The Impact of Corporate Governance on the Performance of U.S. Small-Cap Firms

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ABSTRACT

Small-cap firms provide a significant nexus for entrepreneurship and innovation in the U.S., and hence might be viewed as less prone to governance problems than large firms. This paper tests this assertion, allowing for interactions between internal and external governance mechanisms and performance. Significant interactions between board independence, firm leverage, CEO ownership, and pay-performance sensitivity are observed. The results support the paradigm of entrepreneurial CEO's whose ownership in such firms is optimally aligned with performance. Some suboptimal deployment of governance mechanisms is observed for the sample as a whole. In particular, excess leverage which significantly reduces firm value is observed. This is consistent with the view that debt reduces the entrepreneurial capacity of firms, by hindering the firm's ability or willingness to compete aggressively, particularly against well-financed competitors. Larger board sizes are detrimental to performance. Pay-for performance compensation for CEOs, on the other hand is beneficial for small-cap firm performance. While Sarbanes-Oxley Act compliance may be difficult for many of these firms, its passage does not adversely affect their performance.

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[**] Financial support from the SSHRC and the Autorité des Marches Financiers to Switzer is gratefully acknowledged. Please address all correspondence to Dr. Lorne N. Switzer, Associate Dean, Research, Van Berkom Endowed Chair of Small-Cap Equities, and Associate Director, Institute for Corporate Governance of Private and Public Organizations.

I. INTRODUCTION

This paper looks at the impact of governance mechanisms on small-cap firm performance in the US. Much of the extant research on the effects of governance mechanisms on performance focuses exclusively on large-cap firms, leaving a hiatus on our empirical knowledge about the corporate governance of small companies. In the U.S., small firms have been the nexus of entrepreneurship and innovation, and at the same time, account for a sizable portion of economic activity.[1] While the returns of small-cap companies have been studied extensively since Banz (1981) and Reinganum (1981) documented the "small-cap anomaly,"[2] little attention has been devoted to the governance of such firms. One could argue that small-cap firms may be less prone to governance problems relative to large firms, particularly if they are closely controlled. This could be due to alignment of incentives of entrepreneur-managers, who have significant ownership stakes, with those of outside shareholders. The entrepreneurial imperative for such firms may also be conducive to operational efficiencies resulting in easier coordination of resources.

Ang et al. (2000) find that for non-publicly listed small firms, agency costs (as measured by efficiency ratios) are higher when the firm is outsider-managed (as opposed to owner-managed), and increase when the manager's ownership decreases. In a recent paper, Busheea, Carter and Gerakos (2008) show that governance problems are of a concern to institutional investors with a small-cap focus. Such investors are more likely to tilt their portfolios towards firms with more shareholder rights to protect their investments. Aside from potential expropriation issues that may adversely affect investors in small-cap firms, such firms may be highly sensitive to changes in the external governance environment. For example, it has been argued that the compliance costs of Sarbanes-Oxley are prohibitive for many small firms.[3]

Our approach links a set of interacting governance mechanisms which jointly affect the performance of sample firms. A natural test of the hypothesis of efficiency in governance for small-cap firms is to consider the significance of external and internal governance mechanisms on performance after accounting for the simultaneous interactions between these variables.

The results support the paradigm of entrepreneurial CEO's whose ownership is optimally aligned with performance. However, some suboptimal deployment of governance mechanisms is observed for the sample as a whole. In particular, excess leverage which significantly reduces firm value is observed. Firms also underutilize pay-performance compensation. Finally, while Sarbanes-Oxley Act compliance is difficult for many of these firms, its passage does not adversely affect their performance.

The remainder of the paper is organized as follows. Section 2 deals with variable selection and introduces the basic empirical model. In Section 3, we describe the data. Empirical results are provided in Section 4. We conclude in Section 5.

II. EMPIRICAL APPROACH

A. Model Development

Our point of departure views the firm's control mechanisms as potential substitutes, and

jointly determined with the firm's performance, extending Agrawal and Knoeber (1996) and Switzer (2007). The endogenous governance mechanisms are: the degree of board independence, the leverage ratio, the CEO share ownership, and the CEO pay-performance sensitivity. Our maintained hypothesis is that the endogenous governance mechanisms are substitutes. Hence for any governance mechanism equation, the impact of the other (endogenously determined) mechanisms should be negative. Furthermore, governance mechanisms are optimally deployed in this system when they do not significantly affect firm performance.

The basic five-equation is:

$$BIND=B1+B2*BSIZE+B3*DUAL+B4*OWN+B5*ASSET+B6*RISK+B7*PACQ+B8*SHRRTS+B9*SOX+B10*INDUSTRY+\varepsilon_1$$

$$DBVAL=C1+C2*BIND+C3*PAY+C4*SHRRTS+C5*TOBINLAG+C6*ASSET+C7*RISK+C8*PACQ+C9*NYSE+C10*SOX+C11*INDUSTRY*LISTING+\varepsilon_2$$

$$OWN = D1 + D2*BIND + D3*DUAL + D4*SHRRTS + D5*ASSET + D6*RISK + D7*PACQ + D8*NYSE + D9*SOXLEY + D10*INDUSTRY + \varepsilon_3$$

$$PAY = E1 + E2*BIND + E3*DBVAL + E4*SHRRTS + E5*ASSET + E6*RISK + E7*PACQ + E9*SOX + E10*INDUSTRY + \varepsilon_4$$

$$TOBINQ=F1+F2*BIND+F3*BSIZE+F4*DBVAL+F5*DUAL+F6*PAY+F7*SHRRTS+F8*OWN+F9*PACQ+F10*RD+F11*CAPEX+F12*NYSEBSIZE+F13*SOX+\varepsilon_5$$

The variables are defined as follows:

BIND represents the degree of board independence. We estimate two versions of the system using both measures of board independence: a) BINDA is the tenure of directors relative to the CEO, estimated as the percentage of directors elected to the board before the CEO; b) BINDB is the proportion of outsiders on the board of directors, excluding the CEO.

DBVAL, the leverage ratio, is equal to total long-term debt divided by total assets. PAY is Jensen-Murphy pay sensitivities, denoted as b, where b is calculated from the regression: Δ (total CEO compensation) = a + b Δ (annual stock return) + e. Total compensation is defined as salary plus bonuses and the value of option grants determined by using Black-Scholes.

OWN, CEO ownership is calculated as the number of shares owned by the CEO or close family members divided by the total number of shares outstanding at the fiscal year-end.

BSIZE is the number of board members.

DUAL is a dummy variable equal to 1 if the CEO is also the Chairperson, and 0 otherwise.

TOBINQ, the performance variable is estimated as (market value of common stock + book value of preferred stock + book value of long-term debt) / (book value of total assets).[4]

ASSET is a proxy for the firm size, measured by the total assets of the firm at

the fiscal year end.

RISK is the monthly volatility of stock prices.

PACQ is the frequency of acquisition activities in a firm's corresponding industry, as a measure of takeover activity. It is computed as the number of completed takeovers in a two-digit SIC industry over the past five years divided by the number of firms in that industry.

RD is the fraction of research and development expenses to net sales;[5]

CPTL is the ratio of capital expenditures over net sales.

NYSE is a dummy variable equal to 1 if the firm is listed on the New York Stock Exchange, and 0 otherwise.

SOX is a dummy variable equal to 1 for fiscal years after the implementation of the Sarbanes-Oxley Act, and 0 otherwise.[6]

Finally, INDUSTRY is a vector of dummy variables for the firm's 2 digit SIC industry to capture other possible differential returns/growth opportunities that are not represented in the exogenous variables of the model.

III. DATA DESCRIPTION

The sample consists of a balanced panel of 245 firms, or in fiscal years from 2000 to 2004 (1,225 firm-year observations). Companies were selected from the S&P 600 Small Cap Index as of August 31, 2006 for which we could match with:

1. Accounting and financial statements from Research Insight (COMPUSTAT.)
2. Corporate governance data from definitive proxy statements (DEF 14A) in EDGAR (SEC Filings and Forms).[7]
3. Acquisition data from SDC
4. Stock market returns from CRSP.

Table 1 displays descriptive statistics for each of the variables in our data sample. From Panel A, based on the median estimate for BINDA we note that about 75% of board members have periods of service with their firms longer than the CEO. A large percentage of board members of these firms are also independent (85%). The median board size is seven, which has been posited as the threshold for an effective board (e.g. Lorsch and Lawrence (1992)). The leverage ratios of these firms are fairly low: the mean (median) long-term debt-to-total assets ratio is 14.3% (7.8%). This is consistent with the view that leverage constrains the entrepreneurial capacity of small firms. For approximately two-thirds of the sample firms, the CEO also serves as the chairperson of the board, and has a meaningful stake (on average 7.61%) in the ownership of the firm. Approximately 42% of the sample companies are listed on the New York Stock Exchange.

Panel B of Table 1 reports the components of each sector based on 8 SIC industry categories. Almost 90% of the sample firms are from manufacturing, retail trade, and services. Manufacturing accounts for about 64.49% of the sample.

Table 2 presents the pairwise correlation coefficients among the variables used in this study.

Table 1
Data description

Panel A

	Mean	Median	Maximum	Minimum	Std. Dev.
BINDA	0.3351	0.2500	1.0000	0.0000	0.3472
BINDB	0.8615	0.8571	1.0000	0.3333	0.1424
BSIZE	7.5878	7.0000	15.000	4.0000	1.7943
DBVAL	0.1431	0.0781	0.8751	0.0000	0.1640
DUAL	0.6490	1.0000	1.0000	0.0000	0.4775
PAY	0.1108	0.0689	1.5449	-1.3992	0.3260
SHRRTS	0.0857	0.0000	1.0000	0.0000	0.2801
OWN	0.0761	0.0267	0.8571	0.0000	0.1433
TOBIN	1.6676	1.2704	14.851	0.0974	1.4943
ASSET (million $)	496.13	367.77	2901.6	6.5990	431.42
RISK	0.1674	0.1496	1.2978	0.0429	0.1042
PACQ	0.5803	0.5370	3.0000	0.0598	0.2757
RD	0.0874	0.0309	5.6816	0.0000	0.2494
CPTL	0.0537	0.0339	2.0153	0.0000	0.0901
NYSE	0.4204	0.0000	1.0000	0.0000	0.4938
Total observations					1225

Panel B

Industry	Description	No. of Firms	Percentage	Industry	Description	No. of Firms	Percentage
Division A	Agriculture Forestry, And Fishing	1	0.41%	Division E	Transportation and Communications Electric, Gas, And Sanitary Services	1	0.41%
IND01		1	0.41%				
Division B	Mining	2	0.82%	IND48		1	0.41%
IND14		2	0.82%	Division F	Wholesale Trade	9	3.67%
Division D	Manufacturing	158	64.49%	IND50		5	2.04%
IND20		1	0.41%	IND51		4	1.63%
IND23		1	0.41%	Division G	Retail Trade	33	13.47%
IND25		2	0.82%	IND52		1	0.41%
IND26		5	2.04%	IND53		2	0.82%
IND27		1	0.41%	IND55		3	1.22%
IND28		20	8.16%	IND56		8	3.27%
IND29		1	0.41%	IND57		3	1.22%
IND30		2	0.82%	IND58		10	4.08%

IND31	2	0.82%	IND59		6	2.45%
IND32	1	0.41%	Division H	Finance, Insurance, And Real Estate	12	4.90%
IND33	4	1.63%				
IND34	7	2.86%	IND62		2	0.82%
IND35	21	8.57%	IND67		10	4.08%
IND36	37	15.10%	Division I	Services	29	11.84%
IND37	12	4.90%	IND73		22	8.98%
IND38	36	14.69%	IND80		6	2.45%
IND39	5	2.04%	IND87		1	0.41%
Sum					245	100.00%

The correlation between most of the governance variables is negative, supporting the substitution hypothesis. We observe a fairly strong and negative correlation between leverage and Tobin's q, for which that debt reduces the entrepreneurial capacity of firms by constraining their ability to compete aggressively. This also supports the view that shareholder-bondholder agency costs outweigh improved shareholder-manager agency conflicts when firms increase their leverage. The negative correlation between CEO ownership and board independence suggests that CEOs' control over the board increases with their equity positions within the firm. Though we predict that board size has a mixed impact on firm value, the strong negative correlation seems to show that smaller boards of directors are more effective for the sample firms, consistent with Eisenberg et al. (1998). Another related observation is the divergence of the correlations between the number of directors and the two board independence variables. The findings could imply that, in order to satisfy investors or to comply with new SOX and NYSE governance requirements, some firms deliberately add independent directors without removing enough existing insiders, causing large and inefficient boards. In these firms, the longer directors' tenures are relative to the CEO, the lower the probability that the existing inside directors are removed to maintain an effective board size. While CEO duality is often viewed as a source of agency problems and regulators actively encourage delegation, firms with split chairman and CEO positions are not associated with higher performance in our study. This result seems to suggest that influential CEOs have their means to control the firms, whether or not they are chairmen of the boards. We find the expected inverse relationship between relative director tenure and CEO duality, which means that more seasoned CEOs have an increasing possibility of obtaining the chair positions. In addition, CEO equity ownership is directly related to CEO duality. CEOs may have large equity holdings and hence stronger influence, or may enlarge their equity shares after acquiring more power. Debt financing is negatively related to past firm performance, consistent with the pecking order theory (Myers (1977). Firm size is negatively associated with performance suggestive of growth opportunity differences and bureaucracy strains. The positive correlation between firm valuation and R&D/capital expense ratio may reflect the premium associated with growth opportunities.

Table 2
Correlation matrix

	BINDA	BINDB	DBVAL	OWN	PAY	TOBIN	BSIZE	DUAL	SHERRTS	ASSET	RISK	PACQ	RD	CPTL	NYSE	SOXLEY
BINDA																
BINDB	.1281[a]															
DBVAL	0.0435	0.0326														
OWN	0.1086[a]	0.2173[a]	0.0521[c]													
PAY	0.0262	0.0781[a]	0.0648[b]	0.0075												
TOBIN	0.0124	0.0240	0.4006[a]	0.0331	0.0370											
BSIZE	0.1541[a]	0.1093[a]	0.2559[a]	0.0629[b]	0.0707[b]	0.3071[a]										
DUAL	0.4510[a]	0.0007	0.0636[b]	0.1626[a]	0.0799[a]	0.0235	0.0851[a]									
SHRRTS	0.0608	0.1733[a]	0.0212	0.1159[a]	0.0017	0.0614[b]	0.1289[a]	0.0663[b]	1							
ASSET	0.0308	0.0500[c]	0.5299[a]	0.0411	0.0204	0.5201[a]	0.4378[a]	0.0060	-0.1241[a]							
RISK	0.0094	0.0845[a]	0.1616[a]	0.0159	0.0289	0.1798[a]	0.1687[a]	0.0600[b]	0.0575[b]	0.2691[a]						
PACQ	0.0248	0.0483[c]	0.0772[a]	0.0145	0.0301	0.0386	0.0573[b]	0.0181	-0.0071	0.1690[a]	0.0294					
RD	0.0171	0.0673[b]	0.0367	0.0162	0.0497[c]	0.1174[a]	0.0230	0.0412	0.0677[b]	0.1348[a]	0.2795[a]	0.0293				
CPTL	0.0359	0.0129	0.0093	0.0208	0.0144	0.0803[a]	0.0214	0.0157	0.0174	0.0583[b]	0.1229[a]	0.0682[b]	0.6183[a]			
NYSE	0.0593[b]	0.0831[a]	0.3299[a]	0.0246	0.0239	0.2774[a]	0.3645[a]	0.0528[c]	-0.1527[a]	0.4622[a]	0.2851[a]	0.1925[a]	0.2139[a]	0.1188[a]		
SOXLEY	0.0025	0.0488[c]	0.0336	0.0296	0.0000	0.0540[c]	0.0669[b]	0.0000	0.0000	0.1341[a]	0.0000	0.4464[a]	0.0404	0.0848[a]	0.0000	1

* a/b/c denotes statistical significance at the 1%/5%/10% level.

These inferences of course are based on bivariate correlations. Whether they are consistent with structural model is a matter to which we now turn.

IV. MODEL ESTIMATION

Based on Hausman tests, we confirm the existence of simultaneity between most of the governance mechanisms and firm performance. Furthermore, there are significant correlations between the estimated 2SLS residuals of the model, which suggests that 3SLS estimation is appropriate.[8]

To account for self-selection bias for the decision to list on the NYSE, which could bias the impact of listing on performance, we use the Heckman two-step procedure (e.g., Doidge, Karolyi, and Stulz (2004), Greene (2008, Chapter 24)).

The indicator variable A firm's decision to list on NYSE is given by the binary variable NYSE, where

$$\text{NYSE} = 1 \quad \text{if NYSE}^* > 0, \text{ and NYSE} = 0 \text{ if NYSE}^* < 0, \text{ where}$$

$$\text{NYSE} = \delta_0 + \delta_1 \text{BIND} + \delta_2 \text{OWN} + \delta_3 \text{BSIZE} + \delta_4 \text{DUAL} + \delta_5 \text{SHRRTS} + \delta_6 \text{ASSET} + \delta_7 \text{RISK} + \delta_8 \text{PACQ} + V$$

In the first step, we estimate the coefficients of the probit model for NYSE* by maximum likelihood. Based on the probit model estimates, we compute the selection bias correction term λ as:

$$\lambda = \vartheta_1(\hat{\text{NYSE}}^*)(\text{NYSE}) + \vartheta_2(\hat{\text{NYSE}}^*)(1 - \text{NYSE})$$

where θ_1, the inverse Mill's ratio, is calculated as

$$\vartheta_1 = \phi(\hat{\text{NYSE}}^*) / \Phi(\hat{\text{NYSE}}^*) \quad \text{and} \quad \vartheta_2 = -\phi(\hat{\text{NYSE}}^*) / [1 - \Phi(\hat{\text{NYSE}}^*)]$$

where $\phi(x)$ is the standard normal density function, and $\Phi(x)$ is the standard normal cumulative distribution function evaluated at x. Finally, we regress Tobin's q on all its determinants as well as the selection bias correction term, λ.

Table 3 reports the results of the probit model for the Heckman correction for possible selection bias. The probit model suggests that the decision of listing on the NYSE is considerably influenced by board size, shareholder voting rights, firm size, performance volatility, and industrial takeover activities.

Table 3
Heckman two-step tests for selection bias

Independent Variables	First Step: Selection Probit		Second Step: OLS with Lambda	
	Dependent Variables			
	NYSE		Firm performance	
	BINDA	BINDB	BINDA	BINDB
Constant	-4.0420	-3.6123	3.2394	3.6306
	0.0000 [a]	0.0000 [a]	0.0000 [a]	0.0000 [a]
BIND	0.1754	-0.4112	-0.0436	-0.4257
	0.1970	0.1749	0.7290	0.1369
DBVAL			-2.6373	-2.6359
			0.0000 [a]	0.0000 [a]
OWN	0.0237	-0.0404	-0.2342	-0.3026
	0.9325	0.8870	0.4056	0.2916
PAY			0.2520	0.2659
			0.0430 [b]	0.0340 [b]
BSIZE	0.1581	0.1623	-0.1427	-0.1479
	0.0000 [a]	0.0000 [a]	0.0000 [a]	0.0000 [a]
DUAL	-0.0186	-0.0768	-0.1239	-0.1020
	0.8504	0.3824	0.1761	0.2142
SHRRTS	-0.5097	-0.4665	-0.1298	-0.0983
	0.0012 [a]	0.0032 [a]	0.3760	0.5058
ASSET	1.5305	1.5165		
	0.0000 [a]	0.0000 [a]		
RISK	-2.5603	-2.5098		
	0.0000 [a]	0.0000 [a]		
PACQ	-0.8267	-0.8557	0.7304	0.7390
	0.0000 [a]	0.0000 [a]	0.0195 [b]	0.0184 [b]
RD			0.2820	0.2926
			0.1591	0.1450
CPTL			0.0977	0.0745
			0.8579	0.8917
NYSE			-0.4616	-0.4424
			0.0000 [a]	0.0000 [a]

SOX	0.3716	0.3796
	0.0005 [a]	0.0004 [a]
LAMBDA	-0.4541	-0.4268
	0.0000 [a]	0.0000 [a]
Adjusted R^2	0.2967	0.2932
p-value of F-Stat	0.0000	0.0000

* a/b/c denotes statistical significance at the 1%/5%/10% level.

Table 4
3SLS results adjusted for listing bias

Independent Variables	Dependent Variables									
	Board independence		Debt/Value		CEO ownership		Pay		Performance	
	BINDA	BINDB	BINDA	BINDB	BINDA	BINDB	BINDA	BINDB	BINDA	BINDB
Constant	2.4881	1.5667	-0.3582	-0.4637	0.0161	0.0786	-0.4457	-0.7761	2.3058	2.5389
	0.2664	0.0107[a]	0.0000[a]	0.0000[a]	0.8574	0.3483	0.1474	0.0141[b]	0.0000[a]	0.0000[a]
BIND			0.0005	0.1224	-0.0287	-0.1241	-0.0040	0.3189	-0.0680	-0.3068
			0.9661	0.0006[a]	0.0000[a]	0.0000[a]	0.8994	0.0001[a]	0.5759	0.2633
DBVAL							-0.9246	-1.0469	-3.4643	-3.3484
							0.1534	0.0878[c]	0.0000[a]	0.0000[a]
OWN	31.656	-8.8502							0.0275	-0.0437
	0.0000[a]	0.0000[a]							0.9137	0.8662
PAY			-0.3215	-0.3263					0.2918	0.2864
			0.0000[a]	0.0014[a]					0.0100[a]	0.0114[b]
BSIZE	0.0768	-0.0391							-0.0209	-0.0172
	0.0240[b]	0.0660[c]							0.0687[a]	0.0502[a]
DUAL	0.8994	-0.3359			0.0282	0.0358			-0.1482	-0.1239
	0.0008[a]	0.0000[a]			0.0006[a]	0.0000[a]			0.0891[c]	0.1104
SHRRTS	1.6092	-0.3922	0.0377	0.0298	-0.0587	-0.0570	0.0676	0.0456	-0.2666	-0.2549
	0.0007[a]	0.0022[a]	0.0143[b]	0.0529[c]	0.0007[a]	0.0006[a]	0.0945[c]	0.2774	0.1620	0.1725
TOBINLAG			-0.0087	-0.0083						
			0.0000[a]	0.0000[a]						
LOGASSET	0.3956	0.1452	0.1828	0.1779	0.0362	0.0577	0.1800	0.1985		
	0.3020	0.1666	0.0000[a]	0.0000[a]	0.2303	0.0459[b]	0.1531	0.0965[c]		

RISK	0.0268	0.0545	0.1184	0.1161	-0.0388	-0.0621	0.1046	0.0969		
	0.9828	0.8731	0.1246	0.1345	0.4944	0.2552	0.3925	0.4143		
PACQ	0.4193	0.1077	0.0575	0.0628	0.0005	-0.0111	0.0574	0.0748	-0.4908	-0.5044
	0.6765	0.6961	0.0697[c]	0.0505[c]	0.9875	0.7398	0.5748	0.4533	0.1027	0.1022
RD									0.0705	0.0639
									0.7149	0.7399
CPTL									0.8285	0.8699
									0.1104	0.0925[c]
NYSE			-0.0015	0.0007	-0.0155	-0.0272			-0.5802	-0.5906
			0.9144	0.9641	0.3180	0.1664			0.0000[a]	0.0000[a]
SOX	-0.1937	-0.0412	-0.0190	-0.0196	-0.0061	-0.0047	-0.0152	-0.0187	0.2493	0.2578
	0.5762	0.6644	0.0663[c]	0.0597[c]	0.5760	0.6647	0.6237	0.5388	0.0035[a]	0.0025[a]
Wald Test χ^2									9045	29189
p-value									.0000	.0000

[*] a/b/c denotes statistical significance at the 1%/5%/10% level [**] Industry dummies are included in every governance mechanism equation, but not reported.

To correct for the self-selection bias in our model, we use the fitted NYSE probit estimate of the Heckman first stage as an instrumental variable for NYSE in the performance equation. Estimates of the adjusted 3SLS system are provided in Table 4.[9]

On the whole, the hypothesis of substitutability of governance mechanisms is supported in most cases, when the percentage of outside directors (BIBDB) is used as the proxy for board independence. Using board tenure (BINDA) as the independence proxy, however, we note that a positive relationship is observed between CEO equity ownership and the board's relative tenure. Also, firms with larger boards and with better shareholder rights (i.e. no dual or multiple voting class share structure) are associated with longer director tenure.

In the BINDB equation, we find the expected substitutional link between CEO ownership and outside board representation. Consistent with the bivariate correlations, outsiders are less represented in larger boards. This suggests that firms with large boards may have more severe SOX compliance problems.

We find that the alignment of the interests between owners and managers, through strong pay for performance remuneration structures for CEOs, reduces the use of debt as a source of financing, which is consistent with John and John (1993). Although we argue that multiclass shares may have a mixed link with debt financing, the results show that firms rely more on the monitoring from capital markets when shareholder voting rights are well protected.

As expected, firms are forced to use more debt financing, due to poor past performance. Debt financing is also prevalent for larger firms, and firms operating in

industries with higher takeover frequency. The latter may be due to firms' use of debt to thwart possible takeover bids.

CEO equity holdings are higher when the CEO also serves as chairman. Ownership and control power are self-reinforcing, consistent with the view that the CEO of a small-cap firm can behave as an entrepreneurial leader. Firm size (LOGASSETS) is positively related to the ownership stake of CEOs. Managers do not reduce their (undiversified) portfolio holdings for larger firms in our small-cap sample.

The pay-for-performance equation is somewhat disappointing, consistent with Hall and Liebman (1998). If we measure the level of board independence using directors' tenure relative to CEO, only voting rights are positively related to pay-performance sensitivity. If the alternative independence proxy is employed, the percentage of outside directors, leverage, and firm size are determinants of pay related incentives.

In the performance equation, the negative impact of debt financing is highly significant. This result implies that debt reduces the capacity of small- cap firms to adapt to competitors.

Pay-for performance compensation for CEOs, on the other hand, is beneficial for small-cap firm performance suggesting that agency problems can be reduced when shareholder wealth and CEO compensation are aligned. This result is consistent with Hall and Liebman (1998) who also include all forms of compensation (including the value of option grants) and not just salary in their compensation variable for large companies. They are also consistent with Mishra and Nielson (2000)'s findings for bank holding companies.

We also show that CEO equity holdings do not significantly affect performance, similar to Demsetz and Villalonga (2001). The negative relationship between board size and performance is consistent with Eisenberg et al. (1998) who show that smaller boards of directors are more effective for the small firms. The suboptimal use of large boards may be due to a disinclination of some CEOs to remove inside directors when legal constraints (SOX) and exchange regulations force public corporations to increase outsider representation.

Consistent with Finkelstein and D'aveni (1994), our results show that CEO duality reduces firm value, when board independence is measured by directors' tenure relative to CEOs'. There is a weak link between capital expenditures and firm value, suggesting that growth opportunities are a determinant of performance.

Similar to Gilchrist et al. (2005), we also find a downward valuation effect of listing on the NYSE. This result holds irrespective of whether we endogenize the listing variable to account for selection bias.

Finally, consistent with Switzer (2007), we find that while the compliance costs of SOX may be high for small-cap firms, there is no evidence that SOX has impacted adversely on their valuation.[10]

V. CONCLUSION

This study extends the literature by looking at the links between corporate governance and firm value for US small cap firms. The models document significant interactions among endogenous governance mechanisms. Some suboptimal deployment of governance mechanisms is observed for the sample as a whole. We find that the usage

of debt adversely affects the performance of small-cap firms. This is consistent with the view that leverage reduces the capacity of managers to compete aggressively. For small cap firms with CEOs who typically have high ownership stakes, leverage restricts their ability to behave as entrepreneur risk takers. Firms also underutilize pay-performance compensation. However, CEO ownership appears optimally aligned with performance. While Sarbanes-Oxley Act compliance is difficult for many of these firms, its passage does not adversely affect their performance.

ENDNOTES

1. According to the U.S. Small Business Administration, small firms:
- "Represent 99.7 percent of all employer firms.
- Employ about half of all private sector employees.
- Pay nearly 45 percent of total U.S. private payroll.
- Have generated 60 to 80 percent of net new jobs annually over the last decade.
- Create more than half of nonfarm private gross domestic product (GDP).
- Hire 40 percent of high tech workers (such as scientists, engineers, and computer workers).
- Made up 97.3 percent of all identified exporters and produced 28.9 percent of the known export value in FY 2006.
- Produce 13 times more patents per employee than large patenting firms; these patents are twice as likely as large firm patents to be among the one percent most cited." See http://web.sba.gov/faqs/faqindex.cfm?areaID=24 .

2. The differential performance of small-caps continues to generate significant interest (see, e.g., Dimson and Marsh (1999), Eun, Huang, and Lai (2003), and Switzer and Fan (2006)).
3. See Chris Reidy, "Study: Sarbanes-Oxley costs burden small firms", The Boston Globe, March 1, 2006. See also Chhaochharia and Grinstein (2007).
4. Chung and Pruitt (1994) find high correlations between alternative proxies of Tobin's Q, including the variant that we use.
5. See Chung, Wright, Kedia (2003).
6. We also include industry dummy variables (IND01 to IND80 is equal to 1 for each two-digit SIC industry, and 0 otherwise).
7. We also used annual reports (10-K), when the proxy statements are incomplete or unavailable.
8. Where no simultaneity bias is observed, the relevant variable is treated as exogenous in the estimation. Both the Hausman tests and the 2SLS correlation matrix are available on request.
9. To conserve space, we do not report the 3SLS estimates without the Heckman selection bias correction. They are available on request.
10. Agrawal and Knoeber (1996) suggest that financial firms are not comparable to other firms in terms of Tobin's q, owing to the distorted relation between equity and assets. Following Agrawal and Knoeber (1996) and Switzer and Kelly (2006), we exclude the 12 financial firms (defined as SIC codes starting with H) from the sample. The results are virtually identical to those shown for the complete sample. The restricted sample estimates are available on request.

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