ARE INDEPENDENT DIRECTORS EFFECTIVE IN LOWERING EARNINGS MANAGEMENT IN CHINA?

A Dissertation

by

LIONA HOI YAN LAI

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2005

Major Subject: Accounting

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Approved by:

Chair of Committee,	Lynn Rees
Committee Members,	Edward Swanson
	Suojin Wang
	Michael Wilkins
Head of Department,	James Benjamin

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ABSTRACT

Are Independent Directors Effective in Lowering Earnings Management in China?

(August 2005)

Liona Hoi Yan Lai, B.A., University of Waterloo

Chair of Advisory Committee: Dr. Lynn Rees

This study examines whether board independence is an effective corporate governance mechanism in reducing earnings management in China, a country with significantly different institutional and legal characteristics from the Anglo-Saxon countries. I investigate: (i) whether voluntary adoption of board independence prior to the China Regulatory Securities Commission (CSRC) regulation on board independence is associated with lower earnings management; and (ii) the extent to which the CSRC regulation is effective in achieving the aim of inhibiting earnings management. I employ two stage least squares techniques to control for potential simultaneity problems between earnings management and board independence and documents that failing to control for such problems will lead to biased and inconsistent estimates. Using three different measures of earnings management, I show that firms that voluntarily move towards board independence (i) have lower levels of discretionary accruals; (ii) employ less severe income smoothing strategies; and (iii) are less likely to manage return on equity to meet regulatory thresholds. In contrast, firms adopting board independence following the CSRC regulation in 2002 do not experience any changes in the levels of earnings

management before and after the regulation. These results suggest that regulation alone is not a sufficient solution to motivate effective independent boards.

DEDICATION

To my husband Henry, my son Adam, and my parents

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I. INTRODUCTION

A board of directors is one of several monitoring mechanisms that has been developed in modern corporations to resolve agency problems between top management and shareholders. In the U.S. and the U.K, academics and regulators have emphasized the important monitoring role of independent directors within a firm's corporate governance structure (Fama 1980; Fama and Jensen 1983; SEC 1980; American Law Institute 1982). Whereas the concept of independent directors is largely Anglo-Saxon, the trend of setting up boards with stronger independence has spread to other countries. In 2001, the Chinese Securities Regulatory Commission (CSRC) issued guidelines that required all listed firms to have at least two independent directors by June 2002 and one-third of the board must be independent of management by June 2003. The apparent premise underlying such a movement is that independent directors have, in fact, effectively served their monitoring role in the U.S. and the U.K. and that this concept is applicable to other parts of the world.[1] Given the myriad of institutional and legal arrangements that characterize different countries, it is reasonable to examine whether independent directors are effective in countries that differ significantly from the U.S. and the U.K. To shed light on such a question, this paper investigates the effectiveness of

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This dissertation follows the style of *The Accounting Review*.

[1] Evidence on the effectiveness of independent directors, however, is mixed even in the U.S. Researchers have been unable to document any evidence showing a positive relation between the degree of board independence and long-term firm performance in the U.S. (Hermalin and Weisbach 1991; Agrawal and Knoeber 1996; Klein 1998; Bhagat and Black 2002). On the other hand, other studies reveal that independent directors are effective in protecting shareholders' interests in acute situations and in performing specific tasks. For instance, firms with a higher outsider/insider ratio have a stronger propensity to replace a CEO following poor performance (Weisbach 1988). Also, firms with more independent directors experience higher abnormal returns upon announcing management buyouts (Lee et al. 1992), tender offers (Byrd and Hickman 1992), and the adoption of poison pills (Brickley et al. 1994).

independent directors in China. Specifically, this paper studies whether independent directors effectively reduce earnings management in Chinese publicly listed firms.

China provides a particularly intriguing study for the monitoring role of independent directors in curtailing earnings management. First, the practice of earnings management is both extensive and extreme in China. In 2001, the auditor-general of the State Auditing Bureau reported that "more than two-thirds of 1,290 largest state companies covered in an official audit [in 2000] falsified their accounts, with the illegal money exceeding 100,000,000,000 Yuan." (O'Neill 2001) Academic studies also confirm the prevalence and severity of earnings management in China (e.g., Aharony et al. 2000; Chen and Yuan 2004).

Second, in the U.S. and the U.K., the inclusion of independent directors is likely a market solution to some agency problems. In China, on the other hand, the inclusion of independent directors was made mandatory since 2002. China therefore provides a particularly interesting laboratory to shed light on whether independent board of directors is effective when it is a pure product of regulation.

Third, the institutional and legal environment in China is substantively different from that of the U.S. and the U.K. While the lack of alternative monitoring mechanisms in Chinese firms highlights the importance of independent directors to serve a monitoring role, other factors such as the concentration of ownership by the state, a weak investor protection environment and an excessive demand over supply of independent directors likely undermine the effectiveness of independent directors in China. Therefore, although several empirical studies find that firms with stronger board

independence are related to lower earnings management in the U.S. and the U.K.,[2] whether independent directors are effective at reducing earnings management in a country such as China remains an empirical question.

Moreover, China is still in its infancy in terms of employing independent directors as monitors. Even with the regulation, many firms still have a board with a minority of independence directors. It could be argued that independent directors serve as effective monitors only when they represent a majority in the board. Alternatively, it could also be argued that the marginal effect of an additional director is stronger when the proportion of independent directors is small. Evidence on this issue is mixed in the U.S. and the U.K. (see, e.g., Peasnell et al. 1998; Klein 2002b). The present study on China therefore helps shed light on whether independent directors are effective in reducing earnings management when they represent only a minority of the board.

The present empirical analysis is conducted using data on board of directors from 2000 to 2003 for firms listed on the Shanghai stock exchange and Shenzhen stock exchange. Since both pre-managed earnings and earnings manipulation techniques are unobservable, I utilize three proxies to better capture the underlying construct of earnings management (EM). The first two measures of earnings management capture manager's discretion in influencing report outcomes through the use of accruals. The first accrual measure is based on the Modified-Jones model (Dechow et al. 1995; Bartov

[2] Beasley (1996) and Dechow et al. (1996) find that firms with stronger board independence are less likely to be subject to SEC enforcement actions for accounting violations and frauds. In the earnings management literature, Klein (2002b) demonstrates that boards are effective in lowering earnings management when more than 50% of the board is comprised of independent directors in the U.S. Peasnell et al. (1998) also support that higher fraction of independent directors is associated with lower levels of earnings management in the U.K.

et al. 2000) and the second accrual measure is based on the relation between accruals change and cash flows change (Dechow 1994; Skinner and Myers 1999; Leuz et al. 2003). The last earnings management measure is developed based on the distinctive incentive in China to manage earnings and captures the likelihood of firms managing return on equity (ROE) to meet regulatory thresholds of rights issuance and listing requirements.

To examine the effectiveness of independent directors in China, I conduct two main tests. First, I conduct a cross-sectional analysis on whether firms with board of directors exceeding the regulatory requirement experience lower level of earnings management. I also examine whether firms with a higher fraction of independent directors experience lower earnings management. Due to changes in the regulatory requirement of board structure from 2001 to 2003, the cross-sectional tests are carried out year-by-year. My second test is a direct test of the CSRC regulation on board structure and whether the law is effective in reducing earnings management in Chinese firms. Specifically, I examine the change in earnings management before and after the regulation is in place in the overall sample, as well as in the sample of firms that begin to adopt independent directors post regulation.

The empirical results from the cross-sectional analysis confirm an inverse relation between board independence and earnings management in the *pre-regulation* period. In 2001, firms with at least one independent director experience lower levels of earnings management than firms without independent directors, after controlling for the simultaneity problem between board independence and earnings management. Similar

results are also found using the fraction of independent directors as a measure for board independence. These results are consistent in all three EM measures. Results from the *post-regulation* period under the three EM measures show that firms with board of directors exceeding the regulatory requirement or with a higher fraction of independent directors *are not* associated with lower levels of earnings management.

These results suggest either that having a minimum number of independent board members is important but adding additional members beyond the minimum has no incremental benefit, or that firms that acquire independent directors voluntarily without the law have the incentives to ensure the independent directors perform their duties but firms that adopt independent directors by law lack the incentives to maintain a well-functioned independent board. The results of the test on the change in levels of discretionary accruals from 2001 to 2002, however, point to the latter interpretation. For the overall sample, as well as for the sample of firms that began to adopt independent directors after the law, it is found that there is no change in the average practice of earnings management before and after the regulation. Therefore, having a minimum number of independent directors is not sufficient. A firm's incentives to ensure the proper functioning of its independent directors are imperative for independent directors to serve as effective monitors on earnings management.

This paper contributes to the literature in a number of ways. It contributes to the corporate governance literature by assessing the effectiveness of independent directors in a country with institutional features significantly different from the U.S. and the U.K. The research is timely as more than 18 countries have recently established rules to

mandate the inclusion of independent directors on company boards (Dahya and McConnell 2002). This paper also addresses the questions of whether independent board of directors functions properly when it is a pure product of regulation and whether independent directors are effective when they form only a minority of the board. In addition, even though simultaneity problem is often addressed in the literature on the relationship between independent board of directors and firm performance (Hermalin and Weisbach 1991; Bhagat and Black 2002), addressing simultaneity problem in the relationship between board independence and earnings management is original. The present finding that the degree of earnings management in a firm potentially affects its choice of board structure implies that researchers should be careful of any simultaneity problem inherent between corporate governance mechanisms and the outcome variable of interest when evaluating the effectiveness of such mechanisms.

The remainder of the paper is organized as follows. I discuss the background of the adoption of independent directors in China in Section II and develop the hypotheses. Section III discusses the earnings management measures. Section IV discusses the variables to be used in the study and Section V describes the methodology, the data and provides descriptive statistics. In Section VI, I present the results. Section VII concludes the paper.

II. HYPOTHESES

The Road Map to Board Independence in China

The last thirty years have witnessed a trend toward stronger board independence among U.S. firms. While in the sixties, most boards in U.S. corporations had a majority of inside directors, today, most have a majority of independent directors.[3] More recently, this trend toward a more prominent role for independent directors has become global. Starting with the Cadbury Committee report issued in 1992 in the U.K., a number of countries have since followed suit to issue mandates or guidelines for board composition (Dahya and McConnell 2002). These include not only Australia, France, and Sweden, but also countries with substantially different economic, institutional, and legal environments such as Brazil, Korea, Malaysia, and Mexico.

In China, the Chinese Securities Regulatory Commission (CSRC) has been trying to advance the concept of independent directors since 1997. The first guideline on corporate governance for listed companies in China was introduced in 1997 and the adoption was voluntary. Since then, there have been a number of opinions and guidelines issued by the two stock exchanges (the Shanghai stock exchange and the Shenzhen stock exchange). However, none of these guidelines were intended to be mandatory and not many firms followed the guidelines in the implementation of independent directors. In 2001, the CSRC reported that there were only 314 independent directors out of the 1100 listed firms on both exchanges (Clarke 2001).

[3] For example, Klein (2002b) reports, on average, approximately 60% of board members are outsiders in her sample of S&P 500 firms in 1992-1993 and about 74% of these firms have boards with a majority of independent directors. Similarly, Dahya et al (2002) find that the mean proportion of outside directors on the U.K. boards has risen from 35% in 1989-1992 to 46% in 1993-1996.

In view of the small number of firms following the voluntary guidelines for good corporate governance practices, the CSRC issued a more comprehensive guidance on independent directors in August 2001; and more importantly, this guidance was made mandatory. Under the mandate, all listed firms are required to have at least two independent directors by June 2002 and one-third of the board must be independent of management by June 2003. Another aim of the regulation was to clearly define the qualification for independence, to layout the nomination procedures, and to outline the responsibilities of independent directors. In the final version of this "Guidance Opinion on the establishment of an independent director system in listed companies", measures have been taken to ensure that independent directors will represent minority shareholders. For example, there are specific rules that exclude persons holding more than 1% of shares of the firm, or persons employed by the unit that hold more than 5% of the shares of the firm to become independent directors. In the nomination process, any shareholders holding more than 1% of the shares independently or jointly can nominate independent directors. Furthermore, all related party transactions exceeding 5% of the firms' net assets must be reviewed and approved by the independent directors. This last provision is designed to curb the severe problem of insider dealings among Chinese firms. This guideline is a big leap from the prior endeavors to regulate board structure among listed firms in China.

Behind the development in China and the global movement toward stronger board independence is the implicit belief that independent directors are effective monitors. In China, for example, the CRSC's effort can be seen as a response to curtail

the prevalence and severity of fraudulent accounting and stock price manipulation. But, another possible reason for the action taken by the CSRC is that as the global economy becomes more integrated, regulators simply respond to pressure from foreign institutional investors who believe in the effectiveness of their cultural institutions. China, for example, first started to open its securities market to foreign investors in 1992, when the B share market was launched. More recently, China decided to open its much larger A share market to Qualified Foreign Institutional Investors (QFII), which was initiated in 1998 and finally launched in 2002. The CRSC's mandate in 2001 concerning board composition can therefore be seen as part of the concerted effort to attract foreign investment.

Hypotheses Development

Despite the effort of the CSRC to encourage board independence, there are a number of institutional features of China that might either enhance or hamper the monitoring role of independent directors. In the next sub-section, I discuss the factors that may affect the effectiveness of independent directors in China.

Factors that might affect the effectiveness of independent directors in China

Lack of alternative corporate governance mechanisms. In China, the lack of alternative corporate governance mechanisms highlights the importance of independent directors as monitors. Many governance mechanisms that U.S. firms utilize, such as monitoring from blockholders, takeovers, and management stock ownership, are uncommon among Chinese firms (Tam 2002). While institutional owners and creditors are effective monitors in the U.S., there are a very small number of institutional owners

in China. Furthermore, banks in China are also government owned and must issue loans to firms based on national policies and preset interest rates. Thus there is virtually no monitoring from creditors in China either. In addition, since the State controls more than 50% of the shares in 85% of the firms in China, and their shares are not publicly traded, hostile takeovers are rare. Internal governance mechanisms are insufficient because stock based incentive compensation schemes are uncommon in China. In a sample of 788 Chinese firm-year observations used in a study of corporate governance conducted by the Center for China Financial Research, the mean stock ownership by the top 5 executives is only 0.0187% of total outstanding shares. In contrast, in a study by Denis and Sarin (1999) on executive stock ownership in the U.S., they find that the average CEO in their sample holds more than 7% of the firm's shares.

Similarly, since the Chinese auditing profession is still in its infancy, the reliance on independent directors to protect minority shareholders' interests is considerable, as external auditors likely fail to act as monitors of the financial reporting process. Although China recently adopted a set of new auditing standards in 1995, which were patterned after the International Standards of Auditing, auditors' expertise and independence still cause concerns among the investor community. At the end of 1997, there were only 1,000 CPAs licensed to audit listed companies and the selection process is in part political (DeFond et al. 1999). Furthermore, government affiliated audit firms control 75% of the market share in China. This causes concerns about auditors' independence because government-related entities are also controlling shareholders of more than half of the listed companies.

Because alternative governance mechanisms are lacking, an increase in representation by independent directors in the board is more likely to contribute to effective *overall* monitoring in China. In the U.S., where alternative governance mechanisms exist, greater use of one mechanism need not result in more effective monitoring. When a firm makes greater use of one mechanism, other mechanisms may be used less, resulting in equally effective monitoring. Hermalin and Weisbach (1991) and Agrawal and Knoeber (1996), for instance, employed such an argument to understand the lack of positive correlation between the degree of board independence and long-term firm performance among U.S. firms. There is also direct evidence that firms in the U.S. adjust board composition in response to changes in other governance mechanisms. In a study of insurance companies, Mayers et al. (1997) find that these companies increase the proportion of outside directors once they change from stock ownership to mutual ownership because shares of mutual firms are non-transferable, which precludes monitoring by institutional shareholders, stock-based incentive compensation, and hostile takeovers. As a result of this substitution effect, stronger board independence in a U.S. firm need not indicate monitoring effort has increased overall. On the other hand, since alternative mechanisms are lacking in China, there will likely be no such substitution effect.

Concentration of ownership. While there is great reliance on independent directors to be effective monitors, the ownership structure of Chinese firms will possibly impede the performance of such directors. Firms in China are characterized by high concentration of ownership by the state. Government agencies own more than 50% of

shares in 85% of the listed companies. These agencies often appoint their own management and potentially collude with them at the expense of minority shareholders. Such large shareholders can also nominate and possibly choose the independent directors. Thus, these directors potentially represent the mere interests of the controlling agencies and the management. The "independence" of these directors is therefore conceivably impaired.

Poor legal environment. Fama and Jensen (1983) argue that the fear of lawsuits and the concern for reputation induce independent directors to perform their duties in a country like the U.S., where the rule of law is prominent and investor protection is high. In China, the concept of shareholders rights is a novelty and, in general, shareholders lawsuits are hobbled by an unfriendly judicial environment. These lawsuits are rare and often dismissed at lower courts. Draft provisions on civil lawsuits were enacted only in 2000. Subsequently, in September 2001, however, the Chinese Supreme Court issued a notice to temporarily suspend the acceptance of civil lawsuits against listed companies due to the lack of precedents. This ban was lifted in early 2002 but the regulations on how to handle civil compensation cases arising from management releasing false information that misled investors did not come into effect until 2003. In such a country with low investor protection, it is difficult for shareholders to sue these directors. Independent directors in China, therefore, do not face the same level of legal consequences as those in countries with high investor protection and their expected monetary and reputation costs are much lower.

Minority independent board. More independent directors on a board do not always constitute an independent board. It is arguable that a board needs to consist of at least 50% independent directors to be considered independent of management. In China, since the idea of using independent directors as monitors is still novel, most firms, if they have any independent directors at all, have only a minority of independent directors. It is possible that while an independent board composed of majority independent directors is better able to monitor the earnings process, more independent directors in an insider-dominated board might not produce more effective monitoring at all.

An alternative view is that there is an optimal governance structure. When the proportion of independent directors is small, adding more independent directors has stronger marginal effect on better monitoring. When there are many independent directors already, adding more independent directors might not improve monitoring but might even worsen outcomes. The empirical evidence is also mixed. Klein (2002b), for example, finds that while boards are effective in lowering earnings management when more than 50% of the boards consist of independent directors, the linear association between earnings management and the proportion of independent directors in the board is weaker. However, in her sample of S&P 500 firms, most have a majority of independent directors. Peasnell et al. (1998), on the other hand, find that larger fraction of independent directors in the board is associated with lower earnings management in their sample of U.K. firms, where the average firm in their sample has a minority of independent directors.

Excess demand over supply of independent directors. One idea explaining why independent directors are effective monitoring mechanisms is that there exists a market for these directors and they have incentives to signal their expertise to the market (Fama and Jensen 1983). In China, especially after the regulation on board structure is effective in 2002, the demand for quality independent directors is enormous. The number of independent directors positions grew from 300 in 2001 to over 3,000 in 2003. Since most boards are re-elected every two to three years, independent directors have incentives to signal their quality by providing adequate monitoring of top management. However, the sudden increase in demand for independent directors might also have negative impacts on monitoring effectiveness because the supply of quality independent directors might fail to catch up with this increase in demand after the regulation is in place. As such, the effectiveness of the independent directors post regulation is questionable.

Overall hypotheses

As discussed in the above sub-section, while there are reasons to expect independent directors to play an important monitoring role in alleviating the serious problem of earnings management in China, there are also reasons to suspect their effectiveness. Therefore, whether board independence can, in fact, lessen the practice of earnings management in China remains an empirical question. In this study I utilize two definitions of board independence. First, a firm is said to have a more independent board if the board comprises more than the regulatory requirement of independent directors.

Since the requirement of board structure differs by year, the following null hypothesis is tested year by year:

H1a: Firms with boards that exceed the regulatory requirement of independent directors do not experience lower level of earnings management.

Klein (2002b) shows that firms with higher fraction of independent directors experience lower level of earnings management, hence, the second definition of board independence in this study uses fraction of independent directors in a board and the following null hypothesis is tested:

H1b: Firms with higher fraction of independent directors do not experience lower levels of earnings management.

In addition to assessing the cross-sectional difference in earnings management for firm-years with different board composition, I also assess directly the effectiveness of the regulation on board independence by examining whether firms experience lower level of earnings management after the regulation is in place. Hence, I test the following null hypothesis:

H2: There is no difference in the average practice of earnings management before and after the 2002 regulation on board independence.

III. VARIABLE DEFINITIONS

Earnings Management Measures

In this subsection, I discuss the earnings management measures to be used in the empirical analyses. In the earnings management literature, accruals are of primary interest because accruals are easier to manage than are cash flows. Therefore, the first two measures of earnings management capture manager's discretion over accruals. The first accrual measure is based on the Modified-Jones model (Dechow et al. 1995) and the second accrual measure is based on the relation between accruals change and cash flows change (Skinner and Myers 1999). Another stream of earnings management research focuses on the distribution and discontinuity of earnings at specific thresholds. In China, firms have incentives to manage earnings toward certain thresholds because their listing status and equity offering opportunities depend on specific accounting numbers. I utilize these incentives in formulating the third earnings management measure. Each of these measures is discussed in detail in the following subsections.

Discretionary accruals

Following Jones (1991), Dechow et al. (1995) and Bartov et al. (2000), I first measure the degree of earnings management as the absolute value of discretionary accruals obtained from the cross-sectional Modified-Jones model. This proxy is designed to capture the extent to which management uses discretion over accruals to manipulate earnings. I choose the cross-sectional Modified-Jones model for three reasons. First, the Jones model has a tendency to measure discretionary accruals with error when management exercises discretion in manipulating earnings through revenue recognition.

The modified version attempts to remedy this issue by adjusting the change in revenue by the change in accounts receivable. The modified version can better capture the extent of management discretion in China because there is evidence that Chinese managers make use of accrued sales to manage earnings (Aharony et al. 2000). Second, Bartov et al. (2000) have tested various times-series and cross-sectional variations of the Jones and Modified-Jones models and conclude that the cross-sectional Modified-Jones model has the highest power in detecting earnings management in their setting of audit qualifications. Third, the Chinese stock market started only in 1990 and data for the earlier years is not as readily available as the data in later years. Therefore, sufficient observations for the estimation of the time-series model are not available.

I first calculate total accruals for each firm *i* in year *t* as:

$$TA_{it} = NI_{it} - OCF_{it} \quad (1)$$

where NI_{it} is the reported net income for firm *i* in year *t* and OCF_{it} is the operating cash flows obtained directly from the statement of cash flows for firm *i* in year *t*. Unlike many countries where cash flow statements are not disclosed in the annual reports, most Chinese firms include a cash flow statement where operating cash flows can be directly obtained. This facilitates the computation of discretionary accruals, as Hribar and Collins (2002) find that accruals are less noisy when estimated directly from operating cash flows data.[4]

[4] TA estimated indirectly using the balance sheet tends to be less accurate because operating cash flows are estimated with error. The indirect approach is followed in other studies when cash flows statements are not available.

For each year in which earnings management is hypothesized, I pool all firms by industry and estimate the following regression for each industry *k* that has at least 20 observations:

$$\frac{TA_{it}}{A_{it-1}} = r_{1k}\left(\frac{1}{A_{it-1}}\right) + r_{2k}\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + r_{3k}\left(\frac{PPE_{it}}{A_{it-1}}\right) + v_{it} \qquad (2)$$

where A_{it-1} is total assets in year *t*-1; $\ddot{A}REV_{it}$ is the change of revenue from year *t*-1 to year *t*; $\ddot{A}REC_{it}$ is the change in accounts receivable from year *t*-1 to year *t*; and PPE_{it} is gross property, plant and equipment in year *t*.

The residual from (2) is the estimated discretionary accruals (DA_{it}) for firm *i* in year *t*. The absolute value of DA_{it} is the first measure of earnings management in this study. A non-directional measure of *DA* is used because Chinese firms can have incentives to either smooth earnings or to manage earnings to meet certain thresholds. Therefore, directional predictions cannot be made. Computation of |*DA*| requires lagged data. Since data is collected from 2000 to 2003, |*DA*| is computed for 2001 through 2003.

The relation between accruals change and cash flows change

The next measure of earnings management builds on the relationship between accruals and cash flows. Dechow (1994) examines this relation and confirms that due to the nature of the accrual process, accruals change and cash flows change are negatively related. For example, if a firm incurs cash outflows in year *t* to provide services in year *t* but the cash inflows (customer payment) occur in year *t*+1, the matching principle requires the recognition of revenue in year *t*. Net cash flows in year *t* is negative but the accrual for revenue is positive, which creates a negative relation between accruals and

cash flows. Accordingly, the coefficient g_1 in the following regression is expected to be negative:

$$\Delta Accruals_{it} = g_0 + g_1 \Delta Cashflows_{it} + u_{it} \quad (3)$$

where $\Delta Accruals_{it}$ is defined as $\frac{TA_{it} - TA_{it-1}}{Assets_{it}}$ for firm i in year t and $\Delta Cashflows_{it}$ is defined as $\frac{OCF_{it} - OCF_{it-1}}{Assets_{it}}$ for firm i in year t.

Skinner and Myers (1999) and Leuz et al. (2003) apply this relation in an earnings management context and argue that a stronger relationship implies greater income smoothing. Since firms experiencing unusually high (low) cash flows might have incentives to generate income-decreasing (income-increasing) accruals to maintain the desired level of earnings, a more negative relation between accruals change and cash flows change would be indicative of earnings management.

Note that the earnings management measure here is not the dependent variable, but the relationship between the dependent variable ($\Delta Accruals_{it}$) and the change in cash flows ($\Delta Cashflows_{it}$). Therefore, we would expect the coefficient g_2 to be significantly different from zero in the following regression:

$$\Delta Accruals_{it} = g_0 + g_1 \Delta Cashflows_{it} + g_2 \Delta\left(Cashflows_{it} * x_{it}\right) + u_{it} \quad (4)$$

where x is a factor that influences the degree of earnings management.

Meeting regulatory thresholds

The last earnings management measure is developed based on unique incentives in China to manage earnings to levels that will allow them to meet the rights issuance

and listing requirements. To improve the quality of its capital markets, the Chinese government set stringent rules both for initial public offerings and for subsequent rights issuances. For instance, firms must maintain three years of consecutive profits before they can be listed on the exchange. Moreover, firms will be suspended from trading if they suffer more than two years of losses. The regulation on subsequent rights issuance is also very stringent. For most of our years under consideration (2001-2003), firms have to maintain an average ROE of 6% for the past three years before applying for a new equity offering.[5] Although these stringent rules are intended for improving the quality of the Chinese capital markets, they create incentives for firms to manage earnings to meet these thresholds.

An illustration of the extent of earnings management towards certain thresholds is shown in Figure 1. For each year, a frequency graph is plotted for all firms with ROE between ± 20 percent. Even though there is no requirement since March 2001 to maintain 6% ROE for each year (the requirement is a 3-year average ROE of 6%), the graphs still show that there are spikes at the 6-7% intervals for all four years. This result suggests that Chinese firms engage in income smoothing in anticipation of new equity offerings. Furthermore, the incentive to avoid losses is evident as there is an unusually low number of firms just below 0% ROE and an unusually large number of firms in the 0-1% interval. This phenomenon of loss avoidance in China is similar to what has been documented in the U.S. (e.g., Burgstahler and Dichev 1997).

[5] From 1996 until March 1999, firms must maintain a ROE of 10% in three consecutive years before applying for new rights issues. After March 1999 until March 2001, the CSRC lowers the yearly minimum ROE to 6%, but firms still have to maintain a 3 year average ROE of 10%.

To formulate my third earnings management measure, I follow the suggestions of Healy (1985) and Chen and Yuan (2004). Healy (1985) suggests that managers have incentives to manipulate earnings when actual earnings are very close to the target. Accordingly, I employ a dummy variable (EM3) that is equal to one for firm-year observations where earnings are at a level that is likely to induce earnings management, and zero otherwise. Chen and Yuan (2004) suggest that Chinese firms manipulate *non-operating income* to manage earnings to meet certain thresholds.[6] Thus, I examine ROE before non-operating income around various intervals surrounding the earnings thresholds for Chinese firms. Three different ROE intervals surrounding specific earnings thresholds are examined: ROE from 1%, 2%, and 3% below the thresholds to 1%, 2%, and 3% above the thresholds.

EM3 requires the classification of ROE before and after the inclusion of non-operating income. The data are obtained from the annual reports of Chinese firms, as they are required by the CSRC to report this classification on their annual reports. Because EM3 is a discrete dependent variable, logistic regressions are carried out in the empirical analyses.

Board Independence Measures

Chinese annual reports typically include a list of directors and their affiliations with the firms. If a director is independent according to the CSRC guidelines, he/she will be labeled as an "independent director" in the annual report. I rely on this classification

[6] Chen and Yuan (2004) document relatively poor operating performance subsequent to an equity offering for Chinese firms that manage earnings in the pre-equity offering period and that the CSRC has not been successful in effectively screening earnings management firms during the approval process.

throughout this study. There are two measures for board independence in the empirical tests. The first measure *IND1* (*Voluntary*) is a dichotomous variable that takes the value of one when a firm has more independent directors on the board than the regulatory requirement. Accordingly, a firm-year observation will be coded one in 2001 if it has at least one independent director because there is no requirement on the number of independent directors in that year. Similarly, a firm-year observation will be coded one in 2002 if it has more than the required number of two independent directors and a firm-year observation will be coded one in 2003 if the fraction of independent directors is greater than the regulatory requirement of one-third. The second measure *IND2* (*Fraction*) is a continuous variable measured as the number of independent directors divided by total number of directors on the board.

Control Variables

Leverage

Firms that are close to debt covenant violations are more likely to manage earnings (Dechow et al. 1996). Leverage is defined as total debt to total equity and is used as a proxy for the degree of closeness to violating debt covenants. Leverage is hypothesized to be negatively associated with |*DA*| and higher leverage would accentuate the negative relation between accruals change and cash flows change. However, it is not clear the direction of association between leverage and EM3. Higher leverage firms are poorer firms and they would have higher incentives to manage earnings to avoid losses and meet debt covenants. In contrast, these firms are less likely to manage towards the 6

% rights issue threshold because they are probably further away from meeting the target. High leverage firms therefore would not have a strong incentive to meet this threshold.

External financing

Firms that plan to access the capital markets through initial public offerings (IPOs) or seasoned equity offerings have higher incentive to manage earnings (Teoh et al. 1998; Aharony et al. 2000; Chen and Yuan 2004). Ideally, this control variable should reflect a firm's intention to access the capital market. The year in which firms apply to the CSRC for new equity offerings is the year when they have the highest incentives to manage earnings. However, the data on application for new rights are not publicly available. To capture the intention of issuing new equity and the timing of application, I use the ex-post realization of actual equity offerings as a proxy. This data is readily available in the annual reports. I use two constructs to capture this control variable. First, I include a dichotomous variable ($Rights_t$) that takes the value of one in the year a firm issues new equity and takes the value of zero otherwise. Second, I use $Rights_{t+1}$ as a proxy to allow for timing difference in the application and the actual equity offering.

Growth

Prior literature has shown that high growth firms are more likely to manage earnings because they have strong financing needs (Beneish 1999). Hence, I include a variable as a proxy for growth. The variable is defined as one-year sales growth.

Firm age

U.S. studies have shown that younger firms tend to commit GAAP violation more than older firms (Beneish 1999). However, studies on Chinese firms have shown that older firms are more likely to receive modified audit opinions from their auditors because older Chinese firms tend to be less healthy financially (DeFond et al. 1999). Firm age measured by the number of years since incorporation is included as another control variable.

IV. EMPIRICAL TESTS

I conduct two types of analyses to test the hypotheses developed in Section II. The first set of tests examines cross-sectionally whether firms with higher levels of board independence experience lower levels of earnings management. These tests are performed year-by-year because the change in regulatory environment on board structure might affect the relationship between board independence and earnings management. The second set of tests examines the effectiveness of CSRC's regulation on independent director requirements by investigating whether the level of earnings management changes after the regulation is in place.

Cross-sectional Differences in Board Composition and Earnings Management

To provide evidence on the effect of independent directors on earnings management, I begin with a year-by-year cross-sectional analysis. Statistical analyses are performed using each of the three earnings management measures.

Discretionary accruals and board independence

To examine the relationship between $|DA|$ and board independence, I first run an ordinary least squares (OLS) regression for each year from 2001 to 2003 as follows:

$$|DA_{it}| = a_0 + a_1 * IND_{it}(m) + a_2 * Leverage_{it} + a_3 * SalesGrowth_{it} + a_4 * Age_{it} + e_{it} \quad (5)$$

where $|DA_{it}|$ is the absolute value of discretionary accruals as defined in Section III; $IND_{it}(m)$ is firm i's value of board independence proxy measured as either *IND1* – the dummy variable representing firms with independent directors exceeding regulatory requirements (*Voluntary*), or *IND2* – the fraction of independent directors (*Fraction*);

control variables are included in the model if their simple correlation with the dependent variable is significant at the 10% level. As a result, leverage, sales growth and age are included as control variables.

In addition, I run the regressions using two-stage least squares (2SLS) method. 2SLS regression is used as an alternative estimation method when there is a potential simultaneity problem between $|DA|$ and $IND_{it}(m)$. Board independence is a choice variable and it could be affected by some firm-year outcomes and characteristics. For example, Hermalin and Weisbach (1988) and Bhagat and Black (2002) find that, in the U.S., firms with poor financial performance hire more independent directors. In the present analysis of Chinese firms, if the incentive to choose a more independent board is affected by a firm's level of earnings management, then this posits a potential simultaneity problem in the above regression. If $|DA_{it}|$ and $IND_{it}(m)$ are simultaneously determined, then the OLS estimated coefficients on $IND_{it}(m)$ in (5) will be biased and inconsistent. One way of solving the simultaneity problem is to perform a two-stage least squares (2SLS) analysis.

Two instruments are used to capture factors that might affect board composition, but are likely uncorrelated with the error term in (5). Board size is used as an instrument for two reasons. First, the fraction of independent directors is likely to be smaller for boards with more members (Klein 2002a). Second, firms with larger boards presumably can afford to invite outside directors to their boards without sacrificing representation of the insiders (Agrawal and Knoeber 1996). Therefore, *Voluntary* will depend positively on board size. Another instrument used is the percentage shareholding of foreign

investors. As the shareholder base becomes more diversified, demand for outside representation increases. Moreover, foreign investors are more accustomed to independent boards as a governing mechanism; thus, higher level of foreign investor shareholdings is likely to be associated with a higher degree of board independence. In the first stage of the regression, *IND(m)* is regressed on these instruments together with the control variables used to estimate $|DA_{it}|$.

Although one of the endogenous variables (*Voluntary*) is a dichotomous variable and a logistic regression may seem necessary in the first stage regression, Angrist and Krueger (2001) explain that using logit to obtain the predicted values in the first stage will generate inconsistent estimates if the nonlinear model is not perfectly correct. Moreover, the consistency of the second stage estimates can be obtained even if OLS is carried out in the first stage with a dichotomous endogenous variable. Therefore, the first stage regression is estimated using OLS instead of logistic regression. Formally, the 2SLS is estimated for each year as follows:

$$\text{First stage: } IND_{it}(m) = l_1 + l_2 * BoardSize_{it} + l_3 * \%Foreign_{it} + l_4 * Leverage_{it} + l_5 * SalesGrowth_{it} + l_6 * Age_{it} + x_{it} \quad (6)$$

$$\text{Second stage: } |DA_{it}| = j_0 + j_1 * \widehat{IND_{it}}(m) + j_2 * Leverage_{it} + j_3 * SalesGrowth_{it} + j_4 * Age_{it} + h_{it} \quad (7)$$

Board size is defined as number of directors on the board of firm *i* in year *t*; *%Foreign* is total number of shares held by foreign investors divided by total number of shares outstanding for firm *i* in year *t*; and $\widehat{IND_{it}}(m)$ is the predicted value from (6).

To investigate whether a simultaneity problem exists and whether the instruments used are valid instruments, I perform a simultaneity test as well as the Hausman test for over-identifying restrictions for each year. For the simultaneity test, the first stage regression is carried out as in (6). The residuals $\hat{x}_{it}$ are obtained and added to the year-by-year regression in (5) to form:

$$\begin{aligned} |DA_{it}| = a_0 + a_1 * \widehat{IND_{it}(m)} + a_2 * Leverage_{it} \\ + a_3 * SalesGrowth_{it} + a_4 * Age_{it} + a_5 * \hat{x}_{it} + z_{it} \end{aligned} \quad (8)$$

If the coefficient a_5 in (8) is significant, it suggests that simultaneity problem exists for the year under consideration. In the case that a simultaneity problem does not exist, OLS estimate is more efficient than 2SLS estimate. Nonetheless, the 2SLS estimate is consistent whether a simultaneity problem exists or not, provided that the instruments are valid.

For the Hausman test for over-identifying restrictions, the 2SLS regression in (6) and (7) is performed and the residuals $\hat{h}_{it}$ are obtained and regressed on the instruments and control variables as follows:

$$\begin{aligned} \hat{h}_{it} = q_0 + q_1 * BoardSize_{it} + q_3 * \%Foreign_{it} \\ + q_4 * Leverage_{it} + q_5 * SalesGrowth_{it} + q_6 * Age_{it} + z_{it} \end{aligned} \quad (9)$$

The R^2 is obtained from (9) and multiplied with the number of observations N to form the NR^2 statistics, which is then compared to c_q^2 where q is equal to the number of instruments minus the number of endogenous variables under consideration ($q=1$ in the present analysis). If the value of NR^2 is large compared to the critical Chi-square value, it

indicates that the instruments used are not valid in the sense that they are correlated with the error term in (5). In such a case, the 2SLS estimate is inconsistent and cannot be used to identify the regression coefficient under consideration.

Relation between accruals change and cash flows change

The second cross-sectional test makes use of the negative relation between accruals change and cash flows change as a measure of earnings management. As earnings management increases, this negative relation should be accentuated. To test the relation between board independence and earnings management, the following OLS regression is estimated for each year:

$$\begin{aligned}\Delta Accruals_{it} = {} & g_0 + g_1 * \Delta Cashflows_{it} + g_2 * \Delta(Cashflows_{it} * IND_{it}(m)) \\ & + g_3 * \Delta(Cashflows_{it} * Leverage_{it}) + g_4 * (Cashflows_{it} * Rights_{it}) + u_{it}\end{aligned} \quad (10)$$

g_1 is expected to be negative because of the nature of the accrual accounting process. g_2 is expected to be positive if board independence reduces a firm's tendency to use excessive accruals to smooth income. Both g_3 and g_4 are expected to be negative if firms with higher leverage and capital needs tend to use excessive accruals to conceal cash flows shocks.[7]

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[7] The above regression could also be viewed as a panel data estimation method that caters for unobserved fixed effects. Suppose the structural equation is

$$\begin{aligned}Accruals_{it} = {} & d_t + m_i + g_1 Cashflows_{it} + g_2 Cashflows_{it} * IND_{it}(m) \\ & + g_3 Cashflows_{it} * Leverage_{it} + g_4 Cashflows_{it} * Rights_{it} + n_{it}\end{aligned}$$

where m_i is unobserved firm-specific fixed effect and d_t is a time-specific fixed effect. If the unobserved firm-specific fixed effect is highly correlated with *Cashflows*, the estimated coefficients using ordinary least squares (OLS) regression on the above regression will be biased and inconsistent. To eliminate such bias, one could proceed with first-differencing the equations for each firm to obtain consistent estimates of the γ's. The regression in (10) therefore provides identification of the γ's, which makes possible the analysis of earnings management using this EM2 measure.

Meeting regulatory thresholds

The third earnings management test examines when firms have specific incentives to avoid losses or to meet rights issuance thresholds, whether firms with higher board independence are less likely to manage their ROE using non-operating income. Since there are two distinct thresholds, I first perform the analysis to test for earnings management to meet the rights issuance threshold (ROE of 6%). Then, I repeat the analysis to test for earnings managements to meet either rights or loss avoidance thresholds (i.e. firms are identified as EM firms if they are close to either thresholds and manage non-operating income to marginally surpass them).

In a univariate analysis, I perform year-by-year Chi-square and Fisher's exact tests to examine the frequency of firms falling into each of the three EM3 intervals (as defined in Section III). Second, I run yearly logistic regressions in a multivariate analysis to control for other incentives that might induce firms to manage toward the thresholds. Logistic regression is used instead of OLS because the dependent variable EM3 is a dichotomous variable. In China, higher leverage firms have been found to be less likely to use non-operating income to manage towards the rights issuance threshold and firms that apply for rights issuance are more likely to use this mechanism (Chen and Yuan, 2004). Therefore I include both leverage and the proxies for rights application as control variables.

The logistic regression is estimated as follows:

$$EM3(n)_{it} = p_0 + p_1 * IND_{it}(m) + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it} \quad (11)$$

$EM3(n)_{it}$ is firm i's value of the EM3 metric n in year t, n=1,2,3. p_1 is expected to be negative if firms with higher board independence are less likely to fall into the EM interval(s). p_2 is also expected to be negative because firms with higher leverage are less likely to issue new rights and therefore do not have incentives to manage ROE towards the 6% threshold. p_3 and p_4 are both expected to be positive because firms that need to offer new equity are those who have the highest incentives to manage earnings to meet the threshold.

As discussed earlier, there could be simultaneity problems with the earnings management and the board independence measures. To ensure that the results are not plagued by a simultaneity problem, I also perform a 2SLS analysis similar to the one performed using discretionary accruals. Because EM3 is a dichotomous variable, I also perform a non-linear two-stage least square technique (N2SLS), where I use logistic regression in the second-stage regression. Angrist and Krueger (2001), however, explain that such N2SLS requires a correctly specified functional form in order to interpret the estimates easily. 2SLS, on the other hand, is robust and could capture the average effect of interest even if the underlying second-stage relationship is non-linear.

Mandatory Requirement of Independent Directors and Earnings Management

A motivation for this study is to examine whether mandatory requirements for independent directors inhibits listed firms' practice of managing earnings. So far, the tests have been designed to examine the cross-sectional difference in earnings

management when the degree of board independence differs. In this section, I use the Chow test to assess the difference in earnings management before and after the regulation on board structure is in place.

First, I estimate the pooled regression for 2001 (pre-regulation) and 2002 (post regulation) using $|DA_{it}|$ as the dependent variable as follows:

$$\begin{aligned} |DA_{it}| = {} & j_0 + j_1 * Leverage_{it} * Y01 + j_2 * SalesGrowth_{it} * Y01 + j_3 * Age_{it} * Y01 \\ & + j_4 * Leverage_{it} * Y02 + j_5 * SalesGrowth_{it} * Y02 + j_6 * Age_{it} * Y02 + h_{it} \end{aligned} \quad (12)$$

where *Y01* is a dichotomous variable that takes the value of one when the year is 2001 and is equal to zero otherwise. Similarly, *Y02* takes the value of one when the year is 2002 and is equal to zero otherwise. All other variables are defined in the earlier sections. Next, I estimate equation (12) separately for 2001 and 2002 without year dummies. The intercept in the pooled regression represents the average $|DA_{it}|$ after controlling for leverage, sales growth and age and it is assumed to be equal between 2001 and 2002, while the yearly regressions allow for the intercepts to differ. The Chow test examines whether the intercepts are indeed different by comparing the residual sum of errors of the pooled regression with the residual sum of errors of the yearly regressions combined. A significant F-statistic will imply that the intercepts are different and that the average $|DA_{it}|$ is different in 2001 and 2002.

While the above test examines whether the average $|DA_{it}|$ for the overall sample has changed or not, another sample of interest consists of the firms that do not have any independent directors prior to the regulation on independent directors, i.e. the mandatory change firms. To investigate whether these firms have lower earnings management post

regulation, I repeat the Chow test by including a $Voluntary_{pre}$*$Y01$ interaction variable in the regressions, where $Voluntary_{pre}$ equals one if a firm has independent directors prior to the regulation and is equal to zero otherwise. The intercepts of these regressions represent the average $|DA_{it}|$ for mandatory firms.

V. SAMPLE DESCRIPTION

Data

The sample consists of A-share firms listed on the Shanghai Stock Exchange or the Shenzhen Stock Exchange. Data are hand collected from the firms' annual reports, which are available on the website of China Securities Regulatory Commission (www.csrc.org.cn), the website of the Shanghai Stock Exchange (www.sse.com.cn), and an information website www.cnlist.com. The CSRC website contains annual reports from 2001 to 2003 for firms listed on both exchanges. The Shanghai Stock Exchange website contains annual reports from 2000 to 2003 for firms listed on their exchange. The information website www.cnlist.com contains annual reports from 1999 to 2003 for firms listed on the Shenzhen Stock Exchange. Since the annual reports do not include industry codes, I collect for each firm the industry classification from www.cnlist.com. Firms are manually classified by a two level industry code, similar in spirit to the two digit SIC code. To be included in the sample, a firm must have board of directors information and financial information for computation of at least one earnings management measure. Data on board composition and financial variables are available through these annuals reports. The final sample consists of 3,643 firm-year observations for the fiscal years 2000 to 2003.

Descriptive Statistics

Panel A of Table 1 presents the number of observations by year as well as descriptive statistics for the sample firms. Firms that adopt independent directors pre-regulation (voluntary firms) have mean and median asset values of $4,195 million and

$1,449 million, which are higher than the mean ($1,886 million) and median ($1,285 million) assets of firms that employ independent directors post regulation (mandatory firms) at 1% level. Since voluntary firms have more assets than mandatory firms, all financial variables are scaled by firm size proxies to control for any size effect. Average leverage ratio is very similar between voluntary firms (1.09) and mandatory firms (0.91) and statistically not significantly different from each other. The leverage ratio of Chinese firms is smaller than an average U.S. firm because the Chinese bond market is largely undeveloped and the main source of debt financing is through bank loans. Average one-year sales growth of voluntary and mandatory firms is 25.19% and 24.1% respectively, which are comparable (p-value of 0.6834).

ROE before non-operating income is on average smaller than ROE after non-operating income, which is an indication that firms could be managing net income upwards using non-operating items. In the overall sample, median ROE before non-operating income is just below 6% but ROE after non-operating income just exceeds 6%, which coincides with the incentive to manage ROE above the rights issuance requirement. This phenomenon is also observed with the mandatory firms, but not with the voluntary firms. Absolute value of discretionary accruals has a mean and median value of 0.079 and 0.046 respectively. Contrary to expectation, voluntary firms have higher discretionary accruals (0.090) than mandatory firms (0.074). Prior literature on board composition suggests (Hermalin and Weisbach 1988; Bhagat and Black 2002) that firms with poor financial performance tend to hire more independent directors. If firms with more severe earnings management have the same tendency to move toward board

independence, then it may explain the relatively high discretionary accruals among voluntary firms. At the same time, this is also an indication of potential simultaneity problems between the earnings management proxy and the partitioning variable since firms with higher discretionary accruals may choose to hire more independent directors and board independence may in turn affect the level of earnings management. I address the potential simultaneity problem in the next section.

Panel B of Table 1 provides descriptive statistics for board structure by year. The variation in the number of independent directors across years reflects changes in regulatory requirements of board of directors in this period. The median number of independent directors increases from zero in 2000 and 2001 to two independent directors in 2002, and further increases to three independent directors in 2003. The percentage of firms having at least one independent director on their boards jumps from 4% in 2000 to almost 90% in 2003. The fraction of independent directors on the board also increases from 1% to 32% in the corresponding period. This trend corresponds to China's change in regulatory requirement as discussed in Section II. The change in regulatory requirement has created more than 3,000 independent director positions in two years. Although the fraction of independent directors has increased substantially from 2000 to 2003 in China, it is still less than the average fraction of independent directors in U.S. firms. For example, Beasley (1996) finds that the average board for U.S. firms consists of more than 50% of outside directors.

VI. RESULTS

Discretionary Accruals and Board Independence

Ordinary least squares

To provide evidence on the effectiveness of board independence in inhibiting earnings management, I begin with a year-by-year cross-section analysis using discretionary accruals as a proxy for earnings management. Prior literature suggests that board independence is negatively associated with discretionary accruals in the U.S. and U.K. (Peasnell et al. 1998; Klein 2002b). There is also evidence that firms in China manage earnings through accruals (Aharony et al. 2000), however, there is little evidence that the Modified Jones model is successful in capturing earnings management using Chinese data (Chen and Yuan 2004).

Table 2 and Table 3 report the results of regressing discretionary accruals on board independence, controlling for leverage, sales growth and age. The first column for each yearly regression in Table 2 presents the OLS results using voluntary adoption of independent directors to surpass regulatory requirement (*Voluntary*) as the measure of board independence. Similarly, the first column for each yearly regression in Table 3 presents the OLS results using the fraction of independent directors in the board as the measure of board independence.

The estimated coefficients on leverage and sales growth are positive and significant at 1% in 2001 whether *Voluntary* or *Fraction* is used as the measure of board independence. Sales growth is positive and significant at 5% in 2002. This implies firms

with higher leverage and sales growth tend to manage earnings, which is consistent with prior literature (Beneish 1999; Klein 2002b).

The OLS estimates of our coefficients of interest are, however, not significantly different from zero. The coefficients on *Voluntary* in Table 2 are insignificant in all three years when OLS is used as the estimation method. Similarly, the OLS estimated coefficients on *Fraction* in Table 3 are insignificant across years. These results suggest that higher board independence is not associated with lower level of earnings management. However, there might exist a simultaneity problem between discretionary accruals and board independence, which leads to biased and inconsistent OLS estimation.

Simultaneity problem and two-stage least squares regression

To address the potential simultaneity problem, I perform a 2SLS regression to examine whether board independence is associated with lower earnings management, after instrumenting for board independence. The 2SLS results are presented in the second column for each yearly regression in Table 2 and Table 3. As discussed in Section IV, I use board size and percentage of foreign investors shareholdings as instruments for the board independence variables.

Having instrumented for *Voluntary* in the first stage regression, the second stage results in Table 2 show, in contrast to the OLS estimate, that *Voluntary* has a negative (-0.1113) and significant (p-value of 0.0007) coefficient in 2001, suggesting that as a firm voluntarily includes independent directors on its board prior to the regulatory change on board composition, it will experience lower levels of discretionary accruals. However,

the 2SLS estimated coefficients of *Voluntary* in 2002 and 2003 both remain insignificant, indicating that after independent directors are made mandatory, hiring more than what the law requires does not lead to lower earnings management. Likewise, when *Fraction* is included in the regression in Table 3 instead of *Voluntary*, the 2SLS estimated coefficient of *Fraction* in 2001 becomes negative (-0.6321) and significant (p-value of 0.0013), but no such relationship is found in 2002 and 2003.

The results of the Hausman's test of over-identifying restrictions (as discussed in Section IV) in Table 2 show that the instruments used are valid in the sense that they are uncorrelated with the error term in the second stage regression, when *Voluntary* is used as the board independence measure. Therefore, the 2SLS estimates in Table 2 are consistent. Moreover, the simultaneity test demonstrates that discretionary accruals and board independence are simultaneously determined in 2001. This means that the OLS estimate for 2001 is in fact biased and inconsistent. The 2SLS estimation remedies such simultaneity problems and finds a significantly negative coefficient on *Voluntary* in 2001. The Hausman test results in Table 3 also show that the 2SLS estimate is consistent for 2001, when *Fraction* is used as the board independence measure. The simultaneity test again rejects the null hypothesis of exogeneity of board independence in 2001. Therefore, OLS estimates for 2001 are biased and inconsistent, whereas the 2SLS finding of a significantly negative coefficient on *Fraction* is consistent.[8]

[8] The simultaneity test cannot reject the null hypothesis of exogeneity of board independence in 2002 and 2003, whether *Voluntary* or *Fraction* is used as the measure of board independence. This implies that OLS estimation is consistent. Moreover, OLS estimate is more efficient than 2SLS estimate in these cases. However, whether OLS or 2SLS is used, the coefficient of interest is statistically insignificant.

Endogenous determination of board independence

Although the present paper is mainly interested in whether higher board independence leads to lower earnings management in China, the simultaneity issue gives rise to another interesting question of whether firms with higher earnings management choose to have more independent board members in China.

Table 4 presents the regression results on how the level of discretionary accruals affects board composition. In the second stage of the 2SLS, the estimated coefficient on the predicted |*DA*| is 1.2817 and significant at 5% level in 2001. The result is similar with the N2SLS estimate using logistic regression at the second stage. The positive coefficient suggests that firms with higher |*DA*| tend to voluntarily include independent directors on their board prior to the regulation on independent directors requirement. Besides, higher |*DA*| is associated with a larger fraction of independent directors for 2001. On the other hand, the estimated coefficients on the predicted |*DA*| in 2002 and 2003 are insignificant, regardless of either board independence proxy used, which, in line with the results in the above subsection, suggests that there is no simultaneity problem between |*DA*| and the measures of board independence post regulation.

Relationship of Accruals Change and Cash Flows Change and Board Independence

Dechow (1994) suggests that accruals change and cash flows change are negatively related. Leuz et al. (2003) and Skinner and Myers (1999) interpret a stronger negative relation between accruals change and cash flow change as indicative of more severe income smoothing because firms use excessive accruals to conceal cash flow shocks. In this subsection, I test in a regression framework how board independence

affects this relation, controlling for other factors such as leverage and rights issuance that might also influence earnings management.

Table 5 reports the OLS results. In all years, the estimated coefficient on cash flows change is negative and significant, in accordance with Dechow (1994). The variable of interest in Panel A of Table 5 is the change in the interaction between cash flows and *Voluntary*. If board independence can effectively inhibit earnings management, we should observe a positive coefficient on the interaction of the changes in [*Cash flows***Voluntary*]. The coefficient on the interaction term is significantly positive (coefficient of 0.65039 and p-value of <0.0001) only in 2001 but not in 2002 and 2003, which suggests that voluntarily employing independent directors prior to the regulatory requirements resulted in less earnings management. Similar to the results for |DA|, in 2002 and 2003, surpassing the regulatory requirement of independent directors shows no association with lower earnings management. When the fraction of independent directors is used as a proxy for board independence, presented in Panel B of Table 5, the coefficient on the interaction term of the changes in [*Cash flows***Fraction*] is positive and significant in 2001. The coefficient is not significant in 2002 and even becomes negative in 2003.

Earnings Management to Meet Regulatory Thresholds

The third measure of earnings management that I use relies on unique regulatory environment in China to reach certain earnings thresholds in order to fulfill requirements for rights issuances and security listings.

Univariate tests

Panel A of Table 6 presents the results of the univariate tests on the earnings management of ROE to meet the 6% threshold for rights issuance between voluntary and non-voluntary firms. When earnings management is defined as firms managing ROE before non-operating income from 1% below the 6% threshold to 1% above the 6% threshold (ROE ± 1%), none of the 70 voluntary firms (0%) in 2000 falls into this EM category, whereas 31 out of 918 (3.38%) non-voluntary firms manage non-operating income to meet this threshold. However, notwithstanding the seeming difference, neither the Chi-square test nor the Fisher's exact test finds the difference to be significant at the 10% level.[9] Similarly, in 2001, only 4 out of 324 (1.23%) voluntary firms fall into the EM category versus 22 out of 767 (2.87%) non-voluntary firms, however, the difference is not significant at conventional levels. Since inferences from the univariate tests could be rendered imprecise when there are too few observations in some cells of the 2x2 table, I perform univariate tests by pooling observations for the years prior to the regulation on independent directors (2000 and 2001 combined) as well as for the post regulation years (2002 and 2003 combined). When the tests are performed for the years prior to the regulation (2000 and 2001 combined), voluntary firms are less likely to be in the EM category and the difference is significant at the 5% level. However, there is no significant difference between voluntary and non-voluntary firms in the post regulation

[9] The Chi-square test is the most frequently used test for such 2x2 tables. However, when one of the cells of the 2x2 table has fewer than 5 observations, or when the distribution within the sample is very unbalanced, the Chi-square test, which is an asymptotic result, tends to give imprecise finite sample inferences. Because of this, I also report the Fisher's exact test statistic, which is another commonly used statistic for these finite sample situations. That said, in most of the present results, the Chi-square test and the Fisher's exact test give similar inference.

sample (2002 and 2003 combined). When EM is defined as ROE ± 2% or ROE ± 3% around the 6% threshold, none of the univariate test results is significant for any year. However, the *p*-values of the tests for the sample prior to regulation are much lower than those for the sample post regulation.

Because firms have an incentive to manage earnings to meet the 6% threshold for rights issuance, as well as to avoid losses, Panel B of Table 6 examines the 6% threshold together with the 0% threshold. Moreover, the finite sample problem of the univariate tests will be less severe when there are more observations in the cells of interest. In 2000, none of the 70 voluntary firms (0%) falls within the EM interval of ± 1% around either threshold, whereas 37 out of 918 (4.03%) non-voluntary firms manage non-operating income to meet these thresholds. The Chi-square test gives a p-value of 0.0869, which is marginally significant at the 10% level. In 2001, only 7 out of 324 (2.16%) voluntary firms fall into the EM category versus 35 out of 767 (4.56%) non-voluntary firms. The difference is significant at the 10% level, whether the Chi-square test or the Fisher's exact test is used. In fact, in 2001, voluntary firms are less likely to be classified as an EM firm whether the EM interval is ± 1%, ± 2%, or ± 3%, at significance levels of 10% or better. In the combined pre-regulation years, voluntary firms are less likely to manage non-operating income to meet thresholds when the EM interval is ± 1% and ± 2%, at significance levels of 5% or better. When the ± 3% interval is employed, most of the test results indicate no significant difference in earnings management between voluntary and non-voluntary firms.

Logistic regressions

The above univariate tests do not control for other incentives to manage toward regulatory thresholds. In this subsection, I use multivariate logistic regressions to analyze independent board effectiveness together with other control variables that proxy for firms' incentives to manage earnings to meet thresholds. Since the incentive to avoid negative income is different from the incentive to meet the rights issuance threshold (average ROE of 6%), I first define EM as firms managing non-operating income to meet the rights issuance threshold because this definition will allow for a larger sample for analysis than using the sample for loss avoidance. Table 7 presents the multivariate regression results with *Voluntary* as the board independence measure and Table 8 presents the results with *Fraction* as the independent variable. Panel A presents the year-by-year results with EM interval of ± 1%. The first column shows results from a logistic regression, the second column of results are from a non-linear two stage least squares (N2SLS) regression, and the third column results are from a two stage least squares (2SLS) regression. $Rights_t$ has a significantly positive coefficient in 2000 and 2001, and $Rights_{t+1}$ has a significantly positive coefficient in 2002. As for leverage, it is only significant and negative in 2002 when EM is defined as ROE ± 2% around the threshold. The variables of interest, *Voluntary* and *Fraction*, however, are not significant in any of the logistic regressions across years. Similar to the simultaneity problem observed when discretionary accruals are used as the EM measure, EM3 and board independence could also be determined simultaneously.

To address the simultaneity problem, I perform a N2SLS regression and a 2SLS regression using *Board Size* and *%Foreign* as instruments. The second stage results are shown in the second and third columns for each year and EM interval. After accounting for the simultaneity problem between the proxies for board independence and EM3, the regression results show that both *Voluntary* and *Fraction* are negatively associated with EM3 in 2001. Panels A and B in Table 7 show that when EM3 is defined as ROE ± 1% or ROE ± 2% around the threshold, voluntary firms are less likely to be classified as an EM firm with an estimated coefficient of –0.1195 (p-value of 0.0165) and an estimated coefficient of –0.1365 (p-value of 0.0414) in the 2SLS regressions. Results under the N2SLS regressions are also similar. Likewise, Table 8 shows that the estimated coefficients on *Fraction* are negative and significant with coefficients of –0.5319 (p-value of 0.0440) and –0.6910 (p-value 0.0512) in 2001 when EM3 is measured as ROE ± 1% and ± 2% around the threshold under the 2SLS estimation method. No such relationship is observed in 2002 or 2003.

Tables 7 and 8 also report the simultaneity test results for each 2SLS regression. Similar to the test results in discretionary accruals, the board independence proxies and EM3 are determined simultaneously in 2001 (± 1% and ± 2%) but not in 2002 and 2003 as evident by the significant coefficients on the residual from the simultaneity test in 2001 but insignificant coefficients in 2002 and 2003. Therefore the logistic estimates are biased in 2001. The results of the Hausman's test of over-identifying restrictions indicate that the instruments are valid in all of the 2SLS regressions. Therefore, the estimates on

Voluntary and *Fraction* for all years and intervals are consistent under the 2SLS regressions.

Table 9 and Table 10 summarize the results on the multivariate tests considering both the rights issuance and the loss avoidance thresholds. Since simultaneity is not a problem in 2001 as the simultaneity test cannot reject exogeneity between EM3 and the proxies for board independence, the logistic regression estimates are consistent. The coefficients on *Voluntary* are negative and significant in all three EM intervals and the coefficient on *Fraction* is negative but insignificant. Again, the coefficients of interest are insignificant for 2002 and 2003, whichever method of estimation is used.

Implications from the Cross-sectional Tests

In summary, firms that voluntarily include independent directors prior to the regulation have lower levels of |DA|, experience less income smoothing, and are less likely to use non-operating income to manage ROE to meet specific thresholds. In contrast, firms that hiring more than the required levels of independent directors post-regulation do not experience any difference in any of the earnings management measures.

These results have the two potential implications. First, independent directors seem to be useful only when firms voluntarily choose to adopt them on their board. Firms have higher incentives to maintain the proper functioning of independent directors on the board if firms are resolute to better monitor management, or they desire to increase the confidence of investors, especially foreign investors, in the credibility of the firms' disclosure practice. This explains the effectiveness of independent directors in the

pre-regulation period. When firms are required by law to implement board independence, the incentive to maintain a proper functioning independent board is weaker among the non-voluntary firms, which can explain the insignificant result in the post regulation period. Moreover, the demand for independent directors increases substantially after the regulation is in effect. The number of independent director positions increases from 300 in 2001 to more than 3,000 in 2003. As in any other profession, experience is an important factor in determining the quality of independent directors, therefore the effectiveness of the newly appointed independent directors after the regulation may not be able to provide effective monitoring. This can explain the insignificant result on *Fraction* in the post regulation period because the quality of these independent directors is likely to be lower.

The second implication could be that once firms reach a minimal level of board independence, adding more independent directors do not lead to more effective monitoring. This would explain why higher board independence in the pre-regulatory period is associated with lower levels of earnings management because most firms in 2000 and 2001 do not have any independent directors and adding at least one independent member to the board will result in effective monitoring. However, once the regulation requires certain level of board independence, adding more than the requirement in the post-regulatory period does not result in higher monitoring effectiveness.

To address which implication is more plausible, I examine the changes in the levels of earnings management before and after the law is in effect. If there is significant

difference in the levels of earnings management for firms that employ independent members after the law is in effect, it is likely that a board with minimal level of independence is sufficient for monitoring top management. In contrast, if there is no significant difference, reaching the minimal level of board independence is not sufficient for more effective monitoring. This would support the explanation that independent directors are only effective when firms have the incentives to ensure their proper functioning.

Change in Discretionary Accruals before and after the Regulation

Panel A of Table 11 presents results, for the overall sample, on the change in the levels of earnings management before and after the regulation is in place, using $|DA|$ as the measure of earnings management. Regression analyses is performed for 2001, 2002 and the pooled sample respectively. Coefficients for the control variables are allowed to be different in the pooled regression. The intercepts in 2001 and 2002 represent the average levels of $|DA|$ after controlling for leverage, sales growth and age. I perform the Chow test and examine whether the intercept is different between 2001 and 2002. The *F* statistic has a value of 1.1341 (p-value of 0.2871), which implies there is no significant difference in the average level of $|DA|$ between 2001 and 2002.

Panel B of Table 11 reports the results on the difference in $|DA|$ for firms that employ independent directors only after the law is in effect. Since 2002 is the first year that these firms include independent directors on their boards, testing the difference in $|DA|$ for this subsample allows a direct test of the effectiveness of the regulation. In 2001, the regression has an estimated value of 0.0781 for the average $|DA|$ of mandatory

firms (the intercept of that regression) and in 2002, the regression gives a corresponding estimated value of 0.08, whereas in the pooled sample, such intercept takes the value of 0.07884. Result from the Chow test indicates that there is no difference in the average level of $|DA|$ for these firms pre- and post- regulation period (F-value of 0.0562 and p-value of 0.8127).

Results from this section confirm that the law is ineffective in inhibiting earnings management. Potentially, firms with mandatory independent directors employ these members simply to satisfy the regulatory requirements and have no desire to improve their corporate governance structure. Another explanation is that the changes in regulation imposes tremendous burden onto firms to search for independent members for their boards in a market where quality independent directors are scarce. The result is that overall monitoring effectiveness becomes lower than before the regulation is in effect.

VII. CONCLUSION

The empirical results of the present study of China demonstrate that independent directors could be effective in curtailing the practice of earnings management in firms even in a country with drastically different institutional and legal environment from the U.S. and the U.K. The cross-sectional results for the pre-regulation period are consistent and robust across different measures of earnings management and corroborate that firms with stronger board independence experience lower earnings management. As many countries around the world are following the footsteps of the U.S. and U.K. in encouraging firms to adopt independent directors as a monitoring mechanism, this finding is important.

The empirical results also confirm that independent directors are effective in monitoring managers to reduce earnings management in China even when these directors represent a minority of the board, which contrasts with the results from the U.S. where a majority independent board is crucial to effective monitoring (Klein 2002b). However, this finding is pertinent only to firms that voluntarily employ independent directors prior to the board independence regulation in 2002. After 2002, neither implementing a minimum level of independent directors nor exceeding the regulatory requirements would lead to lower earnings management. The implication is that independent boards are supposed to be a market solution to some agency problems and firms that find the needs to employ this mechanism voluntarily have the incentives to maintain well-functioned independent boards. Therefore, regulation on independent directors requirement is not a sufficient solution to improve board of directors'

monitoring effectiveness. Moreover, such regulatory pressure might generate excessive demand for independent directors over supply and lower the quality of independent directors. This finding is again important in light of the global trend toward a more prominent role of independent directors as a monitoring mechanism in firms.

In terms of empirical strategy, the current research is innovative in accounting for the simultaneity problem between board independence and earnings management. The study finds that failing to cater for the simultaneity problem between independent boards and earnings management would lead to estimates that are biased and inconsistent. It is found that higher earnings management firms tend to choose a more independent board in China. Therefore, a reduced-form regression without accounting for the simultaneity problem produces biased and inconsistent estimate that confounds the effect of board independence on earnings management in China. This confirms the concern that the problems of joint endogeneity often plague the results of board studies and failing to address this issue would generate results that are difficult to interpret (Hermalin and Weisbach 2003).

This study could be extended in a number of ways. Although the present inquiry finds that regulation on board independence fails to put a restrain on the practice of earnings management in China, regulators could have other objectives, such as inhibiting illegal wealth transfer by top management and protecting minority shareholders from the expropriation by major shareholders, when implementing the regulation. Therefore, the study of earnings management is not a comprehensive measure of the success of the board independence regulation. Future research on other aspects of independent

directors' monitoring role will shed more light on the effectiveness of this regulation. Furthermore, independent directors might suffer from a learning curve, especially for those who started after 2002 and possess limited experience in the monitoring role. The period covered by this study does not allow a thorough analysis of any lag effects that independent directors might have in reducing earnings management post regulation. Further research is therefore warranted.

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APPENDIX

Table 1
Descriptive Statistics

Panel A: Descriptive statistics on Financial Variables

	2000 - 2003			Firms with independent directors before regulation			Firms with independent directors after regulation			Test of Difference (two-tailed) p-value	
	n	Mean	Median	n	Mean	Median	n	Mean	Median	T-test	Wilcoxon-Rank Sums test
Return on Equity	3643	-2.56%	6.17%	963	-5.44%	6.44%	2570	-1.90%	6.03%	0.5575	0.0013
Return on Equity before non operating items	3612	-2.43%	5.33%	954	-5.52%	6.02%	2548	-1.71%	4.92%	0.5076	<0.0001
Assets (in millions)	3642	$2,569.00	$1,314.00	963	$4,195.00	$1,449.00	2569	$1,886.00	$1,285.00	<0.0001	<0.0001
Debt to Equity Ratio	3643	0.95	0.54	963	1.09	0.52	2570	0.91	0.55	0.1540	0.3752
One year Sales Growth	3643	24.38%	13.84%	963	25.19%	13.83%	2570	24.10%	13.21%	0.6834	0.4072

Panel B: Descriptive statistics on Board variables

	2000			2001			2002			2003		
	n	Mean	Median	n	Mean	Median	n	Mean	Median	n	Mean	Median
Number of Directors	401	9.60	9	1048	9.40	9	1106	9.90	9	1102	9.90	9
Number of Independent directors	401	0.18	0	1048	0.54	0	1106	2.30	2	1102	3.18	3
Fraction of Independent directors on Board	401	1.95%	0%	1048	6.00%	0%	1106	24%	22%	1102	32%	33%
Number of firms with at least one independent director	401	76		1048	214		1106	1067		1102	1092	1092
Number of firms with number/fraction of directors exceeding regulatory requirement	401	76		1048	214		1106	309		1102	265	

Variable definition:
Return on Equity is calculated as net income$_{it}$/equity$_{it}$ for firm i in year t; Return on Equity before non-operating items is calculated as (net income$_{it}$ - non-operating income$_{it}$)/equity$_{it}$ for firm i in year t; Debt to equity ratio is calculated as total debt$_{it}$ /equity$_{it}$ for firm i in year t, where total debt includes short term debt and long term debt; one year sales growth is calculated as revenue$_{t}$-revenue $_{t-1}$/revenue $_{t-1}$ for firm i in year t, where revenue is gross revenue from core operation.

Table 2
Regression Analysis of the Determinants of Discretionary Accruals
Using Voluntary as a Proxy for Board Independence

	2001				2002				2003	
Dependent Variable	OLS[a] |DA|		2SLS[b] |DA|		OLS[a] |DA|		2SLS[b] |DA|		OLS[a] |DA|	2SLS[b] |DA|
Intercept	0.0479		0.0781		0.0646		0.0754		0.05213	0.3506
	(<0.0001)		(<0.0001)		(<0.0001)		(<0.0001)		(0.0138)	(0.1127)
Voluntary	0.0010		**-0.1113**	***	-0.0105		-0.0508		-0.0071	-1.0576
	(0.9049)		**(0.0007)**		(0.1510)		(0.1931)		(0.6975)	(0.1721)
Leverage	**0.0055**	***	**0.0590**	***	-0.0003		-0.0004		0.0048	-0.0004
	(0.0002)		**(<0.0001)**		(0.6165)		(0.4921)		(0.1056)	(0.9336)
Sales Growth	**0.0192**	***	**0.024**	***	**0.0110**	**	**0.0124**	**	-0.0001	-0.0156
	(<0.0001)		**(<0.0001)**		**(0.0363)**		**(0.0221)**		(0.9888)	(0.3018)
Age	0.0016		**0.0019**	*	0.0007		0.0008		0.0026	-0.0025
	(0.1122)		**(0.0650)**		(0.4289)		(0.3642)		(0.2180)	(0.5558)
N	517		517		571		571		575	575
Adjusted R^2	5.86%		7.94%		0.51%		0.45%		0.10%	0.40%
First stage results:										
Adjusted R^2			5.45%				3.01%			-0.46%
F value			**6.95**	***			**4.54**	***		0.48
			(<0.0001)				**(0.0005)**			(0.7917)
Simultaneity Test [c] results:										
Residuals			**0.1191**				0.04184			1.0511
			(0.0004)				(0.2924)			(0.1752)
Hausman Test [d] results:										
$N*R^2$ Statistics			0.0517				0.6852			1.9550
			(0.8201)				(0.4078)			(0.1620)

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

[a] *OLS regression:*

$$|DA_{it}| = \alpha_0 + \alpha_1 * Voluntary_{it} + \alpha_2 * Leverage_{it} + \alpha_3 * SalesGrowth_{it} + \alpha_4 * Age_{it} + e_{it}$$

[b] *2SLS regression:*

$$Voluntary_{it} = \lambda_0 + \lambda_1 * |DA_{it}| + \lambda_2 * Boardsize_{it} + \lambda_3 * \%Foreign_{it} + \lambda_4 * Leverage_{it} + \lambda_5 * SalesGrowth_{it} + \lambda_6 * Age_{it} + \chi_{it}$$

$$|DA_{it}| = \delta_0 + \delta_1 * \widehat{Voluntary_{it}} + \delta_2 * Leverage_{it} + \delta_3 * SalesGrowth_{it} + \delta_4 * Age_{it} + \eta_{it}$$

[c] Simultaneity test:

$$|DA_{it}| = \alpha_0 + \alpha_1 * \widehat{Voluntary_{it}} + \alpha_2 * Leverage_{it} + \alpha_3 * SalesGrowth_{it} + \alpha_4 * Age_{it} + \alpha_5 * \hat{\chi}_{it} + \zeta_{it}$$

[d] Hausman test:

$$\hat{\eta}_{it} = \theta_0 + \theta_1 * Boardsize_{it} + \theta_2 * \%Foreign_{it} + \theta_3 * Leverage_{it} + \theta_4 * SalesGrowth_{it} + \theta_5 * Age_{it} + \zeta_{it}$$

Variable definitions:

|Discretionary Accruals| ($|DA_{it}|$) is calculated as $|\nu_{it}|$ from the following cross-sectional, industry specific regression:

$$\frac{TA_{it}}{A_{it-1}} = \rho_{1k}\left(\frac{1}{A_{it-1}}\right) + \rho_{2k}\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \rho_{3k}\left(\frac{PPE_{it}}{A_{it-1}}\right) + \nu_{it}$$

where TA_{it} is calculated as the difference between NI_{it} and OCF_{it}; NI_{it} is net income; OCF_{it} is operating cash flows obtained directly from the cash flows statement; A_{it-1} is total assets in year t-1; ΔREV_{it} is the change of revenue from year t-1 to year t; ΔREC_{it} is the change in accounts receivable from year t-1 to year t; and PPE_{it} is gross property, plant and equipment. $Voluntary_{jt}$ is a dichotomous variable that takes the value of one when firm i has more independent directors on the board than the regulatory requirement in year t. $Leverage_{it}$ is calculated as total debt / total equity of firm i in year t. Sales $growth_{it}$ is calculated as (ΔREV_{it}- ΔREV_{it-1})/ ΔREV_{it-1} for firm i in year t. Age_{it} is the number of years incorporated up to year t of firm i. Board $size_{it}$ is the number of directors for firm i in year t. $\%Foreign_{it}$ is the total number of shares held by foreign investors / total number outstanding shares for firm i in year 1.

Table 3
Regression Analysis of the Determinants of Discretionary Accruals
Using Fraction as a Proxy for Board Independence

	2001			2002			2003		
Dependent Variable	OLS[a] |DA|		2SLS[b] |DA|	OLS[a] |DA|		2SLS[b] |DA|	OLS[a] |DA|		2SLS[b] |DA|
Intercept	0.0469		0.0834	0.0684		0.0447	0.0433		0.0046
	(<0.0001)		(<0.0001)	(<0.0001)		(0.1050)	(0.3485)		(0.9832)
Fraction	0.0221		**-0.6321** ***	-0.0272		0.0703	0.0208		0.1388
	(0.5195)		**(0.0013)**	(0.5243)		(0.5171)	(0.8689)		(0.8328)
Leverage	**0.0055**	***	**0.0062** ***	-0.0002		-0.0003	0.0048		0.0048
	(0.0002)		**(<0.0001)**	(0.6558)		(0.6473)	(0.1029)		(0.1024)
Sales Growth	**0.0190**	***	**0.0252** ***	**0.0107** **		**0.0104** **	0.0000		-0.0001
	(<0.0001)		**(<0.0001)**	**(0.0413)**		**(0.0484)**	-0.9965		(0.9927)
Age	0.0016		**0.0019** *	0.0007		0.0007	0.0026		0.0026
	(0.1134)		**(0.0670)**	(0.4511)		(0.4410)	(0.2105)		(0.2064)
N	517		517	571		571	575		575
Adjusted R^2	5.93%		7.75%	0.22%		0.22%	0.08%		0.08%
First stage results:									
Adjusted R^2			2.65%			14.84%			2.86%
F value			**3.80** ***			**20.87** ***			**4.38** ***
			(0.0022)			**(<0.0001)**			**(0.0006)**
Simultaneity Test [c] results:									
Residuals			**0.6747** ***			-0.1154			-0.1225
			(0.0007)			(0.3283)			(0.8550)
Hausman Test [d] results:									
$N*R^2$ Statistics			1.0857			1.9985			**3.7950** *
			(0.2974)			(0.1575)			**(0.0514)**

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

[a] *OLS regression:*

$$|DA_{it}| = \alpha_0 + \alpha_1 * Fraction_{it} + \alpha_2 * Leverage_{it} + \alpha_3 * SalesGrowth_{it} + \alpha_4 * Age_{it} + e_{it}$$

[b] *2SLS regression:*

$$Fraction_{it} = \lambda_0 + \lambda_1 * |DA_{it}| + \lambda_2 * Boardsize_{it} + \lambda_3 * \%Foreign_{it} + \lambda_4 * Leverage_{it} + \lambda_5 * SalesGrowth_{it} + \lambda_6 * Age_{it} + \chi_{it}$$

$$|DA_{it}| = \varphi_0 + \varphi_1 * \widehat{Fraction_{it}} + \varphi_2 * Leverage_{it} + \varphi_3 * SalesGrowth_{it} + \varphi_4 * Age_{it} + \eta_{it}$$

[c] Simultaneity test:

$$|DA_{it}| = \alpha_0 + \alpha_1 * \widehat{Fraction_{it}} + \alpha_2 * Leverage_{it} + \alpha_3 * SalesGrowth_{it} + \alpha_4 * Age_{it} + \alpha_5 * \hat{\chi}_{it} + z_{it}$$

[d] Hausman test:

$$\hat{\eta}_{it} = \theta_0 + \theta_1 * Boardsize_{it} + \theta_2 * \%Foreign_{it} + \theta_3 * Leverage_{it} + \theta_4 * SalesGrowth_{it} + \theta_5 * Age_{it} + z_{it}$$

Variable definitions:
Fraction is calculated as number of independent directors/number of directors for firm i in year t.
All other variables are defined as in Table 2.

Table 4
Regression Analysis of the Determinants of Board Independence

Dependent Variable	Board Independence											
	2001			2002			2003					
	2SLS[a] Voluntary	N2SLS[b] Voluntary	2SLS[a] Fraction	2SLS[a] Voluntary	N2SLS[b] Voluntary	2SLS[a] Fraction	2SLS[a] Voluntary	N2SLS[b] Voluntary	2SLS[a] Fraction			
Intercept	-0.1620	-3.1412	-0.0037	-0.0843	-2.7098	0.3792	0.2958	-0.8252	0.3782			
	(0.0906)	(<0.0001)	(0.8692)	(0.4653)	(<0.0001)	(<0.0001)	(0.0008)	(0.0953)	(<0.0001)			
Predicted Value of |Discretionary Accruals|	**1.2817**	**	**6.1922**	**	**0.2227**	*	0.4581	2.3795	-0.0489	-0.5028	-3.1164	-0.0100		
	(0.0174)		**(0.0173)**		**(0.0791)**		(0.6297)	(0.6145)	(0.7466)	(0.1772)	(0.1780)	(0.8505)		
Number of Directors	**0.0366**	***	**0.1790**	***	**0.0047**	**	**0.0337**	***	**0.1597**	***	**-0.0137**	***	-0.0025	-0.0140	**-0.0054**	***
	(<0.0001)		**(<0.0001)**		**(0.0139)**		**(<0.0001)**		**(0.0001)**		**(<0.0001)**		(0.7602)	(0.7654)	**(<0.0001)**	
Foreign Investors	**0.7441**	***	**3.3594**	***	**0.1556**	***	**0.3322**	**	**1.5172**	*	0.0325		-0.0021	-0.0005	0.0230	
	(<0.0001)		**(<0.0001)**		**(0.0004)**		**(0.0472)**		**(0.0526)**		(0.2219)		(0.9888)	(0.9995)	(0.2878)	
N	517	517	517	571	571	571	575	575	575			
Adjusted R^2	6.21%		3.04%	3.04%		15.06%	-0.15%		3.09%			
First stage results:												
Adjusted R^2 at 1st stage	16.87%		16.87%	3.05%		3.05%	3.83%		3.83%			
F value at 1st stage	**5.99**	***	**5.99**	***	**1.85**	**	**1.85**	**	**2.09**	***	**2.09**	***		
	(<0.0001)		**(<0.0001)**		**(0.0120)**		**(0.0120)**		**(0.0032)**		**(0.0032)**			
Simultaneity Test[c] results:												
Residuals	**-1.198**	**	-0.1692	-0.7642	0.0145	0.4918	0.0119					
	(0.0450)		(0.2286)	(0.4360)	(0.9259)	(0.2026)	(0.8283)					
Hausman Test[d] results:												
$N*R^2$ Statistics	23.6269		24.0922	12.6762		14.9031	17.1925		**27.14**	*		
	(0.1676)		(0.1520)	(0.8104)		(0.6686)	(0.5099)		**(0.0764)**			

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

Table 4 (Continued)

[a] *2SLS regression:*

$$|DA_{it}| = b_0 + b_1 * IND(m)_{it} + b_2 * Leverage_{it} + b_3 * SalesGrowth_{it} + b_4 * Age_{it} + b_5 * Boardsize_{it} + b_6 * \%Foreign_{it} + t * Industry(q) + f_{it}$$

$$IND(m)_{it} = s_0 + s_1 * \widehat{|DA|}_{it} + s_2 * Boardsize_{it} + s_3 * \%Foreign_{it} + y_{it}$$

[b] *N2SLS regression:*

$$|DA_{it}| = b_0 + b_1 * Voluntary_{it} + b_2 * Leverage_{it} + b_3 * SalesGrowth_{it} + b_4 * Age_{it} + b_5 * Boardsize_{it} + b_6 * \%Foreign_{it} + t * Industry(q) + f_{it}$$

Logistic 2nd stage: $Voluntary_{it} = s_0 + s_1 * \widehat{|DA|}_{it} + s_2 * Boardsize_{it} + s_3 * \%Foreign_{it} + y_{it}$

[c] *Simultaneity test:*

$$IND(m) = s_0 + s_1 * \widehat{|DA|}_{it} + s_2 * Boardsize_{it} + s_3 * \%Foreign_{it} + s_4 * \hat{f}_{it} + z_{it}$$

[d] *Hausman test:*

$$\hat{y}_{it} = q_0 + q_1 * Boardsize_{it} + q_2 * \%Foreign_{it} + q_3 * Leverage_{it} + q_4 * SalesGrowth_{it} + q_5 * Age_{it} + x_{it}$$

Variable definitions:
IND(m), *m*=1,2. *IND(1) =Voluntary* and *IND(2) = Fraction*. *Industry (q)*, *q*=1,…,16 and t is a vector of coefficients.
Industry is a dichotomous variable that takes the value of one for each 2-digit industry classification. Fraction is calculated as number of independent directors/number of directors for firm i in year t.
All other variables are defined as in Table 2.

Table 5
Test of Board Independence's Effects on the Relationship between Accruals Change and Cash Flows Change

Panel A: Voluntary as a proxy for board independence

Dependent Variable	**2001** ΔAccruals		**2002** ΔAccruals		**2003** ΔAccruals	
Intercept	-0.0321		-0.0106		0.0060	
	(<0.0001)		(0.0069)		(0.1860)	
Δ*Cashflows*	**-0.8373**	***	**-0.7856**	***	**-0.7813**	***
	(<0.0001)		**(<0.0001)**		**(<0.0001)**	
Δ(*Cashflows* Voluntary*)	**0.6504**	***	0.0784		-0.0609	
	(<0.0001)		(0.1695)		(0.3600)	
Δ(*Cashflows* Leverage*)	0.0022		**-0.0443**	***	**-0.0928**	***
	(0.7173)		**(<0.0001)**		**(<0.0001)**	
Δ(*Cashflows* Rights*$_t$)	**-0.3927**	***	-0.0980		0.0061	
	(<0.0001)		(0.3381)		(0.9667)	
Δ(*Cashflows* Rights*$_{t+1}$)	**-0.2362**	**	-0.0868			
	(0.0481)		(0.5023)			
N	887		1019		1074	
Adjusted R^2	37.71%		56.00%		45.75%	

Panel B: Fraction as a proxy for board independence

Dependent Variable	**2001** ΔAccruals		**2002** ΔAccruals		**2003** ΔAccruals	
Intercept	-0.0321		-0.0123		0.0089	
	(<0.0001)		(0.0040)		(0.0623)	
Δ*Cashflows*	**-0.7020**	***	**-0.7868**	***	**-0.5933**	***
	(<0.0001)		**(<0.0001)**		**(<0.0001)**	
Δ(*Cashflows * Fraction*)	**2.1791**	***	0.1993		**-0.6443**	*
	(<0.0001)		(0.3703)		**(0.0887)**	
Δ(*Cashflows* Leverage*)	0.0001		**-0.0462**	***	**-0.0921**	***
	(0.9926)		**(<0.0001)**		**(<0.0001)**	
Δ(*Cashflows* Rights*$_t$)	**-0.4802**	***	-0.0954		-0.0151	
	(<0.0001)		(0.3524)		(0.9178)	
Δ(*Cashflows* Rights*$_{t+1}$)	**-0.3247**	***	-0.07445			
	(0.0086)		(0.5689)			
N	887		1019		1074	
Adjusted R^2	33.19%		55.95%		45.85%	

Table 5 (Continued)

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

$$\Delta Accruals_{it} = g_0 + g_1 * \Delta Cashflows_{it} + g_2 * \Delta(Cashflows_{it} * IND_{it}(m)) + g_3 * \Delta(Cashflows_{it} * Leverage_{it}) + g_4 * (Cashflows_{it} * Rights_{it}) + u_{it}$$

$\Delta Accruals_{it}$ is defined TA_{it} - TA_{it-1} / $Assets_{it}$ for firm i in year t and $\Delta Cashflows_{it}$ is defined as OCF_{it} - OCF_{it-1} / $Assets_{it}$ in firm i in year t. All other variables are defined as in Table 2 and Table 4.

Table 6
Univariate Tests of Earnings Management to Meet Regulatory Thresholds

Panel A: Managing ROE using non-operating income to meet the rights issuance (6%) threshold

	2000					
	+/-1%		+/-2%		+/-3%	
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms
EM/Voluntary	0/70	0%	2/70	2.86%	2/70	2.86%
EM/Nonvoluntary	31/918	3.38%	45/918	4.90%	50/918	5.45%
Chi-square test (p-value)		0.1182		0.4385		0.3497
Fisher' s Exact test (p-value)		0.1606		0.7678		0.5752

	2002					
	+/-1%		+/-2%		+/-3%	
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms
Voluntary, EM	7/322	2.17%	8/322	2.48%	9/322	2.80%
Nonvoluntary, EM	18/821	2.19%	31/821	3.78%	37/821	4.51%
Chi-square test (p-value)		0.9846		0.2793		0.1853
Fisher' s Exact test (p-value)		1.0000		0.3653		0.2411

	2001					
	+/-1%		+/-2%		+/-3%	
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms
EM/Voluntary	4/324	1.23%	10/314	3.09%	15/324	4.63%
EM/Nonvoluntary	22/757	2.87%	38/767	4.95%	50/767	6.52%
Chi-square test (p-value)		0.1060		0.1692		0.2284
Fisher' s Exact test (p-value)		0.1295		0.1976		0.2639

	2003					
	+/-1%		+/-2%		+/-3%	
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms
Voluntary, EM	5/283	1.77%	10/283	3.53%	13/283	4.59%
Nonvoluntary, EM	17.888	1.91%	31/888	3.49%	37/888	4.17%
Chi-square test (p-value)		0.8734		0.9729		0.7570
Fisher' s Exact test (p-value)		1.0000		1.0000		0.7373

	2000 and 2001 combined					
	+/-1%		+/-2%		+/-3%	
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms
EM/Voluntary	4/394	1.02%	12/394	3.05%	17/394	4.31%
EM/Nonvoluntary	53/1685	3.15%	83/1685	4.93%	100/1685	5.93%
Chi-square test (p-value)		**0.0197** **		0.1076		0.2091
Fisher' s Exact test (p-value)		**0.0160** **		0.1391		0.2267

	2002 and 2003 combined					
	+/-1%		+/-2%		+/-3%	
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms
EM/Voluntary	3/605	0.50%	18/605	2.98%	22/605	3.64%
EM/Nonvoluntary	21/1709	1.23%	62/1709	3.63%	74/1709	4.33%
Chi-square test (p-value)		0.1262		0.4502		0.4622
Fisher' s Exact test (p-value)		0.1621		0.5182		0.5531

EM intervals *+/-1%: ROE before non-operating income (ROE_{before}) is between 5%-6% and ROE after non-operating income (ROE_{after}) is between 6%-7%. +/-2%: ROE_{before} is between 4%-6% and ROE_{after} is between 6%-8%. ROE_{before} is between 3%-6% and ROE_{after} is between 6%-9%.* # of firms *represents the number of firms in the voluntary (non-voluntary) category falling into each of the EM intervals.*

Table 6 (Continued)

Panel B: Managing ROE using non-operating income to meet the rights issuance (6%) threshold or to avoid losses

	2000							2002						
	+/-1%		+/-2%		+/-3%			+/-1%		+/-2%		+/-3%		
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms		# of firms	% of firms	# of firms	% of firms	# of firms	% of firms	
EM/Voluntary	0/70	0%	3/70	4.29%	3/70	4.29%		9/322	2.80%	11/322	3.42%	13/322	4.04%	
EM/Nonvoluntary	37/918	4.03%	58/918	6.32%	70/918	7.63%		25/821	3.05%	46/821	5.60%	62/821	7.55%	
Chi square test (p-value)		**0.0869**	*	0.4959		0.3032			0.8229		0.1266		**0.0309**	**
Fisher' s Exact test (p-value)		0.1035		0.7948		0.4738			1.000		0.1339		**0.0332**	**

	2001							2003						
	+/-1%		+/-2%		+/-3%			+/-1%		+/-2%		+/-3%		
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms		# of firms	% of firms	# of firms	% of firms	# of firms	% of firms	
EM/Voluntary	7/324	2.16%	14/324	4.32%	22/324	6.79%		8/283	2.83%	17/283	6.01%	23/283	8.13%	
EM/Nonvoluntary	35/767	4.56%	62/767	8.08%	78/767	10.17%		28/888	3.15%	58/888	6.53%	78/888	8.78%	
Chi square test (p-value)		**0.0595**	*	**0.0257**	**	**0.0771**	*		0.7818		0.7537		0.7319	
Fisher' s Exact test (p-value)		**0.0601**	*	**0.0267**	**	**0.0851**	*		1.000		0.8892		0.8084	

	2000 and 2001 combined							2002 and 2003 combined						
	+/-1%		+/-2%		+/-3%			+/-1%		+/-2%		+/-3%		
	# of firms	% of firms	# of firms	% of firms	# of firms	% of firms		# of firms	% of firms	# of firms	% of firms	# of firms	% of firms	
EM/Voluntary	7/394	1.78%	17/394	4.31%	25/394	6.35%		17/605	2.81%	28/605	4.63%	36/605	5.95%	
EM/Nonvoluntary	72/1685	4.27%	120/1685	7.12%	148/1685	8.78%		53/1709	3.10%	104/1709	6.09%	140/1709	8.19%	
Chi square test (p-value)		**0.0196**	**	**0.0432**	**	0.1147			0.7192		0.1841		**0.0739**	*
Fisher' s Exact test (p-value)		**0.0185**	**	**0.0425**	**	0.1285			0.7836		0.2206		**0.0749**	*

*, **, *** indicate significance at 10%, 5% and 1% level (two-tailed), respectively.

EM intervals +/-1%: ROE before non-operating income (ROE_{before}) is between 5%-6% (or –1%-0%) and ROE after non-operating income (ROE_{after}) is between 6%-7% (or 0%-1%). +/-2%: ROE_{before} is between 4%-6% (or –2%-0%) and ROE_{after} is between 6%-8% (or 0%-2%). ROE_{before} is between 3%-6% % (or –3%-0%) and ROE_{after} is between 6%-9% (or 0%-3%). *# of firms* represents the number of firms in the voluntary (nonvoluntary) category falling into each of the EM intervals.

Table 7
Regression Analysis on Earnings Management to Meet the Rights Issuance Threshold
Using Voluntary as a Proxy for Board Independence

Panel A: Dependent variable (EM3) interval ROE +/-1% of the rights issuance threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.8315	-4.0848	0.0067	-3.5465	-1.9305	0.0516	-3.7621	-3.2852	0.02756	-3.7027	-2.5662	0.0424
	(<0.0001)	(<0.0001)	(0.6629)	(<0.0001)	(0.0161)	(0.0005)	(<0.0001)	(<0.0001)	(0.0921)	(<0.0001)	(0.6787)	(0.7191)
Voluntary	-12.5423	3.4936	0.0738	-0.9058	**-7.1563** **	**-0.1195** **	0.0389	-1.6850	-0.0328	0.0135	-4.6811	-0.0887
	(0.9718)	(0.5213)	(0.6658)	(0.1020)	**(0.0207)**	**(0.0165)**	(0.9322)	(0.5499)	(0.5603)	(0.9792)	(0.8563)	(0.8567)
Leverage	-0.9661	-1.1395	0.0000	-0.4611	-0.4062	-0.0006	-0.3469	-0.3472	-0.0004	-0.2567	-0.251	-0.0011
	(0.1173)	(0.1034)	(0.9234)	(0.2840)	(0.3510)	(0.7891)	(0.3479)	(0.3463)	(0.6255)	(0.4178)	(0.4299)	(0.5996)
$Rights_t$	**1.8147** ***	**1.9106** ***	**0.0754** ***	**1.1946** ***	**1.7256** ***	**0.0489** ***	0.5321	0.6722	0.0191	-12.2065	-12.1588	-0.0197
	(<0.0001)	**(0.0001)**	**(<0.0001)**	**(0.0048)**	**(0.0005)**	**(0.0002)**	(0.3482)	(0.2768)	(0.2180)	(0.9701)	(0.9702)	(0.2192)
$Rights_{t+1}$	0.3293	-0.2947	-0.0047	-11.6400	-11.4048	-0.014	**1.6618** **	**1.5986** **	**0.0729** ***			
	(0.6766)	(0.7847)	(0.8148)	(0.9757)	(0.9760)	(0.5429)	**(0.0103)**	**(0.0144)**	**(0.0056)**			
N	904	744	744	1081	1074	1074	1107	1097	1097	1151	1138	1138
Adjusted R^2			3.14%			1.22%			0.88%			-0.80%
First Stage Results:												
Adjusted R^2 at 1st stage			1.57%			4.16%			3.02%			-0.31%
F value at 1st stage			**3.37** ***			**10.31** ***			**7.83** ***			0.12
			(0.0051)			**(<0.0001)**			**(<0.0001)**			(0.9743)
Simultaneity Test[d] results:												
Residuals			(0.1096)			**0.01067** **			0.03452			0.0885
			(0.5257)			**(0.0358)**			(0.5463)			(0.8572)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.9672			0.4296			0.6582			0.1138
			(0.3254)			(0.5122)			(0.4172)			(0.7359)

Dependent variable:
EM3 =1 if ROE_{before} is between 5%-6% and ROE_{after} is between 6%-7%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 7 (Continued)

Panel B: Dependent variable – EM3 interval ROE +/-2% of the rights issuance threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.5287	-3.4785	0.0295	-2.8584	-1.9520	0.0729	-2.9916	-2.5344	0.0487	3.3192	-1.7840	0.0892
	(<0.0001)	(<0.0001)	(0.1187)	(<0.0001)	(0.0005)	(0.0002)	(<0.0001)	(0.0001)	(0.0175)	(<0.0001)	(0.6923)	(0.5754)
Voluntary	-0.4506	-0.7150	-0.0440	-0.5142	**-3.9260** **	**-0.1365** **	-0.4211	-2.0173	-0.0625	0.0929	-6.2650	-0.2217
	(0.5455)	(0.8803)	(0.8347)	(0.1621)	**(0.0478)**	**(0.0414)**	(0.2996)	(0.3734)	(0.3752)	(0.8036)	(0.7393)	(0.7387)
Leverage	-0.1977	-0.1307	-0.0001	**-0.6727** *	**-0.6415** *	-0.0020	**-0.5552** *	**-0.5600** *	-0.0009	-0.0015	0.0066	0.0002
	(0.5149)	(0.6524)	(0.8355)	**(0.0564)**	**(0.0711)**	(0.4924)	**(0.0942)**	**(0.0919)**	(0.4559)	(0.9848)	(0.9377)	(0.9329)
$Rights_t$	**1.5796** ***	**1.6231** ***	**0.0968** ***	**1.0118** ***	**1.2995** ***	**0.0686** ***	0.4594	0.5829	0.0275	-1.1358	-1.0725	-0.0220
	(<0.0001)	**(<0.0001)**	**(<0.0001)**	**(0.0021)**	**(0.0004)**	**(0.0001)**	(0.3219)	(0.2444)	(0.1562)	(0.2657)	(0.3010)	(0.3103)
$Rights_{t+1}$	-0.4054	-1.0232	-0.0182	0.3525	0.4767	0.0155	**1.1295** *	**1.0777** *	**0.0587** *			
	(0.5911)	(0.3271)	(0.4641)	(0.6389)	(0.5280)	(0.6161)	**(0.0750)**	**(0.0909)**	**(0.0745)**			
N	904	744	744	1081	1074	1074	1107	1097	1097	1151	1138	
Adjusted R^2			3.78%			1.22%			0.19%			-0.13%
First Stage Results:												
Adjusted R^2 at 1st stage			1.57%			4.16%			3.02%			-0.31%
F value at 1st stage			**3.37** ***			**10.31** ***			**7.83** ***			0.12
			(0.0051)			**(<0.0001)**			**(<0.0001)**			(0.9743)
Simultaneity Test[d] results:												
Residuals			0.0321			**0.12256** *			0.051			0.2246
			(0.8802)			**(0.0727)**			(0.4760)			(0.7355)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.372			0.0134			0.1097			1.5932
			(0.5419)			(0.9078)			(0.7405)			(0.2069)

Dependent variable:
EM3 =1 if ROE_{before} is between 4%-6% and ROE_{after} is between 6%-8%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 7 (Continued)

Panel C: Dependent variable – EM3 interval ROE +/-3% of the rights issuance threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.3321	-3.177	0.0391	-2.7717	-2.1993	0.0853	-2.8583	-2.0511	0.0708	-3.1373	-1.8017	0.0983
	(<0.0001)	(<0.0001)	(0.0483)	(<0.0001)	(<0.0001)	(0.0002)	(<0.0001)	(0.0008)	(0.0014)	(<0.0001)	(0.6621)	(0.5763)
Voluntary	-0.5806	-2.0635	-0.1100	-0.3691	-2.4843	-0.1236	-0.4787	-3.395	-0.1189	0.1722	-5.3429	-0.2278
	(0.4347)	(0.6602)	(0.6180)	(0.2275)	(0.1176)	(0.1123)	(0.2087)	(0.1173)	(0.1195)	(0.6048)	(0.7562)	(0.7562)
Leverage	-0.2750	-0.1852	-0.0001	-0.1371	-0.1167	-0.0015	-0.4288	-0.4367	-0.0011	0.0167	0.0233	0.0012
	(0.3831)	(0.5519)	(0.7960)	(0.4379)	(0.5029)	(0.6588)	(0.1264)	(0.1193)	(0.3750)	(0.7673)	(0.7013)	(0.7042)
Rights	**1.5355** ***	**1.5090** ***	**0.1107** ***	**0.7858** ***	**0.9624** ***	**0.0627** ***	0.2840	0.5276	0.0250	-1.3482	-1.2926	-0.0300
	(<0..0001)	**(<0.0001)**	**(<0.0001)**	**(0.0086)**	**(0.0033)**	**(0.0024)**	(0.5346)	(0.2871)	(0.2328)	(0.1852)	(0.2102)	(0.2110)
$Rights_{t+1}$	-0.5421	-1.1592	-0.0223	0.3170	0.4007	0.0210	**1.2729** **	**1.1774** **	**0.0824** **			
	(0.4699)	(0.2647)	(0.3915)	(0.6083)	(0.5192)	(0.5594)	**(0.0232)**	**(0.0371)**	**(0.0209)**			
N	904	744	744	1081	1074	1074	1107	1097	1097	1151	1138	1138
Adjusted R^2			3.89%			0.60%			0.49%			-0.70%
First Stage Results:												
Adjusted R^2 at 1st stage			1.57%			4.16%			3.02%			-0.31%
F value at 1st stage			**3.37** ***			**10.31** ***			**7.83** ***			0.12
			(0.0051)			**(<0.0001)**			**(<0.0001)**			(0.9743)
Simultaneity Test[d] results:												
Residuals			0.0939			0.1093			0.1051			0.2347
			(0.6737)			(0.1691)			(0.1756)			(0.7492)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.2976			0.2148			0.1097			0.4552
			(0.5854)			(0.6430)			(0.7405)			(0.4999)

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

Dependent variable:
EM3 =1 if ROE_{before} is between 3%-6% and ROE_{after} is between 6%-9%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 7 (Continued)

[a]Logistic regression: $EM3_{it} = p_0 + p_1 * Voluntary_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$

[b]Nonlinear two stage least squares (N2SLS):

OLS 1st stage: $Voluntary_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$

Logistic 2nd stage: $EM3_{it} = p_0 + p_1 * \widehat{Voluntary}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$

[c]Two stage least squares (2SLS):

OLS 1st stage: $Voluntary_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$

OLS 2nd stage: $EM3_{it} = p_0 + p_1 * \widehat{Voluntary}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$

[c]*Simultaneity test:*

$EM3_{it} = a_0 + a_1 * \widehat{Voluntary}_{it} + a_2 * Leverage_{it} + a_3 * Rights_{it} + a_4 * Rights_{it+1} + a_5 * \hat{w}_{it} + e_{it}$

[d]*Hausman test:*

$\hat{w}_{it} = b_0 + b_1 * Boardsize_{it} + b_2 * \%Foreign_{it} + b_3 * Leverage_{it} + b_4 * Rights_{it} + b_5 * Rights_{it+1} + u_{it}$

Table 8
Regression Analysis on Earnings Management to Meet the Rights Issuance Threshold
Using Fraction as a Proxy for Board Independence

Panel A: Dependent variable (EM3) interval ROE +/-1% of the rights issuance threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.8315	-3.9827	0.0122	-3.5721	-1.6201	0.0481	-4.2346	-3.8698	0.0163	-4.7013	-5.1959	-0.0055
	(<0.0001)	(<0.0001)	(0.4287)	(<0.0001)	(0.1454)	(0.0020)	(<0.0001)	(0.0133)	(0.6194)	(0.0006)	(0.3785)	(0.9574)
Fraction	-103.3000	4.4548	-0.0019	-3.9372	**-41.3391** *	**-0.5319** **	1.9731	0.5372	0.0090	3.0442	4.6405	0.0821
	(0.9415)	(0.8892)	(0.9983)	(0.1261)	**(0.0579)**	**(0.0440)**	(0.4539)	(0.9331)	(0.9471)	(0.4440)	(0.7977)	(0.7977)
Leverage	-0.9661	-1.1143	0.0000	-0.4592	-0.4015	-0.0006	-0.3462	-0.3465	-0.0003	-0.2584	-0.2583	-0.0012
	(0.1173)	(0.1109)	(0.8956)	(0.2858)	(0.3568)	(0.7722)	(0.3491)	(0.3495)	(0.6970)	(0.4144)	(0.4125)	(0.5268)
Rights	**1.8147** ***	**1.8899** ***	**0.0746** ***	**1.2053** ***	**2.2749** ***	**0.0536** ***	0.5181	0.5220	0.0163	-12.2037	-12.2188	-0.0209
	(<0.0001)	**(0.0003)**	**(<0.0001)**	**(0.0044)**	**(0.0020)**	**(0.0002)**	(0.3605)	(0.3582)	(0.2702)	(0.9699)	(0.9700)	(0.1742)
$Rights_{t+1}$	0.3293	-0.2424	-0.0039	-11.6069	-10.7503	-0.0065	**1.656** **	**1.648** **	**0.0740** ***			
	(0.6766)	(0.8219)	(0.8453)	(0.9756)	(0.9778)	(0.7834)	**(0.0106)**	**(0.0110)**	**(0.0049)**			
N	904	744	744	1080	1074	1074	1106	1097	1097	1151	1138	1138
Adjusted R^2			3.12%			1.06%			0.49%			-0.07%
First Stage Results:												
Adjusted R^2 at 1st stage			1.46%			3.27%			17.22%			4.02%
F value at 1st stage			**3.2** ***			**8.25** ***			**46.6** ***			**12.92**
			(0.0073)			**(<0.0001)**			**(<0.0001)**			**(<0.0001)**
Simultaneity Test[d] results:												
Residuals			-0.137			**0.4733** *			0.0399			-0.0350
			(0.8780)			**(0.0769)**			(0.7892)			(0.9151)
Hausman Test[e] results:												
$N*R^2$ Statistics			1.116			2.148			1.097			0.1138
			(0.2908)			(0.1428)			(0.2949)			(0.7359)

Dependent variable:
EM3 =1 if ROE_{before} is between 4%-6% and ROE_{after} is between 6%-8%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 8 (Continued)

Panel B: Dependent variable (EM3) interval ROE +/-2% of the rights issuance threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.5739	-3.3644	0.0334	-2.8799	-1.7219	0.0735	-2.7290	-3.8877	0.0068	-4.6759	1.8117	0.2184
	(<0.0001)	(<0.0001)	(0.0800)	(<0.0001)	(0.0130)	(0.0004)	(<0.0001)	(0.0030)	(0.8868)	(<0.0001)	(0.6439)	(0.1208)
Fraction	0.7462	-12.0110	-0.4871	-2.1153	**-23.9732** *	**-0.6910** *	-1.5359	3.3593	0.1024	4.1692	-15.7754	-0.5616
	(0.8068)	(0.6717)	(0.6546)	(0.1902)	**(0.0604)**	**(0.0512)**	(0.4692)	(0.5260)	(0.5466)	(0.1637)	(0.1948)	(0.1949)
Leverage	-0.1902	-0.1262	-0.0001	**-0.6709**	**-0.6363** *	-0.0019	**-0.5576** *	**-0.5612** *	-0.0007	-0.0025	0.0044	0.0002
	(0.5294)	(0.6626)	(0.8202)	**(0.0571)**	**(0.0734)**	(0.5043)	**(0.0941)**	**(0.0921)**	(0.5472)	(0.9758)	(0.9563)	(0.9538)
Rights	**1.5892** ***	**1.5809** ***	**0.0952** ***	**1.0201** ***	**1.6389** ***	**0.0763** ***	0.4330	0.3901	0.0217	-1.1524	-1.0824	-0.0223
	(<0.0001)	**(<0.0001)**	**(<0.0001)**	**(0.0020)**	**(0.0007)**	**(<0.0001)**	(0.3492)	(0.4004)	(0.2412)	(0.2589)	(0.2893)	(0.2822)
$Rights_{t+1}$	-0.4063	-1.0183	-0.0185	0.3692	-0.8774	0.0258	**1.1549** *	**1.1266** *	**0.0602** *			
	(0.5903)	(0.3286)	(0.4548)	(0.6233)	(0.2768)	(0.4156)	**(0.0684)**	**(0.0756)**	**(0.0667)**			
N	904	744	744	1080	1074	1074	1106	1097	1097	1151	1138	1138
Adjusted R^2			3.80%			1.19%			0.15%			0.00%
First Stage Results:												
Adjusted R^2 at 1st stage			1.46%			3.27%			17.22%			4.02%
F value at 1st stage			**3.2** ***			**8.25** ***			**46.6** ***			**12.92**
			(0.0073)			**(<0.0001)**			**(<0.0001)**			**(<0.0001)**
Simultaneity Test[d] results:												
Residuals			0.5628			**0.6292** *			-0.1868			0.7135
			(0.6090)			**(0.0798)**			(0.3178)			(0.1070)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.2232			0.3222			0.5485			0.0002
			(0.6366)			(0.5703)			(0.4589)			(0.9887)

Dependent variable:
EM3 =1 if ROE_{before} is between 4%-6% and ROE_{after} is between 6%-8%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 8 (Continued)

Panel C: Dependent variable (EM3) interval ROE +/-3% of the rights issuance threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.3725	-3.0608	0.0423	-2.7874	-2.0487	0.0883	-2.7515	-4.3921	-0.0129	-4.6836	-0.5164	0.1512
	(<0.0001)	(<0.0001)	(0.0338)	(<0.0001)	(0.0001)	(0.0003)	(<0.0001)	(0.0004)	(0.7728)	(<0.0001)	(0.8890)	(0.3309)
Fraction	0.1063	-19.2008	-0.7819	-1.5300	-15.2546	-0.6717	-0.9202	5.9368	0.2114	**4.7932** *	-7.9138	-0.3312
	(0.9724)	(0.5036)	(0.4926)	(0.2526)	(0.1098)	(0.1033)	(0.6398)	(0.2367)	(0.2505)	**(0.0800)**	(0.4887)	(0.4890)
Leverage	-0.2691	-0.1823	-0.0001	-0.1356	-0.1114	-0.0014	-0.4300	-0.4378	-0.0008	0.0158	0.0189	0.0010
	(0.3935)	(0.5592)	(0.7840)	(0.4413)	(0.5224)	(0.6817)	(0.1270)	(0.1200)	(0.5295)	(0.7790)	(0.7347)	(0.7348)
Rights	**1.5419** ***	**1.4512** ***	**0.0984** ***	**0.7928** ***	**1.1787** ***	**0.0709** ***	0.2507	0.1940	-0.0139	-1.3676	-1.3188	-0.0311
	(<0.0001)	**(<0.0001)**	**(<0.0001)**	**(0.0081)**	**(0.0033)**	**(0.0018)**	(0.5825)	(0.6716)	(0.4871)	(0.1792)	(0.1953)	(0.1749)
$Rights_{t+1}$	-0.5429	-1.1660	-0.0232	0.3307	0.6520	0.0313	**1.2956** **	**1.2566** **	**0.0852** **			
	(0.4693)	(0.2609)	(0.3704)	(0.5930)	(0.3198)	(0.3962)	**(0.0206)**	**(0.0251)**	**(0.0167)**			
N	904	744	744	1080	1074	1074	1106	1097	1097	1151	1138	1138
Adjusted R^2			3.92%			0.61%			0.39%			0.00%
First Stage Results:												
Adjusted R^2 at 1st stage			1.46%			3.27%			17.22%			4.02%
F value at 1st stage			**3.2** ***			**8.25** ***			**46.6** ***			**12.92**
			(0.0073)			**(<0.0001)**			**(<0.0001)**			**(<0.0001)**
Simultaneity Test[d] results:												
Residuals			0.839			0.6094			-0.301			0.5215
			(0.4662)			(0.1449)			(0.1375)			(0.2861)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.0744			0.0000			1.2067			0.0000
			(0.7850)			(0.9956)			(0.2720)			(0.9966)

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

Dependent variable:
EM3 =1 if ROE_{before} is between 3%-6% and ROE_{after} is between 6%-9%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 8 (Continued)

[a]Logistic regression:

$$EM3_{it} = p_0 + p_1 * Fraction_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[b]Nonlinear two stage least squares (N2SLS):

OLS 1st stage:

$$Fraction_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$$

Logistic 2nd stage:

$$EM3_{it} = p_0 + p_1 * \widehat{Fraction}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[c]Two stage least squares (2SLS):

OLS 1st stage:

$$Fraction_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$$

OLS 2nd stage:

$$EM3_{it} = p_0 + p_1 * \widehat{Fraction}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[c]*Simultaneity test:*

$$EM3_{it} = a_0 + a_1 * \widehat{Fraction}_{it} + a_2 * Leverage_{it} + a_3 * Rights_{it} + a_4 * Rights_{it+1} + a_5 * \hat{w}_{it} + e_{it}$$

[d]*Hausman test:*

$$\hat{w}_{it} = b_0 + b_1 * Boardsize_{it} + b_2 * \%Foreign_{it} + b_3 * Leverage_{it} + b_4 * Rights_{it} + b_5 * Rights_{it+1} + u_{it}$$

Table 9
Regression Analysis on Earnings Management to Meet Regulatory Thresholds
Using Voluntary as a Proxy for Board Independence

Panel A: Dependent variable (EM3) interval ROE +/-1% of the rights issuance threshold or the loss threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.4768	-3.4149	0.0211	-2.7928	-2.1978	0.0634	-3.3647	-3.1036	0.0350	-3.0446	-0.1925	0.1299
	(<0.0001)	(<0.0001)	(0.2098)	(<0.0001)	(<0.0001)	(0.0008)	(<0.0001)	(<0.0001)	(0.0638)	(<0.0001)	(0.9661)	(0.3898)
Voluntary	-12.7203	0.9249	0.0046	**-0.7765** *	-2.8683	-0.0938	-0.1714	-1.0787	-0.0289	-0.0309	-11.8947	-0.3930
	(0.7909)	(0.8590)	(0.9803)	**(0.0664)**	(0.1492)	(0.1400)	(0.6801)	(0.6507)	(0.6558)	(0.9399)	(0.5303)	(0.5327)
Leverage	-0.6783	-0.8862	0.0000	**-0.5706** *	-0.5482	-0.0021	-0.2824	-0.2847	-0.0006	-0.4355	-0.4217	-0.0020
	(0.1625)	(0.1214)	(0.8453)	**(0.0968)**	(0.1139)	(0.4447)	(0.3403)	(0.3370)	(0.5920)	(0.1247)	(0.1379)	(0.4502)
Rights	**1.4778** ***	**1.3867** ***	**0.0701** ***	0.5607	**0.7402** *	**0.0342** **	0.211	0.2785	0.0105	-13.2773	-13.1538	-0.0308
	(0.0001)	**(0.0008)**	**(<0.0001)**	(0.1269)	**(0.0656)**	**(0.0420)**	(0.7020)	(0.6353)	(0.5544)	(0.9746)	(0.9748)	(0.1348)
$Rights_{t+1}$	-0.1124	-0.773	-0.0131	-12.8738	-12.832	-0.0327	**1.3084** **	**1.2714** **	**0.0654** **			
	(0.8834)	(0.4632)	(0.5546)	(0.9793)	(0.9797)	(0.2661)	**(0.0397)**	**(0.0471)**	**(0.0308)**			
N	904	744	744	1081	1074	1074	1107	1097	1097	1151	1138	1138
Adjusted R^2			2.33%			0.37%			0.14%			0.11%
First Stage Results:												
Adjusted R^2 at 1st stage			1.57%			4.16%			3.02%			-0.31%
F value at 1st stage			**3.37** ***			**10.31** ***			**7.83** ***			0.12
			(0.0051)			**(<0.0001)**			**(<0.0001)**			(0.9743)
Simultaneity Test[d] results:												
Residuals			-0.0462			0.0728			0.0249			0.3911
			(0.8070)			(0.2614)			(0.7055)			(0.5349)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.9672			2.0406			0.0006			1.1380
			(0.3254)			(0.1531)			(0.9799)			(0.2861)

Dependent variable:
EM3 =1 if ROE_{before} is between 5%-6% and ROE_{after} is between 6%-7%, or ROE_{before} is between -1%-0% and ROE_{after} is between 0%-1%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 9 (Continued)

Panel B: Dependent variable (EM3) interval ROE +/-2% of the rights issuance threshold or the loss threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-3.0389	-3.3349	0.0288	-2.3303	-1.9141	0.1002	-2.6403	-2.1291	0.0764	-2.5751	-0.5944	0.2806
	(<0.0001)	(<0.0001)	(0.1649)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0017)	(<0.0001)	(0.8526)	(0.1848)
Voluntary	-0.3262	2.3852	0.122	**-0.6684** **	-2.1145	-0.1263	-0.5795	-2.3344	-0.1013	-0.0362	-13.3762	-0.8871
	(0.5951)	(0.5456)	(0.5975)	**(0.0293)**	(0.1429)	(0.1358)	(0.1054)	(0.2225)	(0.2252)	(0.8996)	(0.3177)	(0.3145)
Leverage	-0.0736	-0.1154	-0.0001	-0.3522	-0.3313	-0.0032	(0.3349)	-0.3406	-0.0012	-0.0447	-0.0222	-0.0004
	(0.6521)	(0.6149)	(0.8371)	(0.1101)	(0.1337)	(0.3796)	(0.1540)	(0.1475)	(0.3818)	(0.6386)	(0.8145)	(0.9214)
Rights	**1.1521** ***	**1.3545** ***	**0.0961** ***	**0.5831** **	**0.7054** **	**0.0548** **	0.0870	0.2281	0.0143	**-1.8266** *	-1.6642	-0.0467
	(<0.0001)	**(<0.0001)**	**(<0.0001)**	**(0.0412)**	**(0.0227)**	**(0.0137)**	(0.8468)	(0.6339)	(0.5332)	**(0.0716)**	(0.1037)	(0.1050)
Rights2	-0.5098	-0.7145	-0.0209	-0.3378	-0.2796	-0.0144	0.7064	0.6433	0.0422			
	(0.4086)	(0.3430)	(0.4424)	(0.6475)	(0.7055)	(0.7106)	(0.2586)	(0.3055)	(0.2785)			
N	904	744	744	1081	1074	1074	1107	1097	1097	1151	1138	1138
Adjusted R^2			2.97%			0.43%			-0.05%			0.19%
First Stage Results:												
Adjusted R^2 at 1st stage			1.57%			4.16%			3.02%			-0.31%
F value at 1st stage			**3.37** ***			**10.31** ***			**7.83** ***			0.12
			(0.0051)			**(<0.0001)**			**(<0.0001)**			(0.9743)
Simultaneity Test[d] results:												
Residuals			-0.129			0.0918			0.0798			0.8821
			(0.5809)			(0.2834)			(0.3464)			(0.3175)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.1488			0.9666			0.1097			0.1138
			(0.6997)			(0.3255)			(0.7405)			(0.7359)

Dependent variable:
EM3 =1 if ROE_{before} is between 4%-6% and ROE_{after} is between 6%-8%, or ROE_{before} is between -2%-0% and ROE_{after} is between 0%-2%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 9 (Continued)

Panel C: Dependent variable (EM3) interval ROE +/-3% of the rights issuance threshold or the loss threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	-2.7238	-3.0121	0.0388	-2.169	-1.9734	0.1132	-2.4145	-1.5498	0.1188	-2.309	0.0841	0.2939
	(<0.0001)	(<0.0001)	(0.0826)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0016)	(<0.0001)	(<0.0001)	(0.9766)	(0.2288)
Voluntary	-0.5200	2.8699	0.1739	**-0.4320** *	-1.0872	-0.0879	**-0.6921** **	**-3.6614** **	**-0.1969** **	-0.0444	-10.92	-0.8582
	(0.3941)	(0.4259)	(0.4850)	**(0.0879)**	(0.3629)	(0.3579)	**(0.0330)**	**(0.0368)**	**(0.0367)**	(0.8587)	(0.4006)	(0.3993)
Leverage	-0.1163	-0.1662	-0.0001	-0.1315	-0.1205	-0.0032	-0.1618	-0.2330	-0.0016	0.0174	0.0325	0.0031
	(0.5122)	(0.4809)	(0.7929)	(0.3297)	(0.3639)	(0.4408)	(0.3352)	(0.2064)	(0.2822)	(0.6686)	(0.4575)	(0.4680)
Rights	**0.9721** ***	**1.0995** ***	**0.0921** ***	0.4262	**0.4787** ***	**0.0453** *	-0.1843	0.0662	0.0059	**-1.4130** *	**-1.292** *	**-0.0569**
	(0.0003)	**(0.0002)**	**(<0.0001)**	(0.1037)	**(0.0878)**	**(0.0735)**	(0.6778)	(0.8878)	(0.8198)	**(0.0510)**	**(0.0782)**	**(0.0873)**
Rights2	-0.7693	-1.0231	-0.0352	-0.2737	-0.24	-0.0168	0.7343	0.6419	0.0561			
	(0.2078)	(0.1694)	(0.2307)	(0.6538)	(0.6948)	(0.7043)	(0.1832)	(0.2474)	(0.2022)			
N	904	744	744	1081	1074	1074	1107	1097	1097	1151	1138	1138
Adjusted R^2			2.51%			0.07%			0.28%			0.20%
First Stage Results:												
Adjusted R^2 at 1st stage			1.57%			4.16%			3.02%			-0.31%
F value at 1st stage			**3.37** ***			**10.31** ***			**7.83** ***			0.1200
			(0.0051)			**(<0.0001)**			**(<0.0001)**			(0.9743)
Simultaneity Test[d] results:												
Residuals			-0.1938			0.0575			**0.1674** *			0.8518
			(0.4416)			(0.5555)			**(0.0800)**			(0.4031)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.0078			0.1074			0.0012			0.3414
			(0.9298)			(0.7431)			(0.9726)			(0.5590)

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

Dependent variable:
EM3 =1 if ROE_{before} is between 3%-6% and ROE_{after} is between 6%-9%, or ROE_{before} is between -3%-0% and ROE_{after} is between 0%-3%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 9 (Continued)

[a]Logistic regression:

$$EM3_{it} = p_0 + p_1 * Voluntary_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[b]Nonlinear two stage least squares (N2SLS):

OLS 1st stage:

$$Voluntary_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$$

Logistic 2nd stage:

$$EM3_{it} = p_0 + p_1 * \widehat{Voluntary}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[c]Two stage least squares (2SLS):

OLS 1st stage:

$$Voluntary_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$$

OLS 2nd stage:

$$EM3_{it} = p_0 + p_1 * \widehat{Voluntary}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[c]*Simultaneity test:*

$$EM3_{it} = a_0 + a_1 * \widehat{Voluntary}_{it} + a_2 * Leverage_{it} + a_3 * Rights_{it} + a_4 * Rights_{it+1} + a_5 * \hat{w}_{it} + e_{it}$$

[d]*Hausman test:*

$$\hat{w}_{it} = b_0 + b_1 * Boardsize_{it} + b_2 * \%Foreign_{it} + b_3 * Leverage_{it} + b_4 * Rights_{it} + b_5 * Rights_{it+1} + u_{it}$$

Table 10
Regression Analysis on Earnings Management to Meet Regulatory Thresholds
Using Fraction as a Proxy for Board Independence

Panel A: Dependent variable (EM3) interval ROE +/-1% of the rights issuance threshold or the loss threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	**-3.4768** ***	**-3.2126** ***	0.0269	**-2.8582** ***	**-2.4749** ***	**0.0539** ***	**-3.7228** ***	**-3.9316** ***	0.0131	**-2.9925** ***	-3.9118	0.009
	(<0.0001)	**(<0.0001)**	(0.1123)	**(<0.0001)**	**(<0.0001)**	**(0.0066)**	**(<0.0001)**	**(0.0046)**	(0.7286)	**(0.0018)**	(0.3921)	(0.9462)
Fraction	-105.7	-9.7193	-0.374	-2.1604	-8.9474	-0.2952	1.2893	2.2243	0.0576	-0.1812	2.6853	0.0823
	(0.9387)	(0.7608)	(0.6993)	(0.2198)	(0.3969)	(0.3806)	(0.5756)	(0.6937)	(0.7120)	(0.9494)	(0.8483)	(0.8413)
Leverage	-0.6783	-0.8757	-0.0001	**-0.5694** *	-0.5538	-0.0023	-0.2813	-0.2856	-0.0005	-0.4363	-0.4369	-0.0026
	(0.1625)	(0.1262)	(0.8192)	**(0.0981)**	(0.1094)	(0.4052)	(0.3428)	(0.3366)	(0.6402)	(0.1238)	(0.1224)	(0.3056)
Rights	**1.4778** ***	**1.3347** ***	**0.0684** ***	0.5517	0.7489	**0.0344** *	0.1859	0.1704	0.0078	-13.278	-13.2847	**-0.0349**
	(0.0001)	**(0.0020)**	**(<0.0001)**	(0.1310)	(0.1115)	**(0.0631)**	(0.7357)	(0.7575)	(0.6469)	(0.9746)	(0.9746)	**(0.0765)**
$Rights_{t+1}$	-0.1124	-0.7503	-0.0129	-12.8818	-12.7454	-0.0294	**1.3120** **	**1.2957** **	**0.0661** **			
	(0.8834)	(0.4757)	(0.5587)	(0.9794)	(0.9800)	(0.3304)	**(0.0391)**	**(0.0418)**	**(0.0289)**			
N	904	744	744	1080	1074	1074	1106	1097	1097	1151	1138	1138
Adjusted R^2			2.35%			0.24%			0.13%			0.08%
First Stage Results:												
Adjusted R^2 at 1st stage			1.46%			3.27%			17.22%			4.02%
F value at 1st stage			**3.2** ***			**8.25** ***			**46.6** ***			**12.92**
			(0.0073)			**(<0.0001)**			**(<0.0001)**			**(<0.0001)**
Simultaneity Test[d] results:												
Residuals			0.2087			0.2330			-0.0264			-0.0952
			(0.8309)			(0.4947)			(0.8782)			(0.8208)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.8184			**3.4368** *			0.1097			0.4552
			(0.3656)			**(0.0638)**			(0.7405)			(0.4999)

Dependent variable:
EM3 =1 if ROE_{before} is between 5%-6% and ROE_{after} is between 6%-7%, or ROE_{before} is between -1%-0% and ROE_{after} is between 0%-1%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 10 (Continued)

Panel B: Dependent variable (EM3) interval ROE +/-2% of the rights issuance threshold or the loss threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	**-3.0817** ***	**-3.2789** ***	0.0325	**-2.3824** ***	**-2.0452** ***	**0.0915** ***	**-2.4471** ***	**-4.161** ***	-0.0111	**-3.0114** ***	-2.8886	0.0517
	(<0.0001)	**(<0.0001)**	(0.1195)	**(<0.0001)**	**(<0.0001)**	**(0.0005)**	**(<0.0001)**	**(0.0003)**	(0.8189)	**(<0.0001)**	(0.3687)	(0.7823)
Fraction	1.142	8.3657	0.3706	-2.0844	-8.04	-0.4673	-1.3774	5.7954	0.248	1.3125	0.8724	0.0502
	(0.6490)	(0.6906)	(0.7562)	(0.1111)	(0.3060)	(0.2936)	(0.4436)	(0.2058)	(0.2176)	(0.5302)	(0.9297)	(0.9305)
Leverage	-0.0695	-0.1125	-0.0001	-0.3498	-0.3339	-0.0034	-0.3345	-0.3401	-0.0009	-0.0457	-0.0407	-0.0016
	(0.6565)	(0.6199)	(0.8236)	(0.1128)	(0.1309)	(0.3566)	(0.1565)	(0.1486)	(0.4957)	(0.6330)	(0.6601)	(0.6484)
Rights	**1.1619** ***	**1.366** ***	**0.0965** ***	**0.5792** **	**0.7509** **	**0.0572** **	0.0493	-0.0060	0.0044	**-1.8329** *	**-1.7981**	**-0.0556**
	(<0.0001)	**(<0.0001)**	**(<0.0001)**	**(0.0425)**	**(0.0369)**	**(0.0195)**	(0.9127)	(0.9894)	(0.8398)	**(0.0707)**	**(0.0764)**	**(0.0440)**
$Rights_{t+1}$	-0.5127	-0.6881	-0.0198	-0.3263	-0.1753	-0.0085	0.7345	0.6923	0.0443			
	(0.4060)	(0.3599)	(0.4670)	(0.6585)	(0.8170)	(0.8320)	(0.2394)	(0.2681)	(0.2550)			
N	904	744	744	1080	1074	1074	1106	1097	1097	1151	1138	1138
Adjusted R^2			2.95%			0.33%			-0.05%			0.10%
First Stage Results:												
Adjusted R^2 at 1st stage			1.46%			3.27%			17.22%			4.02%
F value at 1st stage			**3.2** ***			**8.25** ***			**46.6** ***			**12.92**
			(0.0073)			**(<0.0001)**			**(<0.0001)**			**(<0.0001)**
Simultaneity Test[d] results:												
Residuals			-0.2305			0.3596			**-0.3794** *			0.0169
			(0.8484)			(0.4249)			**(0.0867)**			(0.9771)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.372			2.148			0.1097			1.138
			(0.5419)			(0.1428)			(0.7405)			(0.2861)

Dependent variable:
EM3 =1 if ROE_{before} is between 4%-6% and ROE_{after} is between 6%-8%, or ROE_{before} is between -2%-0% and ROE_{after} is between 0%-2%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 10 (Continued)

Panel C: Dependent variable (EM3) interval ROE +/-3% of the rights issuance threshold or the loss threshold

	2000			2001			2002			2003		
	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]	Logistic[a]	N2SLS[b]	2SLS[c]
Intercept	**-2.7618** ***	**-2.9924** ***	**0.0406** *	**-2.193** ***	**-2.011** ***	**0.1098** ***	**-2.3062** ***	**-4.3591** ***	-0.0341	**-2.339** ***	-3.3974	0.007
	(<0.0001)	**(<0.0001)**	**(0.0718)**	**(<0.0001)**	**(0.0001)**	**(0.0002)**	**(<0.0001)**	**(<0.0001)**	(0.5364)	**(<0.0001)**	(0.2280)	(0.9740)
Fraction	0.1857	13.3183	0.7728	-1.6552	-4.7852	-0.3770	-0.9992	**7.5487** *	**0.4102** *	0.0602	3.2822	0.2501
	(0.9413)	(0.4697)	(0.5482)	(0.1370)	(0.4641)	(0.4567)	(0.5313)	**(0.0671)**	**(0.0708)**	(0.9726)	(0.7047)	(0.7066)
Leverage	-0.1111	-0.1645	-0.0001	-0.1298	-0.1206	-0.0032	-0.2208	-0.2298	-0.0011	0.0174	0.0174	0.0018
	(0.5240)	(0.4822)	(0.7872)	(0.3331)	(0.3634)	(0.4341)	(0.2330)	(0.2146)	(0.4652)	(0.6689)	(0.6687)	(0.6516)
Rights	**-0.9779** ***	**1.1282** ***	**0.0937** ***	**-0.4312** *	0.5192	**0.0483** *	-0.2297	-0.2934	-0.0129	**-1.4141** *	**1.4016**	**-0.0661**
	(0.0002)	**(0.0003)**	**(<0.0001)**	**(0.1000)**	(0.1037)	**(0.0827)**	(0.6039)	(0.5087)	(0.6034)	**(0.0508)**	**(0.0531)**	**(0.0379)**
$Rights_{t+1}$	-0.7718	-0.9947	-0.0336	-0.2601	-0.1729	-0.0116	-0.7755	0.7257	0.0604			
	(0.2063)	(0.1806)	(0.2508)	(0.6701)	(0.7825)	(0.7989)	(0.1586)	(0.1884)	(0.1687)			
N	904	744	744	1080	1074	1074	1106	1097	1097	1151	1138	1138
Adjusted R^2			2.49%			0.04%			0.18%			0.15%
First Stage Results:												
Adjusted R^2 at 1st stage			1.46%			3.27%			17.22%			4.02%
F value at 1st stage			**3.2** ***			**8.25** ***			**46.6** ***			**12.92**
			(0.0073)			**(<0.0001)**			**(<0.0001)**			**(<0.0001)**
Simultaneity Test[d] results:												
Residuals			-0.6941			0.2601			**-0.5709** **			-0.2694
			(0.5935)			(0.6123)			**(0.0224)**			(0.6917)
Hausman Test[e] results:												
$N*R^2$ Statistics			0.0744			0.4296			1.097			0.0744
			(0.7850)			(0.5122)			(0.2949)			(0.7850)

*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

Dependent variable:
EM3 =1 if ROE_{before} is between 3%-6% and ROE_{after} is between 6%-9%, or ROE_{before} is between -3%-0% and ROE_{after} is between 0%-3%, otherwise EM3=0. All other variables are defined as in Table 6.

Table 10 (Continued)

[a]Logistic regression:

$$EM3_{it} = p_0 + p_1 * Fraction_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[b]Nonlinear two stage least squares (N2SLS):

OLS 1st stage:

$$Fraction_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$$

Logistic 2nd stage:

$$EM3_{it} = p_0 + p_1 * \widehat{Fraction}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[c]Two stage least squares (2SLS):

OLS 1st stage:

$$Fraction_{it} = p_0 + p_1 * EM3_{it} + p_2 * Boardsize_{it} + p_3 * \%Foreign_{it} + p_4 * Rights_{it} + p_5 * Rights_{it+1} + w_{it}$$

OLS 2nd stage:

$$EM3_{it} = p_0 + p_1 * \widehat{Fraction}_{it} + p_2 * Leverage_{it} + p_3 * Rights_{it} + p_4 * Rights_{it+1} + w_{it}$$

[c]*Simultaneity test:*

$$EM3_{it} = a_0 + a_1 * \widehat{Fraction}_{it} + a_2 * Leverage_{it} + a_3 * Rights_{it} + a_4 * Rights_{it+1} + a_5 * \hat{w}_{it} + e_{it}$$

[d]*Hausman test:*

$$\hat{w}_{it} = b_0 + b_1 * Boardsize_{it} + b_2 * \%Foreign_{it} + b_3 * Leverage_{it} + b_4 * Rights_{it} + b_5 * Rights_{it+1} + u_{it}$$

Table 11
Chow Tests on the Change in Discretionary Accruals from 2001 to 2002

Panel A: Change in |DA| for all firms from 2001 to 2002

	2001		2002		Pooled 2001 and 2002	
	OLS		OLS		OLS	
Dependent Variable	|Discretionary Accruals|		|Discretionary Accruals|		|Discretionary Accruals|	
Intercept	**0.0480**	***	**0.0603**	***	**0.0539**	***
	(<0.0001)		**(<0.0001)**		**(<0.0001)**	
Leverage *Y01	**0.0055**	***			**0..0055**	***
	(0.0002)				**(0.0001)**	
Sales Growth *Y01	**0.0192**	***			**0.0190**	***
	(<0.0001)				**(<0.0001)**	
Age *Y01	0.0016				0.0010	
	(0.1158)				(0.2249)	
Leverage *Y02			-0.0002		-0.0002	
			(0.6457)		(0.6660)	
Sales Growth *Y02			**0.0106**	*	**0.0112**	**
			(0.0433)		**(0.0347)**	
Age *Y02			0.0009		**0.0015**	**
			(0.3268)		**(0.0313)**	
N	519		576		1095	
Adjusted R^2	6.00%		0.39%		3.14%	
ESS	3.5006		3.5828		7.0907	

F statistics (Chow test)
1.1341
(0.2871)

OLS regression:

$$|DA_{it}| = j_0 + j_1 * Leverage_{it} * Y01 + j_2 * SalesGrowth_{it} * Y01 + j_3 * Age_{it} * Y01 + j_4 * Leverage_{it} * Y02 + j_5 * SalesGrowth_{it} * Y02 + j_6 * Age_{it} * Y02 + h_{it}$$

Y01 equals 1 if year is 2001 and equals to 0 otherwise; Y02 equals 1 if year is 2002 and equals 0 otherwise. All other variables are defined as in Table 2.

Table 11 (Continued)

Panel B: Change in |DA| for Firms that begin to adopt independent directors in 2002

	2001		2002		Pooled 2001 and 2002	
	2SLS		2SLS		2SLS	
Dependent Variable	|Discretionary Accruals|		|Discretionary Accruals|		|Discretionary Accruals|	
Intercept	**0.0781**	***	**0.0800**	***	**0.07884**	***
	(<0.0001)		**(<0.0001)**		**(<0.0001)**	
$Voluntary_{pre}$ *Y01	**-0.1113**	***			**-0.1127**	***
	(0.0007)				**(<0.0001)**	
Leverage *Y01	**0.0059**	***			**0.0059**	***
	(<0.0001)				**(<0.0001)**	
Sales Growth *Y01	**0.024**	***			**0.024**	***
	(<0.0001)				**(<0.0001)**	
Age *Y01	**0.0019**	*			**0.0018**	*
	(0.0650)				**(0.0507)**	
$Voluntary_{pre}$ * Y02			-0.0638		**-0.06095**	*
			(0.1423)		**(0.0663)**	
Leverage *Y02			-0.0002		-0.0002	
			(0.6983)		(0.7011)	
Sales Growth *Y02			**0.0099**	*	**0.0100**	*
			(0.0580)		**(0.0580)**	
Age *Y02			0.0010		0.0010	
			(0.2881)		(0.2707)	
N	517		571		1088	
Adjusted R^2	7.94%		0.53%		4.31%	
ESS	3.4154		3.5452		6.9609	

F statistics (Chow test)
0.0562
(0.8127)

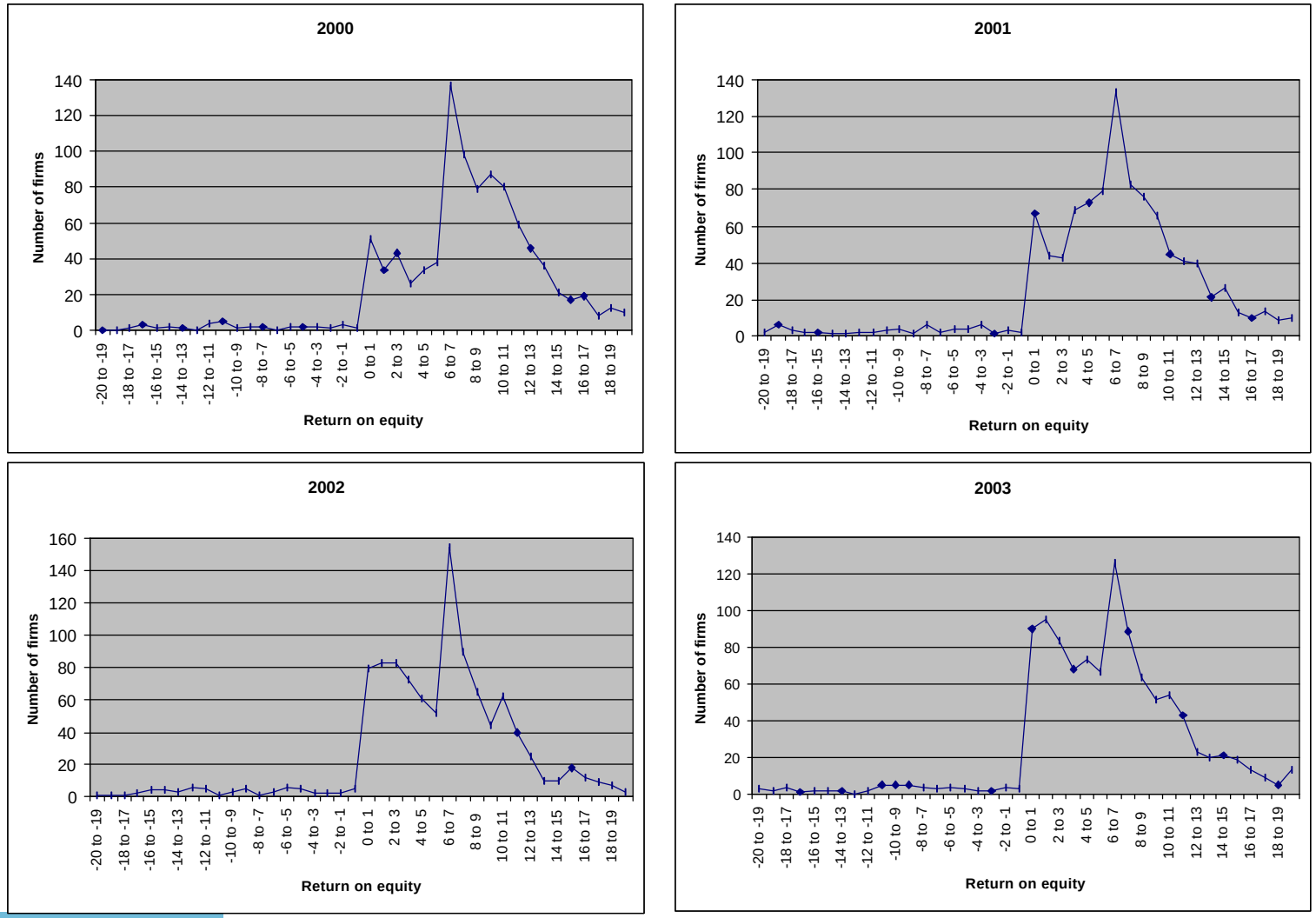
*, **, *** indicate significance at the 10%, 5% 1% level (two-tailed), respectively.

OLS regression:

$$|DA_{it}| = j_0 + j_1 * Voluntary_{pre_{it}} * Y01 + j_2 * Leverage_{it} * Y01 + j_3 * SalesGrowth_{it} * Y01$$
$$+ j_4 * Age_{it} * Y01 + j_5 * Voluntary_{pre_{it}} * Y02 + j_6 * Leverage_{it} * Y02$$
$$+ j_7 * SalesGrowth_{it} * Y02 + j_8 * Age_{it} * Y02 + h_{it}$$

All variables are defined as in Table 2.

Figure 1
Return on Equity Distribution from 2000 to 2003



VITA

Liona Hoi Yan Lai

School of Administrative Studies, Atkinson Faculty of Liberal and Professional Studies
York University, 4700 Keele Street, Toronto, Ontario M3J 1P3
Email Address: liona@yorku.ca

Current Position

- Assistant Professor, School of Administrative Studies, Atkinson Faculty of Liberal and Professional Studies, York University.

Education

- Texas A&M University, Ph.D. in Accounting, August 2005
- University of Waterloo, Canada, B.A. in Accounting - Honors Chartered Accountancy Studies Co-operative Program (Philosophy Minor), May 1997

Professional Qualification

- Canadian Chartered Accountant, 1999
- Passed C.P.A. exam (Montana), State Honors, 1997

Working Paper

- "Changes in Analysts Recommendations and the differential trading responses of small and large investors." (Joint with L. Rees and M. Wilkins)

Academic Experience

- Teaching assistant – management and cost accounting, summer 2003.
- Research assistant for Professor Lynn Rees 2003.

Professional Work Experience

- Senior Associate, Global Risk Management Solutions, Boston, Massachusetts, PriceWaterhouseCoopers L.L.P. 1998-1999
- Senior Accountant, Audit Service, KPMG, Canada 1997-1998
- Staff Accountant, Audit Service, KPMG, Canada 1993-1997 (Internship)

Awards

- Dean's Distinguish Teaching Award to a graduate student, Texas A&M University, 2004
- Catherine E.B. Hanna Accounting Scholarship, University of Waterloo, 1992
- Wilfred Laurier Centennial Scholarship, 1992