the IPO offer price, ensure a high initial return and oversubscription, and enable greater share allocation to smaller investors. This implies a *positive* relationship between earnings management and retained ownership.

The relative importance of these competing motives (wealth protection, signalling or concern about control)[3] is an interesting issue, particularly in the high concentration Malaysian environment. However, it means that *a priori* the directional relationship between earnings management and retained ownership (*RETOWN*) is uncertain. Thus, our fourth hypothesis is:

H4: Earnings management by Malaysian IPO companies is related to pre-IPO owners' level of post-IPO retained ownership.

3.2.3 Control variables: other factors influencing earnings management propensity

In light of the wide variation in earnings management practices across companies, this paper also seeks to assess the importance of other specific motives for earnings management within the distinctive socio-economic environment of Malaysia. Six further factors are investigated, having all been identified in prior literature as potential influences on the level of earnings management.

Auditors and underwriters both play a significant role in IPOs in helping to reduce information asymmetry between company managers/owners and potential investors. The auditor reports on the reliability of the financial data included in the prospectus and the underwriter provides a signal to investors about the quality of the new issue. Aharony et al. (1993) argue that high-quality auditors and underwriters have greater incentives to provide accurate information in IPOs to avoid litigation costs and reputational damage. Thus, earnings management is more likely to be discovered by higher quality auditors and underwriters. However, if company managers believe that earnings management will lead to a higher IPO valuation they have countervailing incentives to appoint low-quality auditors/underwriters who may be less likely to detect the manipulations. Managers are likely to appoint high-quality auditors and underwriters if the signalling benefits exceed any potential IPO value loss from reduced earnings management. In prior studies, both Zhou and Elder (2002) and Chen et al. (2005) find that IPO companies audited by a large (high quality) auditor engage in less earnings management in the IPO year. Overall, these arguments suggest that IPO companies with high-quality auditors and/or underwriters are less likely to manipulate earnings.

[3] Owners may also decide to sell for personal liquidity or diversification reasons which will introduce noise into any relationships implied by the hypothesised motives.

It can be argued that the longer the operating history of a company, the more likely it is to be based on a sound business model and to have a lower level of information asymmetry, suggesting a reduced need and/or opportunity to engage in earnings management. Thus, a negative relationship is expected between company age and the level of earnings management.

The level of earnings management may also be directly related to IPO initial returns (underpricing). Generally, managers may use *positive* discretionary accruals to overstate income to obtain a higher offer price, which in turn will reduce the initial return. In her study of the Chinese IPO market, Kimbro (2005) also finds a negative relationship between earnings management and initial returns but argues that, in that specific environment, managers use *negative* DCAs to understate income and therefore underprice IPOs (increasing the initial return) to offset the agency problem. In both situations, earnings management is anticipated to be *negatively* associated with IPO initial returns (underpricing).

Aharony et al. (1993) argue that companies with higher leverage are more likely to engage in earnings management to ensure the successful completion of an IPO due to the pressure to repay debt. This suggests an expected positive relationship between earnings management and leverage.

Finally, notwithstanding its indirect link with the board of listing, individual company size may have a separate, distinguishable impact on earnings management. Larger companies tend to attract greater analyst and investor interest, with lower information asymmetry reducing the potential opportunities for earnings management. This implies a negative relationship between earnings management and company size, as evidenced empirically by Aharony et al. (1993). Board of listing is also included as a control to check that the potential higher information asymmetry in Second Board companies does not exert a positive influence on earnings management in the multivariate context.

3.2.4 Earnings management and post-IPO long run stock market performance

Prior research (e.g., Teoh et al., 1998, 1998a) suggests that opportunistic IPO earnings management has the potential to (at least partially) explain the typically-observed long term stock market return underperformance of IPOs. Evidence for this can be provided if there is a negative

relationship between earnings management and subsequent return performance, leading to our fifth hypothesis:

H5: 'Aggressive' (high earnings management) Malaysian IPO companies exhibit a lower long run stock return performance than 'conservative' Malaysian IPO companies.

The following section outlines the methods used in testing these hypotheses together with details of the specific proxy measures employed.

4. Methods

4.1 Measure of earnings management

Following DuCharme et al. (2001, 2004) and Roosenboom et al. (2003), discretionary current accruals (DCA) are used to proxy for earnings management since managers are likely to have greater discretion over short term than over long term accruals (Teoh et al., 1998a, b). Dechow et al. (1995) suggest that the 'Modified Jones' model is the most powerful model for detecting earnings management so we adopt this model here, consistent with other IPO studies (Teoh et al., 1998a; Roosenboom et al., 2003). The model separates total current accruals into expected (nondiscretionary) and abnormal (discretionary) components. The modification to the model introduced by Jones (1991) is that nondiscretionary accruals are estimated from a cross-sectional[4] model in which changes in sales are also adjusted for changes in trade receivables. This reduces the possibility of credit sales manipulation resulting from the timing of revenue recognition (Dechow et al., 1995).

The expected current accruals for each of the IPO sample companies in a given year are estimated using an estimation portfolio of all level 3 industry peers available on the Datastream database. A cross-sectional regression is performed separately in each financial year for each industry portfolio to estimate the model coefficients to allow for changes in nondiscretionary accruals over time and across different industries. Thus, the effect of changes in industry-wide economic circumstances

[4] The time-series approach is infeasible for IPOs because the time-series of data is too short to allow estimation of the regression parameters (Peasnell et al., 2000).

on current accruals in each specific year can be controlled. Consistent with most prior studies (e.g., Teoh, et al., 1998; Peasnell et al., 2000; DuCharme et al., 2001), industry portfolios are required to contain at least 10 companies, with IPO companies and companies that made an IPO in the previous three years excluded. Combining small, broadly similar, industries resulted in six industry groups: (i) Basic Industries; (ii) Consumer Goods (Cyclical and Non-Cyclical); (iii) Services (Cyclical and Non-Cyclical); (iv) General Industrials and Information Technology; (v) Resources and Utilities; and (vi) Real Estate Development. There are 84 separate industry-year estimation portfolios during the period, consisting of 4,308 seasoned company-years. Industry portfolios vary in size across industries and over time, averaging 51 constituents and ranging from the required minimum of 10 constituents (in two industry years) to 191 for 'Basic Industries' in 2001. Nondiscretionary accruals for each IPO company in each year are then predicted using the estimated model coefficients from each industry-year estimation portfolio. Finally, discretionary current accruals (DCA), those subject to managerial manipulation, are calculated as the difference between total current accruals and nondiscretionary current accruals. Further details of the method are provided in Appendix A.

4.2 Factors influencing levels of earnings management

After describing the overall time series pattern of earnings management, *univariate* analysis is conducted on the influence of board of listing (i.e., whether the IPO company is listed on the Main or Second Board of the Malaysian Stock Exchange), economic conditions (specifically the East Asian crisis period) and the requirement for some IPO companies to provide a profit guarantee.

Further *multivariate* analysis is undertaken to investigate hypotheses 2 through 4, while controlling for additional factors that may influence earnings management. The level of IPO year earnings management is regressed on experimental variables relating to crisis years, profit guarantees and the level of retained share ownership together with several additional control variables: auditor reputation, underwriter prestige, company age, size of initial returns (underpricing), the degree of leverage, company size and also board of listing. The ordinary least squares (OLS) multiple regression model that is estimated is as follows:

$$DCAYR0_i = \alpha_0 + \beta_1 CRISIS + \beta_2 PG + \beta_3 RETOWN + \beta_4 AUDITOR + \beta_5 UNDWR + \beta_6 AGE + \beta_7 IR + \beta_8 LEV + \beta_9 lnMV + \beta_{10} BOARD + \varepsilon_i$$

where:

DCAYR0	=	IPO year discretionary current accruals as a percentage of lagged total assets;
CRISIS	=	dummy variable = 1 for crisis years (1997-1998) and zero otherwise;
PG	=	dummy variable = 1 for companies that provide a profit guarantee disclosure and zero otherwise;
RETOWN	=	percentage of shares retained by insiders (original owners) after the IPO**;**
AUDITOR	=	dummy variable = 1 if auditor is Big 5 (Arthur Andersen, Deloittes, Ernst and Young, KPMG, PricewaterhouseCoopers, or their pre-merger equivalents) and zero otherwise;
UNDWR	=	dummy variable = 1 for prestigious underwriter as defined in Jelic et al. (2001) and zero otherwise;
AGE	=	company age in years;
IR	=	initial return (%) measured by comparing the share price (p_t) at the end of the first day of trading with the offer price (p_0): $(p_t-p_0)/p_0$;
LEV	=	total borrowings as a percentage of total assets, at the time of the IPO;
lnMV	=	natural log of the market value at the time of the IPO computed as the number of shares outstanding times the closing price on the first trading day;
BOARD	=	dummy variable = 1 for companies listed on the Main Board and zero for companies listed on the Second Board;
ε_i	=	error term

The reported significance levels are based on White's t-statistics to correct for any heteroscedasticity.

4.3 Measure of long run stock market performance

In Malaysia, companies are required to issue their annual audited financial statements within a period not exceeding four months after the close of their financial year. This potential delay in financial information availability needs to be incorporated in the investigation of post-IPO stock market performance. Thus, accruals from the accounting year ending immediately after the IPO are related to the stock market performance over a three year period, starting from four months after the financial year end up to 40 months after the IPO. Although Teoh et al. (1998a) observe that the appropriate benchmark of expected long run stock market performance is 'much debated in the asset pricing literature', their choice of benchmark did not affect their finding of a link between earnings management and subsequent stock market returns. In the absence of a dominant method, and consistent with the greater investor-relevance argument advanced by Teoh et al. (1998a), compounded buy-and-hold returns, based on two benchmarks, are used in the present study. The long run abnormal

performance (benchmark-adjusted buy-and-hold return) for each company is estimated as the difference between the raw buy-and-hold return of an IPO company and the raw buy-and-hold return on the benchmark. The two benchmarks employed are: (i) the KL Composite Index (KLCI), to represent a market benchmark; and (ii) a matching company. Barber and Lyon (1996) found that statistical tests of abnormal performance were only well-specified when sample companies were matched against control companies with similar pre-event performance. Consequently, the matching company is matched on industry, pre-IPO operating performance based on Operating Income/Sales (to control for the mean reversion tendencies in operating performance) and pre-IPO total assets (to control for size effects).[5] To allow for the increase in size of many IPO companies that follows the issue of new shares in the IPO, the match was made with the closest, but larger, non-IPO company. Median and mean benchmark-adjusted buy-and-hold returns are reported across all IPO sample years and separately for the East Asian crisis and non-crisis periods. Comparison is also made between sub-samples of IPO companies that engage in 'aggressive' (top tertile DCA) and 'conservative' (bottom tertile DCA) earnings management practices.

5. Sample selection and data

Our initial sample consists of 543 new companies listed on the Malaysian Stock Exchange during the period 1990 to 2000; the period ends in 2000 to enable analysis of post-IPO long term performance. Thirty-nine companies classified as Infrastructure Project Companies, or included in the Finance, Trust and Closed-End Funds sectors, and five companies listed via the 'introduction' method, are excluded.[6] One company that made a combination offering of debt and equity was also excluded

[5] The matching company is required to have pre-IPO (year -1) operating income/sales within the range of 90% to 110% of the sample IPO company operating income/sales and beginning total assets within 70% to 130% of sample IPO company total assets in year –1. Similar filter levels are applied by Barber and Lyon (1996) while Teoh et al. (1998) use operating income/sales for performance matching. Of the 254 sample IPO companies, 36 are matched on the basis of industry, pre-IPO performance, and total assets, 138 are matched on the basis of industry and pre-IPO performance, while 69 are matched on the basis of industry only. Of the remaining 11 companies, four are matched on the basis of pre-IPO performance and total assets, and seven are matched only on the basis of pre-IPO performance regardless of industry. Application of the comprehensive three measure matching process is limited by the small number of Malaysian listed companies in some industries.

[6] We exclude Infrastructure Project Companies (IPCs) since they have special listing regulations (e.g., there is no minimum profit track record or market capitalisation requirement), which may unduly influence the results. We also exclude the Finance, Trust and Closed-End Fund sector due to the fact that data on these companies are not comparable with those of non-financial companies. However, the Properties (Real Estate) sector was

to avoid any confounding effects of the debt issue. Finally, 151 companies were excluded because they had no 'prior year' comparative figures in the first post-IPO published annual reports (as such data were needed to estimate the earnings management proxy variable), 65 companies had missing annual report files, 21 companies had an incomplete set of five years of financial data and 7 companies changed their financial year end. The final sample comprised 254 IPO companies with 98 in the 'Basic Industries' sector, 58 in 'Consumer Goods', 39 in 'General Industrial and IT', 36 in 'Services', 17 in 'Real Estate Development' and 6 in 'Resources and Utilities'.

Stock return data were sourced from Datastream, and financial data were obtained from Datastream, the Pacific-Basin Capital Market (PACAP) Research Centre database, and the original annual reports. The accrual variables to measure earnings management during the IPO year (year 0) were hand-collected from the first post-IPO published annual reports, which included the financial information for both pre- and post-IPO years. Consistent with Teoh et al., 1998a, it was necessary to use the first published annual reports due to incomplete data in the pre-IPO financial statements contained in the prospectuses.

6. Results

6.1 Descriptive statistics

Table 1 presents descriptive statistics for the full sample of 254 Malaysian IPOs and separately for Main Board (91 IPOs) and Second Board (163 IPOs) listings.[7] Market value, sales and total assets data are expressed in constant 2002 Malaysian Ringgits (RM), adjusted using the

included in the sample because it is not classified as a financial sector by the Malaysian Stock Exchange. Companies listed via 'introduction' were excluded because they are not strictly IPO companies.

[7] Our study does not differentiate between private IPOs and privatisation IPOs (PIPOs), i.e., IPOs in which state-owned enterprises are listed on a stock market to achieve partial or full private ownership. The number of PIPOs in the sample is small (15 companies out of 254) and when PIPOs were excluded the results were almost identical. Ahmad-Zaluki et al. (2007) also found no significant difference in performance between private IPOs and PIPOs.

Consumer Price Index.[8] The mean (median) market value for the full sample is RM545 million (RM180 million); the mean is equivalent to approximately £89 million, or $US143 million, based on 2002 exchange rates. IPO companies listed on the Main Board are typically much larger (mean market value = RM1,257 million) than those listed on the Second Board (RM147 million). However, as can be seen from the market value range, there are some relatively large IPOs that listed on the Second Board. Main Board companies are also significantly larger based on alternative size proxies (sales and total assets) but they have lower leverage. Operating performance prior to the IPO, measured by operating income deflated by sales, is also better for Main Board companies (median = 16.3% compared to 13.6%).[9]

The average age of Malaysian IPO companies at the time of going public is 11 years, slightly higher than the 9 years reported by Teoh et al. (1998) for US companies, but considerably lower than the 35 years reported by Roosenboom et al. (2003) for companies in the Netherlands. Main Board companies have a longer operating history than Second Board companies. The mean (median) level of initial return, or underpricing, is 99% (86%), higher than in many other countries but almost identical to other recent findings for Malaysia (e.g., Jelic et al., 2001; How et al., 2007). The mean proportionate ownership retained by the original owners (retained ownership) is 77%, which is broadly similar to figures reported for other countries (e.g., US: 71%, Jain and Kini, 1994; UK: 74%, Keasey and Short, 1997) but higher than some (Thailand: 39%, Kim et al., 2004; Australia: 51%, Balatbat et al., 2004). The levels of initial return and retained ownership are very similar across Main and Second Board companies. Overall, just over half of the IPO companies (56%) choose Big 5 auditors and the same percentage choose prestigious underwriters but, as expected, Main Board (larger) IPOs opt for higher quality advisers more often than Second Board IPOs, statistically so in the case of auditors.

[Insert Table 1 about here]

[8] The Malaysian Consumer Prices Index (CPI) is obtained from the Global Market Information Database. The year 2002 was used to express values in constant terms because this is the latest year for which CPI information was available at the time the analysis was carried out.

[9] The equivalent mean (median) statistics for the matching companies used in one of the long-term return benchmarks are: operating income/sales 15.3% (13.6%); total assets RM1,619 (341) million; market value RM1,868 (472) million.

6.2 Time-series and cross-sectional patterns of earnings management

The last row of Table 1 reports the level of discretionary current accruals (DCA) during the IPO year (year 0) and, consistent with most prior studies, provides evidence of earnings management with a median (mean) DCA across all companies of 3.24% (5.74%), statistically significant at the 1% level. Thus, there is general evidence of earnings management at the time of the IPO in Malaysia over the study period, consistent with hypothesis 1. However, there is also a very wide range of earnings management as indicated in the reported minimum and maximum DCA levels.

Information asymmetry is likely to be lower in Main Board companies as they require more paid-up capital, a longer trading history, have greater prospectus requirements and are typically larger than those listed on the Second Board. Thus, Second Board IPO companies may be able to retain private information more successfully than larger companies, suggesting a greater potential to engage in earnings management. Indeed, there is some evidence of this here, with companies listed on the Second Board demonstrating a higher level of year 0 earnings management (median = 4.05%) than the Main Board (median = 1.47%) but the difference is not statistically significant. This suggests that board listing *per se* is unlikely to be a major determinant of IPO year earnings management.

The distribution of IPO year DCA (as a percentage of lagged total assets) over the sample period is presented in Table 2.[10] This shows a wide variation across the years with statistically significant (positive) DCA observed in just two of the 11 years. The level of earnings management is much higher for IPOs in 1997 and 1998 (statistically significant at the 1% and 5% levels, respectively), confirmed as different from the other years by the Kruskal-Wallis test (p-value = 0.037). Of the nine years with insignificant DCA, the median is negative in 4 years and is positive but less than 1% in two years. Overall, 61% of the 254 IPOs have positive DCA (row 4) with the remaining 39% of IPOs showing no evidence of the use of accruals to manage earnings upwards. While the overall percentage of IPOs with positive DCA is significantly greater than the 50% expected by

[10] Table 2 also suggests that 1996 and 1997, with larger numbers of IPOs, might be considered 'hot' IPO markets. However, there is no reason to believe that this will affect the analysis in later sections. Helwege and Liang (2004) find little evidence of different characteristics (such as company quality or operating performance) between hot and cold market IPOs; in addition, they find no difference in the use of discretionary accruals.

chance, this is mainly driven by the significant percentages in 1997 and 1998 (and, marginally, in 1993). These observations suggest that earnings management is far from pervasive in the Malaysian market and provide further evidence which is inconsistent with the hypothesis of 'widespread and substantial earnings management by IPO firms' (Ball and Shivakumar, 2008). The large dispersion of discretionary accruals, evidenced by the large standard deviations, also encourages further investigation of the cross-sectional variation to assess the determinants of earnings management propensity.

[Insert Table 2 about here]

The two years with evidence of significant upward earnings management reflect the coincidence of two major environmental characteristics in Malaysia: the East Asian crisis and the requirement for many companies to provide profit guarantees in IPOs. During the crisis years, investors are likely to have been more selective in buying IPOs which may have encouraged earnings management by company managers. The pressure to meet a profit guarantee may also have provided an incentive for earnings management. The high positive level of DCA observed during 1997 and 1998 is certainly consistent with such motivations. These patterns of earnings management are explored in greater detail below in both univariate and multivariate frameworks.

The last row of Table 2 identifies the numbers of sample IPOs in each year over the 1990-2000 period. An unusual feature is that the number of IPOs did not decline significantly during 1997, the first year of the East Asian crisis, though the number did fall quite sharply after 1997. This reflects the overall pattern of 'population' IPOs which shows that there were 88 newly listed companies in 1997, just short of the peak of 92 companies in 1996; i.e., it is not a consequence of data screening. The high number of IPOs in 1997 is contrary to the expectation that fewer companies, perhaps only the desperate ones, choose to go public during a crisis. It may also suggest that short-term wealth maximisation may not be the primary motive for company owners in going public.

6.2.1 Overall earnings management patterns

Table 3 presents the time-series profile of DCA from the financial year of the IPO (year 0) to three years after, with all values expressed as a percentage of lagged total assets. The data are presented first for all sample IPO years (1990 to 2000) then split into sub-periods based on the East Asian crisis years (1997-1998)[11] and non-crisis years (excluding years 1997-1998), profit guarantee years (1995-1998) and non-profit guarantee years (excluding years 1995-1998). Medians are reported in view of the non-normal distribution of the DCAs, the potential for distortion by outliers and in the interests of brevity; the results based on means were very similar, with just minor differences in levels of statistical significance.

[Insert Table 3 about here]

Overall (i.e., across all companies and all years), the median DCA is highest at the time of the IPO (year 0), at 3.24% before declining steadily to -0.56% in year +3. The level of IPO year earnings management is slightly lower than observed by Teoh et al. (1998) and Teoh et al. (1998a), who reported median values of 5.5% and 4.0% for the US and Roosenboom et al. (2003) who reported 3.9% for the Netherlands. Roosenboom et al. (2003), note that other studies have found levels of earnings management ranging from 1.5% to more than 5% of lagged total assets. In the first year after the IPO (year +1), the level of earnings management of 1.47% is still significantly positive, suggesting that Malaysian IPO companies continue to manage their earnings for the financial year immediately after the IPOs. Similar results are reported for the US (Teoh et al., 1998; 1998a) but Roosenboom et al. (2003) found a significant DCA reversal to -4.4% in year +1 in the Netherlands. The continuance of earnings management in the post-IPO year may reflect managers' needs to ensure that actual earnings are close to those forecast in the IPO prospectus and also in the two years of maintainable

[11] The East Asian crisis is usually considered to have started officially on 2 July 1997 with the floating (and prompt significant decline) of the Thai Baht, but there were large capital outflows from Malaysia earlier in 1997 combined with a decline in equity values from February onwards. Consequently, we treat all of 1997 as within the crisis period. The alternative of adopting July 1997 as the start of our 'crisis years' has no differential impact. There were 19 (24) IPOs in the first (last) 6 months of 1997, with median IPO year DCA of 10.3% (9.4%); i.e., IPOs were not all concentrated in the period prior to the official crisis start and the earnings management differences between first and last 6 months of 1997 are statistically insignificant.

earnings following the IPOs. These needs might arise because owners wish to sell more shares after the end of the compulsory 1 year lockup period, or perhaps to meet required profit guarantees.

6.2.2 Earnings management by economic conditions

Our sample period covers the East Asian crisis years 1997-1998, during which the unfavourable economic environment may have driven some managers to engage in a higher level of earnings management to maintain investors' confidence in their company's performance. Analysis of the 58 IPOs in the crisis sub-period confirms that the level of earnings management is significantly positive and higher than for IPOs during non-crisis years (n = 196). IPO year DCA is significantly positive and very large in the crisis years (median = 10.96%) but small and insignificant in the non-crisis years (median = 1.21%); the difference is statistically significant at the 1% level. Thus, DCA is not significant across a large proportion (77%) of the sample IPOs suggesting that earnings management, in normal economic conditions, is neither substantial nor widespread. This observation is consistent with the classification of Malaysia within the 'outsider economy' cluster of countries (Leuz et al., 2003) with its attendant relatively low level of (non-IPO) earnings management. The findings of Cormier and Martinez (2006) related to IPO earnings forecasts would seem to predict a higher level of earnings management in Malaysia, but this is not observed.

6.2.3 Earnings management by profit guarantee period

For part of the sample period (1995-1998) some Main Board and most Second Board IPOs were required to provide profit guarantees, which may have affected companies' propensity to manage earnings. For the full sample, a high level of IPO year earnings management is observed during the profit guarantee years 1995-1998 (median = 5.79%, significant at the 1% level), but not in the other sample years (difference significant at the 5% level), implying that profit guarantees may have exerted an influence on managers. Separate analysis of Second Board companies (not reported in the Table) provides evidence of a high level of earnings management in year 0 (median = 6.24%), but also in year +1 (median = 5.21%), consistent with the profit guarantee requirement. While both of these are higher

than during the non-profit guarantee period, the differences are not statistically significant, so it is far from clear that the profit guarantee requirement is an important determinant of earnings management.

6.2.4 Profit guarantee vs. crisis period explanations

Table 3 provides evidence that, overall, companies listed during the East Asian crisis period and those listed during the profit guarantee years engaged in higher levels of earnings management. However, interpretation of the crisis period and profit guarantee period results is clouded by the overlap between the two periods. To disentangle this issue, in Table 4 we split the profit guarantee period (1995-1998) into non-crisis (1995-1996) and crisis (1997-1998) years and compare the earnings management of IPO companies that did/did not provide a profit guarantee. None of the sample Main Board companies provided guarantees so the focus in Table 4 is on Second Board companies.[12]

[Insert Table 4 about here]

There were 84 Second Board IPOs during the profit guarantee period, 39 (45) in the non-crisis (crisis) period and 10 (37) companies provided profit guarantees. For profit guarantee companies (row 1) the level of IPO year earnings management is 11.62% during the crisis period, significantly higher (at the 5% level) than the 1.23% in non-crisis years. IPO year DCA is also higher in the crisis years for non-profit guarantee companies (row 2) but the difference is not statistically significant, possibly affected by the small number of non-profit guarantee companies (n = 8) in the crisis period. By contrast, the difference in IPO year DCA between profit guarantee and non-profit guarantee companies is small and not statistically significant in either crisis or non-crisis period. Overall, these results suggest that the East Asian crisis was a major factor in managers' decisions to manage IPO year earnings but motivations relating to the provision of profit guarantees were not important.

[12] Prior to July 1997, the profit guarantee agreement was voluntary for certain Main Board Companies and for all Second Board companies but was then mandatory for all Second Board companies until March 1999.

6.3 Multivariate analysis

While the above univariate analysis provides a useful initial analysis of the level and variability of earnings management, multivariate analysis will enable exploration of the hypotheses while controlling for additional factors that may influence earnings management. Specifically, the level of IPO year earnings management (scaled by lagged total assets) is regressed on variables relating to crisis years, profit guarantees, level of retained ownership and several additional control variables: auditor reputation; underwriter prestige; company age; size of initial returns; the degree of leverage; company size; and board of listing. Initial bivariate correlation analysis (see table in Appendix B) shows expected moderate correlations between profit guarantee and crisis period (0.61), and between board of listing and company size (0.59). The positive relationship between company size and initial IPO return (0.44) is interesting and perhaps less expected. However, none of the other independent variables are particularly highly correlated, suggesting that multicollinearity is unlikely to be an issue in the regression models; this is reinforced by the observation that all of the variance inflation factors (VIF) are below 2.

The results for three OLS multivariate regressions are reported in Table 5. The DCA dependent variable is winsorised to reduce the impact of three extreme outlier observations.[13] The results for the full sample (Model 1) confirm the univariate analysis findings. Firstly, the crisis period is a major earnings management determinant (*t*-stat = 3.34) but the provision of a profit guarantee (PG) does not seem to affect the level of IPO earnings management. The percentage of retained ownership (*RETOWN*) has a significantly positive relationship with earnings management. This supports the dominance of the 'control concerns' explanation over the 'wealth protection' and signalling arguments. In other words, pre-IPO owners of companies who sell a relatively large proportion of their ownership interest (low retained ownership) are willing to forego the increase in immediate wealth that might accrue from a higher offer price as a result of income-increasing earnings management. They do so to ensure a high level of underpricing leading to oversubscription for the offer, thereby enabling shares to be allocated to many small investors. This reduces the threat of

[13] A standard method was adopted in which outliers (outside a range of ± 1.5 times the inter-quartile range beyond the upper and lower quartiles) were replaced by the most extreme value within that range.

takeover and monitoring by large block holders (Brennan and Franks, 1997), both of which will be of greater concern to companies in which post-IPO retained ownership is relatively low. Another contributory factor might be that the share moratorium (lock-up) regulations in Malaysia distort the potential signalling effect of insider share retention. Consequently, insiders within even strong (high retained ownership) companies have less incentive to underprice, so might be tempted to resort to income-increasing earnings management to obtain a higher offer price in IPOs.

Two control variables, *AUDITOR* and *AGE,* are also significant earnings management determinants. The significant negative coefficient on the proxy for auditors' reputation implies that companies audited by Big 5 auditors have lower levels of earnings management, consistent with prior research (Zhou and Elder, 2002; Chen et al., 2005). This suggests that either higher quality auditors are more likely to detect or deter earnings management, or managers of high quality IPOs, with reduced need to manage earnings, signal the quality by appointing high quality auditors. The significant negative coefficient on *AGE* suggests that there is less uncertainty about the value of an IPO for a company with a longer operating history, thereby reducing the need and/or opportunity to manage earnings at the time of going public. Meanwhile, underwriter reputation (*UNDWR*), initial return (*IR*), leverage (*LEV*), company size (*lnMV*), and board of listing (*BOARD*) do not appear to have a significant impact on earnings management. The insignificance of the initial return (underpricing) variable is particularly interesting as it implies that DCA are not related to first day returns. This suggests that earnings management is not generally undertaken for wealth-related opportunistic reasons, adding further weight to the argument above for the alternative 'ownership control' motive in Malaysia.

[Insert Table 5 about here]

While the overall level of earnings management is relatively high (low) in the crisis (non-crisis) period, there is considerable cross-sectional variation. For the crisis period, DCA varies between -33% and +92%, with 76% of companies showing positive DCA; for the non-crisis period DCA varies between -62% and +92%, with 57% showing positive DCA. It is interesting to investigate further this cross-sectional variation to gain additional insight into the company-specific factors that

affect earnings management. To reduce the potential confounding impact of the unusual environment during the crisis period, we estimate separate models for crisis years (Model 2) and for non-crisis years (Model 3).

During the crisis period (Model 2), provision of a profit guarantee (PG) remains insignificant while *RETOWN* is of major significance in determining the level of earnings management and, as in the full sample, has a positive coefficient consistent with the 'control concerns' explanation. Of the control variables, there is evidence that leverage may have some impact but the negative coefficient is contrary to expectation. It is possible that company managers recognise that, in such stressful economic conditions, risky (high leverage) companies are likely to be subject to increased scrutiny so they voluntarily reduce earnings management activities. Alternatively, auditors of high leverage companies may be more diligent during crisis conditions and enforce lower earnings management as self-protection.

For the non-crisis period (Model 3), *RETOWN* continues to be positive and highly significant while *PG* now also becomes significant; the unexpected negative sign implies that companies that disclose profit guarantees in the IPO prospectus have *lower* levels of earnings management. One explanation might be that companies which chose (or were required) to provide a profit guarantee were more cautious in their profit forecasts. It would then be easier to meet the forecasts, implying a reduced need to manage earnings. Alternatively, profit guarantee companies might be more closely monitored (by auditors, underwriters, lenders and analysts) thereby reducing the opportunity to manage earnings. Of the control variables, Big 5 auditors (*AUDITOR*) seem to exert some influence in reducing earnings management and older companies (*AGE*) also appear to engage less in earnings management.

As a whole, these results clearly confirm hypothesis 2 that earnings management is higher in the crisis years, but reject hypothesis 3 that earnings management is higher in profit guarantee companies. In fact, in non-crisis years there is evidence to the contrary; i.e. profit guarantee companies are associated with lower levels of earnings management. For hypothesis 4, there is strong evidence of a positive relationship between retained share ownership and earnings management, consistent with

the notion that owners' concerns about post-IPO control may be more important than short-term wealth gains in the high ownership concentration Malaysian market. By contrast, Nagata and Hachiya (2006) found exactly the opposite (a negative relationship with retained ownership) in the Japanese market.

Of the control variables, auditor reputation and company age are significant determinants of the level of earnings management by Malaysian IPOs. Leverage also appears to be related to the level of earnings management but only during the crisis years. Underwriter prestige, initial returns, company size and board of listing are not significantly related to earnings management in any of the three models.[14] Our results contrast with Aharony et al. (1993) who found that earnings management is more pronounced for smaller companies and for those with large financial leverage. Our results also differ from those of Wan-Hussin and Ripain (2003) who reported that income smoothing was more prevalent among smaller companies.

6.4 Earnings management and post-IPO stock market performance

The association between DCAs and post-IPO performance is also examined to see whether companies with high levels of earnings management at the time of the IPO experience a greater deterioration in their stock market performance in subsequent years. To perform this analysis, the sample is first split into tertiles of low, medium and high DCA and comparison is then made between high and low categories. The conservative group (low DCA) has a DCA of less than -1.4%, the medium group -1.4% to 10.2%, and the aggressive (high) group has a DCA of more than 10.2%. Table 6 reports the data on long run stock market performance, with panels A and B showing the median and mean buy-and-hold abnormal returns (BHARs) using a market benchmark and a matched company benchmark, respectively. The returns are calculated for a three year period, commencing at the beginning of the fifth month after the IPO year financial year end to allow for a reporting lag. The BHARs for each IPO company are computed as the raw IPO return minus the equivalent period KL

[14] Given the moderate correlations between board of listing, company size and initial returns, regressions were also performed with the first two variables separately excluded. Similarly to test the robustness of the models to the company size measure, regressions were carried out with the alternate proxy ln(total assets). While occasional minor variations in significance levels were observed, none of these alternative regressions affected the overall results as reported.

Composite Index return or minus a matched company return, winsorised to avoid the distorting impact of outliers on mean performance. The three year BHARs are reported for all years, and also separately for the crisis and non-crisis years. The percentage of companies with high DCAs in the crisis years is 53% (31 out of 58 companies), significantly higher (chi-square = 13.48; $p < 1\%$) than the 28% (54 out of 196 companies) in the non-crisis years; i.e., aggressive earnings management occurs more often during the crisis period.

[Insert Table 6 about here]

Panel A of Table 6 shows that, overall, IPO companies underperform the market benchmark, with a median BHAR of -26.72% in the three-year holding period, which is statistically significant at the 1% level. The median underperformance of -33.02% is even greater during the crisis period than the non-crisis period (median = -25.60%), though the difference is not statistically significant. Comparisons based on the level of IPO earnings management show little difference between aggressive (high DCA) and conservative (low DCA) companies for the full sample and during non-crisis periods. However, for IPOs issued during the crisis period, aggressive earnings management companies significantly underperform conservative companies; the median three-year BHARs are -37.85% and 12.39%, respectively.

To check the robustness of the results, Panel B reports abnormal returns based on the alternative benchmark of matched company returns. Compared to the market benchmark, this shows a lower, and insignificant, level of underperformance in the three-year holding period (median BHAR = -4.99%). However, consistent with the results using the market benchmark, aggressive earnings management IPOs (high DCA) are again found to significantly underperform (at the 5% level) the conservative earnings management group (low DCA) during the crisis period.

As a final robustness check, the sample was split into quartiles (rather than tertiles) based on the level of DCA and comparison made between the top and bottom DCA quartile companies. The (unreported) results are essentially the same as above, but with increased statistical significance (1% for mean and median for both benchmarks) for the differences between low and high DCA subsamples

in the crisis years; again, there is no difference in the non-crisis years. Thus we have strong evidence in support of hypothesis 5, that aggressive earnings management in IPO companies leads to long term underperformance, but *only* for IPOs issued during the period of economic crisis. There appears to be no link between earnings management and long term performance during more normal economic conditions.

Teoh et al. (1998a), Teoh et al. (1998), DuCharme et al. (2001) and Roosenboom et al. (2003) found that IPO companies undertaking aggressive earnings management underperform conservative earnings management IPO companies over a three-year holding period. By contrast, our results suggest that the relationship between earnings management and subsequent stock returns in Malaysia is environment-specific. Economic stress (i.e., during the crisis period) increases the likelihood and level of aggressive earnings management and then those aggressive earning management companies are likely to significantly underperform conservative companies over a three-year holding period. Earnings management is less likely during more normal economic conditions and then aggressive earnings management companies do not underperform their more conservative counterparts. This finding suggests that environmental factors might usefully be considered more fully in IPO studies.

7. Conclusion

Based on the analysis of a sample of 254 Malaysian IPOs over the period 1990-2003, there is general evidence of income-increasing earnings management in the IPO year. However, these overall results appear to be driven mainly by IPOs during 1997 and 1998, two years reflecting the coincidence of the East Asian crisis and a requirement for many companies to provide profit guarantees. Further detailed univariate analysis suggests that income-increasing earnings management is not a general phenomenon. Rather, it is determined primarily by a period of economic stress (the East Asian crisis) with the profit guarantee requirement having little impact. Indeed, multivariate analysis suggests that the impact of profit guarantees is to reduce, rather than increase, the level of earnings management. Unlike Cormier and Martinez (2006), we were not able to investigate this further to see if earnings management is affected by the *ex post* deviation from the profit guaranteed in the IPO prospectus; this is an opportunity for future research.

Controlling for several other potential determinants in a multivariate framework confirms the importance of the crisis period and also identifies the significant impact of the owners' continuing interest in the post-IPO company. The observation of a positive relationship between retained ownership and earnings management is consistent with owners having concerns about retaining control of the company post-IPO; it is not consistent with 'opportunistic' earnings management to protect owners' wealth or with owners seeking to signal IPO quality. Analysis of the period of less-stressful economic conditions (non-crisis period) shows that older companies and those audited by a prestigious (i.e., Big 5) audit firm exhibit lower levels of earnings management, consistent with notions of reduced information asymmetry and/or reduced opportunities for managers to manipulate earnings.

Taken as a whole, our results provide evidence in support of Ball and Shivakumar (2008), consistent with the argument that 'opportunistic' IPO earnings management may be less pervasive than prior research has hitherto suggested. The evidence is also consistent with managers' stated preference for taking real economic actions (i.e., operating decisions) rather than accounting actions when seeking to achieve earnings benchmarks (Graham et al., 2005). Environmental and company-specific factors appear to significantly influence earnings management decisions. In particular, within the high ownership concentration market of Malaysia, ownership concerns act as a constraint on IPO earnings management.

Post-IPO market-based performance was found to depend on the benchmark adopted. IPO companies were found to significantly underperform the market benchmark over the three year post-IPO period, but there was no significant difference in performance when a matched-company benchmark was used. Investigation of the relationship between earnings management and post-IPO performance again showed that results were contingent on environmental factors. In particular, aggressive earnings management IPO companies performed significantly less well than their more conservative counterparts, but only for IPOs issued during the East Asian crisis period. For other periods, IPO earnings management was less pronounced and performance was not affected by the level of earnings management.

APPENDIX A

Earnings management model

The earnings management model employed in the present study is a modified version of the model introduced by Jones (1991), with the nondiscretionary accruals estimated from a modified cross-sectional model, in which changes in sales are also adjusted for changes in trade receivables (Dechow et al., 1995). The model separates total current accruals into expected (nondiscretionary) and abnormal (discretionary) components. The expected current accruals for each of the IPO sample companies in a given year are estimated using an estimation portfolio of all level 3 industry peers available on Datastream, using the following cross-sectional model:

$$\frac{CA_{j,t}}{TA_{j,t-1}} = \alpha_0\left(\frac{1}{TA_{j,t-1}}\right) + \alpha_1\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t} \qquad j \in \textit{estimation portfolio} \tag{1}$$

where:

CA	=	current accruals [i.e., Δ(current assets - cash) - Δ(current liabilities - current maturity of long term debt)];
j	=	companies in the same level 3 Datastream industry subsector but excluding the issuer and companies involved in an IPO in the previous three years;
$\Delta Sales_{j,t}$	=	change in sales for company j in the industry estimation portfolio in year t;
$TA_{j,t-1}$	=	lagged total assets for company j in the industry estimation portfolio;
$\varepsilon_{j,t}$	=	regression disturbances, assumed to be cross-sectionally uncorrelated and normally distributed with zero means.

Consistent with prior studies (e.g., Teoh et al., 1998a; Roosenboom et al., 2003; DuCharme et al., 2004) all of the variables are scaled by lagged total assets to reduce heteroscedasticity and to control for differences in company size. The change in sales is included to control for changes in nondiscretionary accruals caused by changes in economic conditions. A cross-sectional regression is performed separately in each financial year for each industry portfolio to estimate the coefficients α_0 and α_1, to control for changes in nondiscretionary accruals and to allow the nondiscretionary accruals to vary from period to period for different industries. In addition, the coefficients α_0 and α_1 are allowed to vary across years to allow for possible structural changes, such as management changes.

An estimation portfolio is assigned to each of the sample IPO companies in order to estimate the coefficients α_0 and α_1. Industry portfolios are required to contain at least 10 companies after excluding IPO companies and companies that made an IPO in the previous three years. After estimating the coefficients α_0 and α_1 from the current accruals model, the nondiscretionary accruals for each IPO company in each year are then predicted using the estimated coefficients α_0 and α_1

from each industry-year estimation portfolio. The nondiscretionary current accruals are the portion of current accruals that are not influenced by managerial discretion but driven by companies' sales growth. Following Dechow et al. (1995), the change in trade receivables is subtracted from the change in sales to control for the possibility of credit sales manipulation by the issuer. The approach assumes that any change in the level of credit sales during the period reflects earnings management activity. The nondiscretionary current accruals (NDCA) are then calculated as:

$$NDCA_{i,t} = \hat{\alpha}_0 \left(\frac{1}{TA_{i,t-1}} \right) + \hat{\alpha}_1 \left(\frac{\Delta Sales_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} \right) \tag{2}$$

where:

$\hat{\alpha}_0$ = estimated intercept;

$\hat{\alpha}_1$ = the slope coefficient for IPO company i in year t;

$\Delta Sales_{i,t}$ = the change in sales for IPO company i in year t;

$\Delta TR_{i,t}$ = the change in trade receivables for IPO company i in year t;

$TA_{i,t-1}$ = lagged total assets for IPO company i in year t.

Finally, the discretionary current accruals (DCA) are calculated as the difference between total current accruals and nondiscretionary current accruals:

$$DCA_{i,t} = \frac{CA_{i,t}}{TA_{i,t-1}} - NDCA_{i,t} \tag{3}$$

APPENDIX B

Correlation matrix for variables in the determinants of earnings management regressions

	DCAYR0	*CRISIS*	*PG*	*RETOWN*	*AUDITOR*	*UNDWR*	*AGE*	*IR*	*LEV*	*lnMV*
CRISIS	0.16 **									
PG	0.09	0.61 ***								
RETOWN	0.24 ***	0.15 **	0.25 ***							
AUDITOR	-0.13 **	0.08	-0.02	0.08						
UNDWR	-0.06	-0.15 **	-0.14 **	-0.07	0.04					
AGE	-0.16 **	-0.10	-0.15 **	-0.06	0.02	0.04				
IR	0.10	0.01	0.07	0.12	-0.05	0.04	-0.11			
LEV	-0.07	0.05	0.05	0.02	0.03	-0.07	0.07	-0.06		
lnMV	0.10	-0.05	-0.16 **	0.10	0.06	0.04	-0.06	0.44 ***	0.03	
BOARD	-0.02	-0.20 ***	-0.39 ***	-0.06	0.13 **	0.08	0.16 **	-0.14 **	-0.06	0.59 ***

This table shows the bivariate Pearson correlation between dependent and independent variables. *DCAYR0* is the level of IPO year earnings management, *CRISIS* is a dummy variable equal to 1 for crisis years and zero otherwise, *PG* is a dummy variable equal to 1 for companies that provide a profit guarantee disclosure and zero otherwise, *RETOWN* is the percentage of shares retained by insiders after the IPO, *AUDITOR* is a dummy variable for 'reputable' auditors and zero otherwise, UNDWR is a dummy variable for 'prestigious' underwriters and zero otherwise, *AGE* is the age of companies in years , *IR* is the initial return, *LEV* is total borrowings as a percentage of total assets at the time of the IPO, *lnMV* is the natural log of the market value at the time of the IPO computed as the number of shares outstanding times the closing price on the first trading day, and *BOARD* is a dummy variable equal to 1 for companies listed on the Main Board and zero otherwise.

***, ** denote significantly different from zero at the 0.01 and 0.05 levels, respectively, using two-tailed tests.

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Table 1
Descriptive statistics for 254 Malaysian IPOs between 1990 and 2000

	Mean				Median				Minimum			Maximum		
IPO company characteristics	All	Main Board	Second Board	t-stat for diff	All	Main Board	Second Board	z-stat for diff	All	Main Board	Second Board	All	Main Board	Second Board
Market value (RM million)	544.7	1,256.6	147.3	2.32**	179.6	366.5	117.4	9.87***	25.3	61.5	25.3	36,166	36,166	513
Sales (RM million)	156.6	300.9	76.0	3.29***	77.7	135.1	57.6	7.08***	14.1	19.0	14.1	5,101	5,101	414
Total assets (RM million)	282.0	650.8	76.2	2.21**	84.0	166.9	59.4	9.89***	2.3	40.7	2.3	20,467	20,467	795
Leverage (%)	17.1	15.8	17.7	-0.94	14.4	11.5	15.4	-1.98**	0.0	0.0	0.0	93	93	58
Operating income/Sales (%)	16.3	19.0	14.8	2.79***	13.9	16.3	13.6	2.01**	-24.3	1.1	-24.3	63	63	42
Age (Years)	11.1	13.1	10.0	2.70***	10.5	12.9	8.8	2.84***	0.7	0.7	0.7	60	40	60
Initial return (%)	99.4	94.9	102.0	-0.60	85.5	85.9	85.0	0.27	-53.9	-37.2	-53.9	400	387	400
Retained ownership (%)	76.6	75.9	77.0	-0.85	79.2	76.7	80.7	-0.61	50.4	54.6	50.4	97	97	88
Auditor – Big 5 (%)	56.1	64.8	51.3	2.06**	na	na	na	na	na	na	na	na	na	na
Underwriter – prestigious (%)	56.1	61.4	53.2	1.25	na	na	na	na	na	na	na	na	na	na
DCA in IPO year (%)	5.74***	4.06*	6.68**	-0.59	3.24***	1.47**	4.05***	-0.32	-132.2	-51.1	-132.2	301.9	72.9	301.9

This table shows the descriptive statistics for 254 IPOs except for leverage, auditor and underwriter which are for 246 IPOs due to missing prospectuses for eight IPO companies. Market value is computed as the number of shares outstanding after the IPO times the closing price on the first trading day. Sales and total assets are measured at the end of the financial year prior to the IPO. Market value, sales and total assets are expressed in constant 2002 prices, adjusted using the Consumer Price Index (CPI). Leverage is the level of borrowings divided by total assets at the date of the publication of the prospectus. Operating income/Sales is for the financial year prior to the IPO. Age is defined as the number of years between incorporation and the IPO date. Initial return is calculated as the percentage difference between the closing price on the first trading day and the offer price. Retained ownership, α is calculated as in Downes and Heinkel (1982): $\alpha = (N - N_p - N_s) / N$, where α is the proportionate ownership retained by the insiders (original owners); N is the total number of shares outstanding after the initial offer; N_p is the number of primary shares in the initial offer (public issue); and N_s is the number of secondary shares offered by the insiders for resale (offer for sale). Auditor – Big 5 is the percentage of IPO companies audited by one of the Big 5 auditors. Underwriter – prestigious is the percentage of IPO companies which used a prestigious underwriter for the IPO, as defined in Jelic et al. (2001). DCA in IPO year is discretionary current accruals for the year in which the IPO occurred as a % of lagged total assets; discretionary current accruals are estimated using the 'Modified Jones' method.

*** and ** denote significantly different from zero at the 0.01 and 0.05 levels, respectively, using two-tailed tests. The differences between the mean and median of the Main Board (n = 91) and the Second Board (n = 163) are based on the independent *t*-test and the Mann-Whitney U test, respectively.

Table 2
Distribution of IPO year DCA (% of lagged total assets) classified by year of listing

	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Overall
Median (%)	-0.32	-0.78	0.66	2.70	4.67	-0.69	0.87	10.00***	19.58**	-5.35	3.58	3.24***
Mean (%)	-1.31	15.19	-3.24	1.79	0.47	-1.84	5.32*	9.78***	29.87*	-5.22	13.57	5.74***
Standard deviation (%)	17.48	75.77	22.25	39.48	25.19	25.08	19.19	16.46	64.28	17.64	33.00	33.81
% with positive DCA	50.00	47.06	52.63	70.00*	62.07	50.00	58.70	72.09***	86.67***	45.45	68.75	61.42***
Number of companies	16	17	19	20	29	22	46	43	15	11	16	254

1. Four IPO companies exhibited extreme levels of DCA. The IPOs were in 1991 (1 company), 1993 (2 companies) and 1998 (1 company). Exclusion of these outliers would change the medians and means to:
1991: median = -1.72%; mean = -2.73%;
1993: median = 2.70%; mean = 4.22%;
1998: median = 18.35% **; mean = 14.07% **;
Total median = 2.92% ***; mean = 3.78% ***.
2. Kruskal Wallis test for the difference in medians across all years (Chi-Square = 19.246, p-value = 0.037).
3. One-way ANOVA test for the differences in means across all years (F = 1.610, p-value = 0.104).
4. ***, **, and * denote significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using two-tailed tests. The Wilcoxon signed-ranks test is used for the medians, the parametric *t*-test is used for means and the binomial test for whether the '% with positive DCA' differs from 50%.

Table 3
The median levels of discretionary current accruals (DCA)

	Median DCA (% of lagged total assets)			
	year 0	year +1	year +2	year +3
All years (n=254)	3.24***	1.47**	1.36	-0.56
Crisis period				
Crisis years (1997-98; n=58)	10.96***	3.02	2.30	-0.56
Non-crisis years (excl 1997-98; n=196)	1.21	1.03**	0.71	-0.51
z-stat for diff crisis - non-crisis	3.51***	0.00	0.01	-0.10
Profit guarantee period				
Profit guarantee years (1995-98; n=126)	5.79***	2.73**	1.72	-2.92
Non-profit guarantee years (excl 1995-98; n=128)	1.84	0.75	0.93	0.50*
z-stat for diff PG - non-PG years	2.13**	0.64	0.08	-2.41**

This table reports the median discretionary current accruals (DCA), determined using the Modified Jones model, from the financial year of the IPOs (year 0) to three years after; all values are expressed as a percentage of lagged total assets. IPO companies are also categorised according to listing time period (crisis and non-crisis, profit guarantee and non-profit guarantee).

***, **, and * denote significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using two-tailed tests. The Wilcoxon signed-ranked test is used for the medians. The difference in median DCA between the crisis and non-crisis years, and between PG and non-PG years is based on the Mann-Whitney U-test.

Table 4
Earnings management for Second Board IPOs during the profit guarantee period 1995-1998

	Median DCA (% of lagged total assets)										z-stat for diff (crisis – non-crisis)			
	Non-crisis years (1995 & 1996)					Crisis years (1997 & 1998)								
	n	year 0	year +1	year +2	year +3	*n*	year 0	year +1	year +2	year +3	year 0	year +1	year +2	year +3
Profit guarantee (PG)	*10*	1.23	7.11	2.85	-9.43	*37*	11.62***	5.60	2.37	-0.33	2.44**	-0.62	-0.05	1.51
Non-profit guarantee (NPG)	*29*	-0.23	3.19	0.35	-4.14	*8*	12.17	2.44	-0.72	0.32	1.14	-0.18	-0.59	0.48
z-stat for diff (PG - NPG)		0.03	0.58	0.10	-0.77		-0.74	0.91	0.53	-0.95				

This table shows the level of earnings management by Second Board IPO companies during the profit guarantee period 1995-1998, split between profit guarantee (PG) and non-profit guarantee (NPG) companies and by crisis and non-crisis years.

***, **, and * denote significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using two-tailed tests. The Wilcoxon signed-ranks test is used for the medians and the Mann-Whitney U test is used for differences in medians.

Table 5
Determinants of earnings management

	Expected sign	Model 1 All years coeff	Model 1 All years t-stat	Model 2 Crisis years coeff	Model 2 Crisis years t-stat	Model 3 Non-crisis years coeff	Model 3 Non-crisis years t-stat
Experimental variables							
CRISIS	+	0.112	3.34***				
PG	+	-0.062	-1.52	-0.036	-0.49	-0.112	-2.21**
RETOWN	?	0.005	3.62***	0.009	3.24***	0.005	2.67***
Control variables							
AUDITOR	-	-0.078	-2.65***	-0.060	-0.89	-0.082	-2.36**
UNDWR	-	-0.014	-0.49	-0.086	-1.31	0.021	0.62
AGE	-	-0.040	-2.05**	-0.046	-1.20	-0.044	-1.99**
IR	-	0.002	0.38	-0.017	-1.42	0.010	1.27
LEV	+	-0.001	-1.19	-0.002	-2.17**	-0.001	-0.52
lnMV	-	0.015	0.76	0.057	1.01	0.005	0.22
BOARD	-	-0.002	-0.04	-0.054	-0.55	0.024	0.43
constant		-0.368	-2.89***	-0.647	-1.74*	-0.322	-2.26**
n		246		55		191	
Adj *R*-square		9.7%		17.7%		6.5%	
F		3.63***		2.29**		2.46**	

This table reports the results of OLS regressions for the full sample (Model 1), the crisis years subsample (Model 2) and the non-crisis years subsample (Model 3). The dependent variable is the level of IPO year DCA (% of lagged total assets), with outliers winsorised. The *t*-statistics reported in the table were adjusted for heteroscedasticity (White's correction). *CRISIS* is a dummy variable equal to 1 for crisis years and zero otherwise, *PG* is a dummy variable equal to 1 for companies that provide a profit guarantee disclosure and zero otherwise, *RETOWN* is the percentage of shares retained by insiders after the IPO, *AUDITOR* is a dummy variable for 'reputable' auditors and zero otherwise, UNDWR is a dummy variable for 'prestigious' underwriters and zero otherwise, *AGE* is the age of companies in years, *IR* is the initial return, *LEV* is total borrowings as a percentage of total assets at the time of the IPO, *lnMV* is the natural log of the market value at the time of the IPO computed as the number of shares outstanding times the closing price on the first trading day, and *BOARD* is a dummy variable equal to 1 for companies listed on the Main Board and zero otherwise.

***, **, and * denote significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using two-tailed tests.

Table 6
Median and mean three-year equally-weighted buy-and-hold abnormal returns

	All years			Crisis years			Non-crisis years			All
	All	Low DCA	High DCA	All	Low DCA	High DCA	All	Low DCA	High DCA	z-stat/t-stat for diff (crisis - non-crisis)
Panel A: Market-adjusted										
Median	-26.72***	-28.33**	-26.69**	-33.02**	12.39	-37.85**	-25.60**	-28.97***	-22.14	-1.39
Mean	-4.21	-6.75	-6.44	-14.97*	16.01	-20.49*	-1.03	-10.91	1.62	-1.40
z-stat for diff (high-low DCA)		0.05			-1.66*			1.12		
t-stat for diff (high-low DCA)		0.03			-1.75*			1.06		
Panel B: Matched company-adjusted										
Median	-4.99	-13.11	-14.22	-9.68	76.26	-14.22	-4.13	-22.95	-11.90	-1.15
Mean	-0.93	1.16	-10.27	-10.71	45.16	-20.60	1.96	-6.79	-4.34	-0.99
z-stat for diff (high-low DCA)		-0.47			-1.97**			0.64		
t-stat for diff (high-low DCA)		-0.85			-2.15**			0.16		
Number of companies	254	85	85	58	13	31	196	72	54	

This table reports the median and mean three-year buy-and-hold abnormal returns for full sample years (years 1990-2000), non-crisis years (excluding years 1997 and 1998) and crisis years (years 1997 and 1998), split by low and high DCA. Low DCA group refers to 'conservative' IPOs and high DCA refers to 'aggressive' IPOs; low (high) DCA represents the lowest (highest) tertile of DCAs across all sample IPOs. The buy-and-hold abnormal returns data are winsorised to mitigate the effect of outliers on mean performance.
***, **, and * denote significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using two-tailed tests. The Wilcoxon signed-ranked test is used for the medians and the parametric *t*-test is used for means. The market-adjusted and matched company-adjusted are calculated as IPO company return minus the market (KL Composite Index) return, and matched company return, respectively. The difference in median and mean return between non-crisis years and crisis years, and between high and low DCA groups is based on the Mann-Whitney U test and the independent *t*-test.