PRIVATE BENEFITS AND BOARD SIZE: INTERNATIONAL EVIDENCE

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Abstract

In our analyses of 10,390 companies from 51 countries, we find that in countries that have small capital markets free cash flow is positively related to board size. However, this positive relation becomes significantly weak for companies in large securities markets. This result suggests that managers in underdeveloped capital markets have an incentive to construct less effective boards to extract private benefits. However, the distorted managerial incentive is alleviated in developed countries that have various disciplinary mechanisms to ensure good governance practices. We do not find clear evidence that legal protection of shareholder rights mitigates the managerial incentive to construct less effective boards.

Keywords: Board of Directors, Private Benefits, Corporate Governance

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1. Introduction

Corporate boards are expected to serve as an important vehicle to mitigate agency costs through their advisory and monitoring roles. Numerous previous studies have investigated the determinants of board structure and its effect on firm value. Especially, recent empirical works suggest that US and UK firms endogenously choose their optimal board structures (Boone et al., 2007; Guest, 2009; Lehn et al., 2009; Linck et al., 2008). However, most studies focus on US and European firms, and we do not know enough about the determinants of board structure in emerging countries. This paper principally intends to fill this research gap and attempts to investigate the difference in determinants of board size across countries. In developed countries, better information disclosure that includes analyst and media coverage will mitigate information asymmetry. In addition, several disciplinary forces (e.g., monitoring by institutional investors, hostile takeover threats, and regulation) are likely to require managers to adopt optimal board structures in developed countries. However, managers will have an incentive to create a board that is less likely to monitor them if they are released from pressure applied for good governance practices (Jensen, 1993). This managerial incentive is consistent with numerous works that suggest managers and controlling shareholders make distorted decisions.[8]

Specifically, we investigate whether the effect of private benefits on board size differs across countries. Jensen (1986) argues that free cash flow generates agency conflicts, because managers have incentives to use it for private benefits rather than to create shareholder wealth. Boone et al. (2007) hypothesize that firms with large private benefits will adopt strong board structure. However, this story is true only if managers are under disciplinary pressure to adopt optimal corporate governance structures. If managers are released from the pressure, those with the opportunity of extracting private benefits will have an incentive to create less-functioning boards.

[8] Previous papers present evidence that US bidders that have poor governance structures receive low stock price reactions when mergers and acquisitions are announced (Bauguess and Stegemoller, 2008; Bliss and Rosen, 2001; Datta et al., 2001; Masulis et al., 2007). Similarly, it is well cited that diversified firms have decreased firm value (diversification discount) (Berger and Ofek, 1995; Denis et al., 1997; Lang and Stultz, 1994). Several works suggest that controlling shareholders pursue private benefits in emerging countries or countries that show weak legal protection of minority shareholders (Bae et al., 2002; Berkman et al., 2009; Cheung et al., 2006; Claessens et al., 2002; Croci and Petmezas, 2010; Dych and Zingales, 2004; Faccio et al., 2001; Johson et al., 2000).

In our analyses of 10,390 companies from 51 countries, we find that in countries that have small securities markets, free cash flow (proxied by cash-to-assets ratio) is positively related to board size. However, this positive relation becomes significantly weak when the company is located in a large securities market. This result suggests that managers in undeveloped capital markets have an incentive to construct less effective boards to extract private benefits. However, this distorted managerial incentive is alleviated in developed capital markets equipped with various disciplinary mechanisms. As mentioned, recent papers show evidence that US and UK firms choose optimal board structure (Boone et al., 2007; Guest, 2009; Lehn et al., 2009; Linck et al., 2008). Our results cast doubt on the universality of this argument and suggest that conflicts of interests exist between shareholders and managers regarding board size choice. Prior works argue that legal protection of minority shareholder rights is important in mitigating expropriation problems (Croci and Petmezas, 2010; Dyck and Zingales, 2004; La Porta et al., 1998, 1999, 2000b). However, we do not find clear evidence that the legal protection of investor rights mitigates the managerial incentive to construct less effective boards.

The remainder of the paper is organized as follows. Section 2 presents previous papers and the development of our hypothesis. Section 3 describes our sample and data. Section 4 shows the empirical results. A brief summary of our research is presented in Section 5.

2. Previous studies and hypothesis development

Several theoretical papers demonstrate how optimal board size is determined (Harris and Raviv, 2008; Raheja, 2005). As a corporate board includes more members, the board will have more expertise and therefore an enhanced ability to monitor a broad range of managerial behaviors. As board size increases, however, coordination costs increase and the voting power of individual board members decreases. As a result, directors will lose the incentive to critically monitor management (free-rider problem) (Jensen, 1993; Lipton and Lorsch, 1992).

This idea gives rise to several hypotheses about determinants of board size. Firms that have a complex structure will need more expertise on the board and are likely to appoint large boards. Linck et al. (2008) show a positive association between firm age and board size. Guest (2008) and Linck et al. (2008) report a positive correlation between leverage and board size. Boone et al. (2007), Coles et al. (2008), and Linck et al. (2008) find that diversified firms have larger boards. Another important factor associated with optimal board size is the degree of information asymmetry (monitoring costs). As monitoring costs increase, more free-riding problems are likely to occur and firms should adopt small boards. Guest (2008), Lehn et al. (2004), and Linck et al. (2008) report a negative and significant relationship between Tobin's *Q* and board size, while Boone et al. (2007) find a significantly negative relationship between R&D intensity and board size.

Several authors investigate the relation between private benefits and board size (Boone et al., 2007, Coles et al., 2008; Guest, 2008). It is likely that conflicts of interest between shareholders and managers exist regarding the relation between private benefits and board structure. Empire-building managers prefer firm size maximization to shareholder wealth maximization. Jensen (1986) argues that managers who can access free cash flow will undertake negative-NPV projects at the expense of shareholder wealth (overinvestment problem). If firms adopt their optimal board structure, those with a lot of free cash flow are predicted to have strong boards that can prevent managers from spending the free cash flow in value-decreasing projects. In contrast, managers have an incentive to create less-functioning boards that allow them to pursue private benefits. Jensen (1993) suggests that high managerial ownership can allow the CEO to create a board that is unlikely to monitor management.

Recent papers suggest that capital market developments affect the level of private benefits managers or controlling shareholders extract (Croci and Petmezas, 2010; Dyck and Zingales, 2004). In developed countries, various disciplinary forces (e.g., hostile takeover threats; the voice of institutional investors; regulation) will mitigate the distorted managerial incentive. US corporate boards have become more independent since the Sarbanes-Oxley Act (SOX) of 2002 required listed companies to have independent boards (Linck et al., 2008). Wu (2004) finds that US firms publicly named as poor governance companies by CalPERS are more likely to decrease inside directors. Uchida (2010) notes that corporate governance principles released by institutional investors are an important driver of recent Japanese corporate board downsizing. However, those disciplinary forces are likely to be weak in emerging markets. In countries where ownership structure is highly concentrated, controlling shareholders can pursue private benefits. In

these countries, it is less likely that institutional investors and hostile takeover threats provide effective monitoring. Legal protection of shareholder rights is also associated with how shareholders can discipline managers. La Porta et al. (2000a) present evidence that legal protection of shareholder rights gives minority shareholders power to receive high dividends from the firm. Their discussion gives rise to a prediction that managers can construct a board that allows them to extract private benefits in countries where investors' rights are not well protected.

Previous studies use free cash flow and industry concentration as a proxy for private benefits. Industry concentration is adopted because managers of firms with market power could be subject to less market discipline and are better able to extract private benefits than managers of firms in highly competitive industries (Gillan et al., 2003). As mentioned, large boards have a lot of expertise and thereby can provide advice and monitoring on a broad range of issues. However, it is difficult for large boards, in which individual members' voting power is weak, to provide critical monitoring that prevents managers' extraction of private benefits.[9] Boone et al. (2007) note that even if the monitoring benefits of additional board members increase with free cash flow, coordination and free-riding costs increase even faster. Consistent with this idea, Coles et al. (2008) find that free cash flow is negatively related to US corporate board size. Similarly, Guest (2008) finds a negative and significant coefficient on private benefits measures in his fixed effects model estimation of board size. However, the managerial incentive to build less-functioning boards when private benefits are large is likely to overwhelm the pressure for strong boards if managers are not subject to pressure for good governance practices. Those discussions give rise to the following hypothesis.

Hypothesis 1: ***Board*** *size is positively related to private benefits in small capital markets and countries where investors' rights are less protected. This relation is less evident or becomes negative in large capital markets and countries where investors' rights are well protected.*

Recent corporate governance research pays much attention to the expropriation of minority shareholder wealth by controlling shareholders (Faccio et al., 2001; Johnson et al., 2000; Shleifer and Vishny, 1997). Claessens et al. (2002) find that in East-Asian countries firm value decreases when the control rights of the largest shareholder exceed the firm's cash flow ownership. Bae et al. (2002) present evidence that acquisition announcements by Korean chaebol-affiliated companies receive negative stock reactions. Berkman et al. (2009) show that Chinese companies that issued loan guarantees to related parties have low Tobin's Q, ROA, and dividend yield. Leuz et al. (2009) find that foreigners invest less in firms with high managerial or family ownership in countries with weak outside shareholder protection.

It is likely that controlling shareholders who expropriate minority shareholder wealth have an incentive to construct less-functioning boards. This idea gives rise to the following hypothesis.

Hypothesis 2: *Board size of companies that have controlling shareholders is positively related to private benefits. This positive relation becomes weak for those do not.*

3. Sample selection and data

We collect sample firms from a list of companies for which financial, stock price, and corporate board member data is available from the OSIRIS database. Throughout the following analysis, we use year 2009 data. For each company, we count the number of members who appear in the OSIRIS board and officer data; we adopt it as a board size variable (BOARDSIZE) (see Table 1 for a definition of the variables). To avoid using incomplete data, we delete firms from the sample in which BOARDSIZE is one or two (the results are qualitatively unchanged when we include those companies). Our hypotheses can be applied to board independence as well as to board size. However, we do not investigate board composition due to data availability. Table 1 presents a definition of variables.

[9] Several papers find a negative relation between firm performance and board size (Bennedsen et al., 2008; Eisenberg et al., 1998; Yermack, 1996).

Table 1. Definition of variables

LnBOARDSIZE	The natural logarithm of board size. Board size is the number of board members.
LnFIRMAGE	The natural logarithm of the length of years since the firm went public.
LEVERAGE	Total liabilities divided by assets.
MtBr	Market capitalization and total liabilities divided by book value of assets.
R&D	R&D expenditures divided by assets.
VOLATILITY	360-day stock price volatility.
FCF	Cash and equivalents divided by assets.
CONCENT	Sum of the squared ratio of sales over the total sales of the industry. A Global Industry Classification Standard (GICS) code is used for industry classification.
LnASSET	The natural logarithm of assets.
ROA	Operating income divided by assets.
LnMARKETSIZE	The natural logarithm of market capitalization.
COMMON	Dummy variable that takes a value of one for common law countries.
LLSV	Antidirector rights index provided by La Porta et al. (1998).
C_ADRI	Corrected antidirector rights index provided by Spamann (2010).
CONTROL	Dummy variable that takes a value of one for companies that have a shareholder who directly or indirectly holds 20 percent or more shares of the company.

As a proxy variable for operational complexity, we adopt LEVERAGE (liabilities divided by assets) and FIRMAGE (length of years since the firm went public). Market-to-book ratio (market capitalization and liabilities divided by assets; hereafter denoted by MtBr), R&D intensity (R&D expenditures over assets; R&D), and 360-day stock price volatility (VOLATILITY) are included as measures of monitoring costs. Several papers use cash flow as a measure of free cash flow. However, cash flow is likely to be correlated to firm performance. Following Guest (2008), we use cash or the equivalent divided by assets (FCF) as a proxy for free cash flow. Industry concentration (CONCENT) is adopted as an additional measure of private benefits. Specifically, we compute the ratio of a firm's sales over the total sales in the same industry of the country (the Global Industry Classification Standard (GICS) code is used for industry classification). The sum of the squared sales ratio is used as CONCENT. The OSIRIS database includes the direct and indirect percentage ownership of each of the large shareholders. To investigate the effect of controlling shareholders, we make a dummy variable that takes a value of one for companies that have a shareholder who directly and indirectly holds 20% or more company shares (CONTROL) (Claessens et al., 2000; La Porta et al., 1999). We also adopt firm size (natural logarithm of assets; LnASSET) and return on assets (operating income divided by assets; ROA) as control variables. When necessary data is not available, the company is excluded from the sample (but we include firms from countries for which La Porta et al.'s (1998) and Spamann's (2010) shareholder rights indices are not available). As a result of those procedures, 10,390 companies from 51 countries are adopted as our entire sample firms.

Table 2 shows board size by country. Among countries that have ten or more observations, the companies of Egypt, Korea, and the Philippines have large boards, whereas those of Brazil, Chile, China, and Portugal have small boards. The shareholder right protection index (LLSV and C_ADRI) does not seem highly correlated with board size.

Previous studies suggest that La-Porta et al.'s (1998) antidirector rights index is related to corporate financial behaviors and performance (Dittmar et al., 2003; Dyck and Zingales, 2004; La Porta et al., 2000a; Maury, 2006). It is also documented that a high LLSV index is associated with a large capital market and less concentrated ownership structure (La Porta et al., 1997, 1999).

Table 2. Board size by country

Country	Board size			Common law country	LLSV	C_ADRI	N
	Mean	Standard deviation	Median				
Argentina	6.00	0	6.00		4	2	2
Australia	9.48	2.90	9.00	Yes	4	4	461
Austria	13.63	6.17	12.00		2	2.5	48
Belgium	12.35	4.87	11.00		0	3	89
Brazil	5.33	1.16	5.00		3	5	127
Canada	15.17	4.81	14.50	Yes	5	4	414
Chile	5.08	1.15	5.00		5	4	25
China	5.30	1.49	5.00				40
Colombia	6.50	3.54	6.50		3	3	2
Croatia	9.88	3.31	9.50				8
Czech	33.00		33.00				1
Denmark	7.20	3.07	7.00		2	4	35
Egypt	15.56	7.22	14.50		2	3	18
Finland	7.99	1.85	8.00		3	3.5	87
France	14.93	8.04	13.00		3	3.5	138
Germany	11.91	7.12	10.00		1	3.5	245
Greece	8.67	2.46	8.00		2	2	199
Hong Kong	14.05	4.16	13.00	Yes	5	5	143
Hungary	10.14	2.80	10.00				14
Iceland	8.00		8.00				1
India	11.01	3.44	11.00	Yes	5	5	464
Indonesia	5.94	1.84	6.00		2	4	124
Ireland	11.29	3.86	12.00	Yes	4	5	35
Israel	11.96	5.34	12.00	Yes	3	4	106
Italy	6.46	2.38	6.00		1	2	50
Japan	11.16	3.86	11.00		4	4.5	2838
Kenya	12.25	2.36	13.00	Yes	3	2	4
Malaysia	9.95	2.25	10.00	Yes	4	5	539
Morocco	9.32	7.33	8.00				19
Netherlands	10.53	5.34	9.00		2	2.5	89
New Zealand	10.81	3.38	10.00	Yes	4	4	48
Nigeria	15.00		15.00	Yes	3	4	1
Norway	8.46	2.55	8.00		4	3.5	61
Panama	10.00	5.29	8.00				3
Peru	7.00		7.00		3	4.5	1
Philippines	15.58	3.39	15.00		3	4	38
Poland	9.54	4.54	8.00				90
Portugal	5.33	1.06	5.00		3	2.5	21
Republic of Korea	16.94	4.68	20.00		2	4.5	139
Romania	7.50	3.56	7.00				6
Singapore	10.15	3.04	9.00	Yes	4	5	126
Slovakia	13.33	6.66	10.00				3
South Africa	11.37	3.76	11.00	Yes	5	5	159
Spain	5.42	1.08	5.00		4	5	36
Sri Lanka	3.00		3.00	Yes	3	4	1
Sweden	12.63	2.99	13.00		3	3.5	38
Switzerland	11.85	4.48	12.00		2	3	142
Thailand	12.26	3.10	12.00	Yes	2	4	246
Turkey	7.56	2.66	7.00		2	3	125
UK	8.18	2.75	8.00	Yes	5	5	625
USA	13.05	5.53	12.00	Yes	5	3	2116
Total	**11.25**	**4.79**	**10**	**16**			**10390**

Recently, Spamann (2010) presented a new shareholder rights index after thoroughly re-examining local legal data. We use three variables for a measure of legal shareholder protection: common law dummy (one for companies located in a common law country and zero for others) (COMMON); LLSV antidirector rights index (LLSV); and corrected ADRI index (Spamann, 2010) (C_ADRI). It is likely that large capital markets are equipped with various disciplinary forces for good governance practices that include voice by institutional investors, takeover threats, analysts, and media coverage. We adopt the total market capitalization of listed firms in the country, which is available from the World Bank Web site as a measure of the securities market's development (MARKETSIZE). Table 2 indicates board size by country. The sample consists of 10,408 companies from 51 countries. LLSV is the legal shareholder rights index provided by La Porta et al. (1998). C_ADRI is the legal shareholder rights index provided by Spamann (2010).

Previous studies use the ratio of market capitalization over GDP as a measure of the development of a securities market (Brockman and Unlu, 2009; Croci and Petmezas, 2010; Demirgiic-Kunt and Levine, 1996; Dyck and Zingales, 2004). We adopt the absolute size of capital markets because we focus on the degree to which managers receive pressure for good governance practices rather than on the availability of external financing.

Table 3 presents descriptive statistics. The average firm holds approximately 13 percent of its assets in the form of cash and equivalents. About half of our sample firms come from common law countries. Forty percent of the companies have a controlling shareholder.

4. Empirical results

4.1. Basic results

To test our hypotheses, we conduct regressions of board size. We adopt the natural logarithm of board size (LnBOARDSIZE) as a dependent variable. We also take the natural logarithm for FIRMAGE (LnFIRMAGE), assets (LnASSETS), and MARKETSIZE (LnMARKETSIZE). Given that corporate board size and firm characteristics will vary considerably across countries and industries, we use a country- and industry-adjusted variable (raw variable minus the mean value for the same country and industry) for all variables except the dummy variable (CONTROL) and country-specific variables (COMMON, LLSV, C_ADRI, and LnMARKETSIZE).

Table 3. Descriptive statistics

Variable	Mean	Standard deviation	Min	25th percentile	Median	75th percentile	Max
Board size	11.252	4.794	3.000	8.000	10.000	14.000	56.000
Firm age	18.986	18.554	1.000	6.000	13.000	22.000	147.000
LEVERAGE	0.170	0.271	0	0.014	0.112	0.249	15.269
MtBr	0.920	1.116	0.008	0.405	0.651	1.012	17.709
R&D	0.022	0.100	0	0	0	0.006	3.583
VOLATILITY	0.487	0.402	0.050	0.290	0.390	0.550	9.680
FCF	0.134	0.144	0	0.035	0.090	0.183	0.999
CONCENT	0.315	0.280	0.031	0.101	0.208	0.446	1.000
ASSET (million US dollars)	3,191	1,600	0.023	92	341	1,380	782
ROA	-0.004	0.343	-4.969	-0.010	0.039	0.086	17.870
MARKETSIZE (million US dollars)	4,540,000	5,460,000	1,128	836,000	2,800,000	3,380,000	15,100,000
COMMON	0.528	0.499	0	0	1	1	1
LLSV	3.981	1.139	0	4	4	5	5
C_ADRI	4.022	0.828	2	3	4.5	4.5	5
CONTROL	0.387	0.487	0	0	0	1	1

To make the adjusted variable, the first four digits of the GICS code are used for industry classification. This adjustment is particularly important for FCF because cash holdings beyond the industry mean can be viewed as excess cash holdings (accumulation of free cash flow). In unreported analyses, we conduct analyses that add country and industry dummies instead of using the adjusted variables; this analysis engenders qualitatively the same results. Table 3 indicates descriptive statistics. The sample consists of 10,408 firms from 51 countries. See Table 1 for a definition of variables.

Table 4 indicates correlations among variables. Consistent with previous studies, board size is highly correlated with firm size (LnASEET). VOLATILITY is negatively related with board size. However, we need to control for firm-size effects to examine their marginal effect on board size because VOLATILITY is highly correlated with LnASSET.

Table 4. Correlation matrix

	LnBOARDSIZE	LnFIRMAGE	LEVERAGE	MtBr	R&D	VOLATILITY	FCF	CONCENT	LnASSET	ROA
LnBOARD SIZE	1.000									
LnFIRM AGE	0.195	1.000								
LEVERAGE	-0.136	0.018	1.000							
MtBr	-0.124	-0.058	0.149	1.000						
R&D	-0.217	-0.032	0.121	0.197	1.000					
VOLATILITY	-0.431	-0.131	0.107	0.082	0.198	1.000				
FCF	-0.114	-0.137	-0.068	0.209	0.119	0.058	1.000			
CONCENT	-0.009	0.003	0.031	0.024	0.014	-0.004	-0.002	1.000		
LnASSET	0.646	0.284	-0.090	-0.173	-0.208	-0.493	-0.241	0.035	1.000	
ROA	0.182	0.066	0.037	-0.088	-0.219	-0.292	-0.049	-0.008	0.275	1.000
LnMARKETSIZE	0.355	0.022	-0.122	-0.068	-0.291	-0.217	0.000	-0.006	0.166	0.046
COMMON	0.272	0.037	-0.088	-0.053	-0.222	-0.181	-0.103	0.004	0.279	0.085
LLSV	0.239	0.023	-0.087	-0.048	-0.204	-0.139	-0.050	0.008	0.206	0.060
C_ADRI	-0.333	-0.006	0.082	0.059	0.269	0.210	0.008	0.016	-0.151	-0.042
CONTROL	-0.077	-0.061	0.011	0.017	0.066	0.067	0.008	0.001	-0.063	-0.036

Table 4. Continued

	LnMARKETSIZE	COMMON	LLSV	C_ADRI	CONTROL
LnMARKETSIZE	1.000				
COMMON	0.183	1.000			
LLSV	0.634	0.590	1.000		
C_ADRI	-0.173	-0.036	0.206	1.000	
CONTROL	-0.314	-0.025	-0.266	-0.062	1.000

Proxy variables for private benefits do not have a high correlation with other independent variables. LLSV is highly correlated with COMMON (La Porta et al., 1998), but C_ADRI does not show a high correlation with LLSV and COMMON (Spamann, 2010). The existence of a controlling shareholder is more common in low LLSV countries (La Porta, 1999). Consistent with La Porta et al.'s (1997) finding, countries that have large stock exchanges tend to have a high LLSV index but LnMARKETSIZE is not highly related to C_ADRI. Table 4 shows the correlation coefficients among variables. The sample consists of 10,408 firms from 51 countries. Country- and industry-adjusted data is used for this table (the first fur digits of the SICS code is used for industry classification). See Table 1 for the definition of variables.

Table 5 presents regression results for the entire sample. To test our hypotheses, we adopt interaction terms between private benefits measures (FCF and CONCENT), legal shareholder right protection variables (COMMON, LLSV, C_ADRI), LnMAREKTSIZE, and CONTROL. In model (1) that adopts the interaction term between private benefits and LnMARKETSIZE, FCF has a positive and significant coefficient. Different from US and UK evidence, this result implies that firms that have high free cash flow tend to have large boards in countries that have small securities markets. Importantly, FCF*LnMARKETSIZE has a negative and significant coefficient. Consistent with our hypothesis, those results suggest that managers tend to construct less effective boards to pursue private benefits in developing countries but this tendency becomes weak as the securities market becomes developed.

Models (2) to (4) adopt interaction terms between private benefits and a legal characteristic variable. Models (2) and (3) engender a positive and significant coefficient on FCF, suggesting that firms located in civil law countries or weak legal countries tend to adopt large boards when firms have large free cash flow. Model (3) engenders a negative and significant coefficient on FCF*LLSV. Consistent with our hypothesis, the result implies that the positive relation between private benefits and board size becomes weak in countries with strong legal shareholder protection. However, model (4), that uses C_ADRI, presents an opposite result. The interaction term between FCF and C_ADRI has a positive coefficient, suggesting that managers in countries with a high corrected ADRI index are more likely to increase board size when they have an opportunity to extract private benefits. Spamann (2010) made substantial corrections to the LLSV index to construct a more reliable index (C_ADRI). For example, he collected raw legal data directly from primary materials and analyzed them with the help of local lawyers. He also made a detailed coding protocol to convert the raw data into replicable index values. Given those attitudes, we cannot conclude that managers in countries with strong legal shareholder protection are less likely to build weak boards when the opportunity of private benefits extraction exists. The model (3) result potentially derives from the positive correlation between LnMARKETSIZE and LLSV. Table 5 indicates regression results of LnBOARDSIZE. The sample consists of 10,408 firms from 51 countries. In models (3) and (4), the sample size declined because LLSV and C_ADRI are not available for some countries. Country- and Industry-adjusted data are used for this analysis (the first four digits of the SICS

code are used for industry classification). See Table 1 for a definition of the variables. Figures in parenthesis are *t*-statistics computed by using robust standard errors.

Table 5. Regression results

	(1)	(2)	(3)	(4)	(5)
FIRMAGE	0.013 (2.92)***	0.012 (2.85)***	0.011 (2.60)***	0.012 (2.71)***	0.012 (2.85)***
LEVERAGE	-0.055 (-5.39)***	-0.055 (-5.37)***	-0.054 (-5.36)***	-0.054 (-5.33)***	-0.055 (-5.38)***
MtBr	0.002 (0.36)	0.001 (0.14)	0.001 (0.13)	0.001 (0.17)	0.000 (0.11)
R&D	-0.243 (-4.67)***	-0.261 (-4.92)***	-0.256 (-4.79)***	-0.251 (-4.87)***	-0.259 (-4.84)***
VOLATILITY	-0.143 (-7.99)***	-0.144 (-8.03)***	-0.143 (-8.00)***	-0.143 (-7.93)***	-0.144 (-8.02)***
FCF	3.144 (6.96)***	0.102 (2.45)**	0.466 (3.53)***	-0.558 (-4.05)***	0.085 (2.55)**
FCF*LnMARKETSIZE	-0.138 (-6.67)***				
FCF*COMMON		0.033 (0.62)			
FCF*LLSV			-0.080 (-2.66)***		
FCF*C_ADRI				0.176 (5.29)***	
FCF*CONTROL					0.105 (1.94)*
CONCENT	0.256 (0.83)	-0.043 (-1.46)	-0.039 (-0.65)	-0.099 (-1.02)	-0.068 (-2.48)**
CONCENT* LnMARKETSIZE	-0.015 (-1.01)				
CONCENT*COMMON		-0.036 (-0.92)			
CONCENT*LLSV			-0.008 (-0.50)		
CONCENT*C_ADRI				0.008 (0.35)	
CONCENT*CONTROL					0.011 (0.29)
CONTROL	-0.020 (-3.02)***	-0.022 (-3.24)***	-0.023 (-3.46)***	-0.024 (-3.56)***	-0.020 (-2.93)***
LnASSET	0.123 (49.47)***	0.123 (49.48)***	0.123 (49.37)***	0.123 (49.66)***	0.123 (49.49)***
ROA	-0.035 (-1.91)*	-0.034 (-1.82)*	-0.034 (-1.76)*	-0.039 (-2.24)**	-0.034 (-1.89)*
Adj. R2	0.445	0.441	0.447	0.449	0.441
N	10390	10390	10205	10205	10390

***: Significant at the 1% level; **: Significant at the 5% level; *: Significant at the 10% level

Model (5) adopts interaction terms between private benefits variables and CONTROL. Consistent with our hypothesis, model (5) engenders a positive coefficient on FCF*CONTROL (significant at the 10 percent level). Firms that have controlling shareholders tend to appoint less-functioning boards when their managers have an opportunity to extract private benefits. However, we should view the result with caveats because CONTROL is negatively correlated to LnMARKETSIZE. In all models, we find no significant coefficients on interaction terms that use CONCENT.

To isolate the effect of legal shareholder right protection (or the existence of controlling shareholders) from that of capital market size, we conduct a regression analysis that includes all interaction terms (but we do not simultaneously include interaction terms that use COMMON, LLSV, and C_ADRI). All

models in Table 6 engender a negative and significant coefficient on FCF*LnMARKETSIZE. Consistent with the former result (model (1) of Table 5), firms in large securities markets are less likely to construct weak boards when the managers have an opportunity to extract private benefits.

In contrast, the coefficients of FCF*LLSV have a significantly positive coefficient. We interpret that model (3) of Table 5 engenders a negative and significant coefficient on FCF*LLSV because countries with large capital markets tend to have high LLSV index. Again, model (3) of Table 6 engenders a positive and significant coefficient on FCF*C_ADRI, suggesting that firms located in countries that protect shareholder rights have a greater tendency to appoint boards that suffer from free-riding problems when large free cash flow is available.

Table 6. Regression results when simultaneously including interaction terms

	(1)	(2)	(3)
FIRMAGE	0.012 (2.67)***	0.010 (2.38)**	0.011 (2.58)***
LEVERAGE	-0.055 (-5.36)***	-0.054 (-5.33)**	-0.054 (-5.34)***
MtBr	0.001 (0.24)	0.001 (0.20)	0.001 (0.26)
R&D	-0.245 (-4.76)***	-0.242 (-4.71)***	-0.241 (-4.66)***
VOLATILITY	-0.142 (-7.97)***	-0.142 (-7.94)***	-0.142 (-7.93)***
FCF	3.357 (7.01)***	3.716 (7.47)***	2.437 (3.98)***
FCF*LnMARKETSIZE	-0.153 (-6.96)***	-0.184 (-7.13)***	-0.120 (-4.98)***
FCF*COMMON	0.161 (2.96)***		
FCF*LLSV		0.100 (2.74)***	
FCF*C_ADRI			0.076 (2.03)**
FCF*CONTROL	0.002 (0.04)	0.021 (0.37)	0.032 (0.55)
CONCENT	0.266 (0.80)	0.342 (0.95)	0.264 (0.80)
CONCENT* LnMARKETSIZE	-0.015 (-0.93)	-0.020 (-1.09)	-0.016 (-1.01)
CONCENT*COMMON	-0.020 (-0.52)		
CONCENT*LLSV		0.008 (0.45)	
CONCENT*C_ADRI			0.004 (0.17)
CONCENT*CONTROL	-0.012 (-0.29)	-0.023 (-0.56)	-0.022 (-0.53)
CONTROL	-0.021 (-3.05)***	-0.023 (-3.34)***	-0.022 (-3.25)***
LnASSET	0.123 (49.66)***	0.123 (49.75)***	0.123 (49.66)***
ROA	-0.034 (-1.94)*	-0.036 (-2.02)**	-0.037 (-2.10)**
Adj. R2	0.445	0.451	0.451
N	10390	10205	10205

***: Significant at the 1% level; **: Significant at the 5% level; *: Significant at the 10% level

The corrected ADRI index takes a high value for some emerging markets. For example, Malaysia has a high corrected ADRI but Claessens et al. (2002) show evidence that expropriation of minority shareholder wealth by controlling shareholders exists in Malaysia as well as in other East-Asian countries. Similarly, Korea has a relatively high corrected ADRI, but Bae et al. (2002) argue that the tunneling hypothesis is supported for Korean chaebol-affiliated companies. We interpret that a strict legal system is not a direct force that makes management build powerful boards; capital market size is a more important factor associated with the adoption of good corporate governance practices. Table 6 indicates regression results of LnBOARDSIZE. The sample consists of 10,408 firms from 51 countries. Country- and industry-adjusted data are used for this analysis (the first four digits of the SICS code are used for industry classification). Models (1) and (2) have smaller sample size because LLSV and C_ADRI are not available for some countries. See Table 1 for a definition of the variables. Figures in parenthesis are *t*-statistics computed by using robust standard errors.

All models engender a not significant coefficient on FCF*CONTROL. The result does not support the idea that firms with controlling shareholders have a greater tendency to adopt weak boards to extract private benefits. Given that CONTROL is negatively correlated with LnMARKETSIZE, it is likely that the positive coefficient in model (5) of Table 5 derives from the correlation between CONTROL and LnMARKETSIZE. As with the results in Table 5, Table 6 engenders no significant coefficients on interaction terms that include CONCENT.

Regarding control variables, VOLATILITY and R&D have a negative and significant coefficient. Consistent with US studies, firms that suffer from information asymmetry tend to have small boards. Tables 5 and 6 present the result that firms tend to appoint large boards as firm age increases, which is also consistent with previous US studies. However, we cannot conclude that organizational complexity has a positive impact on board size because LEVERAGE has a negative and significant coefficient. Similar to US findings, large companies tend to have large boards.

4.2. Results of subsamples

To further investigate whether free cash flow is positively related to board size in countries with large capital markets, we divide sample companies into subsamples: (a) firms from the US, China, Japan, Hong Kong, and the UK (large market sample); (b) firms from other countries (small market sample). The World Bank database suggests that the US, China, Japan, the UK, and Hong Kong are the five largest markets in terms of market capitalization. The subsample method merits in that we do not need to assume the same coefficients for all independent variables but for private benefits variables. Table 7 indicates regression results of LnBOARDSIZE for subsamples. The small market sample includes all countries except the US, China, Japan, the UK, and Hong Kong. The large market sample includes those five countries and regions. Country- and industry-adjusted data are used for this analysis (the first four digits of the SICS code are used for industry classification). See Table 1 for a definition of the variables. Figures in parenthesis are *t*-statistics computed by using robust standard errors.

Model (2) of Table 7 shows that FCF has a positive and significant coefficient for the small market sample. This result presents clear evidence that managers in small capital markets tend to appoint large boards when they have an opportunity to extract private benefits. In contrast, Table 7 engenders a not significant coefficient on FCF for the large market sample. As mentioned, it is likely that various disciplinary forces exist in countries with large capital markets; pressure will offset the managerial incentive to make less effective boards when free cash flow is large.

A potential problem in this analysis is that China and Hong Kong are emerging markets, and the central government still retains strong power over corporate governance (especially in State-owned enterprises). The existing literature suggests that state control is associated with poor firm performance (Gunasekarage et al., 2007; Sun and Tong, 2003; Xu and Wang, 1999; Zhang et al., 2001). Berkman et al. (2009) and Cheung et al. (2006) show evidence that expropriation problems exist in China and Hong Kong companies. Those facts give rise to the inference that Chinese and Hong Kong firms are less likely to face pressure for good corporate governance practices. To address this concern, we conduct the same analysis for the US, Japan, and the UK. Consistent with our hypothesis, model (3) of Table 7 shows that FCF has a not significant coefficient.

Table 7. Regression results for subsamples

	(1)	(2)	(3)
	Large market sample	Small market sample	Large market sample without China and Hong Kong
FIRMAGE	0.005 (0.89)	0.015 (2.25)**	0.004 (0.76)
LEVERAGE	-0.167 (-7.49)***	-0.020 (-3.35)***	-0.161 (-7.29)***
MtBr	0.011 (2.10)**	-0.002 (-0.26)	0.010 (2.00)**
R&D	-0.126 (-2.60)***	0.331 (3.97)***	-0.114 (-2.41)**
VOLATILITY	-0.124 (-5.34)***	-0.083 (-5.65)***	-0.121 (-5.33)***
FCF	0.023 (0.70)	0.129 (3.16)***	0.020 (0.58)
CONCENT	-0.056 (-1.70)*	-0.039 (-1.71)*	-0.072 (-2.12)**
CONTROL	-0.006 (-0.56)	0.040 (4.61)***	0.011 (1.00)
LnASSET	0.141 (43.52)***	0.010 (30.87)***	0.143 (43.82)***
ROA	0.007 (0.40)	-0.067 (-2.68)***	0.006 (0.36)
Adj. R2	0.552	0.260	0.556
N	5762	5030	5579

***: Significant at the 1% level; **: Significant at the 5% level; *: Significant at the 10% level

Model (3) of Table 7 engenders a negative and significant coefficient on CONCENT. This result is consistent with US and UK findings by Coles et al. (2008) and Guest (2008). In contrast, there is no significant (at the five percent level) relation between CONCENT and board size for the small market sample. Those results are also consistent with our hypothesis, suggesting that firms in large securities markets are subject to disciplinary forces calling for good governance and, as a result, need to adopt effective boards when private benefits are available. Regarding other variables, LnASSET has a positive and significant coefficient both for large- and small-market samples. Similarly, VOLATILITY has a significantly negative coefficient for all subsamples. However, the sign of the R&D coefficient is the opposite between large and small markets. ROA and FIRMAGE have a significant coefficient only in the small market sample. It is less clear whether factors other than private benefits have a similar impact on board size around the world.

In unreported analyses, we conduct the regression analysis for the following subsamples: (a) common law countries versus civil law countries; (b) firms from countries that have a 4 or higher LLSV versus those from countries that have an LLSV index lower than 4; (c) firms from countries that have 4 or higher C_ADRI versus those from countries that have C_ADRI lower than 4. We do not find clear evidence that firms in countries that have strong legal shareholder protection are less likely to make large boards when FCF is high.

4.3. Additional analyses

So far, we have defined controlling shareholders as shareholders who (directly and indirectly) have 20 percent or more shares of a company. However, several papers use 10 percent stock ownership as a criterion for controlling shareholders (Bodnaruk et al., 2008; Maury, 2006; La Porta et al., 1999; Laeven and Levine, 2008). Following those studies, we conduct a regression analysis which uses a dummy variable that takes a value of one for companies that have a shareholder who directly and indirectly hold ten percent or more shares of the company.

Table 8 suggests that FCF*CONTROL has a positive coefficient and it is statistically significant in model (3). The result provides weak evidence that firms that have controlling shareholders tend to make less effective boards when they have an opportunity to extract private benefits. As with previous results, Table 8 suggests that firms in small capital markets tend to adopt large boards if there is an opportunity to extract private benefits, but the tendency becomes weak in large capital markets. FCF*COMMON, FCF*LLSV, and FCF*C_ADRI have a positive and significant coefficient. Again, there is no evidence that the positive relation between board size and free cash flow weakens in countries that have strong legal shareholder right protection.

Recent studies suggest that capital market development affects corporate financial behaviors and performance (Brockman and Unlu, 2009; Croci and Petmezas, 2010; Demirgiic-Kunt and Levine, 1996; Dyck and Zingales, 2004); those studies use the ratio of market capitalization over GDP as a measure of the development of the securities market. We finally conduct a regression analysis that uses the dummy variable instead of LnMARKETSIZE that takes a value of one for firms in the largest 10 markets in terms of the ratio of market capitalization to GDP (South Africa, Singapore, Jordan, Australia, Malaysia, UK, Chile, Canada, Sweden, USA). We do not find robust evidence that the positive relation between board size and FCF becomes weak in those countries. We argue that market size is a more appropriate indicator of disciplinary forces that require managers to adopt strong boards. Indeed, we find that FCF is positively related to board size for non-G8 countries, whereas we find a not significant relation for G8 countries.

5. Conclusions

Recent US and UK studies argue that firms endogenously adopt optimal board structures (Boone et al., 2007; Guest, 2009; Lehn et al., 2009; Linck et al., 2008). However, studies are limited especially to developed countries and we do not know much about determinants of corporate board structure in emerging markets. In developed countries such as the US and the UK, several disciplinary forces (e.g., institutional investors, takeover threats, regulation) are likely to exist that require companies to adopt a strict corporate governance structure. However, those forces are potentially weak in emerging countries and managers there are able to adopt board structures that allow them to pursue private benefits.

This paper investigates whether the relation between private benefits and board size differs across countries. From the viewpoint of shareholder value-maximization, firms with opportunities for extracting private benefits should adopt boards that can effectively monitor management. This is the case for countries in which managers are pressurized to adhere to good governance practices. However, managers who have an opportunity to extract private benefits will adopt less-functioning boards if they are released from disciplinary forces for good governance. Table 8 indicates regression results of LnBOARDSIZE. The sample consists of 10,408 firms from 51 countries. Country- and industry-adjusted data are used for this analysis (the first four digits of the SICS code are used for industry classification). Models (1) and (2) have a smaller sample size because LLSV and C_ADRI are not available for some countries. See Table 1 for a definition of variables. In this table, CONTROL is a dummy variable that takes a value of one for companies that have a shareholder who directly or indirectly owns 10 percent or more shares of the company. Figures in parenthesis are *t*-statistics computed by using robust standard errors.

To test this idea, we collected 10,390 firms' data from 51 countries and investigated determinants of board size. We find a significantly positive relation between free cash flow and board size for firms in small securities markets. However, the effect of free cash flow on board size significantly deceases as the securities market becomes large. These results suggest that managers in small securities markets can design boards in their own interests. In other words, determinants of board size differ significantly across countries. La Porta et al. (2000b) argue that the legal protection of shareholder rights has a good explanatory power of corporate governance and its reform. However, we do not find clear evidence that legal shareholder protection affects the relation between private benefits and board size.

Table 8. Regression results when using the alternative definition of controlling shareholder

	(1)	(2)	(3)
FIRMAGE	0.011 (2.64)***	0.010 (2.31)**	0.011 (2.50)**
LEVERAGE	-0.055 (-5.35)***	-0.054 (-5.32)***	-0.054 (-5.32)***
MtBr	0.001 (0.20)	0.001 (0.14)	0.001 (0.18)
R&D	-0.245 (-4.71)***	-0.242 (-4.66)***	-0.241 (-4.62)***
VOLATILITY	-0.143 (-7.97)***	-0.142 (-7.93)***	-0.142 (-7.93)***
FCF	3.208 (6.62)***	3.563 (7.07)***	2.172 (3.55)***
FCF*LnMARKETSIZE	-0.147 (-6.68)***	-0.179 (-6.84)***	-0.113 (-4.75)***
FCF*COMMON	0.140 (2.41)**		
FCF*LLSV		0.095 (2.57)***	
FCF*C_ADRI			0.087 (2.32)**
FCF*CONTROL	0.074 (1.22)	0.098 (1.73)*	0.129 (2.23)**
CONCENT	0.296 (0.89)	0.376 (1.02)	0.284 (0.87)
CONCENT* LnMARKETSIZE	-0.015 (-0.99)	-0.021 (-1.14)	-0.016 (-1.03)
CONCENT*COMMON	-0.018 (-0.44)		
CONCENT*LLSV		0.010 (0.53)	
CONCENT*C_ADRI			0.004 (0.18)
CONCENT*CONTROL	-0.029 (-0.60)	-0.041 (-0.88)	-0.040 (-0.84)
CONTROL	-0.020 (-3.00)***	-0.022 (-3.31)***	-0.022 (-3.22)***
LnASSET	0.123 (49.65)***	0.123 (49.75)***	0.123 (49.68)***
ROA	-0.034 (-1.94)*	-0.036 (-2.02)**	-0.037 (-2.13)**
Adj. R2	0.445	0.451	0.451
N	10390	10205	10205

***: Significant at the 1% level; **: Significant at the 5% level; *: Significant at the 10% level

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