

Role Of Underwriters In Restraining Earnings Management In Initial Public Offerings

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ABSTRACT

We investigate the relationship between underwriter reputation and earnings management of IPO firms over the period of 1991-2005. We find that IPO firms engage in less earnings management if they are underwritten by prestigious investment bankers. Furthermore, the role of prestigious underwriters in restraining earnings management of IPO issuers do not change during the Internet Bubble period or after the passage of the Sarbanes-Oxley Act (SOX). The findings support the certification role of underwriters in the IPO process. We also document that firms going public in the post-SOX period engage in less earnings management compared to firms going public in the pre-SOX period. Further findings suggest that the changing objectives of venture capitalists may explain the reduction in the level of earnings management of IPO firms following the passage of SOX.

Keywords: Earnings Management; Underwriter Reputation; IPO Firms; Internet Bubble; Sarbanes-Oxley Act

1. INTRODUCTION

Earnings management of initial public offering issuers is a great concern to investors due to their information disadvantage regarding the quality of the issuers. Investors rely on information, especially reported earnings, presented in the offering prospectus to assess the quality and value of an initial public offering (IPO) (Brau and Fawcett, 2006). Since IPO issuers' earnings and their peers' price-earnings ratios are used to determine the offer price, issuers could be motivated to manipulate their reported and projected earnings to boost the offer prices for larger proceeds. Empirical evidence shows that earnings management of IPO firms does not align with investors' interests. IPO firms that engage in income-increasing earnings management through opportunistic accrual choices underperform their peers in both post-issue earnings performance and post-issue stock returns (Teoh et al., 1998a; Teoh et al., 1998b; DuCharme et al., 2001). DuCharme et al. (2004) report that the incidence and the settlement of shareholder lawsuits involving stock offerings increase with the level of discretionary accruals around the issuance.¹ Thus, it is in the interest of less informed investors to seek assistance in detecting the earnings management and hence the quality and value of IPO issuers.

Investment bankers, who act as underwriters, and venture capitalists (VCs), who act as private equity investors, of IPO firms could play important roles in restraining earnings management. However, existing empirical findings on their roles in restraining earnings management of IPO issuers are mixed. Aharony et al. (1993) report a weak inverse relation between underwriter reputation and earnings management, while Morsfield and Tan (2006) find a significant inverse relation. Besides, Morsfield and Tan find a significant role of VCs in restraining earnings management, but Lee and Masulis (2011) do not report a similarly significant role for venture capitalists as a group. However, they find that a significantly lower level of earnings management among IPOs that are underwritten by

¹ Various terms, such as discretionary accruals, abnormal accruals, and unexpected accruals, are used in the literature to describe earnings management through managers' accrual choices. We use discretionary accruals throughout the paper for consistency.

prestigious investment bankers and are backed by reputable venture capitalists. Hence, the literature calls for further research on the roles of underwriters and venture capitalists in restraining earnings management of IPO issuers.

In the past two decades, the IPO market has gone through profound changes due to the Internet bubble in late 1990s and the passage of the Sarbanes-Oxley Act (SOX) in 2002. Ritter and Welch (2002) report that issuing volume, average first-day returns, and long-run underperformance of IPO issuing firms peaked during the Internet bubble period, and then sharply declined following the burst of the bubble. Elstrom (2001), Loughran and Ritter (2004), and Agrawal and Cooper (2010) suggest that investment bankers lower their standards by taking public an increasing number of low quality IPO issuers for enormous fees. This results in the unusual volume and underpricing of IPOs during the Internet bubble period. These findings suggest that the changing practice of underwriters may undermine their role in monitoring earnings management of IPO firms during the Internet boom.

In contrast, the passage of the Sarbanes-Oxley Act has been documented to reduce earnings management of firms. Cohen et al. (2008) document that accrual-based earnings management increased steadily from 1987 until the passage of the SOX in 2002, followed by a significant decline afterwards. Iliev (2010) finds that SOX led to conservative reported earnings. However, there is a void in the literature concerning possible changes in the role of underwriters in restraining earnings management of IPO firms post SOX.

In this study, we examine the influence of underwriter reputation in earnings management of IPO issuers over an extended period of 1991 to 2005. More importantly, we investigate whether the effectiveness of reputable underwriters in restraining earnings management has changed during the Internet boom and following the passage of SOX. In our analysis, we control for and examine the role of venture capitalists in restraining earnings management of IPO issuers, especially in the Internet bubble period and in the post-SOX era.

Consistent with Morsfield and Tan (2006) and Lee and Masulis (2011), we also document a significantly negative relation between underwriter reputation and earnings management of IPO firms, after controlling for known factors that impact earnings management. The finding that firms taken public by prestigious underwriters manage earnings less aggressively than their peers suggests a unique role of underwriters in mitigating earnings management in IPOs, and supports the notion that prestigious underwriters serve as a certifying agent for the quality of the issuing firm, i.e., the underwriter certification hypothesis. Consistent with Lee and Masulis (2011), we do not find a significant role for venture capitalists as a group in restraining earnings management of IPO issuers.

Second, we do not find significant changes in the impact of prestigious underwriters on earnings management of IPO issuers during the Internet bubble period or in the post-SOX era. The results suggest that prestigious underwrites have played a consistent role in restraining earnings management of IPO issuers, despite material changes in the market and regulatory environments. In contrast, we find that VC backed IPO issuers engaged in more earnings management during the Internet bubble period but engaged in less earnings management post SOX. The results suggest that VCs may be driven by their motive to realize windfall investment returns during the Internet boom, but strengthen their monitoring role after the passage of SOX.

In addition, we find that IPO issuers pursue a significantly lower level of earnings management after the passage of SOX. The finding is consistent with Cohen et al. (2008), though their sample is not limited to IPO firms. However, we do not find significant difference in earnings management by IPO firms between the Internet bubble period and non-bubble period.

Our study contributes to the literature in several folds: first, our results show that underwriter reputation, in contrast to VC backing, plays a consistent and effective role in restraining earnings management of IPO firms. Second, we thoroughly investigate possible changes in the roles of underwriters and venture capitalists in restraining earnings management of IPO firms over time. Finally, we provide new evidence on the earnings management of IPO firms during the Internet bubble period and after the passage of Sarbanes-Oxley Act.

In the next section, we review the literature on the certification role of underwriters. Section 3 constructs the measures of earnings management and describes the sample selection. Section 4 develops models that test the

relation between underwriter reputation and earnings management and presents the empirical results. Finally, Section 5 summarizes the findings and concludes the study.

2. THE CERTIFICATION ROLE OF UNDERWRITERS

Reputable underwriters help mitigate the information asymmetry problem by serving as the credible agent certifying the quality of IPO issuers. Previous research shows that prestigious underwriters are more effective in mitigating the adverse impact of information asymmetry in the equity market, resulting in better post-issue stock price performance for high quality IPO issuers (Chemmanur and Fulghieri, 1994; Carter et al., 1998; McLaughlin et al., 2000). From the issuer's perspective, McLaughlin et al. (2000) suggest that hiring a less reputable underwriter conveys a bad signal to the market that is associated with greater underpricing. As such, quality IPO issuers with less incentive for earnings management select prestigious underwriters to convey a favorable signal to the market. Hence, we expect an inverse relation between underwriter reputation and earnings management of IPO firms.

Besides, underwriters, who are repeated players in the competitive underwriting market, concern about the value of their reputation capital (Carter and Manaster, 1990; Chemmanur and Fulghieri, 1994). If they lower their standards by taking low quality IPO issuers with aggressive earnings management, they may suffer litigation and reputation costs of being co-defendants in class action lawsuits from disgruntled investors if the malpractice is unraveled afterwards (DuCharme et al., 2004). Class action lawsuits will damage underwriters' reputation and hurt their underwriting businesses and firm values in the long-run. In particular, prestigious underwriters generally invest substantial efforts to build up their reputation by successfully taking quality issuers public over time. Hence, they incur higher reputation costs for underwriting a lower quality IPO to gain short-term benefits than their less reputable peers. Consequently, prestigious underwriters would have greater incentives to discern earnings management of low quality IPO firms (Logue et al., 2002). Moreover, prestigious underwriters are inclined to work with high-quality issuers to reduce potential damage to their reputation. Chemmanur and Fulghieri (1994) document that prestigious underwriters prefer to underwrite low risk firms. Fang (2005) shows that investment banks' underwriting decisions reflect reputation concerns and thus signal issue quality. Thus, an inverse relation between earnings management and underwriter reputation in the IPOs is expected.

In the underwriting process, investment bankers must perform "due diligence" investigation that closely examines the completeness and accuracy of information about the issuer's financial conditions and prospects. Hansen and Torregrosa (1992) suggest that underwriters' monitoring can reduce agency problems and improve the performance of issuing firms. In particular, prestigious underwriters possess better resources and superior professional expertise and experience, thereby more likely to perform effective monitoring function than their less reputable peers. As such, prestigious underwriters are more capable to restrain earnings management of IPO issuers. On the other hand, IPO issuers that heavily manage earnings are reluctant to hire prestigious underwriters to avoid revealing their true quality. The monitoring function of underwriters thus predicts a negative relation between underwriter reputation and earnings management of IPO firms as well.

3. DATA AND SAMPLE

3.1 Measures of Earnings Management and Underwriter Reputation

In this study, we use the performance-matched discretionary accruals² to measure earnings management. As pointed out by Kothari et al. (2005), performance-matched discretionary accruals are more reliable than traditional measures of discretionary accruals because they mitigate the bias in the estimation of treatment effects, which is induced by non-random samples. As in Kothari et al. (2005), we estimate discretionary accruals with the modified Jones model (Dechow et al., 1995). We first compute total accruals (*TACC*) of IPO firms in the fiscal year

² Reported earnings are composed of cash flows from operations and accruals. Because it is more difficult to manipulate cash flows, managers tend to manage accruals for earnings management. Accruals are further divided into two types - (i) nondiscretionary accruals that vary with sales and depreciation and hence offer limited room for manipulation in their calculation; and (ii) discretionary accruals that are the main source of earnings management.

of going public as follows:³

$$TACC_{it} = (NI_{it} - OCF_{it}) / TA_{it-1}, \tag{1}$$

where $TACC_{it}$ = total accruals for firm i in IPO year t ;
 NI_{it} = net income for firm i in IPO year t ;
 OCF_{it} = operating cash flow for firm i in IPO year t ;
 TA_{it-1} = total assets for firm i in pre-IPO year $t-1$.

Next, we employ the modified Jones model to separate discretionary accruals from nondiscretionary accruals. That is,

$$TACC_{it} = \alpha_1(1/TA_{it-1}) + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) / TA_{it-1} + \alpha_3 PPE_{it} / TA_{it-1} + \varepsilon_{it}, \tag{2}$$

where ΔREV_{it} = change in revenue for firm i in IPO year t ;
 ΔREC_{it} = change in receivables for firm i in IPO year t ;
 PPE_{it} = property, plant and equipment for firm i in IPO year t .

In equation (2), the difference between the change in revenue (ΔREV_{it}) and the change in receivables (ΔREC_{it}) captures the normal level of working capital accruals. The property, plant and equipment (PPE_{it}) controls for the normal level of depreciation expense and related deferred tax accruals. To mitigate the effect of common industry factors on the estimation of discretionary accruals, we run a separate cross-sectional regression for each two-digit SIC industry for each year. We require at least ten observations per year for each industry. Non-discretionary accruals are the fitted values of equation (2). The residuals of the regression are discretionary accruals ($DACC$). That is,

$$DACC_{it} = TACC_{it} - \hat{\alpha}_1(1/TA_{it-1}) - \hat{\alpha}_2(\Delta REV_{it} - \Delta REC_{it}) / TA_{it-1} - \hat{\alpha}_3 PPE_{it} / TA_{it-1}, \tag{3}$$

where $\hat{\alpha}_1$, $\hat{\alpha}_2$ and $\hat{\alpha}_3$ are the parameters estimated from equation (2).

Following Kothari et al. (2005), we match each IPO firm with a non-IPO firm that has the closest return on assets (ROA) in the same two-digit SIC industry and year, where ROA is net income divided by lagged total assets. The ROA matching is done in the same year for which the discretionary accruals are calculated. The performance-matched discretionary accruals are the difference in the modified Jones model discretionary accruals calculated for each IPO firm and its matched firm.⁴

³ We follow Teoh et al. (1998a) to calculate accruals variables by using both pre-IPO and post-IPO financial data. To calculate pre-IPO accruals, we need two years of financial data preceding the IPO. This data requirement leads to severe missing data problem. Teoh et al. argue that management continues to have strong incentive to manage earnings after IPO because of their concerns of lawsuits and lock-up agreements. DuCharme et al. (2004) and Jo and Kim (2007) show that similar incentives exist for seasoned equity offerings. Therefore, it is reasonable to use both pre-IPO and post-IPO financial data to measure earnings management.

⁴ Here is an illustration of our calculation of the performance matched discretionary current accruals - Assume that IPO Company A's discretionary current accruals were 0.008 and the two-digit SIC code was 31 for 1996 during which it went public. Non-IPO Company B had the same two-digit SIC code as Company A and had the closest ROA to Company A's ROA among all non-IPO firms with the same 2-digit SIC code in 1996. Company B's discretionary current accruals were 0.006 for 1996. Then, the performance matched discretionary current accruals were 0.002 for Company A in 1996.

In terms of underwriter reputation, we define high-prestige underwriter as lead underwriters who have a Carter-Manaster underwriter rank (Carter et al., 1998) of eight or higher on their nine-point scale, and low-prestige underwriter otherwise.⁵ The dummy variable, BANKER, takes a value of one for high-prestige underwriter, and zero otherwise.

3.2 Sample Construction and Description

We obtain an initial sample of 6,931 firms that went public during the period of 1991-2005 from the Thomson Financial SDC New Issues database. We exclude financial services and utility issuers because they have different financial disclosure requirements, and are heavily regulated. We also exclude issuers with total assets less than one million dollars to migrate the small size effect, and issuers that do not have underwriter rank data and/or financial data from the COMPUSTAT database. Our final sample includes 2,880 IPO firms.

Table 1 presents the distribution of IPOs by industry, which is defined with the two-digit SIC codes, with further partition into subsamples of IPOs underwritten by high- and low- prestige underwriters. The distribution indicates industry clustering among IPO issuers, with a concentration in the computer, electronics, and chemical industries. For instance, computer services and software industry alone accounts for 26% of the sample. Chemical products and electronics industries comprise 18% of the sample. Moreover, prestigious investment bankers, in general, underwrite more IPOs in most industries, especially in the clustering industries. In total, reputable investment bankers underwrite 1,898 IPOs, compared to only 982 IPOs underwritten by less reputable investment bankers.

Table 1: IPO Issuers by Industry

This table describes the industry distribution of IPO firms during the sample period of 1991 to 2005. The total number of sample firms is 2880. *BANKER* proxies for underwriter reputation and takes a value of 1 (0 otherwise) if the IPO’s underwriter has a rank of 8 or above on the Loughran and Ritter (2004) 9-point scale.

Industry	Codes	Number of Companies		
		BANKER = 1	BANKER = 0	Total
Oil and Gas	13	47	23	70
Food Products	20	31	23	54
Paper and Paper Products	24-27	44	29	73
Chemical Products	28	163	65	228
Manufacturing	30-34	69	43	112
Machinery & Computer Equipment	35	129	78	207
Electronic Equipment	36	201	84	285
Transportation	37,39	45	53	98
Scientific Instruments	38	162	79	241
Durable Goods	50	34	43	77
Retail	53-57,59	145	63	208
Eating and Drinking Establishments	58	26	30	56
Entertainment Services	70,78,79	32	33	65
Computer Services and Software	73	542	195	737
Health	80	59	31	90
	1,10,14,15,16,17,21, 22,23,29,51,52,72,	169	110	279
All others	75,76,82,83,87,99			
Total		1,898	982	2,880

Table 2 presents the summary statistics of the variables used in the analysis. The mean and median levels of earnings management, measured by discretionary accruals (DACC), are 2.1% and 0.7%, respectively. The mean and median values of the underwriter reputation variable, BANKER, are 0.66 and 1.00, respectively, i.e., two-thirds of our sample IPOs is underwritten by prestigious investment bankers. The two dummy variables, AUDIT and VC,

⁵ The updated list of the Carter-Manaster ranking is available on Professor Jay Ritter’s website.

proxy the auditor reputation and VC backing, respectively. If the auditor is a Big Five accounting (Big 5) firm, *AUDIT* equals 1, and 0 otherwise. If an IPO is backed by a venture capitalist, *VC* equals 1, and 0 otherwise. The mean and median *AUDIT* are, respectively, 0.90 and 1.00, but the mean and median *VC* are 0.45 and 0.00, respectively. These statistics indicate that most of our sample IPOs are audited by Big 5 firms, but less than half of them are VC backed.

Other variables, which are also known for impacting the level of earnings management (Sweeney, 1994; Burgstahler and Dichev, 1997; Becker et al., 1998), include the offer size⁶, which is proxied by the log of total proceeds (*Off_Size*); the absolute value of total accruals as a percentage of lagged total assets (*Abstacc*); the leverage ratio (*Lev*), which is defined as total liabilities divided by total assets; and two dummy variables, *Incchg* and *Loss*. The *Incchg* dummy equals 1 if current year's income before discretionary accruals is less than previous year's income, and 0 otherwise. The *Loss* dummy equals 1 if current year's income before discretionary accruals is negative, and 0 otherwise. These two dummy variables capture the incentive of IPO issuers to report increases in income, and their incentive to report a profit by managing discretionary accruals, respectively.

Table 2: Descriptive Statistics for the Sample

This table reports the summary statistics of the selected variables. *DACC* is discretionary accruals in the year of the IPO scaled by lagged total assets. *BANKER* proxies for underwriter reputation and takes a value of 1 (0 otherwise) if the IPO's underwriter has a rank of 8 or above on the Loughran and Ritter (2004) 9-point scale. *AUDIT* takes a value of 1 (0 otherwise) if the IPO's auditor is a member of the Big Five accounting firms. *VC* takes a value of 1 (0 otherwise) if the IPO is backed by venture capitalists. *Proceed* is the total proceeds received from IPOs. *Off_Size* is the natural log of total proceeds. *Abstacc* is the absolute value of total accruals scaled by lagged total assets. *Incchg* takes a value of 1 (0 otherwise) if current year's income before discretionary accruals is less than previous year's level. *Loss* takes a value of 1 (0 otherwise) if current year's income before discretionary accruals is less than zero. *Lev* is the leverage of a firm and is defined as total liabilities over total assets.

	Mean	Median	First Quartile	Third Quartile	Standard Deviation
<i>DACC</i>	0.021	0.007	-0.145	0.185	0.377
<i>BANKER</i>	0.659	1.000	0.000	1.000	0.474
<i>AUDIT</i>	0.899	1.000	1.000	1.000	0.301
<i>VC</i>	0.450	0.000	0.000	1.000	0.498
<i>Proceed</i> (\$MM)	66.97	35.20	18.00	66.25	175.12
<i>Off_Size</i>	3.535	3.561	2.890	4.193	1.065
<i>Abstacc</i>	0.262	0.148	0.063	0.350	0.305
<i>Incchg</i>	0.098	0.000	0.000	0.000	0.297
<i>Loss</i>	0.004	0.000	0.000	0.000	0.062
<i>Lev</i>	0.349	0.285	0.159	0.490	0.255

The summary statistics reported in Table 2 indicate that sample firms raise an average amount of \$66.97 million from their initial public offerings, with average absolute total accruals that account for 26.2% of their lagged total assets, and have an average debt ratio of 34.9%. On average, 9.8% of IPO firms experience decreases in income before discretionary accruals during the issuance year, and 0.4% of them experience losses in the year of going public.

4. EMPIRICAL RESULTS

4.1 Univariate Analysis

We report preliminary results on the role of underwriters in restraining earnings management of IPO issuers by presenting the comparison of earnings management based on underwriter reputation and VC backing in Table 3. Panels A and B compare means of discretionary accruals between the following groups: high-prestige underwriters versus low-prestige underwriters, and VC backing versus non-VC backing. The results show that the mean of discretionary accruals of IPO firms that are underwritten by high-prestige underwriters (*BANKER*=1), -1.8%, is

⁶ While the issuer's size is also used to control for the effect of firm size on earnings management, we follow the IPO literature to use offer size instead in order to mitigate the missing data problem in the analysis.

significantly lower than that of those underwritten by low-prestige underwriters (BANKER=0), 9.6%. However, the mean discretionary accruals of IPO firms backed by VCs (VC=1), 0.8%, is not significantly different from that of the non-VC backed sample (VC=0), 3.1%.

Second, prestigious underwriters tend to pair up with reputable auditors in the IPO process. Panel A indicates that 96.7% of IPO issues underwritten by prestigious investment bankers (BANKER=1) are audited by Big Five accounting firms, compared to only 76.8% of those IPOs underwritten by low-prestige underwriters (BANKER=0). Similarly, Panel C reports that VC backed IPO issuers prefer to hire prestigious underwriters and quality auditors. For IPOs that are backed by venture capitalists (VC=1), 77.4% of the issues underwritten by prestigious investment bankers and 97.6% are audited by Big 5 firms, respectively, compared to 56.5% and 83.7%, respectively, for the non-VC backed sample. The results suggest that underwriter reputation, auditor quality, and VC backing are positively correlated.

Table 3: Comparisons of the Selected Variables

This table reports comparisons of the selected variables between different groups. *DACC* is discretionary accruals in the year of the IPO scaled by lagged total assets. *BANKER* proxies for underwriter reputation and takes a value of 1 (0 otherwise) if the IPO’s underwriter has a rank of 8 or above on the Loughran and Ritter 9-point (2004) scale. *AUDIT* takes a value of 1 (0 otherwise) if the IPO’s auditor is a member of the Big Five accounting firms. *VC* takes a value of 1 (0 otherwise) if the IPO is backed by venture capitalists. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels based on two-sided tests.

Panel A: Comparisons of the Selected Variables for High-prestige vs. Low-prestige Underwriters

Statistics	Mean		t-Statistics
	BANKER = 1	BANKER = 0	
DACC	-0.018	0.096	7.69***
AUDIT	0.967	0.768	-14.17***
VC	0.528	0.298	-12.36***
No. of Obs.	1,898	982	

Panel B: Comparisons of the Selected Variables for VC-backed IPOs vs. Non VC-backed IPOs

Statistics	Mean		t-Statistics
	VC = 1	VC = 0	
DACC	0.008	0.031	1.63
BANKER	0.774	0.565	-12.23***
AUDIT	0.976	0.837	-13.65***
No. of Obs.	1,295	1,585	

Overall, the univariate results show a significantly negative relation between earnings management of IPO firms and underwriter reputation. On the other hand, the results do not show a significant relation between VC backing and the level of earnings management. Also, the correlations among underwriter reputation, auditor quality and VC backing highlight the need to control for the potential roles of auditors and venture capitalists in the examination of the role of underwriter reputation in restraining earnings management of IPO issuers.

4.2 Multivariate Analysis of Earnings Management and Underwriter Reputation

We use the following regression model to examine the role of underwriter reputation in restraining earnings management of IPO issuers over the entire sample period.

$$DACC_{it} = \beta_0 + \beta_1 BANKER_{it} + \beta_2 Off_Size_{it} + \beta_3 Abstacc_{it} + \beta_4 Incchg_{it} + \beta_5 Loss_{it} + \beta_6 Lev_{it} + Industry\ dummies + \varepsilon_{it} \tag{4}$$

Since Table 1 suggests industry clustering among our sample IPOs, we include industry dummies as grouped by two-digit SIC codes to control for the fixed industry effects. Table 4 reports the parameter estimates and *t* statistics for various versions of the regression model. Model (A), i.e., Equation (4), shows that the coefficient for

BANKER is -4.7% and significant at 1% level, indicating that the discretionary accruals of IPO firms decline by 4.7% if the IPOs are underwritten by high-prestige underwriters, after controlling for the effects of other variables that are known for impacting the level of earnings management. The significantly negative BANKER coefficient thus supports the notion of the underwriter certification hypothesis.

The effects of the control variables on earnings management are in line with those documented in the literature. For instance, the coefficient estimates of the absolute value of total accruals (*Abstacc*) and offer size (*Off_size*) variables are negative and significant at the 1% level, echoing the findings of Becker et al. (1998) and Zmijewski and Hagerman (1981). Similar to Burgstahler and Dichev (1997), we document that firms reporting a decrease in earnings (*Incchg*) are significantly more aggressive in their earnings management. Consistent with Lee and Masulis (2011), we do not find a significant relation between earnings management of IPO issuers and leverage. Overall, the set of explanatory variables jointly explains 7.38% of variation in discretionary accruals.

Model (B) in Table 4 replaces the BANKER variable with the VC variable to examine the effect of VC backing on restraining earnings management of IPO firms. Consistent with Lee and Masulis (2011), the insignificant coefficient of -1.1% suggests that venture capitalists as a group does not significantly restrain earnings management of IPO issuers.

Table 4: Multivariate Analysis of the Relation between Underwriter Reputation and Earnings Management by IPO Firms

This table reports results of relation between underwriter reputation and earnings management by performing multivariate regression analysis. The dependent variable is *DACC* that stands for discretionary accruals in the year of the IPO scaled by lagged total assets. *BANKER* proxies for underwriter reputation and takes a value of 1 (0 otherwise) if the IPO’s underwriter has a rank of 8 or above on the Loughran and Ritter (2004) 9-point scale. *AUDIT* takes a value of 1 (0 otherwise) if the IPO’s auditor is a member of the Big Five accounting firms. *VC* takes a value of 1 (0 otherwise) if the IPO is backed by venture capitalists. *Off_Size* is the natural log of total proceeds. *Abstacc* is the absolute value of total accruals scaled by lagged total assets. *Incchg* takes a value of 1 (0 otherwise) if current year’s income before discretionary accruals is less than previous year’s level. *Loss* takes a value of 1 (0 otherwise) if current year’s income before discretionary accruals is less than zero. *Lev* is the leverage of a firm and is defined as total liabilities over total assets. *Industry dummies* are grouped by two-digit SIC codes and have 48 in total. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels based on two-sided tests.

Explanatory Variables	Model (A)	Model (B)	Model (C)
<i>Constant</i>	0.164 (1.00)	0.175 (1.06)	0.167 (1.01)
<i>BANKER</i>	-0.047*** (-2.67)		-0.046** (-2.53)
<i>AUDIT</i>			-0.004 (-0.15)
<i>VC</i>		-0.011 (-0.74)	-0.002 (-0.12)
<i>Off_Size</i>	-0.041*** (-5.10)	-0.052*** (-7.67)	-0.041*** (-4.97)
<i>Abstacc</i>	-0.210*** (-8.91)	-0.210*** (-8.89)	-0.209*** (-8.89)
<i>Incchg</i>	0.195*** (7.81)	0.199*** (7.99)	0.194*** (7.76)
<i>Loss</i>	-0.024 (-0.18)	-0.024 (-0.18)	-0.025 (-0.19)
<i>Lev</i>	-0.038 (-1.29)	-0.038 (-1.26)	-0.039 (-1.30)
<i>Industry dummies</i>	Yes	Yes	Yes
Adj. R ²	7.38%	7.17%	7.32%

Since the univariate results reported in Table 3 suggest positive correlations among underwriter reputation, auditor quality, and venture capitalists in the IPO process, we expand our multivariate analysis to include the *AUDIT* and *VC* dummies in the regression model to control for their possible effects on earnings management of

IPO issuers:

$$DACC_{it} = \beta_0 + \beta_1 BANKER_{it} + \beta_2 AUDIT_{it} + \beta_3 VC_{it} + \beta_4 Off_Size_{it} + \beta_5 Abstacc_{it} + \beta_6 Incchg_{it} + \beta_7 Loss_{it} + \beta_8 Lev_{it} + Industry\ dummies + \varepsilon_{it} \tag{5}$$

Model (C) of Table 4, i.e., Equation (5), indicates that the significant negative relation between earnings management and underwriter reputation persists after controlling for the effects of auditor quality and VC backing. On the other hand, auditor quality and VC backing do not show significant impacts on reducing earnings management, which is consistent with Lee and Masulis (2011). The persistent role of underwriter reputation in restraining earnings management of IPO issuers is also evidenced by the comparable magnitude of the coefficients of the BANKER variable in Models (C) and (A).

4.3 Changing Roles of Underwriters and Venture Capitalists over Time

Several studies (Elstrom, 2001; Loughran and Ritter, 2004; Agrawal and Cooper, 2010) note that investment bankers and venture capitalists relaxed their standards in underwriting and backing IPO issues during the Internet bubble period, which may result in greater tolerance for earnings management of IPO issuers. Following the burst of the Internet bubble and the revelation of numerous corporate scandals, the passage of the Sarbanes-Oxley Act (SOX) in 2002 tightens the oversight and regulations of public companies and capital market professionals, which probably strengthens the incentives of underwriters and venture capitalists to restrain earnings management of issuing firms. The changing practices of underwriters and venture capitalists, as well as changes in the regulatory environment, suggest that the roles of underwriters and venture capitalists in restraining earnings management of IPO issuers may revolve over time.

Table 5: Comparison of Selected Variables Over Time

This table reports comparisons of the selected variables over time. *DACC* is discretionary accruals in the year of the IPO scaled by lagged total assets. *BANKER* proxies for underwriter reputation and takes a value of 1 (0 otherwise) if the IPO’s underwriter has a rank of 8 or above on the Loughran and Ritter (2004) 9-point scale. *AUDIT* takes a value of 1 (0 otherwise) if the IPO’s auditor is a member of the Big Five accounting firms. *VC* takes a value of 1 (0 otherwise) if the IPO is backed by venture capitalists. *Net* takes a value of 1 (0 otherwise) if the issuing date is between 1996 and March 2000. *SOX* takes a value of 1 (0 otherwise) if the issuing date is between 2002 and 2005. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels based on two-sided tests.

Panel A: Comparisons of the Selected Variables for Internet Bubble Period vs. Non Bubble Period			
Statistics	Mean		t-Statistics
	Net = 1	Net = 0	
<i>DACC</i>	0.027	0.016	-0.78
<i>BANKER</i>	0.683	0.641	-2.36**
<i>AUDIT</i>	0.897	0.901	0.34
<i>VC</i>	0.421	0.472	2.72***
No. of Obs.	1,254	1,628	

Panel B: Comparisons of the Selected Variables for Post-SOX vs. Pre-SOX			
Statistics	Mean		t-Statistics
	SOX = 1	SOX = 0	
<i>DACC</i>	-0.032	0.024	2.15**
<i>BANKER</i>	0.705	0.656	-1.44
<i>AUDIT</i>	0.874	0.901	1.10
<i>VC</i>	0.584	0.440	-3.88***
No. of Obs.	190	2,690	

We first examine the earnings management pattern of IPOs over time by comparing the means of a set of selected variables over the Internet bubble period versus the non-bubble period, as well as between the post-SOX period and the pre-SOX period, and report the results in Table 5. The Internet bubble period covers 1996 through

March 2000, and the post-SOX period covers 2002 to 2005. Table 5 reports that the mean of discretionary accruals of IPO firms during the Internet bubble period (2.7%) is not significantly different from that during the non-bubble period (1.6%). However, the mean of the BANKER variable for the bubble period (0.683) is significantly higher than that for the non-bubble period (0.641). The mean of the VC backing variable over the bubble period (0.421) is significantly lower than that over the non-bubble period (0.472). The results presented in Panel A suggest that there were more firms underwritten by prestigious investment bankers but fewer firms backed by venture capitals when they went public during the bubble period compared to those went public in the non-bubble period.

In contrast, Panel B reports that the mean discretionary accruals in the post-SOX period (-3.2%) is significantly lower than that in the pre-SOX period (2.4%), suggesting a tightening of earnings management among IPO issuers following the passage of SOX. Besides, the fraction of VC backed IPOs in the post-SOX era (0.584) is significantly higher than that before the passage of SOX (0.440). The increasing backing of venture capitalists might have helped reduce the level of earnings management of IPO issuers. On the other hand, there is no significant difference in the fraction of IPOs underwritten by prestigious investment bankers surrounding the SOX.

In sum, the univariate results reported in Table 5 suggest that the roles of underwriter and venture capitalists in restraining earnings management by IPO issuers may change during the Internet bubble period and after the passage of SOX. Hence, we use the following regression model to examine the possible changing monitoring roles of underwriters and venture capitalists over the internet bubble cycle:

$$\begin{aligned}
 DACC_{it} = & \beta_0 + \beta_1 BANKER_{it} + \beta_2 AUDIT_{it} + \beta_3 VC_{it} + \beta_4 Net + \beta_5 BAV_{it} \times Net + \beta_6 Off_Size_{it} \\
 & + \beta_7 Abstacc_{it} + \beta_8 Incchg_{it} + \beta_9 Loss_{it} + \beta_{10} Lev_{it} + Industry\ dummies + \varepsilon_{it},
 \end{aligned}
 \tag{6}$$

where BAV stands for BANKER or VC; *Net* is a dummy variable that is equal to 1 if the IPO date is between 1996 and March 2000⁷, and 0 otherwise.

Model (A) in Table 6 reports the estimates of the regression model with the interaction term of underwriter reputation with *Net*. The coefficient for BANKER is -4.0% and significant at the 10% level, indicating that underwriter reputation helps restrain the level of earnings management of IPO firms by 4.0% during the non-bubble period. While underwriter reputation further reduces earnings management during the Internet bubble period, the insignificant coefficient of the interaction term, BANKER*NET, suggests that the incremental effect is limited. The statistically significant positive coefficient of the *Net* variable indicates that there is an increase in the level of earnings management for IPO issuers underwritten by less reputable underwriters during the Internet bubble. This suggests that less reputable underwriters may have lowered their standards by taking low quality firms public during the Internet bubble period.

Model (B) in Table 6 shows that venture capitalists generally play a minor role in restraining earnings management of IPO issuers during the non-bubble period. It is interesting to note that the magnitude of the significantly positive coefficient for the interaction term, VC*Net, is larger than that of the insignificant negative coefficient of the VC variable. The net of the two coefficients, 3.3% ($\beta_3 + \beta_5$), indicates that VC-backed IPO issuers engage in more earnings management than their non-VC-backed peers during the Internet boom. This finding suggests that venture capitalists may have lowered their monitoring standards on earnings management of IPO issuers during the Internet bubble period.

⁷ While there is a general consensus among researchers that March 2000 was the ending point of the Internet bubble, there is no consensus for the starting point, with 1996, 1997, and 1998 being the popular versions. We also use 1997 and 1998, respectively, as the starting point of Internet Bubble period in our analysis, and find that the results are qualitatively similar to those reported in the paper.

Table 6: Examination of the Change of Relation between Underwriter Reputation and Earnings Management by IPO Firms over the Internet Bubble Period

This table reports results of the change in relation between underwriter reputation and earnings management over the Internet Bubble period. The dependent variable is *DACC* that stands for discretionary accruals in the year of the IPO scaled by lagged total assets. *BANKER* proxies for underwriter reputation and takes a value of 1 (0 otherwise) if the IPO’s underwriter has a rank of 8 or above on the Loughran and Ritter (2004) 9-point scale. *AUDIT* takes a value of 1 (0 otherwise) if the IPO’s auditor is a member of the Big Five accounting firms. *VC* takes a value of 1 (0 otherwise) if the IPO is backed by venture capitalists. *Net* takes a value of 1 (0 otherwise) if the issuing date is between 1996 and March 2000. *BANKER*Net* is the interaction term between underwriter reputation and *Net*. *Off_Size* is the natural log of total proceeds. *Abstacc* is the absolute value of total accruals scaled by lagged total assets. *Incchg* takes a value of 1 (0 otherwise) if current year’s income before discretionary accruals is less than previous year’s level. *Loss* takes a value of 1 (0 otherwise) if current year’s income before discretionary accruals is less than zero. *Lev* is the leverage of a firm and is defined as total liabilities over total assets. *Industry dummies* are grouped by two-digit SIC codes and have 48 in total. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels based on two-sided tests.

Explanatory Variables	Model (A)	Model (B)
INTERCEPT	0.136 (0.82)	0.158 (0.95)
BANKER	-0.040* (-1.82)	-0.046** (-2.51)
AUDIT	-0.001 (-0.05)	-0.002 (-0.08)
VC	0.003 (0.20)	-0.019 (-0.97)
Net	0.053** (2.20)	0.023 (1.20)
BANKER*Net	-0.011 (-0.38)	
VC*Net		0.052* (1.85)
<i>Off_Size</i>	-0.044*** (-5.34)	-0.044*** (-5.31)
<i>Abstacc</i>	-0.216*** (-9.14)	-0.218*** (-9.23)
<i>Incchg</i>	0.198*** (7.88)	0.195*** (7.80)
<i>Loss</i>	-0.022 (-0.17)	-0.022 (-0.17)
<i>Lev</i>	-0.034 (-1.11)	-0.035 (-1.14)
<i>Industry dummies</i>	Yes	Yes
Adj. R-square (%)	7.59%	7.69%

To examine the possible change in the roles of underwriter and venture capitalists in restraining earnings management by IPO issuers after the passage of SOX, we propose the following regression model:

$$\begin{aligned}
 DACC_{it} = & \beta_0 + \beta_1 BANKER_{it} + \beta_2 AUDIT_{it} + \beta_3 VC_{it} + \beta_4 SOX + \beta_5 BAV_{it} \times SOX + \beta_6 Off_Size_{it} \\
 & + \beta_7 Abstacc_{it} + \beta_8 Incchg_{it} + \beta_9 Loss_{it} + \beta_{10} Lev_{it} + Industry\ dummies + \varepsilon_{it},
 \end{aligned}
 \tag{7}$$

where *SOX* is a dummy variable that is equal to 1 if the IPO took place in 2002 to 2005, and 0 otherwise; and other variables are defined as before.

Model (A) in Table 7 shows that the coefficient of -4.1% for *BANKER* is significant at the 5% level, indicating that underwriter reputation lowers the level of earnings management of IPO firms by 4.1% during the pre-SOX period. While underwriter reputation further reduces earnings management post SOX, the incremental effect is not significant as evidenced by the statistically insignificant coefficient for the interactive term, *BANKER*SOX*.

Model (B) in Table 7 shows that the role of venture capitalists in reducing earnings management is insignificant during the pre-SOX period. However, the statistically significant negative coefficient of the interaction term, VC*SOX, indicates that VC backing helps reduce the level of earnings management of IPO issuers by 14.5% ($\beta_3 + \beta_5$) in the post-SOX period when compared to that of their non-VC-backed peers. The result suggests that venture capitalists tighten their standards following the passage of SOX.

Table 7: Examination of the Change of Relation between Underwriter Reputation and Earnings Management by IPO Firms after the Sarbanes–Oxley Act

This table reports results of the change of relation between underwriter reputation and earnings management post SOX. The dependent variable is *DACC* that stands for discretionary accruals in the year of the IPO scaled by lagged total assets. *BANKER* proxies for underwriter reputation and takes a value of 1 (0 otherwise) if the IPO’s underwriter has a rank of 8 or above on the Loughran and Ritter (2004) 9-point scale. *AUDIT* takes a value of 1 (0 otherwise) if the IPO’s auditor is a member of the Big Five accounting firms. *VC* takes a value of 1 (0 otherwise) if the IPO is backed by venture capitalists. *SOX* takes a value of 1 (0 otherwise) if IPO date is between 2002 and 2005. *BANKER*SOX* is the interaction term between underwriter reputation and SOX. *VC*SOX* is the interaction term between VC-backing and SOX. *Off_Size* is the natural log of total proceeds. *Abstacc* is the absolute value of total accruals scaled by lagged total assets. *Incchg* takes a value of 1 (0 otherwise) if current year’s income before discretionary accruals is less than previous year’s level. *Loss* takes a value of 1 (0 otherwise) if current year’s income before discretionary accruals is less than zero. *Lev* is the leverage of a firm and is defined as total liabilities over total assets. *Industry dummies* are grouped by two-digit SIC codes and have 48 in total. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels based on two-sided tests.

Explanatory Variables	Model (A)	Model (B)
INTERCEPT	0.160 (0.96)	0.165 (1.00)
BANKER	-0.041** (-2.20)	-0.048*** (-2.60)
AUDIT	-0.004 (-0.14)	-0.007 (-0.27)
VC	-0.001 (-0.05)	0.009 (0.53)
SOX	0.044 (0.86)	0.071 (1.66)
BANKER*SOX	-0.087 (-1.45)	
VC*SOX		-0.154*** (-2.75)
<i>Off_Size</i>	-0.040*** (-4.78)	-0.039*** (-4.68)
<i>Abstacc</i>	-0.211*** (-8.93)	-0.212*** (-8.98)
<i>Incchg</i>	0.195*** (7.75)	0.194** (7.73)
<i>Loss</i>	-0.025 (-0.19)	-0.023 (-0.18)
<i>Lev</i>	-0.038 (-1.24)	-0.042 (-1.38)
<i>Industry dummies</i>	Yes	Yes
Adj. R-square (%)	7.33%	7.51%

Overall, the results reported in Table 7 suggest that prestigious underwriters do not change their monitoring role in earnings management of IPO issuers either during the Internet bubble period or in the post-SOX period. In contrast, venture capitalists loosen their standards during the Internet bubble period but reverse their course after the passage of SOX. This may be due to changing objectives of venture capitalists over the course of the sample period. In order to take advantage of favorable market conditions with growing reception of IPOs through the Nineties, some venture capitalists, which have substantial equity positions in the issuing firms, are motivated to push lower quality, less developed firms public for realizing windfall returns on their investments in the IPO firms. According to the venture capitalist moral hazard explanation (Gompers and Lerner, 1998), some venture capitalists are motivated to go along with the earnings management of issuing firms in order to benefit from the inflated value

when they exit from their investments in the issuing firm soon following the lock-up period. This moral hazard motive of some venture capitalists may reduce the effectiveness of their role in mitigating earnings management of IPO issuers.

However, as the market conditions turn tide following the burst of the Internet bubble, coupled with the change in the regulatory environment following the Sarbanes-Oxley Act in 2002, an increasing number of venture capitalists become more cautious by selecting quality firms and better preparing them for going public. Further, in order to protect their investments in the issuing firms and their reputation for raising future private capital, venture capitalists may become more motivated to restrain earnings management of IPO firms under stringent market and regulatory conditions in the post-SOX period. This may explain the significant incremental monitoring effect of venture capitalists in restraining earnings management of IPO issuers in the post-SOX period, when compared to the pre-SOX period. As the direct interest of underwriters in the IPO firms is mainly gross spreads, changes in their monitoring efforts may not be as strong as that of venture capitalists across different capital market and regulatory environments. Hence, we do not observe significant incremental effects on the earnings management of IPO issuers for prestigious underwriters in the Internet bubble or the post-SOX period.

5. CONCLUSION

In the IPO process, underwriters play an important certification role by performing “due diligence” investigation. As credible certifiers, underwriters serve as the agent to help reduce information asymmetry between IPO issuers and investors. Prestigious underwriters have an incentive to restrain aggressive earnings management of IPO firms to protect their reputation capital and reduce litigation risk. Similarly, high quality IPO issuers with less earnings management tend to select prestigious underwriters to convey a positive signal to investors. This underwriter certification hypothesis predicts an inverse relation between underwriter reputation and earnings management of IPO issuers.

Our study reports a persistent significant negative relation between underwriter reputation and earnings management of firms going public during the period of 1991 to 2005. Our results demonstrate that reputable underwriters, who serve as certifying agents, assist less informed investors in the IPO marketplace. Our findings support the underwriter certification hypothesis.

Following the burst of the Internet bubble and the passage of the Sarbanes-Oxley Act, there are changes in the regulatory environment that discourage earnings management of IPO firms. We observe a reduction in the level of earnings management of IPO firms during the post-SOX period when compared to the pre-SOX period. Further analysis suggests that changing objectives of venture capitalists may contribute to less earnings management of IPO firms in the post-SOX period.

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NOTES