

Independent Directors and the Long-run Performance of IPOs

Tsai-Ling Liao¹, Min-Teh Yu² and Chih-Jen Huang³

Abstract

The Securities and Futures Bureau (SFB) of Taiwan prescribes that firms applying for an initial listing after February 2002 must have at least two seats of independent directors (IDs) on the board. Under the SFB 2002 rules, this paper investigates the effect of such governance reforms in ID requirement on the long-run performance of IPOs. Our results, based on 494 IPOs between 1999 and 2005, find that though IPOs typically underperform in the post-issue period, firms after 2002 perform better than those before 2002. Moreover, firms with IDs also experience less negative stock performance than those without IDs. The results further suggest a positive association between the proportion of IDs on corporate boards and post-listing stock performance for IPOs after 2002.

JEL classification numbers: G14, M41

¹ Department of Finance, Providence University, Taichung, 433 Taiwan,
e-mail: tlliao@pu.edu.tw.

² Department of Finance, National Taiwan University, Taipei, 106 Taiwan,
e-mail: mtyu@ntu.edu.tw.

³ Department of Finance, Providence University, Taichung, 433 Taiwan,
e-mail: cjh@pu.edu.tw.

Keywords: Corporate governance, independent directors, initial public offerings

1 Introduction

Countries around the world have been amending their legal systems and stock exchange listing requirements to reform corporate governance as well as develop new codes of best practices. The recent corporate scandals such as WorldCom and Enron highlight the need for corporate governance reform at a global level. For example, the Sarbanes–Oxley Act of 2002 and recently modified exchange listing requirements in the U.S. mandate an increased role of monitoring by outside or ‘independent’ directors on all firms. The global movement towards a more noticeable role for independent outside directors (IDs) can be traced to the Cadbury Report issued in the United Kingdom in 1992. Among other things, it recommends publicly-traded UK companies to have at least three IDs. Following that, Dahya and McConnell [12] indicate at least 18 other countries that have guidelines proposing a minimum representation of IDs on corporate boards.

Taiwan introduced independent directors for publicly-held corporations as a listing requirement in 2002. The Securities and Futures Bureau (SFB) of the Financial Supervisory Commission in Taiwan prescribes that firms applying for an initial listing on Taiwan Stock Exchange (TSE) and GreTai Securities Market (OTC) after February 22, 2002 must have at least two IDs on their boards.⁴ The apparent premise underlying the movement towards greater ID representation is that more IDs will lead to different and, presumably, better corporate governance.

⁴ This requirement is based on the SFB 2002 correspondence (NO.172349) with the Taiwan Stock Exchange (TSE) and the GreTai Securities Market (OTC). Related rules can be found in Article 9 of *Rules Governing Review of Securities Listings, Taiwan Stock Exchange Corporation*, Article 17 of the *Supplementary Provisions to the Rules Governing Review of Securities Listings*, and Article 172 of the *Company Act*.

As suggested by prior research, IDs, particularly those without existing or potential ties to the company other than their directorship, play an important role in corporate governance and their presence helps to align the interests of management and shareholders. Consequently, from the perspective of agency theory, oversight provided by IDs is deemed of paramount importance for shareholders, because the arrangement of IDs on corporate boards should reduce the information asymmetry facing their firms in the equity market. If IDs perform a monitoring role, as argued by Fama [15] and Fama and Jensen [18], then the boards are more likely to make decisions consistent with shareholder-wealth maximization.

Consistent with the above observation, many studies find that IDs have a positive impact on firm performance (Schellenger et al. [34]; Rosenstein and Wyatt [33]). Similarly, Gales and Kesner [19] note that declining firms experience a loss of IDs in the period leading up to the bankruptcy declaration. Furthermore, Cornett et al. [10] indicate that the presence of IDs on the board and other governance variables reduce the use of discretionary accruals and increase the quality of financial performance. Chen and Jaggi [9] use comprehensive financial disclosures as a proxy for a corporate board's responsiveness and find a positive association with the proportion of IDs on boards.

However, Hermalin and Wesbach [20] and Klein [22] present no association or even a negative relation between the inclusion of IDs on corporate boards and corporate market performance. Drymiotes [14] shows that less independent boards can sometimes be more effective at monitoring, while Randøy and Jenssen [30] note that board independence reduces firm performance in industries with highly competitive product markets. Given the mixed evidence on the effectiveness of IDs in prior studies, this study intends to exploit the opportunity offered by the SFB rules in Taiwan to better assess the effect of IDs on the long-run performance of IPOs.

Though the issue of IPO performance has been extensively examined in the

literature, little is known about the impact of IDs on the long-run aftermarket performance of IPOs. IPO firms typically experience poor post-issue performance (Ritter [31]; Loughran and Ritter [26]) and the long-run underperformance phenomenon is not sample or country specific (Ritter and Welch [32]). Chen et al. [8] document the same empirical findings for Taiwan markets. Within the context, this study's purpose is to examine whether the presence of IDs on the board affects post-IPO underperformance.

We employ a sample of 494 IPOs in Taiwan during 1999 to 2005 and use cumulative abnormal returns (CARs) and buy-and-hold abnormal returns (BHARs) via the size-and-book-to-market reference portfolio approach to measure the long-term post-IPO stock performance. The results show that although IPOs in Taiwan generally experience poor post-issue stock performance, IPOs after 2002 perform better than those before. Furthermore, issuers with IDs on boards are associated with better post-IPO performance than those without.

Our results herein suggest a positive association between the proportion of IDs on corporate boards and post-issue stock performance. Additional tests show that the positive effect of IDs is more pronounced for IPOs classified in the electronics industry, and those with big offerings, low family-controlled shareholdings, and support from venture capital than non-electronics firms, and those with small offerings, high family-controlled shareholdings, or no support from venture capital. Overall, these results confirm the notion that the inclusion of IDs and a higher proportion of IDs on corporate boards improve the quality of governance provided to IPO firms, thus helping to mitigate the aftermarket underperformance of IPOs. By showing that IDs add value to shareholder wealth in the IPO context, this article contributes to the line of research that examines the relation between corporate governance and firm performance and to the literature that studies the desirability of governance rules on corporations.

2 Method and Data

2.1 Development of Hypotheses

Boards of directors are viewed as the linchpin of corporate governance. With a fiduciary obligation to shareholders and a responsibility to provide strategic direction and monitoring, the board plays a central role in governance. Fama [15] in his analysis of ownership and control provides a theoretical explanation in support of the IDs' role in monitoring activities. Fama and Jensen [18] expand on Fama's explanation and argue that a higher proportion of IDs on corporate boards results in more effective monitoring of boards and limits managerial opportunism. Several researchers also suggest that IDs, particularly those with no ties to the company other than their directorship, affect the value and decisions of companies (Byrd and Hickman [5]; Cotter et al. [11]; Dahya and McConnell [12]).

Under this line of logic and the ID provisions of the new rules, we expect that IPOs applying for listing after February 22, 2002 (IPOs after 2002, hereafter) perform better than those applying before February 22, 2002 (IPOs before 2002, hereafter). Additionally, IPOs with IDs are expected to exhibit better post-issue performance. Therefore, we propose the following hypotheses:

H₁: IPOs after 2002 experience better aftermarket performance than those before.

H₂: IPOs with the presence of IDs on boards experience better aftermarket performance than those without.

Given that the governance reform in 2002 imposes uniformly high levels of monitoring by IDs on new listing firms, our interest lies in the relationship between the proportion of IDs and the post-issue performance of IPOs. If the new requirement of IDs does exert positive influence on the IPO market, then we should observe a relation between the proportion of IDs on boards and post-IPO stock performance. Accordingly, conditional on H₁ and H₂ being supported, we propose the following hypothesis:

H₃: IPOs with a higher fraction of IDs on the board experience better aftermarket performance.

2.2 Method

The primary methods employed to measure the magnitude of the long-run market performance of IPOs include cumulative abnormal returns (CARs) and buy-and-hold abnormal returns (BHARs) via the reference portfolio approach over the three-year period following the offering. Beginning with Ritter [31], the most popular approach to estimate long-run returns has been BHARs, since it captures the experiences of long-term investors better (Barber and Lyon [2]; Lyon et al. [27]). However, CARs can avoid the problems caused by compounding monthly returns to obtain long-term BHARs and are less skewed (Fama [16]). We thus use both CARs and BHARs over the three-year period following the offering to measure long-run stock performance. Abnormal returns are estimated via the size-and-book-to-market reference portfolio approach. Since Fama and French [17] and Lakonishok et al. [23] find that stock returns tend to be associated with firm size and book-to-market ratios, we adjust returns for size as well as book-to-market ratio to avoid a potential misspecification problem.

At the end of each June from 1999 to 2008, we first rank all stocks trading on the Taiwan Stock Exchange (TSE) into five portfolios on the basis of market value and then sort each of the five size-based portfolios into five additional portfolios on the basis of book-to-market ratios. The book-equity values are from the annual reports. Monthly portfolio returns are calculated by equally weighting the returns to firms sorted into each of the 25 portfolios for July through the subsequent June, at which point all TSE stocks are re-ranked and the process is repeated. For each IPO firm, abnormal performance is calculated monthly relative to the return to its respective portfolio. The portfolios are reformed annually to allow the benchmark for a given firm to change as its relative size and book-to-market change.

2.3 Regression model and definition of variables

This study uses the following regression model to test the association between the post-IPO stock performance (CARs and BHARs) and the main independent variable of the ratio of IDs to total number of directors and other control variables.

$$CARs_i = \beta_0 + \beta_1 * IDRatio_i * DSFBrule + \beta_2 * Gindex_i + \beta_3 * Age_i + \beta_4 * VC_i + \beta_5 * UW_i + \beta_6 * AD_i + \beta_7 * OS_i + \beta_8 * Market_i + \varepsilon_i \quad (1)$$

$$BHARs_i = \beta_0 + \beta_1 * IDRatio_i * DSFBrule + \beta_2 * Gindex_i + \beta_3 * Age_i + \beta_4 * VC_i + \beta_5 * UW_i + \beta_6 * AD_i + \beta_7 * OS_i + \beta_8 * Market_i + \varepsilon_i \quad (2)$$

where i is the firm indicator. The definition and justification of independent variables are in the following discussions.

(1) Independent director ratio (IDratio): IDratio is the ratio of IDs to the number of directors on the board at the issuing time. Here, DSFBrule is a dummy equal to 1 for IPOs after 2002 and zero otherwise. Therefore, IDratio*DSFBrule is equal to IDratio for IPOs after 2002 and zero otherwise. To support H₃, β_1 is expected to be positive.

(2) Corporate governance index (Gindex): We construct a composite index of governance with a comprehensive set of eleven indicator variables and categorize them into three different aspects: ownership structure, board composition, and non-related party transaction. We employ factor analysis to assess factor weights. Gindex is the sum of multiplying the transformed weighting factor score by its corresponding value. Table 1 summarizes the definition and the corresponding weight for each variable. The three groups of selected variables are as follows.

A. Ownership Structure: It consists of institutional shareholdings (INS), block shareholdings (BS), non-family controlled shareholdings (NFS), and executive shareholdings (ES). O'Brien and Bhushan [29] find that more shareholdings owned by institutional investors enhance IPO performance. Similarly, Shleifer and Vishny [35] argue that large block shareholdings improve the effectiveness of the takeover mechanism by mitigating the free rider problem.

Agrawal and Mandelker [1] show that non-family shareholdings and executive shareholdings are positively correlated with firm performance.

B. Board Composition: It includes director and supervisor shareholdings (DS), number of non-controlled directors (NCDS), number of directors (NDS), and the ratio of non-inside directors (ODS). Holthausen and Larcker [21] indicate that the change in performance is positively related to the change in the percentage of equity owned by the directors and supervisors.

Table 1: Corporate Governance Indicators

Measure	Variable	Definition	Weighting
Ownership Structure	Institutional investor shareholdings (INS)	Shares held by institutions (at the end of the IPO month)/shares outstanding (at the end of the IPO month)	0.11
	Block shareholdings (BS)	Shares held by block holders (at the end of the IPO month)/shares outstanding (at the end of the IPO month)	0.09
	Non-family controlled shareholdings (NFS)	1- family controlled ownership	0.07
	Executive shareholdings (ES)	If executive shareholdings are more than 25% or less than 5%, then ES=1; otherwise ES=0	0.13
Board Composition	Directors and supervisors shareholdings (DS)	Shares held by directors and supervisors (at the end of the IPO month)/shares outstanding (at the end of the IPO month)	0.12
	Seats of non-controlled director (NCDS)	Board seats - number of controlled directors	0.09
	Board seats (NDS)	Number of directors on the corporate board	0.11
	Seats of non-inside directors (ODS)	Board seats-number of inside directors	0.07
Non-related Party Transaction	Ratio of sales to non-related party (NRPS)	1-[sales to related party (at the end of the IPO year)/net sales (at the end of the IPO year)]	0.09
	Ratio of purchases from non-related party (NRPP)	1-[purchases from related party (at the end of the IPO year)/net purchases (at the end of the IPO year)]	0.07
	Ratio of financing from non-related party (NRPF)	1-[financing from related party (at the end of the IPO year)/total financing (at the end of the IPO year)]	0.05

Block holdings (BS) are the shares held by shareholders holding more than 10% of the outstanding shares. Executive shareholdings (ES) are the shares held by executives (at the end of the IPO month)/ shares outstanding (at the end of the IPO month). Inside director = seats of controlled family + seats of executives.

La Porta et al. [24] find a negative valuation effect associated with an increased number of controlling shareholders on the board, while Dalton et al. [13] find that more directors on the board provide a stronger incentive to monitor management. Rosenstein and Wyatt [33] argue that non-inside directors are valued not for their ability to monitor, but for their ability to provide advice and to signal that the company is doing well.

C. Non-related Party Transaction: This dimension comprises the ratio of sales to the non-related party (NRPS), the ratio of purchases from the non-related party (NRPP), and the ratio of financing from the non-related party (NRPF). Related party transactions may result in illegal business practices, since the special relationship inherent between the involved parties creates potential conflicts of interest and may benefit other parties as opposed to shareholders' interest.

(3) Firm age (Age): Older IPO firms tend to reveal more information to the public before issuance, and these IPOs are expected to underperform less. Age is defined as the natural logarithm of years from the firm's establishment date to its offering date, and its coefficient β_3 is expected to be positive.

(4) Venture capital (VC): Megginson and Weiss [28] and Brav and Gompers [4] find that VC-backed IPOs outperform non-VC-backed IPOs. Here, VC is a dummy equal to one if the IPO firm is VC-backed, and the coefficient β_4 is expected to be positive.

(5) Underwriter prestige (UW): Megginson and Weiss [28] and Carter et al. [7] show that IPOs with prestigious underwriters experience better long-term performance. The lead underwriter represents the underwriting syndicate of the new issuance. As in Beatty and Ritter [3], UW is the ratio of the market share of the lead underwriter to total IPO proceeds from 1999 to 2005. The coefficient β_5 is expected to be positive.

(6) Auditor reputation (AD): Teoh and Wong [36] suggest that auditors play a role in reducing information asymmetry at the time of the IPO. Following prior research, AD is a dummy equal to one if the auditor of the sample firms is a

member of the Big-Four and zero otherwise. The coefficient β_6 is expected to be positive.

(7) Offering size (OS): OS is the natural logarithm of the product of the offering price and the number of shares offered in an IPO (in NT dollars). As Ritter [31] and Levis [25] find that small offerings tend to have a worse long-run aftermarket performance compared to large offerings, we predict the sign of the coefficient β_7 to be positive.

(8) Stock exchange or over-the-counter (Market): Generally, the stricter requirements of an organized stock exchange imply a lower investment risk for exchange-listed IPOs. Therefore, Market is a dummy equal to one if the issue is listed on TSE and zero otherwise. The coefficient β_8 is expected to be positive.

(9) Industry dummy (Dindustry): Since electronics firms dominate our sample, we also include an additional dummy to control for the industry effect.

2.4 Regression model and definition of variables

We initially identify 659 Taiwanese IPOs during 1999 and 2005 from the *Taiwan Economic Journal* (TEJ) database. We exclude financial firms because these firms have distinctly different financial characteristics. We also exclude IPO firms with insufficient information on stock returns and corporate governance. The final sample consists of 494 industrial firms. The sources of selected variables and the sample distribution of IPOs are reported in Table 2 and Table 3, respectively. The number of IPOs increases from 2000 to 2002 and then decreases following the corporate governance reform of 2002. Moreover, 77% (382/494) of the sample IPOs come from the electronics industry, reflecting the potential effect of the industry.

Table 2: Summary of Data Sources

Variable	Data source
The ratio of independent directors (IDratio) and necessary data for calculating Gindex	The <i>Family Control and Board Composition File</i> of the <i>Taiwan Economic Journal</i> (TEJ) database
Firm age (Age), Stock exchange or over-the-counter (Market), & Industrial dummies (DInd)	The <i>Company Attribute File</i> of TEJ database
Auditor reputation (AD)	The <i>CPA Form File</i> of TEJ database
Underwriter prestige (UW) & Offering size (OS)	The <i>Underwriting File</i> of TEJ database
Venture capital (VC)	The <i>Taiwan Venture Capital Association 2007 Yearbook</i>

Table 3: Distribution of IPOs by Year and Industry

Panel A: Distribution of IPOs by issuing year	
Year	Number of IPOs
1999	48
2000	45
2001	77
2002	122
2003	96
2004	79
2005	27
Total	494

Panel B: Distribution of IPOs by industry

Industry	Number of IPOs
Foods	1
Plastics	5
Textiles	12
Electric Machinery	25
Chemistry	31
Automobile	1

Electronics	382
Construction	6
Transportation	2
Tourism	2
Marketing and Distribution	5
Oil and Gas	2
Others	20
Total	494

3 Empirical Results

3.1 Sample description

This section presents various firm characteristics that may help explain post-IPO stock performance. Table 4 lists descriptive statistics for all sample IPOs and two subgroups - IPOs before 2002 vs. IPOs after 2002. Of 494 sample IPOs, 246 IPOs applied for listing after February 22, 2002. The mean value of the proportion of IDs to the total number of directors (IDratio) is 14%, indicating that IPO firms do not have a substantial portion of IDs on their boards at the end of the issuing month. More specifically, IPOs before 2002 typically included no IDs at the issuing time. The ratio of VC-backed IPOs to the number of all IPOs averages 43%, revealing that more than half of the IPOs in our sample are not backed by venture capital. Moreover, 63% of the sample firms choose the Big-Four (AD) as their auditors. Columns 3 and 4 of Table 4 provide similar data for two subgroups. Columns 5 and 6 report the *t*-tests and non-parametric Wilcoxon tests for the mean and median difference between subgroups. As expected, the Gindex and AD are greater for the subgroup of IPOs after 2002.

Table 4: Descriptive Statistics

	All IPOs N=494		IPOs before 2002 N=248		IPOs after 2002 N=246		<i>t</i> -statistics for the mean difference	Wilcoxon <i>z</i> -values for the median difference
	Mean	Median	Mean	Median	Mean	Median		
	IDratio	0.14	0	0	0	0.29		
Gindex	32.30	31.15	31.75	30.64	32.85	31.89	-1.49	-2.04**
Age	2.48	2.52	2.47	2.52	2.49	2.53	-0.40	-0.47
VC	0.43	0	0.45	0	0.40	0	1.10	0.95
UW	0.07	0.07	0.07	0.08	0.06	0.07	2.29**	2.70***
AD	0.63	1	0.55	1	0.70	1	-3.50***	-2.90***
OS	18.98	18.83	19.16	19.07	18.80	18.69	4.12***	4.23***
Market	0.20	0	0.23	0	0.18	0	1.18	0.82
Dindustry	0.77	1	0.75	1	0.80	1	-1.46	1.05

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

3.2 Comparisons of post-IPO stock performance

Table 5 reports the abnormal returns for all sample IPOs and two subgroups - IPOs before 2002 vs. IPOs after 2002. On average, the post-IPO CARs (BHARs) over the one-year, two-year, and three-year periods are respectively -8.6% (-14.4%), -11% (-22.6%), and -12.9% (-22.8%), and all are significant at the 0.05 level or better. This indicates the underperformance phenomenon for IPOs in Taiwan.

Columns 3 and 4 of Table 5 provide similar data for two subgroups. The last two columns of Table 5 present the skewness-adjusted *t*-tests and non-parametric Wilcoxon tests for the mean and median differences between subgroups. From Panel A of Table 5, we find that compared to IPOs before 2002 that experience significantly negative CARs after the issue, IPOs after 2002 are associated with less negative CARs during the first two years and improved CARs in the third year. For BHARs, we also observe similar patterns. These results show that

though IPOs typically underperform in the post-issue period, IPOs before 2002 apparently suffer more negative post-IPO stock returns than those after 2002. It indicates that the SFB 2002 rules have a positive effect on post-issue stock performance and thus lends support to Hypothesis H₁.

Table 5: Performance Comparisons between IPOs Before and After 2002
Panel A: Comparisons of CARs

Event period	All IPOs N=494		IPOs before 2002 N=248		IPOs after 2002 N=246		<i>t</i> -statistics for the mean difference	Wilcoxon <i>z</i> -values for the median difference
	Mean	Median	Mean	Median	Mean	Median		
1 year	-0.086***	-0.129***	-0.127***	-0.221***	-0.044	-0.088**	-1.62*	-2.26**
2 year	-0.110***	-0.125***	-0.116**	-0.103**	-0.104**	-0.126***	-0.17	0.25
3 year	-0.129***	-0.161**	-0.202***	-0.215**	-0.055	-0.120	-1.73**	-1.17

Panel B: Comparisons of BHARs

Event period	All IPOs N=494		IPOs before 2002 N=248		IPOs after 2002 N=246		<i>t</i> -statistics for the difference	Wilcoxon <i>z</i> -values for the difference
	Mean	Median	Mean	Median	Mean	Median		
1 year	-0.144***	-0.263***	-0.249***	-0.394***	-0.037	0.157***	-3.50***	-4.87***
2 year	-0.226***	-0.329***	-0.404***	-0.432***	-0.047	0.303***	-3.24***	-3.10***
3 year	-0.228***	-0.330***	-0.558***	-0.599***	0.105	-0.234**	-2.86**	-3.00***

p*<0.1; *p*<0.05; ****p*<0.01.

To examine whether the inclusion of IDs on corporate boards actually improves the aftermarket underperformance of IPOs, we proceed to conduct performance comparisons between IPOs with and without IDs on boards. Table 6 shows that compared with IPOs without IDs, IPOs with IDs experience less negative CARs and BHARs over the three-year period on average, and the difference is significant. In addition, IPOs with IDs are associated with improved three-year stock performance. These findings demonstrate a positive effect of the presence of IDs on post-IPO stock returns and are consistent with our expectation in Hypothesis H₂.

Table 6: Performance Comparisons between IPOs with and without Independent Directors

Panel A: Comparisons of CARs

Event period	All IPOs N=494		IPOs with IDs N=224		IPOs without IDs N=270		<i>t</i> -statistics for the mean difference	Wilcoxon <i>z</i> -values for the median difference
	Mean	Median	Mean	Median	Mean	Median		
1 year	-0.086***	-0.129***	-0.058*	-0.096**	-0.108***	-0.187***	0.94	1.72*
2 year	-0.110***	-0.125***	-0.126**	-0.155***	-0.097*	-0.085*	-0.41	-1.57
3 year	-0.129***	-0.161**	-0.059	-0.104	-0.186***	-0.215***	1.78**	1.68*

Panel B: Comparisons of BHARs

Event period	All IPOs N=494		IPOs with IDs N=224		IPOs without IDs N=270		<i>t</i> -statistics for the difference	Wilcoxon <i>z</i> -values for the difference
	Mean	Median	Mean	Median	Mean	Median		
1 year	-0.144***	-0.263***	-0.048	-0.166***	-0.223***	-0.366***	0.96	2.00**
2 year	-0.226***	-0.329***	-0.112*	-0.366***	-0.321***	-0.389***	1.99**	0.99
3 year	-0.228***	-0.330***	-0.058	-0.334***	-0.369***	-0.595***	3.01**	3.67***

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

3.3 The proportion of IDs on boards and post-IPO stock performance

We next adopt equations (1) and (2) to examine the association of the proportion of IDs on boards with post-IPO stock performance. Table 7 reports the regression results. Aside from the testable relationship in column #1, we also use expanded models in columns #2 to #3 to better compare the results across firms by controlling various firm characteristics that are important in determining stock returns as described above. This positive relation prevails even after controlling for other factors in columns #2 to #3 under Equations (1) and (2), and the magnitude and significance level are virtually identical. The results show that the positive effect of IDs on post-IPO stock returns is greater for firms with a higher

Hypothesis H₃. It indicates that the inclusion of IDs and the proportion of IDs on boards have a positive impact on the valuation of the IPO market. Overall, the evidence is consistent with the monitoring role of IDs on the actions of managers and thus helps to mitigate post-issue underperformance.

proportion of IDs on boards at the offering time, which is consistent with our

Table 7: The Relation between Proportion of IDs and Post-IPO Performance for the Full Sample

	Expected Sign	Equation (1)			Equation (2)		
		#1	#2	#3	#1	#2	#3
Intercept		-0.198 (-3.48)***	-0.295 (-1.54)	-1.285 (-1.17)	-0.331 (-4.37)***	-0.274 (-0.90)	-1.999 (-1.77)*
IDratio*DSFBrule	+	0.484 (1.92)*	0.477 (1.90)*	0.525 (1.98)**	0.723 (2.06)**	0.727 (2.11)**	0.742 (2.08)**
Gindex	+		0.003 (0.54)	0.003 (0.47)		-0.002 (-0.22)	-0.0003 (-0.05)
Age	+			0.078 (1.21)			0.179 (2.14)**
VC	+			0.060 (0.63)			-0.049 (-0.40)
UW	+			0.649 (0.62)			2.682 (1.31)
AD	+			0.008 (0.09)			0.116 (1.00)
OS	+			0.040 (0.67)			0.049 (0.79)
Market	+			-0.094 (-0.74)			-0.129 (-1.17)
Didustry.	?			-0.014 (-0.15)			0.116 (1.06)
R^2		0.007	0.008	0.014	0.009	0.010	0.031
Adj. R^2		0.005	0.004	0.005	0.007	0.006	0.013
F value		3.58**	1.95*	1.12	4.72***	2.39*	1.70*
N		494	494	494	494	494	494

*p<0.1; **p<0.05; ***p<0.01.

To further explore whether the relation between the proportion of IDs on boards and the post-IPO stock performance varies with other firm characteristics, we perform additional tests for sub-samples categorized by industry, offering size, growth opportunity, and whether backed by venture capital or controlled by a family or not. These characteristics have been shown to be related to post-event stock performance in previous studies. Table 8 presents the regression results for the sub-samples, respectively.

Panels A and B of Table 8 collectively show similar findings that the positive relation between the fraction of IDs and post-IPO stock performance is stronger for electronics firms, firms backed by venture capital, big offerings, or those with low family-controlled shareholdings versus non-electronics firms, firms not backed by venture capital, small offerings, or those with high family-controlled shareholdings. In summary, this evidence manifests that the electronics industry, support from venture capital, offering size, and family-controlled shareholdings play pivotal roles in explaining the positive effect of IDs on post-IPO stock performance.

3.4 Further tests

We perform the following sensitivity tests to check the robustness of our results. First, we replicate the regression analysis by replacing the ratio of IDs (IDratio) at the end of the issuing month with the mean proportion of IDs over the three years after the offering. The regression results are qualitatively similar to those reported above and hence are not reported here.

Table 8: The Relation between Proportion of IDs and Post-IPO Performance for Subsamples

Panel A: Equation (1)

	Electronics	Non-electronics	VC-backed	Non-VC-backed	Small-sized	Big-Sized	Low growth opportunity	High growth opportunity	Low family-controlled	High family-controlled
Intercept	-2.544 (-1.93)*	2.800 1.50	-3.015 (-1.71)*	-0.128 (-0.09)	-3.204 (-1.21)	-2.379 (-1.47)	-0.923 (-0.50)	-1.014 (-0.70)	1.212 (0.81)	-3.958 (-2.54)**
IDratio* DSFBrule	0.825 (2.67)***	-0.845 (-1.88)*	1.019 (2.44)**	0.062 (0.18)	0.330 (0.88)	0.617 (1.76)*	0.723 (1.56)	0.287 (0.84)	0.898 (2.44)**	0.217 (0.59)
Gindex	0.003 (0.46)	0.003 (0.53)	0.003 (0.33)	0.002 (0.24)	-0.005 (-0.53)	0.007 (1.03)	0.006 (0.56)	-0.004 (-0.52)	0.004 (0.42)	0.001 (0.20)
Age	0.114 (1.42)	0.069 (0.70)	0.038 (0.38)	0.143 (1.67)*	0.171 (1.79)*	-0.042 (-0.49)	0.074 (0.75)	0.081 (0.97)	0.033 (0.38)	0.136 (1.49)
VC	-0.013 (-0.12)	0.459 (2.70)***			-0.046 (-0.30)	0.181 (1.46)	0.125 (0.85)	0.059 (0.49)	0.066 (0.49)	0.056 (0.42)
UW	0.929 (0.73)	2.224 (1.38)	1.177 (0.71)	0.272 (0.20)	2.325 (1.40)	-1.718 (-1.41)	1.414 (0.86)	-0.105 (-0.08)	1.447 (1.07)	-0.174 (-0.11)
AD	0.016 (0.14)	0.101 (0.72)	-0.069 (-0.44)	0.083 (0.70)	0.179 (1.34)	-0.162 (-1.27)	0.092 (0.57)	-0.066 (-0.58)	-0.003 (-0.02)	-0.005 (-0.04)
OS	0.098 (1.42)	-0.181 (-1.78)*	0.148 (1.52)	-0.028 (-0.38)	0.142 (0.99)	0.112 (1.36)	0.004 (0.04)	0.044 (0.56)	-0.089 (-1.10)	0.179 (2.06)**
Market	-0.104 (-0.66)	-0.049 (-0.26)	-0.093 (-0.46)	-0.214 (-1.28)	-0.130 (-0.23)	-0.069 (-0.52)	-0.106 (-0.49)	-0.046 (-0.32)	0.094 (0.47)	-0.303 (-1.97)**
Dindustry			-0.300 (-1.78)*	0.069 (0.64)	-0.094 (-0.76)	-0.028 (-0.20)	-0.034 (-0.23)	0.070 (0.59)	-0.208 (-1.39)	0.123 (1.04)
R^2	0.027	0.098	0.046	0.022	0.038	0.044	0.026	0.012	0.040	0.041
Adj. R^2	0.006	0.028	0.009	-0.007	0.001	0.008	-0.011	-0.025	0.004	0.005
F value	1.27	1.39	1.23	0.75	1.03	1.22	0.71	0.33	1.10	1.13
N	382	112	211	283	247	247	247	247	247	247

Panel B: Equation (2)

	Electronics	Non-electronics	VC-backed	Non-VC-backed	Small-sized	Big-Sized	Low growth opportunity	High growth opportunity	Low family-controlled	High family-controlled
Intercept	-2.573 (-1.83)*	-1.548 (-0.96)	-2.847 (-1.50)	-1.466 (-1.09)	-11.223 (-3.73)**	-3.214 (-1.65)	-0.952 (-0.42)	-2.715 (-1.83)*	-1.304 (-1.06)	-2.379 (-1.14)
IDratio* DSFBR ULE	1.008 (2.38)**	0.016 (0.04)	1.760 (3.10)***	0.008 (0.02)	0.558 (0.94)	0.908 (2.78)***	0.731 (0.89)	0.565 (1.82)*	1.209 (3.43)***	0.250 (0.41)

Gindex	-0.001 (-0.13)	-0.002 (-0.32)	-0.003 (-0.36)	0.000 (-0.05)	-0.008 (-0.50)	0.003 (0.46)	0.001 (0.04)	-0.002 (-0.34)	0.007 (0.69)	-0.006 (-0.62)
Age	0.225 (2.12)**	0.075 (0.68)	0.309 (1.79)*	0.115 (1.29)	0.209 (1.61)*	0.107 (1.36)	0.241 (1.77)*	0.102 (1.24)	0.055 (0.75)	0.317 (2.21)**
VC	-0.107 (-0.74)	0.116 (0.70)			-0.123 (-0.54)	0.017 (0.15)	-0.098 (-0.44)	-0.003 (-0.03)	-0.091 (-0.65)	0.019 (0.10)
UW	3.811 (1.49)	-0.221 (-0.13)	3.357 (1.07)	2.495 (0.89)	5.187 (1.47)	-0.296 (-0.25)	4.706 (1.33)	0.104 (0.08)	1.323 (0.93)	3.694 (0.99)
AD	0.225 (1.50)	-0.154 (-1.10)	0.001 (0.01)	0.225 (1.37)	0.355 (1.66)*	-0.114 (-0.97)	0.351 (1.39)	-0.083 (-0.72)	0.128 (1.15)	0.106 (0.52)
OS	0.073 (1.03)	0.064 (0.71)	0.082 (0.75)	0.033 (0.45)	0.557 (3.51)** *	0.125 (1.26)	-0.031 (-0.26)	0.115 (1.47)	0.021 (0.33)	0.058 (0.48)
Market	-0.151 (-1.09)	-0.137 (-0.84)	-0.017 (-0.10)	-0.328 (-2.15)* *	-0.036 (-0.16)	-0.017 (-0.15)	-0.113 (-0.62)	-0.070 (-0.49)	-0.030 (-0.20)	-0.219 (-1.33)
Dindustry			-0.104 (-0.64)	0.165 (1.17)	0.050 (0.35)	0.077 (0.54)	0.149 (0.82)	0.078 (0.65)	-0.008 (-0.06)	0.236 (1.34)
R^2	0.043	0.030	0.096	0.025	0.071	0.043	0.052	0.029	0.060	0.042
Adj. R^2	0.023	-0.005	0.061	-0.003	0.035	0.006	0.016	-0.007	0.024	0.006
F value	2.11**	0.69	2.69***	0.88	2.00**	1.18	1.44	0.80	1.67*	1.16
N	382	112	211	283	247	247	247	247	247	247

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Second, as an alternative to CARs and BHARs, we measure the long-run stock performance using the calendar-time abnormal return approach proposed by Lyon et al. [27]. In each month we form equally weighted (EW) and value-weighted (VW) portfolios of all firms that participate in the event within the previous 3 years. The value-weighted monthly returns use the market value of equity at the end of the previous month as the weighting vector. The portfolios are rebalanced monthly so that all companies which reach the end of their 3-year period can be dropped and all companies which have executed a transaction can be added. The portfolio abnormal returns are regressed onto the three factors as in Fama and French [17]:

$$R_{p,t} - R_{f,t} = \alpha_0 + \alpha_1(R_{m,t} - R_{f,t}) + \alpha_2SMB_t + \alpha_3HML_t + \varepsilon_{i,t}, \quad (3)$$

where $R_{p,t}$ is the return of the portfolio of IPO firms, $R_{f,t}$ is the return of 1-month time deposit from the Bank of Taiwan, $R_{m,t}$ is the return on the TSE index, SMB is the difference between returns of value-weighted portfolios of small and big stocks, and HML is the difference between returns of value-weighted portfolios of high and low book-to-market stocks. The intercept α_0 is interpreted as the mean monthly abnormal return of the portfolio.

The regression results (not reported) show that the EW portfolio has a significant mean abnormal return of -1.66% per month for the sample IPOs during 1999–2005 - that is, -59.77% for a 3-year period (-1.66%*36months). Likewise, the VW portfolio exhibits statistically significant mean abnormal returns: -1.42% per month or -51.16% after 3 years. Of the sub-samples, IPOs before 2002 have a significant EW (VW) portfolio intercept of -2.01% (-1.82%), which is more negative than that for IPOs after 2002. The subset with IDs has a mean abnormal return of -1.37% (EW) or -1.38% (VW) per month as compared with -1.91% (EW) or -1.50% (VW) per month for the subset without IDs. These findings reveal that IPOs tend to underperform in the post-issue period. Moreover, IPOs after 2002 or IPOs with IDs on boards are prone to experience better aftermarket performance as compared with the subset before 2002 or the subset without IDs. The evidence is similar to that reported in previous sections, thereby confirming that our results are not sensitive to the choice of stock performance measure.

4 Conclusion

A key feature of recent corporate governance reform around the world is imposing uniformly high levels of monitoring through the requirement of IDs on corporate boards. Taiwan established a requirement for IDs according to the SFB 2002 rules, which state that firms applying for an initial listing after February 22,

2002 must have at least two seats of IDs on their boards. The implementation of the rules provides an opportunity to examine the effect of ID requirement on IPOs performance. By measuring the post-IPO abnormal returns via the size-and-book-to-market reference portfolio approach, we find that IPOs generally experience long-run underperformance following the offerings. However, IPOs after 2002 perform better than those before. Additionally, IPO firms with IDs on boards are associated with better post-IPO performance than those without. The proportion of IDs on boards is positively associated with post-issue stock performance. In particular, the positive effect of IDs on aftermarket performance is pronounced for IPOs classified in the electronics industry, IPOs backed by venture capital, big offerings, or those with low family-controlled shareholdings.

The effects are robust to the use of a mean proportion of IDs over the three years after the offering and alternative measures of long-term stock performance. This paper to our knowledge is the first to investigate the effect of IDs on post-IPO performance. It contributes to the literature on the relation between corporate governance and firm performance and on the desirability of governance rules on corporations by providing evidence that ID information has a positive association with post-IPO stock performance, thus favoring the listing requirements of IDs as an appropriate corporate governance design for IPO firms. The results in turn stand consistent with the claim that IDs usually share a common interest with outsider shareholders and have incentives as well as expertise to monitor management. The empirical evidence also provides policy implications in support of mandating strong corporate governance codes and laws such as the recent Sarbanes-Oxley Act in the U.S.

References

- [1] A. Agrawal and G. Mandelker, Large shareholders and the monitoring of managers: the case of anti-takeover charter amendments, *Journal of Financial and Quantitative Analysis*, **25**(2), (1990), 143-161.
- [2] B.M. Barber and J.D. Lyon, Detecting long-run abnormal stock returns: the empirical power and specification of test statistics. *Journal of Financial Economics*, **43**(3), (1997), 341-372.
- [3] R.P. Beatty and J.R. Ritter, Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics*, **15**(1/2), (1986), 213-232.
- [4] A. Brav and P.A. Gompers, Myth or reality? The long-run underperformance of initial public offerings: evidence from venture and non-venture capital-backed companies. *Journal of Finance*, **52**(4), (1997), 1791-1821.
- [5] J. Byrd and K. Hickman, Do outside directors monitor managers? Evidence from tender offer bids, *Journal of Financial Economics*, **32**(2), (1992), 195-221.
- [6] Cadbury Committee, Report on the financial aspects of corporate governance. Gee Publications, London, 1992.
- [7] R. Carter, F. Dark and A. Singh, Underwriter reputation, initial returns, and the long-run performance of IPO stocks, *Journal of Finance*, **53**(1), (1998), 285-311.
- [8] A. Chen, S.L. Chiou, C.Wu, Efficient learning under price limits: evidence from IPOs in Taiwan, *Economics Letters*, **85**(3), (2004), 373-378.
- [9] C.J.P. Chen and B. Jaggi, Association between independent non-executive directors, family control and financial disclosures in Hong Kong. *Journal of Accounting and Public Policy*, **19**(4/5), (2000), 285-310.
- [10] M.M. Cornett, A.J. Marcus and H. Tehranian, Corporate governance and pay-for-performance: the impact of earnings management, *Journal of Financial Economics*, **87**(2), (2008), 357-373.

- [11] J.F. Cotter, A. Shivdasani and M. Zenner, Do independent directors enhance target shareholder wealth during tender offers?, *Journal of Financial Economics*, **43**(2), (1997), 195-218.
- [12] J. Dahya and J.J. McConnell, Outside directors and corporate board decisions. *Journal of Corporate Finance*, **11**(1-2), (2005), 37-60.
- [13] D.R. Dalton, J.L. Johnson and Q.E. Ellstrand, Number of directors and financial performance: a meta-analysis, *Academy of Management Journal*, **42**(6), (1999), 674-686.
- [14] G. Drymiotes, The Monitoring role of insiders. *Journal of Accounting and Economics*, **44**(3), (2007), 359-377.
- [15] E.F. Fama, Agency Problem and the theory of the firm. *Journal of Political Economy*, **88**(2), (1980), 288-307.
- [16] E.F. Fama, Market Efficiency, Long-term returns, and behavioral finance. *Journal of Financial Economics*, **49**(3), (1998), 283-306.
- [17] E.F. Fama and K.R. French, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics*, **33**(2), (1993), 3-56.
- [18] E.F. Fama and M. Jensen, Separation of ownership and control, *Journal of Law and Economics*, **26**(2), (1983), 301-325.
- [19] L.M. Gales and I.F. Kesner, An analysis of board of director size and composition in bankrupt organizations. *Journal of Business Research*, **30**(3), (1994), 271-282.
- [20] B.E. Hermalin and M.S. Weisbach, The effects of board composition and direct incentive on firm performance, *Financial Management*, **20**(4), (1991), 101-112.
- [21] R. Holthausen and D. Larcker, The financial performance of reversed leverage buyouts, *Journal of Financial Economics*, **42**(3), (1996), 293-332.
- [22] A. Klein, Firm performance and board committee structure, *Journal of Law and Economics*, **41**(1), (1998), 275-303.

- [23] J. Lakonishok, A. Shleifer and R.W. Vishny, Contrarian investing, extrapolation and risk, *Journal of Finance*, **49**(5), (1994), 1541-1578.
- [24] R. La Porta, F.A. Shleifer and R.W. Vishny, Investor protection and corporate valuation. *Journal of Finance*, **57**(3), (2002), 1147-1170.
- [25] M. Levis, The long-run performance of initial public offerings: the UK experience 1980-1988, *Financial Management*, **22**(1), (1993), 28-41.
- [26] T. Loughran and J. Ritter, The new issues puzzle, *Journal of Finance*, **50**(1), (1995), 23-52.
- [27] J.D. Lyon, B.M. Barber and C. Tsai, Improved methods for tests of long-run abnormal stock returns, *Journal of Finance*, **54**(1), (1999), 165-201.
- [28] W.L. Megginson and K.A. Weiss, Venture capitalist certification in initial public offerings, *Journal of Finance*, **46**(3), (1991), 879-903.
- [29] P.C. O'Brien and R. Bhushan, Analyst following and institutional ownership. *Journal of Accounting Research*, **28**(3), (1990), 55-76.
- [30] T. Randøy and J.I. Jenssen, Board independence and product market competition in Swedish firms, *Corporate Governance: An International Review*, **12**(3), (2004), 281-289.
- [31] J.R. Ritter, The long-run performance of initial public offerings, *Journal of Finance*, **46**(1), (1991), 3-27.
- [32] J.R. Ritter and I. Welch, A review of IPO activity, pricing, and allocations, *Journal of Finance*, **57**(4), (2002), 1795-1828.
- [33] S. Rosenstein and J.G. Wyatt, Outside directors, board independence, and shareholders wealth, *Journal of Financial Economics*, **26**(2), (1990), 175-192.
- [34] M.H. Schellenger, D. Wood and A. Tashkori, Board of director composition, shareholder wealth and dividend policy, *Journal of Management*, **15**(3), (1989), 457-467.

- [35] A. Shleifer and R. Vishny, A survey of corporate governance, *Journal of Finance*, **52**(2), (1997), 737-783.
- [36] S.H. Teoh and T.J. Wong, Perceived auditor quality and the earnings response coefficient, *Accounting Review*, **68**(2), (1993), 346-366.