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THE IMPACT OF DEREGULATION AND CORPORATE STRUCTURE ON PRODUCTIVE EFFICIENCY: THE CASE OF THE U.S. ELECTRIC UTILITY INDUSTRY, 1990–2004

Mika Goto and Anil K. Makhija

ABSTRACT

We present empirical evidence on the productive efficiency of electric utilities in the United States from 1990 to 2004. This period is marked by major attempts to introduce deregulation with an expectation that it will lead to improved operating efficiency and ultimately to lower consumer prices. However, relying on improved techniques of estimating productive efficiency, we find that firms in jurisdictions that adopted deregulation have in fact lower productive efficiency, and have also experienced decreases in efficiency over time. In particular, the vertical separation of generation, a hallmark of an effort to deregulate the industry, is associated with an adverse impact on productive efficiency.

1. INTRODUCTION

The primary purpose of this paper is to empirically examine the impact of deregulation and organizational structure of firms on the productive efficiency of the U.S. electric utility industry during the period, 1990–2004.[1] The enactment of the Energy Policy Act of 1992 opened the wholesale power market to competition, bringing many independent power producers (IPPs) into the wholesale markets. Competition was further encouraged by the Federal Energy Regulatory Commission (FERC) through the issuance of its Order 888 in 1996 and Order 2000 in 1999, which approved access to the transmission network for all participants. These orders also fostered competitive mechanisms in wholesale power markets by promoting the wide-scale development of transmission networks under the regional transmission organizations (RTOs). Indeed, by 2000, nearly half of the states in the United States and the District of Columbia had passed legislation adopting competition as envisaged by the FERC (Rose & Meeusen, 2005). The introduction of such substantial deregulation constitutes a natural experiment to study the impact of competition on the productive efficiency of electric utilities.

At the heart of the liberalization effort of the electric power industry is simply a notion that the productivity of the industry will benefit from the introduction of competition. Nickell (1996) argues that this is not necessarily so, and that there is in fact little empirical evidence in support of such a claim. He goes on, however, to himself report some supporting evidence based on his large sample of U.K. firms whose productivity improvements are associated with increases in the number of rival firms. In some cases, exposure to market forces can be enhanced in other ways besides an increase in the number of rivals. For example, firms that were previously shielded by government ownership typically face deregulation after privatization. Ng and Seabright (2001) indicated the possibility of cost reductions for the airlines industry through further privatization and liberalization. Deregulation per se contributed to productivity gains for Spanish banks in Kumbhakar and Lozano-Vivas (2005). Olley and Pakes (1996) revealed productivity gains associated with deregulation in the telecommunications equipment industry. Galdón-Sánchez and Schmitz (2002) showed that competitive pressures from the shrinking of the producers' market led to gains in productivity for iron-ore producers. Though limited, this literature conforms with and motivates our basic hypothesis that the introduction of greater competition in the electric utility industry should be beneficial to productivity.

Meanwhile, there is a literature that suggests that there is a negative impact of deregulation on firms' productive efficiency or productivity. Delmas and Tokat (2005) showed that the process of deregulation had a negative impact on firms' productive efficiency for the U.S. electric power utilities. In addition, several studies also found a negative impact of deregulation on efficiency in the banking and gas industries (Hollas, Macleod, & Stansell, 2002; Mukherjee, Ray, & Miller, 2001; Wheelock & Wilson, 1999). Even though these industries are different in many aspects, this literature indicates that the process of deregulation can negatively influence the efficiency of firms.

However, experience from the deregulation of telecommunications, airlines, and trucking industries in the United States. seems to support the claim that competition fosters productivity gains. For example, a decade after the introduction of competition, long-distance telephone providers were profitable even after lowering rates by half.[2] Similarly, it was expected that electric utilities, in response to competitive pressures, would reduce waste, adopt improved technologies, and even restructure to obtain greater efficiencies, consequently bringing benefits to consumers by sharing these gains.

The deregulation of the electricity industry did not begin till the early 1990s, which was much later than that of other regulated industries. However, it was expected that the economic impact of the restructuring on consumers would be larger than that of the other industries. Under the former rate-of-return regulatory regime, electric utilities had incentives to overcapitalize (the Averch–Johnson Effect), and had recovery procedures that severely limited efforts at cost reduction. Consequently, a priori we hypothesize that (1) electric utilities in jurisdictions that adopted competition exhibit better performance compared to those in jurisdictions that retained rate-of-return regulation and (2) electric utilities in jurisdictions that adopted competitive measures exhibit better performance compared with the same utilities when they were under rate-of-return regulation. Finally, we also examine how the changes in organizational structure of utilities affect their productive efficiency.

Evidence on the relative performance of electric utilities – those in deregulated jurisdictions versus those still in rate-of-return regulation, and before and after the introduction of competition – may help explain what has actually transpired in terms of electricity prices. Surprisingly, electricity prices have not decreased to the degree that was expected and may even have increased to levels higher than those before deregulation in some states, even though achieving efficient lower electricity prices was a primary

purpose of the deregulation.[3] In addition, rate increases have been higher in states that deregulated compared with those that kept the old regulatory framework.[4]

Regarding influences of the organizational structure on productive efficiency, we examine impacts of the diversification policy of electric utilities, the decision to purchase versus generate power, and the extent of wholesale activity. The managerial decision to purchase versus generate is influenced by the vertical structure of firms. The decision is also influenced by deregulation because part of the effort to deregulate the industry consists of separating out the generation function into a free-market setting and fostering efficient wholesale power markets. In addition, with deregulation, managerial discretion has increased, making it possible to undertake various forms of restructuring including venturing into diversified businesses far from the core electricity business. In fact, while there had been little merger activity before 1995, many mergers have been filed after deregulation (Joskow, 2000). That trend reflects a major policy change for the Securities and Exchange Commission (SEC), which historically oversaw strict restrictions in merger activities among electric utilities under the 1935 Public Utilities Holding Company Act. In itself, the evidence is not in as to whether greater managerial discretion, with its consequent freedom to restructure and undertake new businesses, has translated into productivity gains and consequently larger benefits to shareholders or consumers. For example, though they are frequently argued to be complements with economies of scale and potential operating synergies, there is little evidence that even the combination of gas and electric businesses has turned out to be valuable.[5]

Our work is related to a number of strands in the literature. Work on vertical integration/separation has investigated whether vertical separation of functions causes economic loss or not. Most of the previous studies conducted after Kaserman and Mayo (1991) indicate that vertical economies could be lost through vertical separation of electric power utilities. Therefore, vertical separation that accompanies competition, as in generation being separated out after deregulation, should be evaluated in terms of such potential loss of economies as well as possible efficiency improvements by competition (Michaels, 2006). Yet, these studies do not explicitly examine impacts of deregulation and corporate structure (e.g., separation) on the operational performance of firms. Indeed, Fabrizio, Rose, and Wolfram (2007) point out that, ''While many of the costs of electricity restructuring have been intensively studied, relatively little effort has been devoted to

quantifying any ex post operating efficiency gains of restructuring". Using data on electric power generation plants, Fabrizio et al. (2007) estimated input demand equations with unobserved inefficiency factors that were caused by a deviation from the cost-minimizing behavior of firms, and indicated that generation efficiency gains were achieved through electricity restructuring. Their results support previous studies for other industries such as the telecommunication and the airline industries, which indicate that increased competition is associated with productivity gains. Meanwhile, several studies on wholesale power markets, such as Borenstein, Bushnell, and Wolak (2002), focused on effects of the possible exercise of market power on wholesale electricity payments. However, they did not examine the effects of the wholesale power market on the operational performance of firms.

In another strand of the literature pursued by financial economists, diversification is a subject of considerable research. Following Lang and Stulz (1994) and Berger and Ofek (1995), a number of studies have documented that diversified firms sell at a discount relative to the sum of the values of their stand-alone component segments. The implication is that diversification destroys corporate value. Offering an alternative explanation, Campa and Kedia (2002) argued that diversification discounts can be explained by a selection bias instead, whereby poorly performing firms elect to undertake diversification. Moreover, Villalonga (2004) presented evidence that, instead of a diversification discount, there may be a diversification premium if we use better establishment-level data to avoid certain biases in the commonly used segment data. Pertinent to this study, Schoar (2002) examined diversification by investigating its real effects. She estimated the total factor productivity (TFP) for diversified firms and stand-alone firms, and reported that diversified firms were more productive than stand-alone firms. Thus, the literature on the impact of diversification on a firm's performance offers mixed results.

Although most studies do not include firms from the utility industry, a few researchers have examined the impact of diversification on performance of electric utilities. Sing (1987) examined potential synergy effects arising out of natural monopoly, but concluded against economies of scope between electricity and gas supply businesses. Jandik and Makhija (2005) examined diversification premium/discount for the U.S. electric utilities, and contrary to the discounts reported for the other diversifying firms in the finance literature, they found that diversification actually created value because it led to more efficient investment for firms during the period under regulation. However, this advantage disappeared after deregulation.

In this study, we estimate productive efficiency as a firm's performance measure. We apply a Stochastic Frontier Analysis (SFA) model that is estimated by Bayesian inference using Markov chain Monte Carlo (MCMC) computational methods (described in the Methodology section). We find that

(1) Electric utilities in jurisdictions that have adopted competitive measures had significantly lower productive efficiency in comparison with utilities in jurisdictions that have retained rate-of-return regulation.
(2) Firms in states that adopted deregulation indicated a trend of decreasing productive efficiency, while those in states under traditional regulation showed increases in efficiency.
(3) In terms of organizational structure of the firm, we find that separating generation from other functions had adversely affected productive efficiency. We also find that the extent of joint operation of electricity and gas businesses and the level of wholesale activity of firms did not significantly influence productive efficiency.

In sum, our findings suggest that deregulation of the electric power industry has not translated into benefits in terms of productive efficiency for electric utilities.

Finally, we conjectured reasons for our findings, which might lie in the functioning of the wholesale power markets. As a direct consequence of attempts to bring greater competition and lower prices through restructuring, the decoupling of generation has led electric utilities to increasingly depend on the performance of wholesale power markets. We document an increased dependency of utility firms on wholesale power markets and higher prices of purchased power from these markets over the period of our study, which may explain a decrease in their operational performance.

The rest of the chapter is organized as follows. In the next section, we briefly describe a methodology for the measurement of productive efficiency as a performance measure. Section 3 explains our data. Section 4 describes an empirical model and its estimation. Section 5 presents results and findings. Finally, in Section 6 we offer some concluding remarks.

2. METHODOLOGY

The productive efficiency of a firm's activities is an important concept for corporate management because there is a common belief that a higher

efficiency is a necessary condition for a firm to survive. Yet, the productivity literature ignored the efficiency component for many years. The traditional approaches to the measurement of the TFP generally assume that the observed output is the "best" practice and that all firms are fully efficient. The reason for these approaches may lie in the difficulties researchers have in empirically determining the potential that a production unit could achieve. For the sake of such potential, Koopmans (1951) provided a formal definition of technical efficiency: A producer is technically efficient if, and only if, it is impossible to produce more of any output without producing less of some other output or using more of some input. Debreu (1951) and Shephard (1953) introduced a measure of technical efficiency as a radial distance of a producer from a frontier, and Farrell (1957) was the first to empirically measure this productive efficiency. If we do not take account of the possible deviation from efficient production for each firm, the resulting measures of productivity may be biased. Since Farrell's (1957) work, a number of researchers have contributed to the study of technical efficiency.

Technical efficiency, or productive efficiency as it is more commonly called, refers to the ability to avoid waste by producing as much output as input usage allows, or by using as little input as output production allows.[6] Several alternative methods have been proposed for the measurement of productive efficiency, which can be classified into parametric and non-parametric frameworks. Fried, Lovell, and Schmidt (1993) include various types of such methods and their applications to measure efficiency. The common essence of these methods is that productive efficiency is evaluated by the degree of deviation or distance of the observed data from the efficient frontier, which represents the "best practice" production technology and serves as a norm for efficiency evaluation.

This study employs a parametric estimation of the efficient frontier that is referred to as SFA. The SFA was initiated by Aigner, Lovell, and Schmidt (1977), Meeusen and van den Broeck (1977), and Battese and Corra (1977). Kumbhakar and Lovell (2000) describe the basic theory of the SFA as well as a wide range of advanced SFA techniques and models. From a technical viewpoint, the SFA investigates the "best practice technology" of production considering a two-part error term, i.e., normal error term and inefficiency. The SFA model could be specified in the production function, the cost function, and the distance function. The decision on which function we use depends on the purpose of each study and on the availability of data. In this study, we estimate a production function using SFA, based on which we measure the degree of inefficiency that varies not only with

each firm but also with each period without imposing the same trajectory for all firms.

The production function with a two-part error term can be formulated as follows:

$$Y_{nt} = f(R_{nt}) + v_{nt} - u_{nt} \tag{1}$$

where Y_{nt} is an output for firm n ($n = 1, \ldots, N$) in period t ($t = 1, \ldots, T$) and R_{nt} is a vector of explanatory variables for firm n ($n = 1, \ldots, N$) in period t ($t = 1, \ldots, T$). v_{nt} is a random error term and u_{nt} is a non-negative random variable assumed to represent inefficiency in production. Specifically, the degree of productive efficiency (PE) is measured by $PE_{nt} = \exp(-u_{nt})$, which ranges from larger than 0 to smaller than or equal to 1, which indicates the best practice among firms. Thus, the more the PE approaches unity, the more efficient the firm.

To estimate the model, we assume (a) the random error term, v_{nt}, is independently and identically distributed as $N(0, \sigma_v^2)$, (b) the inefficiency variable, u_{nt}, is independently (but not identically) distributed as a non-negative truncation of the general normal distribution of the form, $N^+(w'_{nt}\eta, \sigma_u^2)$, where w_{nt} is a vector of variables for firm n ($n = 1, \ldots, N$) in period t ($t = 1, \ldots, T$)[7] that are firm- and/or period-specific characteristics that affect the mean inefficiency of firms, and η is a vector of constant and slope parameters to be estimated, and (c) v_{nt} and u_{nt} are distributed independently of each other, and of the regressors R_{nt}.

Note that R_{nt} consists of X_{nt}, Z_{nt}, and t. X_{nt} is a vector of input variables for firm n ($n = 1, \ldots, N$) in period t ($t = 1, \ldots, T$), Z_{nt} is a vector of control variables for firm n ($n = 1, \ldots, N$) in period t ($t = 1, \ldots, T$), and t is a time trend variable to capture technological changes. It is often discussed that the firm-specific heterogeneity should be controlled in estimating the efficiency of firms.[8] Since our dataset consists of regulated utilities, it is important to control several factors in the production function because operation and management of electric power firms are restricted to some extent by state and federal regulation, demand-side conditions, as well as a combination of generation technologies. For example, given the historical service area in which they are the monopolistic supplier with an obligation to supply electricity, they do not have complete discretion to enhance their customers outside their service area, or it may be practically difficult to sell their product only to some specific groups of customers within their service area to achieve higher profit margins.

3. DATA

3.1. Variables for Estimating Production Frontier

Our data consist of investor-owned electric power utilities (IOUs) in the U.S.A. during the period 1990–2004. To avoid excessive dispersion in size for our sample data (and to avoid incomparable small firms), we screened out firms using a minimum threshold value of the total retail sales of 100,000 megawatt hours (MWh). Therefore, firms that sell electricity less than or equal to 100,000 MWh to final customers are not included in our dataset. This procedure not only restricts the size of firms to above the threshold, but also restricts the dataset to include utility firms that are involved in the retail sales business along with other functions. In other words, firms that are only involved in generation and wholesale business are excluded from our dataset. After deleting firms with missing data, our final annual-based balanced panel dataset is composed of 104 firms in total that cover the period 1990–2004.

Approximately one-third of the firms included in our sample provide gas and other utility services as well as core electricity supply services. This mix of services within our sample firms provides us with an opportunity to measure the effects of diversification on productive efficiency. However, it simultaneously leads to a problem on how we should define the output in this study. This problem is apparent, if we consider firms that operate gas and other businesses, because it is not appropriate to simply measure the output by volume of electricity sold to customers that does not reflect any outputs produced by gas and other businesses. To circumvent this problem, we define the output by total operating revenues measured in financial terms. Yet, it is desirable in theory that the production function be defined by purely quantity data, because in a usual definition, productive efficiency is measured as real output produced per unit of real total input employed such as labor, capital, and materials. Consequently, we use financial data that is converted into real terms by a deflator (being a proxy for quantity data). Specifically, we define revenue as output, but after it is converted into real terms using state-level discount rates as deflators (see note 9).

As in the case of output, we use financial data on operation and maintenance (O&M) cost that is converted into real terms as a proxy for the consolidated quantity of inputs that include labor, fuel, and purchased power.[9] These three terms are the usual components of inputs for producing electricity.[10] In addition, capital is measured by capital stock that is constructed by applying a commonly used procedure of the perpetual

inventory method (see Appendix A for construction of the capital stock data). Note that all the data used in this study are restricted to those associated with the utility business of the firm, electricity, gas and others, and do not include non-utility businesses. Hence, the data are consistent with our purpose that an electric and gas combination is the focus of the diversification to be examined in this study.

In addition to the basic variables employed in formulating the production function described above, this study utilizes the following control variables:

(1) *Residential customer ratio (RCR)*. Ratio of residential customers to total customers, which is calculated by electricity sold to residential customers divided by the electricity sold to all customers, represented in percentage terms.

(2) *Environmental protection ratio (EPR)*. The firm's expenses for environmental protection, which are the required expenses based on state legislation that stipulates standards for environmental protection. Specifically, the ratio is calculated such that the cost expensed for environmental protection facilities is divided by the book value of the total utility plant. The ratio is represented in percentage terms. This is an interesting control variable because emissions from the generation sector have been important issues of environmental protection in the U.S.A. (Burtraw, Bharvirkar, & McGuinness, 2003).

(3) *Nuclear ratio (NCR)*. Ratio of nuclear generation to total generation, which is calculated by electricity generated by nuclear technology divided by the total volume of electricity generated by all types of generation technology in use, such as that based on fossil-fuel and others, represented in percentage terms. This factor is expected to affect the firm's production through the impact of selection and the combination of different types of generation technologies. The generation technology cannot be instantaneously adjusted once the investment in a specific technology is completed. For example, a firm cannot readily change in the short-run from nuclear generation to the other generation once it has invested in this (nuclear) technology. Therefore, we use this variable as a control variable.

In addition, it is important to note that a different combination of generation technology influences total productive efficiency at least through two paths: influences stemming from (a) different fuel costs and (b) capacity factors of plants. The latter effect is expected to be measured by productive efficiency. Although the former effect is partly controlled by the nuclear ratio, the effect may be more directly controlled by introducing a fuel cost

variable.[11] Furthermore, since our output variable is defined by total revenue, it may be influenced by initiation of the retail competition (that was generally accompanied by rate reductions for customers). To avoid these factors' influence on productive efficiency, we conducted a robustness check of the results by replacing the nuclear ratio variable by the fuel cost variable and a dummy variable with respect to the retail competition for each state.

3.2. Variables for Estimating Mean Efficiency

We assume the following five variables affect productive efficiency of firms from a perspective of deregulation of the industry and the organizational restructuring of firms. All of them with the exception of the state dummy variable, directly or indirectly, depend on the management's decisionas to which businesses they should be actively involved in to achieve optimal operations. Specifically, those variables are described as follows:

(1) *Electricity ratio (ER)*. Ratio of electricity business to firm's total operations, which is calculated by electricity revenue divided by utility total revenue, represented in percentage terms. This ratio indicates the degree of business concentration in the electricity business. Most firms that jointly operate electricity and gas businesses have inherited such joint structures since their foundation. However, this ratio changes as a result of deregulation of the industry. Hence, to capture such dynamic changes in business concentration that occurred during the period covered in this study, we use this ratio to explain changes in efficiency.

(2) *Purchased power ratio (PPR)*. Ratio of purchased power to total sales, which is calculated by the amount of purchased power divided by the amount of total sales of electricity in megawatt hours, represented in percentage terms. If this ratio is large, the firm purchases electricity from other firms through power exchange markets and/or through long- and/or short-term over-the-counter trading without generating electricity by its own plants. Hence, if the ratio is large, it implies that the firm has adopted a more separated organizational form of vertical structure between generation and other functions.

(3) *Wholesale ratio (WSR)*. Ratio of wholesale power to total sales, which is calculated by the amount of wholesale power divided by the amount of total sales in MWh, represented in percentage terms. This ratio reflects a management strategy with respect to the firm's degree of activity in the wholesale business. If this ratio is large, it implies that the

firm is actively involved in the wholesale power business by providing relatively large amounts of electricity to other firms. Consequently, as a corporate structure, it becomes an organization which is more focused on the generation and trading functions.

In addition to the organizational variables described above, this study also considers the other two direct effects of deregulation on productive efficiency. One of them is a cross-sectional effect that may be different for firms in states under traditional regulation and for those that adopted deregulation. Another interesting effect is a temporal effect of deregulation, particularly the effect since the issuance of FERC Orders 888 and 889. As a result of these orders and the state level restructuring legislation, there has been greater restructuring and retail competition. These effects are captured through the following variables:

(1) *State-level deregulation dummy (DRST).* A state dummy variable based on the regulatory policy for each state (traditional regulation versus adoption of deregulation): Our classification is derived from the ''Map of State Electricity Markets'' described in Potter (2003) (NRRI), December 2005 version. The map indicates the status of deregulation for each state. The dummy variable takes the value one if the state belongs to ''traditionally regulated states (27 states)'' or ''states with formally reversed, suspended, or delayed restructuring (4 states)'', and takes the value zero if the state belongs to ''states with full restructuring (17 states)'' or ''states with limited restructuring (3 states)''.
(2) *Progress of deregulation dummy (DRP).* In 1996, FERC Orders 888 and 889 were issued. By this issuance, open access to the transmission network was assured to all market participants. Some states immediately began to implement restructuring of the electricity industry by promoting competition in retail markets. In 1996, California and Rhode Island passed landmark legislation to restructure their electric power industry and then gave their consumers the right to choose among alternative suppliers for providing electricity. To examine the major impact of deregulation since 1996 on productive efficiency, this dummy variable takes the value one over the period from 1996 onward, and zero otherwise.

All data for the production frontier are obtained from FERC Form 1[12] and those compiled by Platts (the McGraw-Hill companies). A dataset used to calculate deflators for the revenue and costs and price index to construct capital stocks are obtained from the Bureau of Economic

Analysis (BEA) of the U.S. Department of Commerce (see note 9 and Appendix A). The list of firms, states and status of deregulation of each state is indicated in Table 1. Descriptive statistics of the dataset are summarized in Table 2.

The average output increased by 68% from $1.296 billion in 1990 to $2.172 billion in 2004. Meanwhile, input 1 (fuel, labor, and purchased power in O&M cost) increased by 100% from $0.785 billion in 1990 to $1.566 billion in 2004, and input 2 (capital stock) increased by 68% from $44.426 million in 1990 to $74.778 million in 2004. The growth rates of output and input 2 are almost parallel, but the growth rate of input 1 is larger than that of output, implying that decreasing efficiency is expected. Environmental protection ratio, nuclear ratio, and electricity ratio decreased by 40%, 49%, and 3%, respectively, whereas purchased power ratio and wholesale ratio increased by 91% and 39%, respectively, over the period.

4. EMPIRICAL MODEL AND ESTIMATION

We specify the production function by the translog functional form, which makes a production function flexible using a second-order approximation to an unknown function. The translog function allows representation of various substitution possibilities without restrictive assumptions about the shape of the technological relationship.

Let us consider production with I inputs ($i, j = 1, \ldots, I$). The general formulation of the production function under the variable returns-to-scale (RTS) production technology can be mathematically expressed as follows:

$$\ln Y_{nt} = \beta_0 + \sum_{i=1}^{I} \beta_i \ln x_{int} + \frac{1}{2} \sum_{i=1}^{I} \sum_{j=1}^{I} \gamma_{ij} \ln x_{int} \ln x_{jnt}$$

$$+ \theta_t t + \theta_{tt} t^2 + \sum_{i=1}^{I} \delta_{it} \ln x_{int} t + v_{nt} - u_{nt} \tag{2}$$

where Y_{nt} is an output for firm n ($n = 1, \ldots, N$) in period t ($t = 1, \ldots, T$), x_{int} is an ith ($i = 1, \ldots, I$) input for firm n ($n = 1, \ldots, N$) in period t ($t = 1, \ldots, T$), and t is a time trend. Distributional assumptions on the error term, v_{nt} and u_{nt}, have been defined in the previous section. Conditions for symmetry of the cross-effects are imposed by restricting the parameters as $\gamma_{ij} = \gamma_{ji}, \forall i, j$, and $\delta_{it} = \delta_{ti}, \forall i, t$.

Table 1. Sample of Electric Utilities, States, and Status of Deregulation.

No.	Company Name	State	DRST
1	Alabama Power Co.	AL	1
2	Alaska Electric Light & Power Co.	AK	1
3	Aquila Inc.	MO	1
4	Arizona Public Service Co.	AZ	0
5	Atlantic City Electric Co.	NJ	0
6	Avista Corp.	WA	1
7	Baltimore Gas & Electric Co.	MD	0
8	Black Hills Power Inc.	SD	1
9	Boston Edison Co.	MA	0
10	Cambridge Electric Light Co.	MA	0
11	Carolina Power & Light Co.	NC	1
12	Central Hudson Gas & Electric Corp.	NY	0
13	Central Illinois Light Co.	IL	0
14	Central Illinois Public Services Co.	IL	0
15	Central Vermont Public Service Corp.	VT	1
16	Cincinnati Gas & Electric Co.	OH	0
17	Cleco Power LLC	LA	1
18	Commonwealth Edison Co.	IL	0
19	Commonwealth Electric Co.	MA	0
20	Connecticut Light & Power Co.	CT	0
21	Consolidated Edison Co. Of New York Inc.	NY	0
22	Consumers Energy Co.	MI	0
23	Dayton Power & Light Co.	OH	0
24	Delmarva Power & Light Co.	DE	0
25	Detroit Edison Co.	MI	0
26	Duke Power Co.	NC	1
27	Duquesne Light Co.	PA	0
28	Edison Sault Electric Co.	MI	0
29	El Paso Electric Co.	TX	0
30	Electric Energy, Inc.	IL	0
31	Empire District Electric Co.	MO	1
32	Entergy Arkansas, Inc.	AR	1
33	Entergy Gulf States, Inc.	TX	0
34	Entergy Louisiana, Inc.	LA	1
35	Entergy Mississippi, Inc.	MS	1
36	Entergy New Orleans, Inc.	LA	1
37	Fitchburg Gas & Electric Light Co.	MA	0
38	Florida Power & Light Co.	FL	1
39	Florida Power Corp.	FL	1
40	Georgia Power Co.	GA	1
41	Granite State Electric Co.	NH	0
42	Green Mountain Power Corp.	VT	1
43	Gulf Power Co.	FL	1
44	Hawaiian Electric Co., Inc.	HI	1

Table 1. (*Continued*)

No.	Company Name	State	DRST
45	Idaho Power Co.	ID	1
46	Illinois Power Co.	IL	0
47	Indianapolis Power & Light Co.	IN	1
48	Jersey Central Power & Light Co.	OH	0
49	Kansas City Power & Light Co.	MO	1
50	Kentucky Utilities Co.	KY	1
51	KGE, A Westar Energy Co.	KS	1
52	Kingsport Power Co.	TN	1
53	Louisville Gas & Electric Co.	KY	1
54	Madison Gas & Electric Co.	WI	1
55	Massachusetts Electric Co.	MA	0
56	Maui Electric Co., Ltd.	HI	1
57	Metropolitan Edison Co.	OH	0
58	Minnesota Power, Inc.	MN	1
59	Mississippi Power Co.	MS	1
60	Monongahela Power Co.	PA	0
61	Mount Carmel Public Utility Co.	IL	0
62	Nevada Power Co.	NV	0
63	New York State Electric & Gas Corp.	NY	0
64	Niagara Mohawk, a National Grid Co.	NY	0
65	Northern Indiana Public Service Co.	IN	1
66	Northern States Power Co.	MN	1
67	Northern States Power Co. Wisconsin	WI	1
68	Ohio Edison Co.	OH	0
69	Oklahoma Gas & Electric Co. (OG&E)	OK	1
70	Orange & Rockland Utilities, Inc.	NY	0
71	Otter Tail Power Co.	MN	1
72	Pacific Gas and Electric Co.	CA	1
73	PacifiCorp	OR	0
74	Pennsylvania Electric Co.	PA	0
75	Portland General Electric Co.	OR	0
76	Potomac Edison Co.	MD	0
77	Potomac Electric Power Co.	DC	0
78	PPL Electric Utilities Corp.	PA	0
79	PSC of Colorado	CO	1
80	PSC of New Hampshire	NH	0
81	Public Service Electric and Gas Co.	NJ	0
82	Puget Sound Energy, Inc.	WA	1
83	Rochester Gas & Electric Corp.	NY	0
84	Rockland Electric Co.	NJ	0
85	San Diego Gas & Electric Co.	CA	1
86	Savannah Electric & Power Co.	GA	1
87	Sierra Pacific Power Co.	NV	0
88	South Carolina Electric & Gas Co.	SC	1

Table 1. (*Continued*)

No.	Company Name	State	DRST
89	Southern California Edison Co.	CA	1
90	Southwestern Public Service Co.	TX	0
91	Superior Water, Light & Power Co.	WI	1
92	Texas-New Mexico Power Co.	TX	0
93	Tucson Electric Power Co.	AZ	0
94	Union Electric Co.	MO	1
95	Union Light, Heat & Power Co.	KY	1
96	United Illuminating Co.	CT	0
97	Upper Peninsula Power Co.	MI	0
98	Virginia Electric & Power Co.	VA	0
99	West Penn Power Co.	PA	0
100	Western Massachusetts Electric Co.	MA	0
101	Wheeling Power Co.	OH	0
102	Wisconsin Electric Power Co.	WI	1
103	Wisconsin Power & Light Co.	WI	1
104	Wisconsin Public Service Corp.	WI	1

Including the control variables and omitting subscripts of variables for conciseness of description, our empirical model of the production function is specified as follows:

$$
\ln Y = \beta_0 + \beta_v \ln x_v + \beta_f \ln x_f + \frac{1}{2}\beta_{vv}(\ln x_v)^2 + \beta_{vf} \ln x_v \ln x_f
$$
$$
+ \frac{1}{2}\beta_{ff}(\ln x_f)^2 + \beta_t t + \frac{1}{2}\beta_{tt}t + \beta_{vt} \ln x_v t + \beta_{ft} \ln x_f t
$$
$$
+ \beta_{h1} \cdot \text{RCR} + \beta_{h2} \cdot \text{EPR} + \beta_{h3} \cdot \text{NCR}
$$
$$
+ v_{nt} - u_{nt} \tag{3}
$$

where Y is an output measured by the revenue converted to real terms, x_v is a consolidated input consisting of fuel, labor, and purchased power that is measured by the O&M costs in real terms, and x_f is a capital input measured by the capital stock. The mean of the inefficiency (μ_{nt}) is specified as follows:

$$
\mu_{nt} = \eta_0 + \eta_1 \cdot \text{ER} + \eta_2 \cdot \text{PPR} + \eta_3 \cdot \text{WSR} + \eta_4 \cdot \text{DRST}
$$
$$
+ \eta_5 \cdot \text{DRP} + \eta_6 \cdot \text{DRST} \cdot \text{DRP} \tag{4}
$$

where the productive efficiency for each firm and period is measured by $\text{PE}_{nt} = \exp(-\mu_{nt})$.

To deal with the statistical complexity of the SFA model, we apply Bayesian inference using MCMC computational methods for the estimation of the production frontier of electric power utilities. The Bayesian SFA was first proposed by van den Broeck, Koop, Osiewalski, and Steel (1994) and enhanced with respect to the numerical technique by Koop, Osiewalski, and Steel (1994) using the Gibbs sampler.[13] This study uses WinBUGS to perform inferences for the Bayesian SFA model with MCMC techniques (Griffin & Steel, 2007). The WinBUGS is a flexible tool to implement MCMC techniques. The prior specification is based on Section 6 of van den Broeck et al. (1994). They specify the model for the case with no covariates in the efficiency distribution while the model in this study incorporates covariate information in the efficiency distribution by modeling the underlying mean of a truncated normal inefficiency distribution. Yet the basic structure of their prior specification is applicable to the model of our study and WinBUGS can implement the estimation of such an extended model as described in Griffin and Steel (2007), note 11, and Appendix.

The Bayesian approach requires choosing a prior parameter. For example, β are assigned priors of a multivariate normal as $\beta \sim N(0, \Sigma)$. A gamma distribution with shape parameter a_0 and mean a_0/b_0 is assigned to the usual error term as $\sigma_v^{-2} \sim Ga(a_0, b_0)$. We set parameters a_0 and b_0 of this prior distribution at 0.001. In addition, the specification uses a particular right-skewed skew-normal prior for the standardized underlying mean $\varphi_0 = \eta_0 \sigma_u^{-1}$ and an independent gamma prior for σ_u^{-2}. In particular, it is written as

$$p(\varphi_0, \sigma_u^{-2}) = 2\Phi(\varphi_0)\phi(\varphi_0)f_G(\sigma_u^{-2}|5, 5\log^2 r^*) \qquad (5)$$

where $\Phi(\cdot)$ and $\phi(\cdot)$ denote the cdf and pdf of a standard normal, and $f_G(\cdot|a, b)$ denotes the pdf of a gamma distribution of $Ga(a, b)$. The prior median efficiency is equal to r^* which we set at 0.75 in this study. In the more general case with multiple (P) covariates in mean inefficiency, which is employed in this study, the above specification (Eq. (5)) is extended by adopting vague priors centered over zero for the other element of the vector $\varphi = \eta \sigma_u^{-1}$ as

$$\varphi_p \sim N(0, 10), p = 1, ..., P \qquad (6)$$

after normalizing any continuous covariates to have zero mean and unitary standard deviation (see Griffin & Steel, 2007). All data pertaining to the production function are normalized by their means for the estimation.

Table 2. Descriptive Statistics.

Variables	Statistics	1990	1991	1992	1993	1994	1995
Output: Real-term	Average	1,296,421	1,352,705	1,380,639	1,439,635	1,465,659	1,499,147
total revenue	Maximum	10,062,883	10,143,058	10,341,272	10,306,718	10,121,649	9,348,288
(1,000$)	Minimum	12,351	11,713	10,802	12,336	12,755	12,722
	Standard deviation	1,596,216	1,656,568	1,683,979	1,690,568	1,728,350	1,736,438
Input 1: Real-term	Average	784,605	812,431	826,465	861,299	879,342	863,674
O&M costs	Maximum	6,254,421	6,233,423	6,240,879	6,081,679	6,056,963	5,015,195
(1,000$)	Minimum	10,460	9,509	8,921	10,228	10,948	10,850
	Standard deviation	951,672	980,451	983,411	985,129	1,013,044	949,706
Input 2: Real-term	Average	44,426	46,929	49,533	52,127	54,534	56,507
capital stocks	Maximum	291,805	304,391	327,355	345,227	357,852	368,108
(1,000$)	Minimum	106	131	167	178	189	200
	Standard deviation	55,312	58,439	61,668	64,601	67,106	69,233
Residential customer	Average	32.84	33.28	32.49	33.13	32.63	32.73
ratio (%)	Maximum	51.34	51.58	51.52	52.07	52.60	53.19
	Minimum	0.00	0.00	0.00	0.00	0.00	0.00
	Standard deviation	8.11	8.00	7.97	7.99	8.00	7.89
Environmental	Average	6.27	6.35	6.13	6.00	5.98	5.77
protection ratio	Maximum	23.91	23.36	22.91	22.25	23.73	25.08
(facility, %)	Minimum	0.00	0.00	0.00	0.00	0.00	0.00
	Standard deviation	6.91	6.91	6.60	6.46	6.58	6.55
Nuclear ratio (%)	Average	12.49	12.10	12.44	12.07	12.00	11.96
	Maximum	78.02	74.35	80.88	74.18	69.11	70.91
	Minimum	0.00	0.00	0.00	−0.16	−0.16	0.00
	Standard deviation	16.76	15.84	16.09	16.23	15.80	15.82
Electricity ratio (%)	Average	91.97	92.11	91.89	91.65	91.73	91.89
	Maximum	100.00	100.00	100.00	100.00	100.00	100.00
	Minimum	31.65	37.98	45.27	40.11	43.49	44.49
	Standard deviation	12.84	12.51	12.59	12.94	12.70	12.37
Purchased power	Average	34.02	37.29	38.23	39.88	40.04	40.89
ratio (%)	Maximum	118.50	128.04	107.31	106.55	105.90	106.20
	Minimum	0.02	1.33	1.06	1.43	1.22	1.91
	Standard deviation	32.69	32.64	31.35	30.82	30.87	30.68
Wholesale power	Average	11.94	14.00	15.38	15.61	15.10	15.66
ratio (%)	Maximum	47.52	51.11	51.18	47.10	49.46	44.63
	Minimum	0.00	0.00	0.00	0.00	0.00	0.00
	Standard deviation	11.64	11.96	11.95	11.69	11.27	11.08

1996	1997	1998	1999	2000	2001	2002	2003	2004	Total Average
1,545,997	1,599,703	1,643,213	1,640,494	1,780,110	1,864,345	1,752,610	1,839,909	2,172,247	1,618,189
9,065,855	9,591,783	9,010,297	9,280,011	9,685,976	10,546,336	10,581,740	10,630,539	11,888,609	11,888,609
13,471	11,881	12,219	12,083	12,786	13,816	14,307	14,807	15,949	10,802
1,744,663	1,808,779	1,837,259	1,796,639	1,881,445	1,979,671	1,955,973	2,052,807	2,450,771	1,856,854
920,708	967,830	1,020,225	1,015,438	1,231,126	1,295,001	1,138,178	1,262,076	1,566,161	1,029,637
5,580,057	5,626,258	5,386,502	5,528,167	10,754,943	7,407,964	4,969,750	6,653,593	10,346,257	10,754,943
11,476	9,907	9,856	9,180	10,038	10,959	11,524	12,644	14,478	8,921
1,013,518	1,071,049	1,140,207	1,082,154	1,482,862	1,360,886	1,147,319	1,372,195	1,795,259	1,193,655
58,378	60,252	62,119	64,121	66,237	68,331	70,382	72,404	74,778	60,071
381,662	398,413	412,981	425,087	437,327	449,986	463,764	478,334	493,040	493,040
212	221	227	235	241	249	256	264	274	106
71,362	73,655	75,829	78,191	80,714	83,040	85,431	87,827	90,469	74,491
32.78	32.22	32.41	33.41	33.70	33.63	35.18	35.86	36.42	33.51
53.41	52.41	53.43	59.08	57.40	52.75	55.39	54.86	55.43	59.08
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.02	7.85	7.82	8.54	8.72	8.04	8.43	8.88	9.71	8.34
5.88	5.57	5.37	4.27	3.90	3.74	3.74	3.74	3.74	5.10
29.86	25.62	25.02	24.65	31.87	33.33	33.33	33.33	33.33	33.33
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.88	6.48	6.40	5.80	6.15	6.20	6.20	6.20	6.20	6.50
10.72	9.45	10.63	11.62	9.75	7.99	7.31	6.72	6.42	10.24
63.17	60.89	60.93	66.53	66.66	55.55	52.14	50.04	49.14	80.88
0.00	−0.47	−0.28	0.00	0.00	0.00	0.00	0.00	0.00	−0.47
14.40	13.97	14.65	15.28	14.21	13.32	13.29	12.52	12.11	14.84
91.30	91.11	92.33	92.18	91.18	90.60	91.25	90.15	89.26	91.37
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
41.60	42.04	49.76	50.95	45.39	42.80	47.33	42.02	41.76	31.65
13.22	13.24	11.42	11.60	13.20	14.08	13.21	14.79	16.14	13.14
43.28	44.50	43.74	45.96	53.03	58.99	61.45	63.55	65.06	47.33
106.33	105.62	105.98	107.05	118.75	122.42	144.74	156.45	173.25	173.25
1.49	1.04	1.23	1.69	1.36	1.32	2.03	1.66	1.73	0.02
31.45	31.28	31.01	31.62	34.19	36.83	37.76	39.80	41.55	35.11
17.09	18.70	19.76	20.44	20.32	17.98	18.12	17.27	16.55	16.93
59.07	67.83	70.75	70.80	65.70	76.56	86.08	90.42	93.09	93.09
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12.88	14.99	15.55	15.73	16.26	16.39	17.42	16.67	17.44	14.51

Table 3. Results of MCMC Parameter Estimates (Posterior Means and *t*-ratios).

Variables	Parameters	Model 1		Model 2		Model 3		Model 4	
		Mean	*t*-ratio	Mean	*t*-ratio	Mean	*t*-ratio	Mean	*t*-ratio
Production technology									
Constant	β_0	0.3417	5.43**	0.3233	8.03**	0.3479	6.91**	0.3919	4.43**
$\ln x_v$	β_v	0.6982	53.96**	0.6976	53.13**	0.6962	54.35**	0.6962	52.54**
$\ln x_f$	β_f	0.3150	26.88**	0.3130	26.30**	0.3166	27.27**	0.3168	26.33**
$1/2(\ln x_v)^2$	β_{vv}	0.1370	10.86**	0.1388	10.97**	0.1380	11.21**	0.1377	10.95**
$1/2(\ln x_f)^2$	β_{ff}	0.1377	14.32**	0.1376	14.19**	0.1386	14.87**	0.1388	14.31**
$\ln x_v \ln x_f$	β_{vf}	−0.1342	−12.67**	−0.1351	−12.67**	−0.1352	−13.15**	−0.1351	−12.73**
t	β_t	−0.0029	−1.51	−0.0039	−1.58	−0.0041	−1.73	−0.0043	−1.75
$1/2\,t^2$	β_{tt}	−0.0013	−5.84**	−0.0012	−5.01**	−0.0012	−5.14**	−0.0012	−5.05**
$\ln x_v t$	β_{vt}	0.0031	2.78**	0.0032	2.92	0.0032	2.92**	0.0032	2.88**
$\ln x_f t$	β_{ft}	−0.0045	−4.81**	−0.0045	−4.85**	−0.0046	−4.95**	−0.0046	−4.86**
Control variables									
RCR	β_{h1}	0.0017	6.66**	0.0017	6.88**	0.0017	6.72**	0.0017	6.81**
EPR	β_{h2}	0.0010	2.73**	0.0011	3.16**	0.0010	2.86**	0.0010	2.84**
NCR	β_{h3}	0.0006	3.90**	0.0006	3.69**	0.0006	3.87**	0.0006	3.92**
Deregulation/organizational variables									
Constant	γ_0	0.2867	4.69**	0.2544	6.53**	0.2879	5.69**	0.3109	4.03**
ER	γ_1	0.0024	1.15	0.0035	1.73	0.0028	1.32	0.0026	1.20
PPR	γ_2	0.0110	9.40**	0.0121	10.39**	0.0110	9.39**	0.0110	9.22**
WSR	γ_3	0.0031	1.51	0.0041	2.04*	0.0031	1.54	0.0030	1.49
DRST	γ_4	−0.1820	−3.17**			−0.1784	−3.13**	−0.1828	−3.18**
DRP	γ_5			−0.0905	−0.86	−0.0861	−0.82	−0.0994	−0.93
DRST*DRP	γ_6							0.3183	0.94
Variances									
σ_u^2		0.0048	24.50**	0.0048	24.89**	0.0048	24.03**	0.0048	24.33**
σ_v^2		0.0003	3.13**	0.0002	2.73**	0.0002	3.03**	0.0002	2.96**
DIC		−6892.01		−6906.81		−6944.58		−7038.19	

Note: The asterisks ** and * of *t*-ratio indicate significance at the 1% and the 5% levels, respectively.

5. RESULTS

The results of the estimation for Eqs. (3) and (4) are described in Table 3, which indicates means of posterior distributions and *t*-ratios of parameters. We estimated four models that are slightly different from each other with

respect to deregulation dummies that are used as explanatory variables of mean inefficiency. Model 1 is a base-case estimation that only includes the cross-sectional impact of deregulation (DRST). Meanwhile, Models 2–4 include temporal effects of deregulation without and with the cross-sectional impact and a cross-term. We generated three chains using the Gibbs sampler. Each chain was run with a burn-in of 5,000 iterations with 20,000 retained draws. All three chains converged to almost the same values so that it is credibly considered that the convergence to posterior distribution was achieved.

Technology parameters of the production function are all statistically significant except for that of the time trend (t) variable, and meet regularity conditions of the function. The parameters mildly indicate economies of scale at the sample average. Variance parameters related to normal error term and inefficiency term, σ_v^2 and σ_u^2, are both significant so that the model provides reasonable estimates of productive efficiencies. All parameters of time trend and its related variables are estimated to reveal negative signs with the exception of the cross-term parameter with x_v, which implies that there is no technological progress with respect to this production function.

Parameters of all control variables are statistically significant. Specifically, the parameter of the residential customer ratio (RCR) is positive, which indicates that productivity increases when the firms supply more electricity to residential customers. This ratio can be interpreted as a proxy for the economies of density over the service area of electricity as discussed in Roberts (1986), because the ratio of residential customers is higher in cities with a higher population density.[14] Therefore, the positive sign of this parameter reveals the effect of economies of density on total production. The parameter of the environmental protection variable is positive, which indicates that productivity increases when the firms spend more on environmental protection facilities. This variable works as a proxy for the firm's proactive employment of new generation technology such as the highly efficient combined-cycle gas turbines. Introduction of these technologies may be the result of relatively strict environmental standards, which paradoxically lead firms to achieve higher production using the same level of inputs compared to firms with a lower environmental protection ratio. The sign of the parameter of the nuclear power ratio is also positive, which indicates that a higher ratio of nuclear generation contributes to a higher level of productivity. This is consistent with our expectations because nuclear power plants are used to provide base-load power, which constantly operates under a relatively higher capacity usage ratio if it is soundly managed.[15]

In addition to Table 3, we present results of estimations using other control variables in Appendix B (as discussed in Section 3.1 regarding robustness checks). The results indicate that parameters of these other control variables, fuel cost variable (FUELC[16]) and the introduction of retail competition (RComp[17]), are not significant except for RComp in Model 2A. This result indicates that the fuel cost variable and the state-level retail competition do not directly affect production. Hence, this study does not employ these alternative control variables. Note also that the estimated parameters for the other variables are almost the same as those described in Table 3. Thus, the main results in Table 3 are robust even using alternative control variables.

Meanwhile, variables related to organizational structure that are expected to affect productive efficiency, reveal mixed results. First, electricity ratio shows a negative impact on productive efficiency, but it is not statistically significant. This implies that a joint operation of electricity and gas are neutral to the productive efficiency of utility firms. Consequently, there is no clear evidence to show the economic synergy effect of the joint operation of electricity and gas supply businesses. This is partly consistent with the result of Sing (1987) and those of previous finance studies that claim a disadvantage from diversification and an associated diversification discount. Second, purchased power ratio (PPR) has a positive and statistically significant parameter. Hence, productive efficiency decreases when firms purchase more electricity from outside firms instead of generating it by themselves. This negative effect of PPR may be attributed to the inefficient or non-competitive pricing of wholesale electricity that is caused by a possible exertion of market power as discussed in several previous studies (Borenstein et al., 2002; Wilson, 2002). This ratio can be interpreted as a proxy for the degree of vertical disintegration of the organization. Therefore, the result implies that vertical separation of functions is not a good strategy for improving operational performance of firms, at least under the recent performance of the wholesale power markets. This result indirectly supports most previous studies that investigated economies of vertical integration for electric power utilities and is partly consistent with the finding of Delmas and Tokat (2005).[18] Third, the parameter of wholesale power ratio (WSR) is positive such that the degree of efficiency decreases when the ratio increases. However, the parameter is not significant with the exception of Model 2. Therefore, this ratio is also mostly neutral in its impact on the performance of firms.

Furthermore, regarding cross-sectional impacts on productive efficiency through deregulation (DRST), all results identified in Models 1, 3 and 4

indicate that firms in states under traditional regulation are more efficient compared to those exposed to deregulation. This result suggests that there was a difference in degrees of efficiency between those two groups of firms before deregulation, and the difference remained unchanged by the restructuring of the industry. This difference in the efficiencies is also confirmed by a statistical test comparing average productive efficiencies between those two groups of firms. The second and the third columns of Table 4 show means and other descriptive statistics for productive efficiency, as well as the statistical tests for the null hypothesis that both groups belong to the same population with respect to the degree of the productive efficiency. Note that productive efficiency is calculated based on Model 4, because the deviance information criterion (DIC; Spiegelhalter, Best, Carlin, & van der Linde, 2002) model comparison criterion indicates support for Model 4 over the other models. The null hypothesis of equal means with those two groups of firms is rejected by Welch's *t*-test with a 1% significance level (*t*-ratio: 7.34).

Meanwhile, the temporal effects of deregulation (DRP) are not clear from the estimated parameters because they are not statistically significant (Models 2– 4). In addition, the cross-term of DRST with DRP – which captures temporal effects of efficiency only for the regulated group of firms – is not significant as well. Such an ambiguous result regarding the temporal impact of deregulation on productive efficiency can be also confirmed by an ex post statistical test as described in the fourth and the fifth columns of Table 4. The null hypothesis that both groups of productive efficiencies,

Table 4. Statistical Tests of Productive Efficiency.

	DRST		DRP		DRST = 1: Regulation		DRST = 0: Deregulation	
	1: Regulation	0: Deregulation	1: 1990–1995	0: 1996–2004	1: 1990–1995	0: 1996–2004	1: 1990–1995	0: 1996–2004
Average	0.695	0.678	0.687	0.684	0.691	0.698	0.684	0.674
Maximum	0.918	0.903	0.880	0.918	0.880	0.918	0.810	0.903
Minimum	0.586	0.441	0.510	0.441	0.596	0.586	0.510	0.441
Standard deviation	0.041	0.050	0.042	0.050	0.037	0.044	0.045	0.052
Number of observations	659	899	623	935	263	395	359	539
t-statistics		7.34**		1.05		−2.32*		2.96**

Note: The *t*-test is conducted under the assumption of different variances between two groups.

Fig. 1.   Central Tendency of Productive Efficiency.

before and after 1996, belong to the same population, cannot be rejected (*t*-ratio: 1.05). Fig. 1 shows temporal developments of the mean, the maximum, and minimum productive efficiencies over the period 1990–2004. Compared to changes in the highest and the lowest levels of efficiency, levels of the mean are relatively stable over the period.

In order to further examine the above ambiguous results, we conducted statistical tests of the temporal impacts of deregulation on productive efficiency for each group of firms in the regulated and deregulated states, respectively. The null hypotheses of these tests are that productive efficiencies of firms before and after 1996 belong to the same population. The results of tests for these two groups are indicated in the sixth and the seventh columns (the regulated group) and the eighth and the ninth columns (the deregulated group) in Table 4, respectively. Regarding the regulated group, the productive efficiency increases over time with statistical significance (*t*-ratio: −2.32), while the level of efficiency decreases over time for the deregulated group (*t*-ratio: 2.96). These findings are contrary to our expectation that deregulation leads to improvements in the performance of firms.

Fig. 2 describes central tendencies of efficiencies for the entire sample, the regulated group of firms, and the deregulated group of firms, respectively. Consistent with the estimated parameter of DRST in Table 3 and the
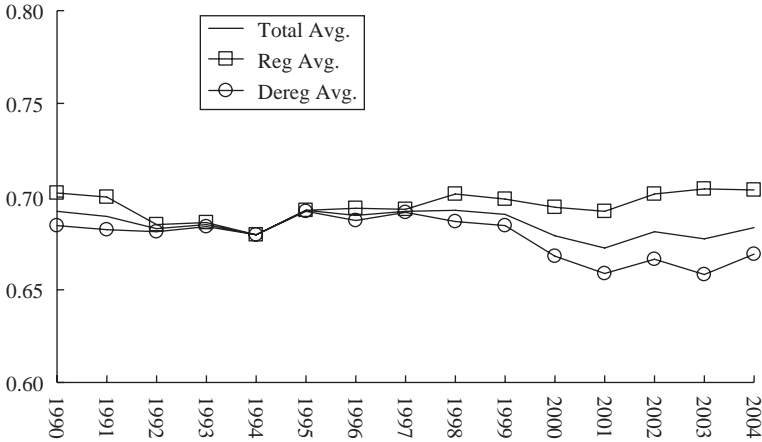
Fig. 2. Central Tendency of Productive Efficiency for Overall Sample, Regulated States, and Deregulated States.

statistical tests in Table 4, the average efficiency for the regulated group is constantly higher than the overall average for all years with the exception of 1994, while that for the deregulated group is lower than the overall average. Both of them (regulated and deregulated) decrease toward 1994 to come to almost the same level, after which they turn to an increasing trend toward 1997. Then after 1997, the average efficiency for the regulated group slightly increases till 2004, whereas the average efficiency for the deregulated group deteriorates till 2004. Such a discrepancy between average efficiencies in terms of the two groups, particularly for that observed after 1997, results in relatively unvaried overall average efficiencies in Fig. 1.

Regarding impacts of deregulation on productive efficiency of firms, results identified in this study are different from those of previous studies such as Nickell (1996) which found evidence of productivity improvements promoted by competition. However, our results are the same as in several other studies like Delmas and Tokat (2005) that found negative impacts of deregulation on productive efficiency. Results in this study suggest that effects of deregulation may not be apparent for the electric power utilities in the short-term. Efficiency improvements of plants can be achieved in the relatively short-term, because it is purely a technical matter, whereas productive efficiency of a firm's total operation is not so straightforward. The performance of a firm entails many factors that influence operations,
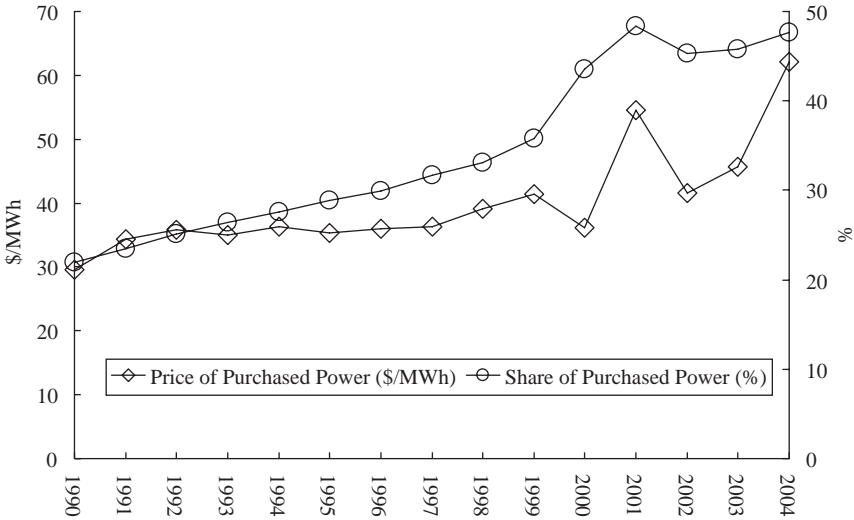
Fig. 3.   Price of Purchased Power and Cost Share of Purchased Power in Total
O&M Costs.

various costs, organizational structure, and the performance of wholesale
power markets, etc. Indeed, as identified in our estimation results
summarized in Table 3, a higher PPR is associated with lower productive
efficiency, which implies that higher exposure to wholesale markets results in
lower efficiency of firms. This relationship is also implied in the data such
that the average PPR for the regulated group of firms is 38.4% over the
period, while that for the deregulated group of firms is 53.9%.

   In addition, Fig. 3 depicts temporal developments of prices of purchased
power ($/MWh) and cost shares of purchased power in total O&M
costs (%).[19] Both of them increase significantly over the period. Specifically,
the average price of the purchased power increases from about $30/MWh
in 1990 to over $60/MWh in 2004, and the cost share of the purchased
power in total O&M costs increases from about 22% to about 48% over
the same period. If the wholesale power markets do not provide electricity
at favorable prices, it negatively affects the operational performance of
electric utilities that purchase electricity from the markets. This is because
a higher price of wholesale electricity leads to an increase in inputs for
producing the same level of outputs in production of the electric utilities.
In other words, following vertical separation of firms, efficiency of electric

utilities depends increasingly on the performance of costly wholesale power markets.

6. CONCLUSION

In this study, we empirically examined relative performance of large electric utilities in the U.S.A. over the period, 1990 –2004. We applied SFA methods to data on electric utilities and estimated productive efficiency for each firm. The period of our study constitutes a natural experiment to study the impact of deregulation on productive efficiency because it was marked by major deregulatory actions by the FERC, state-level easing of regulation, and even the softening of SEC oversight over merger and acquisition (M&A) activity.

While the deregulation was motivated by improvements in efficiency and subsequent lower consumer prices that increased competition was assumed to engender, actual electric prices in fact have either fallen too little or have even risen in some states. This is contrary to the prior experience in other industries, such as telecommunications, airlines, and trucking. It is, however, consistent with our findings. We found that the productive efficiency of firms in deregulated jurisdictions was in fact lower than that for electric utilities in jurisdictions with rate-of-return regulation. Furthermore, firms in states that adopted deregulation showed a trend of decreasing efficiency, while those in states under traditional regulation indicated increases in efficiency. These results lead us to question the prevalent notion that there is a positive relationship between deregulation and the operational performance of firms.

We also did not find any clear evidence of economic synergy from the joint operation of electricity and gas businesses, which too is commonly assumed. Furthermore, we found that productive efficiency decreased when firms purchased more electricity from outside instead of generating electricity by themselves. This result indicated a disadvantage from a vertical separation of the generation function in electric utilities, which has been a major goal of those seeking deregulation.

Finally, our analysis suggests what might have gone awry here. We found that increases in purchased power ratios, a proxy for vertical disintegration, had a negative impact on the productive efficiency of electric utilities. As a result of separating out generation, electric utilities have come to increasingly depend on wholesale power markets. The dramatic increases in prices of purchased power in wholesale markets over the period of this study suggest that the separation might have proved to be too expensive.

NOTES

1. We refer to deregulation here as an enhancement of competition.

2. *New York Times*, October 15, 2006, p. 1 "Competitive Electricity Markets Fail to Deliver Promised Savings."

3. *New York Times*, October 15, 2006, p. 1, "Competitive Electricity Markets Fail to Deliver Promised Savings."

4. *Washington Post*, March 12, 2006, p. 1, "Electricity Deregulation: High Cost, Unmet Promises."

5. Wilson (2002) briefly refers to the similarity of electricity and gas businesses from a perspective of homogeneity of commodities and their transmission systems; however, there is no clear empirical evidence on the issue.

6. In a precise sense, productive efficiency is defined as consisting of two components: the technical or physical efficiency and allocative or price efficiency. The allocative efficiency component refers to the ability to combine inputs and outputs in optimal proportions in the light of prevailing prices. Hence, price information of inputs is required to measure allocative efficiency. This study does not examine allocative efficiency, however, because of the nature of our input and output data. The productive efficiency measured in this study partly includes the influence of allocative efficiency.

7. These assumptions are consistent with $u_{it} = w'_{nt}\eta + v_{it}$ where the random variable, v_{it}, is defined by the truncation of the normal distribution with zero mean and variance, σ^2, such that the point of truncation is $-w'_{nt}\eta$ (Battese & Coelli, 1995).

8. Instead of introducing explicit control variables into a model, Orea and Kumbhakar (2004) proposed a single-stage latent class stochastic frontier model for a panel dataset to account for heterogeneity.

9. As a deflator for the revenue and O&M cost, this study uses a ratio of the nominal (current price) to the real (2000 constant price) gross domestic product by the state that is provided by the U.S. Department of Commerce, Bureau of Economic Analysis. The data is downloadable from http://www.bea.gov/regional/gsp/. The advantage of using this deflator is that we can obtain different time-series deflators for each state. However, the disadvantage is that the index is general and includes all industries other than electricity industry.

10. The reason for this definition of the consolidated input is primarily due to the fact that our dataset includes firms other than electricity-specialized firms. However, it is also related to the fact that constructing a firm-level quantity data of fuel use often requires cumbersome calculations based on additional technical assumptions for each plant. This is because each firm uses several different types of fuel, such as gas, coal and even nuclear. In addition, thermal efficiency is different for each plant and unit. A promising way to obtain a consistent quantity data of fuel is to calculate a heat-equivalent quantity of the fuel measured in calories or BTUs for each plant, and then aggregate them to construct a firm-level data. But major electric utilities usually own many plants and units, and the task is not straightforward.

11. As discussed in Thompson and Wolf (1993), costs of electricity generation are influenced by different generation technologies and regional conditions such as fuel availability.

12. Annual Report of Major Electric Utility, downloadable from http://www.ferc.gov/docs-filing/eforms.asp

13. Kleit and Terrell (2001) is a recent example that applied the Bayesian SFA to the analysis of the electric power utilities. Using data on generation plants fueled by natural gas, they estimated a degree of potential cost reduction through increased efficiency. Other recent Bayesian papers using MCMC techniques to estimate SFA models include Fernández, Koop, and Steel (2000), Kurkalova and Carriquiry (2002), and Kumbhakar and Tsionas (2005). Kumbhakar and Tsionas (2005) measured allocative efficiency as well as technical efficiency using a translog cost system.

14. Alternatively we used an industrial customer ratio instead of using the residential customer ratio. The estimated parameter of the industrial customer ratio was negative and significant, so that those results were consistent with each other.

15. The importance of nuclear generation varies for each country or region, depending on the availability of natural resources for them. There are frequently political issues surrounding nuclear generation, but our findings show that nuclear generation positively influences productivity. This is an element that is overlooked in these debates.

16. We obtain this data from Platts powerdat database.

17. RComp is a dummy variable that takes a value of 1 after the states introduced retail competition and 0 otherwise.

18. Delmas and Tokat (2005) indicated that firms that were vertically integrated into electricity generation, or that relied on the market for the supply of their electricity, were more efficient than firms that adopted hybrid structures combining vertical integration and contracting. Hence, the result of this study is consistent with their finding with regard to the higher efficiency of vertically integrated firms, but this study does not examine a nonlinear relationship between vertical integration and efficiency, which is presented in Delmas and Tokat.

19. Since these statistics are calculated in nominal terms, these values do not directly correspond to the input data used for estimating production function.

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APPENDIX A. CONSTRUCTION OF CAPITAL STOCKS DATA

This study constructs the real-term capital stocks data employing a perpetual inventory method as follows. The data period of this study is 1990–2004.

$$CS_{it} = CS_{it-1}(1 - \delta) + \frac{GI_{it}}{PI_t}, \quad t = 1991, \dots, 2004 \qquad (A.1)$$

where CS_{it} is a real-term capital stocks for firm i in period t, GI_{it} is a nominal-term gross investment for firm i in period t, which is calculated by summation of gross additions to utility capital assets, obtained from the cash flow statement. PI_t is a price index applied to the gross capital investment in period t. Regarding a depreciation rate, δ, this study uses an economic depreciation rate published by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce, downloadable from http://bea.gov/bea/an/0597niw/tableA.htm. Specifically, we used a constant depreciation rate of 0.0211 over the period, which is constructed for the category of "private nonresidential structure–electric light and power".

The capital stocks for a base-year period ($b = 1990$) is constructed applying a "triangularized" weighted average procedure proposed by Cowing, Stevenson, and Small (1981) to the data as follows:

$$CS_{ib} = \frac{BK_{ib}}{\sum_{r=1}^{20}\left\{ \left(r / \sum_{r=1}^{20} r \right) PI_r \right\}}, \quad b = 1990 \qquad (A.2)$$

where BK_{ib} is a book value of the capital assets for firm i in base-year period b and PI_1 to PI_{20} corresponds to PI_{1971} to PI_{1990}, respectively. A price index, PI, used in Eqs. (A.1) and (A.2), is obtained from a table of "Price Indexes for Gross Domestic Product" published by the BEA. The table is listed in the section of *National Income and Product Accounts Table*. Specifically, we applied a decomposed index constructed for the category of "gross private domestic investment–fixed investment–nonresidential structures". This index is downloadable from http://www.bea.gov/national/nipaweb/TableView. asp?SelectedTable = 4&FirstYear = 2004&LastYear = 2006&Freq = Qtr

APPENDIX B. RESULTS OF ESTIMATION WITH ALTERNATIVE CONTROL VARIABLES

Variables	Parameters	Model 1A		Model 2A		Model 3A		Model 4A	
		Mean	*t*-ratio	Mean	*t*-ratio	Mean	*t*-ratio	Mean	*t*-ratio
		Production technology							
Constant	β_0	0.3766	4.61**	0.3599	4.48**	0.4424	4.35**	0.3416	7.18**
$\ln x_v$	β_v	0.6902	54.39***	0.6874	53.83***	0.6884	55.07***	0.6897	56.67***
$\ln x_f$	β_f	0.3255	28.53***	0.3258	28.65***	0.3268	29.05***	0.3260	29.96***
$1/2(\ln x_v)^2$	β_{vv}	0.1350	10.83***	0.1370	11.40***	0.1353	11.31***	0.1343	11.15***
$1/2(\ln x_f)^2$	β_{ff}	0.1416	15.08***	0.1422	15.59***	0.1423	15.63***	0.1413	15.78***
$\ln x_v \ln x_f$	β_{vf}	−0.1345	−12.97***	−0.1361	−13.53***	−0.1352	−13.55***	−0.1341	−13.40***
t	β_t	−0.0039	−2.05*	−0.0054	−2.20*	−0.0054	−2.25*	−0.0054	−2.18*
$1/2t^2$	β_{tt}	−0.0012	−5.21***	−0.0010	−4.21**	−0.0011	−4.41**	−0.0011	−4.41**
$\ln x_v t$	β_{vt}	0.0036	3.28***	0.0038	3.48***	0.0037	3.36**	0.0036	3.40**
$\ln x_f t$	β_{ft}	−0.0051	−5.50***	−0.0052	−5.61***	−0.0052	−5.60**	−0.0051	−5.65**
		Control variables							
RCR	β_{h1}	0.0020	7.80***	0.0020	8.42***	0.0020	7.97***	0.002	8.12**
EPR	β_{h2}	0.0025	8.28***	0.0025	8.30***	0.0025	8.41***	0.002	8.41**
FUEL	β_{h3}	0.0003	0.17	0.0000	0.02	0.0003	0.16	0.000	0.15
Rcomp	β_{h4}	−0.0100	−1.50	−0.0171	−2.70**	−0.0104	−1.53	−0.010	−1.48

APPENDIX B. (*Continued*)

Variables	Parameters	Model 1A		Model 2A		Model 3A		Model 4A	
		Mean	t-ratio	Mean	t-ratio	Mean	t-ratio	Mean	t-ratio
		Deregulation/organizational variables							
Constant	γ_0	0.3455	4.45**	0.3140	3.89**	0.4025	4.08**	0.2783	5.58**
ER	γ_1	0.0019	0.85	0.0030	1.45	0.0027	1.29	0.0018	0.87
PPR	γ_2	0.0099	7.94**	0.0104	8.52**	0.0099	7.94**	0.0099	7.97**
WSR	γ_3	0.0042	2.08**	0.0049	2.40*	0.0042	2.13*	0.0042	2.13*
DRST	γ_4	−0.1738	−2.89**			−0.1685	−2.80**	−0.1754	−2.82**
DRP	γ_5			−0.1049	−0.99	−0.1081	−1.02	−0.1031	−0.93
DRST*DRP	γ_6							0.4223	1.39
		Variances							
σ_u^2		0.0047	24.17**	0.0047	24.60**	0.0047	23.69**	0.0046	24.67**
σ_v^2		0.0002	3.02**	0.0002	2.98**	0.0002	3.04**	0.0002	2.77**
DIC		−7028.61		−7145.25		−7065.01		−7044.86	

Note: The asterisks ** and * of *t*-ratio indicate significance at the 1% and the 5% levels, respectively.

IMPLICATIONS OF CASH HOARDING FOR SHAREHOLDERS

Derek Oler and Marc Picconi

ABSTRACT

Agency theory suggests that firms with very high cash balances ("cash hoarders") are likely to misinvest their funds. However, if investors do not fully recognize the implications of a high cash balance, then future returns may be predictable for cash-hoarding firms. We find that cash hoarders significantly underperform over the two years following their identification as hoarding. In subsequent analysis, we find that returns are significantly negative in the year that a prior cash-hoarding firm reports a significant decrease in cash. Our results suggest that investors do not fully appreciate the implications of a high cash balance for future returns, but do recognize problems when that cash is subsequently spent.

1. INTRODUCTION

Over time, firms have steadily increased the level of cash and marketable securities reported on their annual balance sheets. Although a growing body of research has investigated the determinants of a firm's cash level, and the valuation effects of cash holdings, less research has been done on the implications of large cash holdings for future returns. On the one hand, firms

holding large amounts of cash are better able to respond to risks or take advantage of opportunities without having to make costly trips to external capital markets (Myers & Majluf, 1984). A high cash balance may also suggest superior ability to generate cash, either from operations or from convincing financers (creditors or shareholders) that the firm represents a good investment. On the other hand, large cash holdings reduce the ability of the market to monitor manager's decisions (Easterbrook, 1984; Jensen, 1986). Managers of firms with excess cash may be tempted to make investments that maximize their personal utility rather than shareholder value.

If the market is completely efficient in its assessment of a firm's cash level, then future abnormal returns will not be predictable using this information (Fama, 1970). More recent theoretical research, however, deals with the possibility that investors may have limited attention (Hirshleifer & Teoh, 2003), and may therefore not fully appreciate the implications of a high cash balance. Because of conflicting possible interpretations of a high cash balance, we hypothesize that the market overestimates the benefits of a high cash level (or underestimates its drawbacks). Accordingly, we investigate whether firms reporting extremely high cash levels ("cash-hoarding" firms) have negative future abnormal returns.

We show that cash-hoarding firms have significantly negative abnormal returns over the two years following the public release of their financial statements. These abnormal returns persist after controlling for book-to-market and momentum effects, as well as controlling for sales growth and accruals. We interpret our results as being consistent with Jensen's (1986) free cash flow theory in that firms with very high cash balances are more likely to improperly invest resources; however, the market does not become fully aware of this problem until future periods. Cash-hoarding firms that suffer a subsequent, significant drop in cash level suffer significantly negative contemporaneous returns, suggesting that the market becomes aware of the misinvestment problem associated with excess cash when the funds are actually spent.

2. PRIOR RESEARCH AND HYPOTHESIS DEVELOPMENT

The amount of cash held by firms has been the subject of a growing body of research. Prior work in this area has concerned itself with two primary questions: First, what are the determinants of a firm's cash holdings?

Second, what are the valuation and performance effects of a firm's cash holdings?

The first line of research into cash levels seeks to understand why some firms might hold relatively more cash and why others might hold less; in other words, what determines a firm's cash level? Results from Kim, Mauer, and Sherman (1998) and Opler, Pinkowitz, Stulz, and Williamson (1999) indicate that a firm's cash level is increasing in measures of firm and market-level growth opportunities (firm growth opportunities proxied by the firm's market-to-book ratio, and market-level growth proxied by growth in an index of leading economic indicators) and risk (proxied by either the average standard deviation of industry cash flows over prior years, or by the standard deviation of the firm's free cash flow). A firm's cash level is decreasing in its size, net working capital (calculated excluding cash), and leverage. Firms that pay dividends and firms in regulated industries tend to have lower cash levels. Harford, Mansi, and Maxwell (2008) show that firms with weaker shareholder rights tend to hold lower levels of cash than firms with stronger shareholder rights, and find that entrenched managers tend to dissipate cash reserves faster than other managers. Foley, Hartzell, Titman, and Twite (2007) add a tax explanation for cash holdings and show that growing cash levels in U.S. multinational corporations is partly explained by companies leaving cash in their foreign subsidiaries to avoid incurring a repatriation tax by moving the cash into to the United States. Overall, these results suggest that firms facing greater risk, firms with greater growth opportunities, firms with stronger shareholder rights, and firms with profitable foreign subsidiaries tend to maintain higher cash levels.

A second line of research deals with the effect of a firm's cash level on its current valuation and performance. Harford (1999) argues that an excess cash balance represents stockpiled free cash flow, and therefore a firm with a high amount of excess cash should face severe agency problems, following Jensen (1986). Harford investigates whether these agency problems manifest themselves in acquisitions, and shows that cash-rich firms have a greater propensity to undertake acquisitions (and that those acquisitions are less promising than those undertaken by other firms). Pinkowitz and Williamson (2002) investigate the market value of firms' cash holdings, and report large cross-sectional differences between firms: firms with poor growth options, more predictable investment opportunities, and those nearer to financial distress have a much lower marginal value of cash. Dittmar and Mahrt-Smith (2007) investigate the relationship between the value of cash holdings and corporate governance, and find that the market value of excess cash reserves is much lower for poorly governed firms. They also find that poorly governed

firms tend to dissipate their cash reserves faster than firms with superior governance, confirming the results of Harford et al. (2008). Overall, this line of research finds that the valuation of excess cash depends on the market's assessment of the probability that the cash can be profitably invested. Firms that seem to have a limited set of investment opportunities, firms that are more likely to go bankrupt, and firms with weaker corporate governance are penalized by the market for holding excess cash. Firms that are more likely to be able to profitably invest excess cash, however, are not penalized.

This chapter adds to the second stream of research on cash holdings by investigating the implications of a firm's cash balance on *future* returns and performance. Contemporaneous valuation gives the market's current assessment of the firm's cash balance, but does the market get it right? A growing body of research suggests that, at least in certain settings, the market does not "get it right" in the short term with respect to a number of items, including accruals (Sloan, 1996) and net operating assets (Hirshleifer, Hou, Teoh, & Zhang, 2004).[1] Hirshleifer and Teoh (2003) present an analytical model based on some investors having limited attention and processing power. In such a setting, the equilibrium price is a weighted average of the beliefs of both the attentive and inattentive investors.[2] As we argue later, market participants receive conflicting advice on the implications of a firm's cash balance, and therefore it is likely that a greater proportion of investors will not be attentive to the negative implications of an extreme cash balance for future returns.

In a contemporaneous paper, Oler and Picconi (2008) examine the future performance of firms that deviate from an estimated optimal cash level. They find that both positive and negative deviations from an estimated optimal are associated with reduced future returns. Our study differs from theirs in that we focus on only firms that hold extremely high amounts of cash, while they focus on the degree to which a firm deviates from an optimal amount.

Some market participants may assume that a high cash level is "good news" for future performance. Many accounting textbooks discuss how a higher cash level is desirable because it increases financial flexibility (e.g., Kieso, Weygandt, & Warfield, 2007, p. 171). That is, a higher cash balance can allow a firm to take advantage of opportunities or respond to threats on a more timely basis. Similarly, a high cash balance can allow a firm to invest in positive net present value (NPV) projects without the need to access capital markets (Myers & Majluf, 1984), thus reducing the underinvestment problem.

A high cash level may also signal "bad news" for future performance. Academics (Jensen, 1986; Harford, 1999; Oler, 2008) argue that a high cash

level exacerbates agency problems between managers and shareholders. Managers have incentives to continue to spend cash in ways that increase their power and prestige (e.g., in making acquisitions) even if such expenditures do not maximize firm value. Cash accumulation may also signal that the firm has run out of future viable investment opportunities, even though current investments are successful in generating cash.

Market participants may have a difficult time disentangling the positive implications of high cash inflows from the ambiguous implications of cash accumulations. Because of these potential problems with a high cash level, and because these problems are likely not fully recognized by market participants at the time a high cash level is reported, we hypothesize that future abnormal returns will be significantly lower for high-cash firms than for other firms. In addition, to provide some context for our examination of future returns, we will investigate contemporaneous returns for the year that a high cash balance is first reported.

In contrast to our expectations, Mikkelson and Partch (2003) show that firms maintaining a high cash balance over a five-year period do not appear to underperform peer firms in terms of operating performance.[3] Their findings, with results from Harford, Mansi, and Maxwell (2008) and also Dittmar and Mahrt-Smith (2007) suggest that negative returns are incurred when excess cash is poorly invested, and not when it is accumulated (or maintained). Accordingly, we also examine contemporaneous and future returns for the year that a prior high-cash firm reports a significant drop in its cash balance.

3. DATA AND VARIABLE CALCULATIONS

We use annual financial statement from Compustat, and monthly stock returns and shares outstanding from CRSP (all drawn from WRDS). Because statement of cash flow information is not available for firms before 1988, we limit our investigation to fiscal years from 1988 to 2003. We require that firms have total assets (Compustat annual item no. 6) of at least $10 million, positive shareholders' equity (item no. 60), and have a share price above $2 per share. We exclude financial firms (SIC code 6xxx) and utilities (49xx), using SIC codes from Compustat. Firms must have reported numbers for cash from operations (item no. 308), cash from investing (no. 311), cash from financing (no. 313), and net increase in cash (no. 274). Firms must also have sufficient information to calculate accruals (no. 123 – (no. 308-no. 124))/ (prior year no. 6), momentum (defined as size-adjusted abnormal returns

for the six months preceding the investment start date), and sales growth (no. 12 – prior year no. 12)/(prior year no. 12).[4] After applying the above screens, we have 41,852 firm-years of observations. Table 1 provides descriptive statistics for our observations, and Table 2 shows correlation coefficients for our variables. All variable calculations are provided in the Appendix.

We define a firm as "cash hoarding" if it is in the top decile, ranked by cash level, of firms in that year and industry, has a cash level of at least 0.1. As an exception to the above rule, we also define a firm as cash hoarding if it has a cash level of 0.8 or more, regardless of where it falls within its year/industry rank.[5] As Table 1 shows, cash-hoarding firms are smaller and have much lower book-to-market values than firms never identified as cash hoarders. The strong correlation between cash level and book-to-market suggested by Table 1 is confirmed in Table 2 ($\rho = -0.24$, $p < 0.01$).

Table 1. Descriptive Statistics.

	Number of Firm-Years	Cash Level		Industry-Adjusted Cash Level		Market Capitalization		Book-to-Market	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
All firm – years	41,852	0.16	0.07	−0.08	−0.31	1979	185	0.70	0.52
Firms that are not cash hoarders	27,197	0.10	0.04	−0.39	−0.31	2028	171	0.75	0.55
Cash hoarding firm-years									
Year −1	741	0.35	0.29	0.34	0.15	570	129	0.57	0.37
Year 0	1,060	0.70	0.71	1.87	1.42	695	169	0.46	0.27
Year 1	1,051	0.47	0.43	0.81	0.53	1101	204	0.46	0.32
Year 2	951	0.38	0.34	0.53	0.22	850	213	0.55	0.38
Year 3	866	0.36	0.31	0.55	0.24	822	189	0.60	0.43

Notes: Financial statement information is drawn from the Compustat Annual Industrial database, and share price information is drawn from the CRSP monthly dataset from 1988 to 2003. We define a firm as "cash-hoarding" if its scaled cash level (cash and short-term investments, Compustat annual item no. 1, divided by prior year's total assets, item no. 6 from the prior year) is in the top decile of firms for that industry/year, its scaled cash level is at least 0.1, and its industry-adjusted cash level is at least 0, or if its raw scaled cash level is above 0.8. In addition, we require that all firms defined as "cash-hoarding" be listed for at least three years on the CRSP database (to exclude the initial stages of an IPO firm's life), and have at least the prior year's financial statements available on Compustat. We exclude financial firms (SIC code 6xxx) and utilities (SIC code 49xx). Industry-adjusted cash level is raw scaled cash level less the industry mean for that year, divided by the industry standard deviation for that year. Market capitalization is defined as share price x shares outstanding (in millions), scaled to $2,000 using the Consumer Price Index, as of the end of the previous fiscal year. Book-to-market is defined as total common shareholder's equity (item no. 60) divided by market capitalization, as of the end of the previous fiscal year.

Table 2. Correlation Coefficients.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Current-year returns	1	0.00	0.05	-0.05	0.06	0.21	-0.10	-0.03	0.05	-0.03	0.05	0.01	-0.07
		0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00
2. 2-Year ahead returns	-0.04	1	-0.04	-0.02	0.00	0.09	-0.11	0.03	0.04	0.03	-0.04	0.11	0.00
	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Hoarding dummy	0.08	-0.02	1	-0.03	0.40	0.04	0.11	-0.08	-0.04	0.01	0.07	0.09	-0.03
	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
4. Big drop dummy	-0.03	-0.01	-0.03	1	0.08	-0.07	-0.01	-0.01	-0.04	0.02	-0.04	0.04	0.01
	0.00	0.00	0.00		0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.20
5. Cash level	0.09	0.03	0.42	0.08	1	0.07	-0.32	-0.04	-0.23	0.01	0.05	-0.02	-0.03
	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
6. Cash from operations	0.11	0.01	0.04	-0.07	0.07	1	-0.32	-0.37	-0.22	0.25	0.16	0.06	-0.16
	0.00	0.02	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
7. Cash from financing	-0.02	-0.03	0.12	-0.01	-0.32	-0.32	1	-0.47	-0.15	-0.02	0.15	-0.01	0.04
	0.00	0.00	0.00	0.09	0.00	0.00		0.00	0.00	0.00	0.00	0.08	0.00
8. Cash from investing	-0.03	0.02	-0.08	-0.01	-0.05	-0.37	-0.48	1	0.30	-0.23	-0.15	-0.05	0.11
	0.00	0.00	0.00	0.06	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
9. Book-to-market	0.03	0.03	-0.14	-0.04	-0.23	-0.21	-0.15	0.30	1	-0.50	-0.27	-0.08	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.54
10. Market capitalization	-0.08	-0.04	0.01	0.02	0.01	0.25	-0.02	-0.23	-0.50	1	0.15	-0.01	-0.02
	0.00	0.00	0.02	0.00	0.04	0.00	0.00	0.00	0.00		0.00	0.00	0.00
11. Momentum	0.02	-0.04	0.07	-0.04	0.05	0.16	0.15	-0.15	-0.27	0.15	1	0.08	-0.04
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
12. Sales growth	0.00	-0.02	0.01	0.04	-0.02	0.06	-0.01	-0.05	-0.08	-0.01	0.08	1	0.01
	0.52	0.00	0.09	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00		0.07
13. Accruals	-0.06	-0.02	-0.01	0.01	-0.03	-0.16	0.04	0.11	0.00	-0.02	-0.04	0.06	1
	0.00	0.00	0.21	0.20	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	

Notes: Spearman coefficients are in the upper triangle and Pearson coefficients are in the lower triangle. All variables, except for returns, the hoarding dummy, and the "big drop" dummy, are scaled by converting the value into a decile rank, subtracting one, and dividing by nine. This controls for scale differences in variables in our regressions.
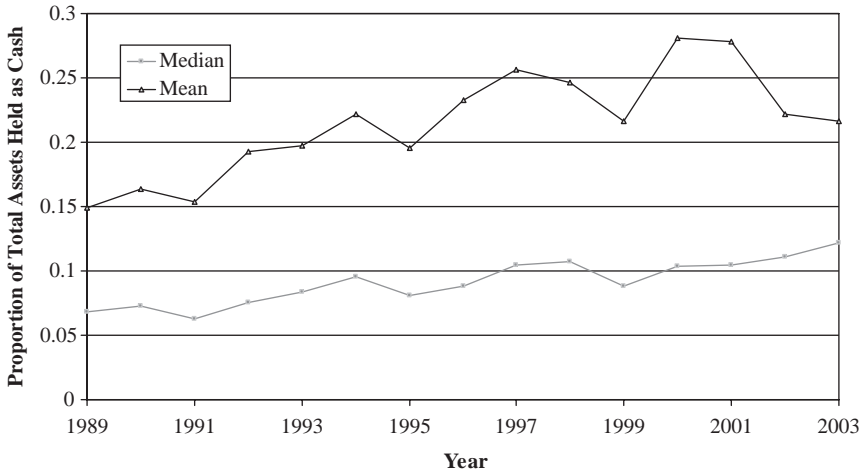
Fig. 1. Cash Holdings by Year.

Fig. 1 provides an overview of proportionate cash held by firms meeting our data requirements. Consistent with Greenwood (2005), we show a general increase in cash held by firms from 1989 to 2003 (median cash levels increase from a low of 0.069 in 1989 to high of 0.122 in 2003). The increase in cash levels has also caught the attention of the business press (Zuckerman, 2005).

Fig. 2 tracks industry-adjusted (subtracting the mean and dividing by the industry standard deviation) cash level and cash flows by major category (cash from operations, cash from financing, and cash from investing) for firms that we identify as hoarding cash in year 0. These values reflect the number of standard deviations that the variable differs from the industry mean (e.g., the median cash level for firms identified as cash hoarding is 0.44 standard deviations higher than their industry averages). Raw cash levels show a very similar pattern. As shown in Fig. 2, most cash-hoarding firms quickly decrease their cash level in subsequent years. Cash-hoarding firms also show a steady increase in cash from operations, from years −2 to 0, which reverses by year +1 and is followed by a continued steady increase in cash from operations in future years. Cash hoarders show an increase in cash from financing in year 0, although they appear to require less cash from financing than most other firms in their industry (industry-adjusted cash from financing in Fig. 2 never rises above 0). Cash-hoarding firms also show cash outflows for investing activities that are lower than the industry mean
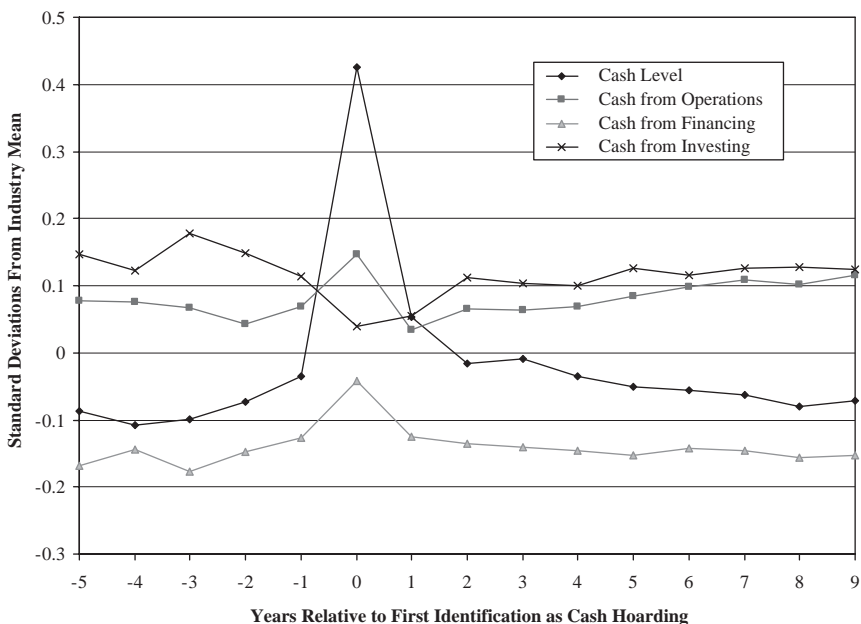
Fig. 2. Industry-Adjusted Cash Level and Flows – Cash-Hoarding Firms.

(indicated by the industry-adjusted line for cash from investing in Fig. 2 never falling below zero).[6]

4. ANALYSIS AND RESULTS

We begin by examining contemporaneous returns and future returns for firms identified as cash hoarding. We regress size-adjusted buy-and-hold returns on a cash-hoarding dummy, and add variables to control for cash level and cash flows, as well as the more standard controls for book-to-market, momentum, sales growth, and accruals. In order to enhance comparability of our estimated coefficients, and to control for possible outliers in our data, we transform all our continuous independent variables by determining their decile rank as of each year, subtracting one, and then dividing by 9. The estimated coefficient on the transformed variable can be interpreted as the returns to moving from the bottom decile of that variable to the top decile.[7] As a robustness check on our results, we use two models for our analysis. In Model 1, we pool our observations and include industry

and year dummies, although the estimated coefficients on these dummies are not shown. In Model 2, we report the mean estimated coefficients from 16 yearly regressions (i.e., the Fama–MacBeth approach), with industry dummies (not shown). Model 1 p-values are adjusted for heteroscedasticity, and Model 2 p-values reflect the Newey–West adjustment for autocorrelation, because our buy-and-hold returns span two years. Our results are shown in Table 3.[8]

These results indicate that in the year a firm is identified as cash hoarding, it enjoys significantly positive returns after controlling for other factors (18% for Model 1 and 13% for Model 2, in Panel A). However, cash-hoarding firms significantly underperform in the two years following their identification (returns are −13% in Model 1 and −9% in Model 2, both with $p < 0.01$, or about −6.6% per year for Model 1 and −4.5% per year for Model 2).[9] After controlling for cash hoarding, subsequent returns are increasing in cash level (returns to moving from the bottom decile of firms ranked by cash level to the top decile are 11%, $p < 0.01$). As suggested by Sloan's (1996) results, future returns are significantly increasing in cash from operations, and as suggested by Richardson and Sloan (2003), future returns are significantly decreasing in cash from financing (which includes cash from equity issues and cash from additional borrowing).

These results support our hypothesis that market participants do not appear to attend to the implications of an extreme cash balance in the year that it is reported. In fact, a comparison of panels A and B suggests that the market initially believes a high cash balance is desirable, but then subsequently reverses its assessment. One possible explanation for this reversal is that in future years, when the cash is ultimately spent, the market recognizes that the cash outflow is not into investments that maximize firm value (or, at least, is not into investments that meet the market's expectations). Accordingly, in Table 4, we regress contemporaneous returns on the same variables used in Table 3, save that we switch the cash-hoarding dummy for a "big drop" dummy set to one if a firm previously identified as cash hoarding subsequently reports a reduction in its cash balance from the prior year of 50% or more.

Results here show that the "big drop" dummy is negatively associated with contemporaneous returns (Model 1, −10%, $p < 0.01$). This suggests that although the market does not appear to recognize the problems associated with an extremely high cash balance in the year it is reported, the market does recognize problems in the year that a high cash balance is used up.

Do these findings represent an exploitable anomaly? In other words, in the "real world," is it possible to profit from the arbitrage opportunity that we suggest exists? In order to investigate this question, we begin by looking

Table 3. Returns to Cash-Hoarding Firms – Contemporaneous and Future.

	Panel A: D. V. is Contemporaneous Returns		Panel B: D. V. is 2-Year Future Returns	
	[1]	[2]	[1]	[2]
Hoarding dummy	0.178	0.133	−0.127	−0.088
	0.000	0.022	0.000	0.000
Cash level	0.125	0.117	0.110	0.098
	0.000	0.058	0.000	0.220
Cash from operations	0.402	0.390	0.112	0.081
	0.000	0.000	0.000	0.190
Cash from financing	0.130	0.132	−0.125	−0.128
	0.000	0.010	0.001	0.000
Cash from investing	0.135	0.136	0.035	0.009
	0.000	0.000	0.434	0.767
Book-to-market	0.249	0.214	0.186	0.173
	0.000	0.000	0.000	0.003
Momentum	0.059	0.021	−0.127	−0.067
	0.000	0.193	0.000	0.151
Sales growth	0.011	0.032	−0.072	−0.054
	0.376	0.154	0.006	0.275
Accruals	−0.105	−0.105	−0.076	−0.080
	0.000	0.000	0.001	0.007
Intercept	−0.549	−0.472	0.108	−0.036
	0.000	0.000	0.034	0.648
Number of observations	41,852	16	41,852	16
F-score	72.78		19.52	
Adjusted R^2	5.66%		1.53%	

Notes: The results of regressions of contemporaneous returns (Panel A) and future returns (Panel B) on a dummy variable set to one if the firm is defined as "cash hoarding" for a given year. "D. V." stands for "Dependent Variable." We control for cash level; cash flows from operations, financing, and investing activities; as well as book-to-market, size, momentum, sales growth, and accruals. Returns are calculated as buy-and-hold returns for the firm less buy-and-hold returns for the CRSP-defined portfolio of firms within the same size decile, using the decile assignment as of December of the prior year. Model 1 reflects a pooled regression with year and industry dummies (not shown), and p-values shown under the estimated coefficients reflect heteroscedasticity-adjusted values. Model 2 reflects mean estimated coefficients from cross-sectional regressions by year, and p-values for Panel B reflect the Newey–West adjustment for autocorrelation (not needed for Panel A). All continuous independent variables are transformed by dividing the decile rank (less one) by nine, so that estimated coefficients can be interpreted as the returns from moving from the bottom decile of that variable to the top decile. For contemporaneous returns in Panel A, we open our position as of four months after the year-end of the prior fiscal year, and close our position 12 months later. In Panel B, we open our position four months after the end of the current fiscal year, and close our position 24 months later.

Table 4. Returns to "Dropping Out" from Hoarding.

	D. V. is Contemporaneous Returns	
	[1]	[2]
"Big Drop" dummy	−0.102	−0.062
	0.000	0.006
Cash level	0.198	0.173
	0.000	0.037
Cash from operations	0.397	0.388
	0.000	0.000
Cash from financing	0.137	0.143
	0.000	0.014
Cash from investing	0.129	0.133
	0.000	0.000
Book-to-market	0.243	0.208
	0.000	0.000
Momentum	0.061	0.023
	0.000	0.150
Sales growth	0.014	0.033
	0.295	0.147
Accruals	−0.106	−0.106
	0.000	0.000
Intercept	−0.560	−0.483
	0.000	0.000
Number of observations	41,852	16
F-score	69.46	
Adjusted R^2	5.42%	

Notes: The results for regressing size-adjusted contemporaneous buy-and-hold abnormal returns on cash level and a dummy set to one for firms defined in a prior year as "cash hoarding" who subsequently experience a significant drop ($<50\%$) in cash level. "D. V." stands for "Dependent Variable." We control for cash from operations, financing, and investing, as well as book-to-market, size, momentum, sales growth, and accruals. Model 1 reflects a pooled regression with year and industry dummies (not shown), and p-values shown under the estimated coefficients reflect heteroscedasticity-adjusted values. Model 2 reflects mean estimated coefficients from cross-sectional regressions by year. All continuous independent variables are transformed by dividing the decile rank (less one) by nine, so that estimated coefficients can be interpreted as the returns from moving from the bottom decile of that variable to the top decile. We open our position as of four months after the year-end of the prior fiscal year, and close our position 12 months later.

at abnormal returns to a simple investment strategy of shorting all firms identified as cash hoarding. We open our position as of the start of the month falling four months after the firm's fiscal year-end, and close our position 24 months later. As in Tables 3 and 4, we use size-adjusted,
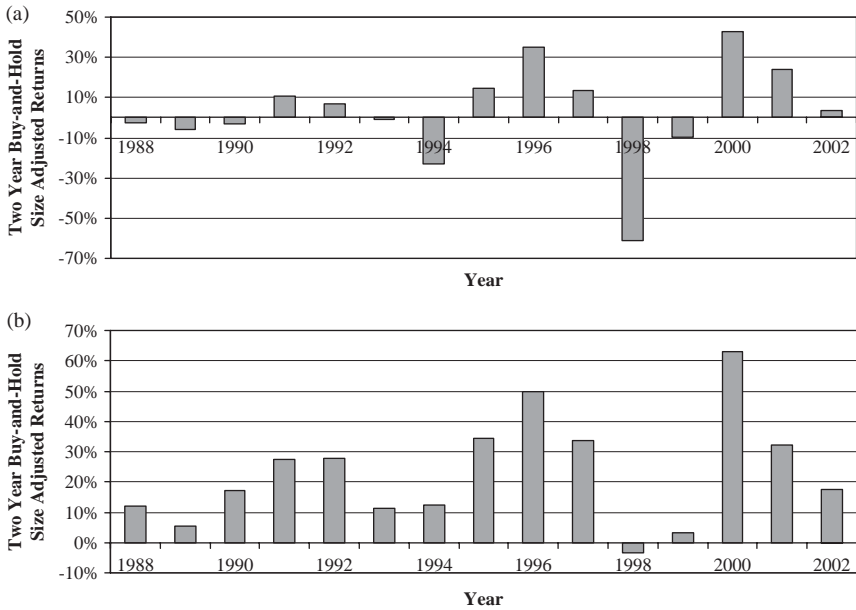
(a)

(b)

Fig. 3. (A) Mean Returns to Shorting Cash-Hoarding Firms. (B) Median Returns to Shorting Cash-Hoarding Firms.

buy-and-hold returns as our measure of abnormal returns. Results are shown graphically in Fig. 3.

Panel A of Fig. 3 shows mean abnormal returns, by year, from 1988 to 2002. These years reflect the year that the cash-hoarding firm is identified, so returns shown for the 1988 year are actually accumulated over 1989 and 1990. Overall, our simple strategy is slightly profitable (mean equal-weighted returns across all years are $+5.8\%$, $p < 0.01$). From the graph, it is clear that there are some years where the strategy is not profitable (including 1998, where mean returns are -61%). However, median returns (Panel B) suggest that the poor returns in Panel A are largely attributable to outliers. The overall median return from 1988 to 2002 is 23.7% (or 11% per year), $p < 0.01$.

The "star" performance of a few cash-hoarding firms provides a possible explanation for why the market does not fully recognize the implications of cash hoarding for future returns. If, as Hirshleifer and Teoh (2003) assert, investors have limited attention, then information that is more salient should be better reflected in market price than information that is less

salient. The astronomical performance a few high-cash firms likely receives much more media attention than the poor performance of the majority of such firms, leading more investors to incorrectly conclude that extreme cash levels are desirable. For example, one firm identified as cash hoarding in 1998 that earned subsequent returns of over 1,900% was Qualcomm Inc., and over the holding period from 2/1/1998 to 2/1/2000, Qualcomm was mentioned 252 times in the *Wall Street Journal* (*WSJ*). DSC Communications, a firm identified as cash hoarding in 1996, had negative abnormal returns of −119% from 5/1/1996 to 5/1/1998, and was mentioned in the *WSJ* only 66 times over that period.[10] Returns experienced by these two firms also serve to illustrate the risk arbitrageurs face in shorting firms: the arbitrageur's maximum return is around 100%, but he faces exposure to losses that are, in theory, infinite. Thus, it should not be surprising that this apparent mispricing is not quickly arbitraged away.

5. CONCLUSIONS AND IMPLICATIONS

This chapter explores the performance implications of firms that accumulate large amounts of cash. While large cash holdings provide firms with increased operational flexibility and security, holding cash above that needed as working capital provides a minimal return and is subject to possible misuse by management. We find that although firms that generate large amounts of cash do well in the year of cash accumulation, they experience significant negative returns in the following two years. This implies that the hoarding of cash by management has a negative impact on future firm performance that is not fully accounted for by investors at the time of the cash accumulation. This negative impact tends to outweigh any potential benefits gained from increased operational flexibility. We also show that the returns of hoarding firms significantly reducing their cash holdings are extremely negative, suggesting that investors recognize the problems of cash hoarding when the cash is actually dissipated.

While most cash-hoarding firms underperform, a few show spectacular future performance. We provide anecdotal evidence that investors are more aware of the ''star'' performers than the underperformers as one possible explanation for why this apparent anomaly exists. Our findings are also consistent with a recent observation by Henry McVey, chief U.S. investment strategist at Morgan Stanley on the growing cash balances reported by a number of firms: ''Instinctively, cash is good ... but a good thing has gone too far'' (Zuckerman, 2005).

NOTES

1. For a more detailed discussion and review on market efficiency and the implications of inefficiency for research, see Lee (2001).

2. Fully attentive investors do not completely arbitrage away mispricing in this setting because doing so is risky.

3. However, results from Mikkelson and Partch (2003) are not directly comparable because they do not test stock price performance. A firm may outperform a peer in fundamental operating performance but still have negative abnormal returns if the market expected the firm to perform even better.

4. Item no. 123 is income before extraordinary items and discontinued operations, and item no. 124 is extraordinary items and discontinued operations.

5. We consider that firms holding over 80% of their assets in the form of cash are, intuitively, cash-hoarding, even if a significant number of firms in that industry are doing the same thing. However, this criteria may also cause our results to be driven by one industry, and to control for this possibility, we include industry dummies in our multivariate analysis.

6. Note that the cash outflow from investing is shown as a negative number, and therefore if a firm is paying less than the industry average, the difference will appear as a positive value in Fig. 2.

7. However, we show non-transformed variables in Table 1.

8. As a further check on our results, we confirm our findings using a robust regression methodology developed by Huber (1973), which controls for outliers in the dependent variable. Our conclusions are unchanged from our results using OLS.

9. We also examine years +1 and +2 independently, and find that the estimated coefficient on the cash-hoarding dummy is significantly negative (for both models 1 and 2) in both years.

10. Both firms had similar market capitalizations. Qualcomm's market cap was $3.4 trillion at the end of January 1998. DSC Communication's market cap was $3.6 trillion at the end of April 1996.

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APPENDIX

Description and Calculation of Dependent Variables

We calculate contemporaneous and future buy-and-hold-abnormal returns, calculated as follows:

$$BHAR_i = \prod_{t=s}^{e}(1 + R_{i,t}) - \prod_{t=s}^{e}(1 + R_{sz,t}) = BHR_{firm} - BHR_{sz}$$

where $R_{i,t}$ is the returns for firm i for month t, where t runs from month s and to month e, and $R_{sz,t}$ the returns for that size decile for month t, where decile is determined by CRSP as of December 31 of the prior year.

For contemporaneous returns, s is set to 4 months after the fiscal year-end of the firm's prior year, and e is 12 months later. For future returns, s is set to 4 months after the firm's fiscal year-end and e is 24 months later.

Description and Calculation of Independent Variables

Variable Name	Description
Cash level	The amount of cash and cash equivalents (Compustat annual item no. 1) reported by the firm in year t, divided by book value of total assets (item no. 6) reported for the year $t-1$. Cash levels calculated to be less than -1 and more than 1 are winsorised at 1.
Hoarding dummy ("hoarding")	Dummy variable set to 1 if the firm's cash level is within the 10th decile of firms within that industry and year and the firm's cash level exceeds 0.1, or if the firm's cash level exceeds 0.8. Any firm classified as hoarding must also have financial statement data available for the prior year, and must have been listed on CRSP for at least the last three years.
Big drop dummy ("big drop")	Dummy variable set to 1 if the firm was classified as hoarding in the prior year, and the current year's cash level is at least 50% lower than the prior year's cash level.
Cash from operations	Net cash flow from operating activities (no. 308), scaled by prior year's total assets (no. 6).
Cash from financing	Net cash flow from financing activities (no. 314), scaled by prior year's total assets (no. 6).
Cash from investing	Net cash flow from investing activities (no. 311), scaled by prior year's total assets (no. 6).
Book-to-market	Book value of common equity (no. 60) for year $t-1$ scaled by total market capitalization (price × shares outstanding as of four months following the firm's fiscal year-end) for year $t-1$.

(*Continued*)

Variable Name	Description
Market capitalization	Price × shares outstanding as of four months following the firm's fiscal year-end for year $t-1$, scaled to 2000 dollars using the Consumer Price Index.
Momentum	Buy-and-hold abnormal returns (size-adjusted, using returns from CRSP decile portfolios) for the period two months before the firm's fiscal year-end to four months after the firm's fiscal year-end (i.e., six months before the beginning of the calculation of contemporaneous returns).
Sales growth	Sales for year $t-1$ (no. 12) less sales for year $t-2$, divided by sales for year $t-2$.
Accruals	Net income before discontinued operations and extraordinary items, as reported on the statement of cash flows (no. 123) plus extraordinary items and discontinued operations (no. 124), less cash from operations (no. 308), scaled by prior year total assets (no. 6).
	Because cash from operations is not available for years prior to 1988, for those years, we use the balance sheet formulation of change in current assets (no. 4) less change in current liabilities no. 5) less change in cash (no. 1) plus change in short-term debt (no. 34) less depreciation (no. 14), all scaled by prior year total assets (no. 6).

Note that in order to enhance comparability of our estimated coefficients, and to control for possible outliers in our data, we transform all our continuous independent variables by determining their decile rank as of each year, subtracting one, and then dividing by 9. The estimated coefficient on the transformed variable can be interpreted as the returns to moving from the bottom decile of that variable to the top decile.

DETECTING AND PREDICTING FINANCIAL STATEMENT FRAUD: THE EFFECTIVENESS OF THE FRAUD TRIANGLE AND *SAS NO. 99*

Christopher J. Skousen, Kevin R. Smith and Charlotte J. Wright

ABSTRACT

This study empirically examines the effectiveness of Cressey's (1953) fraud risk factor framework adopted in SAS No. 99 *in detection of financial statement fraud. According to Cressey's theory pressure, opportunity and rationalization are always present in fraud situations.*

We develop variables which serve as proxy measures for pressure, opportunity, and rationalization and test these variables using publicly available information relating to a set of fraud firms and a matched sample of no-fraud firms. We identify five pressure proxies and two opportunity proxies that are significantly related to financial statement fraud. We find that rapid asset growth, increased cash needs, and external financing are positively related to the likelihood of fraud. Internal versus external ownership of shares and control of the board of directors are also linked to increased incidence of financial statement fraud. Expansion in the number of independent members on the audit committee, however,

is negatively related to the occurrence of fraud. Further testing indicates that the significant variables are also effective at predicting which of the sample firms were in the fraud versus no-fraud groups.

1. INTRODUCTION

The past decade has witnessed a number of major accounting scandals causing many to speculate that top management was guilty of financial statement fraud. If financial statement fraud is indeed a significant problem, the auditing profession must effectively detect the fraudulent activities before they evolve into scandals. In response to perceived weaknesses in existing fraud-detection procedures, the American Institute of Certified Public Accountants' (AICPA) (2002) issued *Statement of Auditing Standards No. 99* (*SAS No. 99*), "Consideration of Fraud in a Financial Statement Audit" in October 2002. The stated goal of *SAS No. 99* is to increase the effectiveness of auditors in detecting fraud through the assessment of firms' "fraud risk factors." The fraud risk factors adopted in *SAS No. 99* are based on Cressey's (1953) fraud risk theory. While the adoption of Cressey's fraud risk factor framework in *SAS No. 99* is broadly supported by accounting professionals, academics, and various regulatory agencies, there is little empirical evidence actually linking Cressey's theory to financial statement fraud.

This study seeks to fill that gap by empirically examining the effectiveness of the fraud risk factor framework adopted in *SAS No. 99* in detection of financial statement fraud. Cressey (1953) contends that, to some extent, three conditions are always present when financial statement fraud occurs. These conditions (pressure, opportunity, and rationalization) provide the basis of Cressey's fraud risk factor framework. *SAS No. 99*'s adoption of the fraud risk factor framework requires auditors to attempt to detect the presence of fraudulent behavior by comprehensively assessing the extent to which pressure, opportunity, and rationalization are present.

Using Cressey's theory, *SAS No. 99* and prior fraud-related research, we develop a number of variables which serve as proxy measures for pressure, opportunity, and rationalization. We test these variables using publicly available information relating to a set of fraud firms and a matched sample of no-fraud firms. We identify five pressure proxies and two opportunity proxies that are significantly related to financial statement fraud. We find that rapid asset growth, increased cash needs, and external financing are

positively related to the likelihood of fraud. Internal versus external ownership of shares and control of the board of directors are also linked to increased incidence of financial statement fraud. Expansion in the number of independent members on the audit committee, however, is negatively related to the occurrence of fraud.

In order to test the robustness of our results, we then perform a series of additional tests to determine whether the significant proxy variables could actually be used in the prediction of financial statement fraud. Persons (1995) and Kaminski, Wetzel, and Guan (2004) develop fraud prediction models using financial ratios; however, their models suffer from high misclassification rates. Skousen and Wright (2008) use logistic regression to predict fraud roughly 69 percent of the time. Our testing results in correctly predicting sample firms' fraud/no-fraud status 73 percent of the time. This represents a substantial improvement over other fraud prediction models.

Overall, our results support the fraud risk factor framework adopted in *SAS No. 99* and provide additional support for the Sarbanes–Oxley Act (2002) corporate governance and internal control regulations suggesting that the benefits of better corporate governance will justify the cost. The results contribute to the fraud prediction, corporate governance, internal control, and public policy literature.

2. RELEVANT FRAUD-RELATED RESEARCH

Accounting research identifies a variety of financial factors that appear to be related to financial statement fraud. For example, Beneish (1997) concludes that sales growth, leverage, and total accruals divided by total assets are useful in identifying GAAP violators and firms that are aggressively using accruals to manipulate earnings. Summers and Sweeney (1998) note that growth, inventory, and return on assets, differ between companies that have committed fraud and companies that have not. Dechow, Sloan, and Sweeney (1996) posit that the desire to obtain low-cost financing is a primary motivation for the commission of fraud through earnings manipulation and that fraudulent firms tend to have relatively high costs of capital.

Corporate governance has also been linked to fraudulent financial reporting. Dechow et al. (1996) determine that the incidence of fraud is highest among firms with weak corporate governance systems. Further, Dechow et al. (1996) find that fraud firms are more likely to have boards dominated by insiders and are less likely to have an audit committee.

Beasley (1996) notes that the incidence of financial statement fraud decreases as the number of outside members and outside member tenure on the audit committee increase. This is consistent with Abbott, Park, and Parker (2000) who observe an inverse relationship between the level of audit committee independence and the incidence of fraud. Finally, Dunn (2004) concludes that fraud is more likely to occur when there is a concentration of power in the hands of insiders.

In contrast to these studies, Farber (2005) investigates the market response to corporate governance changes on a post-fraud firm. Farber finds that credibility remains a problem for fraud firms, even after corporate governance changes. Other studies such as Beneish (1999) and Agrawal, Jaffe, and Karpoff (1999) investigate management turnover following a fraud announcement. While important, these studies focus on post-fraud responses. Skousen and Wright (2008) focus on detecting fraud prior to any fraud-related public announcement. This study also focuses on detecting fraud prior to any fraud-related public announcement being made.

Cressey's (1953) fraud risk factor theory is based largely on a series of interviews conducted with people who had been convicted of embezzlement. He concludes that frauds generally share three common traits. First, the embezzler had the opportunity to perpetrate fraud. Second, the individual perceived a non-shareable financial need (pressure). Third, the individual involved in a fraud rationalized the fraudulent act as being consistent with their personal code of ethics. Thus the fraud risk factors are pressure, opportunity, and rationalization, also referred to as the "fraud triangle." Cressey contends that, to some extent, all three factors are present in any given fraud. According to the AICPA, only one of these factors need be present in order for fraud to be committed. *SAS No. 99* requires the auditor to apply numerous new procedures aimed at examining the firm environment and to evaluate expansive amounts of new information in an effort to identify facts and circumstances that are indicative of the existence of pressures, opportunities, and/or rationalizations. Table 1 appears in *SAS No. 99* and provides examples of situations and circumstances that are symptomatic of each fraud risk category.

We seek to empirically examine the applicability of Cressey's (1953) theory to financial statement fraud by testing the basic premise that

$$FRAUD = f(Pressure, \ Opportunity, \ Rationalization) \qquad (1)$$

In addition to being useful in the detection of fraud, we posit that the fraud risk factors may also be useful in predicting fraud. If so, the results would be of considerable interest since publicly available information could

Table 1. Examples of Fraud Risk Factors from *SAS No. 99* Relating to Financial Statement Misstatements.

Pressures	Opportunities	Rationalizations
1. *Financial stability or profitability is threatened by economic, industry, or entity operating conditions:*	1. *Industry provides opportunities for*	1. *Attitudes/rationalizations by board members, management, or employees that allow them to engage in and/or justify fraudulent financial reporting*
• High degree of competition or declining profit margins	• Related-party transactions beyond ordinary	• Ineffective communication, implementation, support, or enforcement of ethics
• High vulnerability to rapid changes (i.e., technology, obsolescence, or interest rates)	• A strong financial presence or ability to dominate a certain industry sector that allows the entity to dictate terms or conditions to suppliers or customers	• Non-financial management's excessive participation in selection of accounting principles or the determining estimates
• Declines in customer demand	• Accounts based on significant estimates	• Known history of violations of securities laws or other laws
• Operating losses	• Significant, unusual, or highly complex transactions	• Excessive interest in maintaining or increasing stock price
• Recurring negative cash flows from operations	• Significant operations across international borders environments and cultures	• Aggressive or unrealistic forecasts
• Rapid growth or unusual profitability	• Significant bank accounts in tax-haven jurisdictions	• Failure to correct known reportable conditions on a timely basis
• New accounting, statutory, or regulatory requirements		• Interest by management in employing inappropriate means to min. reported earnings for tax
		• Recurring attempts by management to justify marginal or inappropriate accounting on the basis of materiality
		• Strained relationship with current or predecessor auditor
		○ Frequent disputes with the current or predecessor auditor
		○ Unreasonable demands on the auditor, such as unreasonable time constraints
		○ Restrictions on the auditor that inappropriately limit access
		○ Domineering management behavior in dealing with the auditor

Table 1. (*Continued*)

Pressures	Opportunities	Rationalizations
2. Excessive pressure exists for management to meet requirements of third parties: • Profitability/trend expectations • Need to obtain additional debt or equity financing • Marginal ability to meet exchange listing requirements or debt repayment or other debt covenant requirements • Likely poor financial results on significant pending transactions	*2. Ineffective monitoring of management allows* • Domination of management by a single person or small group • Ineffective board of directors or audit committee oversight	
3. Management or directors' personal financial situation is: • Significant financial interests in the entity • Significant performance based compensation • Personal guarantees of debts	*3. There is a complex or unstable organizational structure* • Difficulty in determining the organization or individuals that have control of company • Overly complex structure • High turnover of senior management, counsel, or board	
4. There is excessive pressure on management or operating personnel to meet financial targets set up by directors or management	*4. Internal control deficient* • Inadequate monitoring of controls • High turnover rates or employment of ineffective accounting, internal audit, or information technology staff • Ineffective accounting and information systems	

be used to predict which firms are more likely to be involved in fraudulent activities. Therefore, posit that significant factors used in detecting fraud may also be used to predict fraud. We test the following hypothesis:

H_0. The fraud risk factors (pressure, opportunity and rationalization) are positively related to financial statement fraud and can be used to both detect and predict fraud.

3. PROXIES FOR PRESSURE, OPPORTUNITY, AND RATIONALIZATION

The components of the fraud triangle (pressure, opportunity, and rationalization) are not directly observable, thus it was first necessary for us to develop a set of proxy variables. We look to fraud risk factor examples cited in *SAS No. 99* (Table 1) along with prior fraud-related accounting research in developing our proxy measures. These variables and the rationale supporting our choices are described below.

3.1. Proxies for Pressure

According to *SAS No. 99*, there are four general types of pressure that may lead to financial statement fraud. These are financial stability, external pressure, managers' personal financial situations, and meeting financial targets. We include proxy variables for each of these types of pressure.

3.1.1. Financial Stability
According to *SAS No. 99*, managers face pressure to commit financial statement fraud when financial stability and/or profitability are threatened by economic, industry, or entity operating conditions. Loebbecke, Eining, and Willingham (1989) and Bell, Szykowny, and Willingham (1991) indicate that, in instances where a company is experiencing growth that is below the industry average, management may resort to financial statement manipulation to improve the firm's outlook. Likewise, following a period of rapid growth, management may resort to financial statements manipulation to provide the appearance of stable growth. Thus, we include gross profit margin, growth in sales (Beasley, 1996; Summers & Sweeney, 1998), and growth in assets (Beneish, 1997; Beasley, Carcello, Hermanson, & Lapides, 2000) as

proxies for financial stability. These are computed as:

$$GPM = \text{Gross profit margin}$$

$$SCHANGE = \text{Change in sales} - \text{Industry average change in sales}$$

$$ACHANGE = \text{Percent change in assets for the two years prior to fraud}$$

Recurring negative cash flows from operations or an inability to generate positive operating cash flows in light of reported earnings growth may also be associated with financial stability. Therefore, we include the following ratio to relate cash flows to earnings growth (Albrecht, 2002):

$$CATA = \frac{\text{Operating income} - \text{Cash flow from operations}}{\text{Total assets}}$$

Albrecht (2002) and Wells (1997) conclude that certain items appearing on the balance sheet and income statement are useful in detecting fraud. Persons (1995) suggests that sales to accounts receivable, sales to total assets, and inventory to total sales are especially useful in fraud detection. Therefore, we use the following financial security proxies:

$$SALAR = \frac{\text{Sales}}{\text{Accounts receivables}}$$

$$SALTA = \frac{\text{Sales}}{\text{Total assets}}$$

$$INVSAL = \frac{\text{Inventory}}{\text{Total sales}}$$

3.1.2. External Pressure

The ability to meet exchange-listing requirements, repay debt, or meet debt covenants are widely recognized sources of external pressure. Vermeer (2003) and Press and Weintrop (1990) report that, when faced with violation of debt covenants, managers are more likely to rely on questionable discretionary accruals. Furthermore, debt levels are associated with income-increasing discretionary accruals (DeAngelo, DeAngelo, & Skinner, 1994; DeFond & Jiambalvo, 1991). In addition, managers may feel pressure as a result of the need to obtain additional debt or equity financing to stay

competitive. For example, new financials may be necessary in order to pursue major research and development or to expand plant and facilities. Therefore, we include leverage as a proxy for external pressure:

$$LEV = \frac{\text{Total debt}}{\text{Total assets}}$$

Dechow et al. (1996) argue that the demand for external financing depends not only on how much cash is generated from operating and investment activities but also on the funds already available within the firm. They suggest that the average capital expenditure during the three years prior to financial statement manipulation is a measure of the desired investment level during the financial statement manipulation period. Dechow et al. (1996) incorporated both of these factors into a measure of firms' ex ante demand for financing in the first year of manipulation, t, where:

$$FINANCE_t = \frac{\text{Cash from operations}_t - \text{Average capital expenditures}_{t-3 \text{ to } t-1}}{\text{Current assets}_{t-1}}$$

When *FINANCE* is negative, the absolute value of the ratio (1/*FINANCE*) provides an indication of the number of years that the firm can continue to internally fund its current level of activity. As *FINANCE* becomes more negative, the pressure to engage in financial statement manipulation is more likely. Therefore, we include *FINANCE* as a proxy variable. The closer the absolute value of FINANCE is to zero, the greater the need to obtain external financing.

Demand for external financing is related to cash generated from operating and investment activities. Therefore, we include *FREEC*.

$$\begin{aligned} FREEC = {} & \text{Net cash flow from operating activities} - \text{cash dividends} \\ & - \text{capital expenditures} \end{aligned}$$

3.1.3. Personal Financial Need

Beasley (1996), Committee of Sponsoring Organizations of the Treadway Commission (COSO) (1999), and Dunn (2004) indicate that when executives have a significant financial stake in a firm, their personal financial situation may be threatened by the firm's financial performance. Accordingly, we include *OSHIP* and *5%OWN* as proxies for personal

financial need:

$OSHIP$ = The cumulative percentage of ownership in the firm held by insiders. Shares owned by management divided by the common shares outstanding

$5\%OWN$ = The cumulative percentage of ownership in the firm held by management who hold 5 percent of the outstanding shares or more divided by the common shares outstanding

3.1.4. Financial Targets

Return on total assets (ROA) is a measure of operating performance widely used to indicate how efficiently assets have been employed. ROA is often used in assessing managers' performance and in determining bonuses, wage increases, etc. Summers and Sweeney (1998) report that ROA differs significantly between fraud and no-fraud firms. We include ROA as a financial target proxy.

$$ROA = \frac{\text{Net income before extraordinary items}_{t-1}}{\text{Total assets}_t}$$

Table 2 summarizes the variables we use as proxy measures for pressure.

3.2. Opportunity Proxies

SAS No. 99 classifies opportunities that may lead to financial statement fraud into three categories. These include nature of industry, ineffective monitoring, and organizational structure. Using these categories we identified seven proxies for opportunity.

3.2.1. Nature of Industry

The balances in certain accounts are determined largely based on estimates and subjective judgments. Summers and Sweeney (1998) note estimates of uncollectible accounts and obsolete inventory are subjectively determined. They suggest that management may focus on such accounts when engaging in financial statement manipulation. Consistently, Loebbecke et al. (1989), observe that a number of frauds in their sample involve accounts receivable

Table 2. Fraud Risk Factor Proxies for Pressure.

Fraud Risk Factors	SAS No. 99 Categories	Proxies	Definition of Proxies
Pressures	Financial stability	GPM	Gross profit margin
		SCHANGE	Change in sales−industry average change in sales
		ACHANGE	The average percentage change in total assets for the two years ending before the year of fraud
		CATA	$\dfrac{\text{Operating income} - \text{cash flow from operations}}{\text{Total assets}}$
		SALAR	Sales/accounts receivable
		SALTA	Sales/total assets
		INVSAL	Inventory/sales
	External pressure	LEV	Total debt/total assets
		FINANCE	$\dfrac{\text{Cash from operations}_t - \text{average capital expenditures}_{t-3 \text{ to } t-1}}{\text{Current assets}_{t-1}}$
		FREEC	Operating activities−net cash flow−cash dividends−capital expenditures
	Personal financial need	OSHIP	The cumulative percentage of ownership in the firm held by insiders
		5%OWN	The percentage of shares held by management who hold greater than 5% of the outstanding shares
	Financial targets	ROA	Return on assets

and inventory. Accordingly, we include the following variables

$$RECEIVABLE = \left(\frac{\text{Receivable}_t}{\text{Sales}_t} - \frac{\text{Receivable}_{t-1}}{\text{Sales}_{t-1}} \right)$$

$$INVENTORY = \left(\frac{\text{Inventory}_t}{\text{Sales}_t} - \frac{\text{Inventory}_{t-1}}{\text{Sales}_{t-1}} \right)$$

SAS No. 99 and Albrecht (2002) indicate that when a firm has significant operations located in different international jurisdictions the opportunities for fraud increase. We include FOPS as a proxy for opportunity resulting from significant foreign operations:

$FOPS =$ Percent of sales which are foreign. This is calculated as
total foreign sales divided by total sales

3.2.2. Ineffective Monitoring

Beasley et al. (2000), Beasley (1996), Dechow et al. (1996), and Dunn (2004) observe that fraud firms consistently have fewer outside members on their board of directors when compared to no-fraud firms. Therefore, we include *BDOUT* to proxy for related to board composition:

$BDOUT =$ Percentage of board members who are outside members

Beasley et al. (2000) observe a reduced incidence of fraud among companies having an audit committee. Further, larger audit committees are associated with a lower incidence of fraud (Beasley et al., 2000). Consistently, we use the following measures related to audit committees:

$AUDCOMM =$ Indicator variable with the value of 1 if mention of oversight
by an internal audit committee; and 0 otherwise

$AUDCSIZE =$ The number of board members who are on the audit committee

Abbott and Parker (2001), Abbott et al. (2000), Beasley et al. (2000), and Robinson (2002) identify a relationship between the independence of audit committee members and the incidence of fraud. Therefore, we include *IND* and *EXPERT* as proxies for ineffective monitoring. We define an independent audit committee member as a member who is not: a current employee of the firm, former officer or employee of the firm or related entity, a relative of management, professional advisor to the firm, officers of significant suppliers or customers of the firm, interlocking

director, and/or one who has no significant transactions with the firm (Robinson, 2002).

$IND =$ The percentage of audit committee members who are
 independent of the company

$EXPERT =$ Indicator variable with the value of 1 if the audit committee
 does not include at least one director who is (or has been)
 a CPA, investment banker or venture capitalist, served as
 CFO or controller, or has held a senior management position
 (CEO, President, COO, VP, etc.) with financial
 responsibilities; and 0 otherwise

3.2.3. Organizational Structure

Loebbecke et al. (1989), Beasley (1996), Beasley, Carcello, and Hermanson (1999), Abbott et al. (2000), and Dunn (2004) conclude that, as a CEO accumulates titles, he/she is in a position to dominate decision-making. Since control of decision-making may provide an opportunity to commit fraud we include:

$CEO =$ Indicator variable with a value of 1 if the chairperson of the
 board holds the managerial positions of CEO or president;
 and 0 otherwise

Complex or unstable organizational structure may be evidenced by high turnover of senior management, counsel, or board members. Loebbecke et al. (1989) note that in 75 percent of the fraud cases they examined, operating and financial decisions were dominated by a single person. They argue that this factor creates an environment that allows management to commit financial statement fraud. Beasley (1996) reasoned that the longer the CEO holds a position of power, the greater the likelihood that the CEO will be able to control the decisions of the board of directors. Accordingly, we include the *TOTALTURN* to measure CEO power.

$TOTALTURN =$ The number of executives that left the
 firm in the two years prior to fraud

Table 3 summarizes the variables we use as proxy measures for opportunity.

Table 3.   Fraud Risk Factor Proxies for Opportunity.

Fraud Risk Factors	*SAS No. 99* Categories	Proxies	Definition of Proxies
Opportunity	Nature of industry	*RECEIVABLE*	(Receivables$_t$/sales$_t$−receivables$_{t-1}$/sales$_{t-1}$)
		INVENTORY	(Inventory$_t$/sales$_t$−inventory$_{t-1}$/sales$_{t-1}$)
		FOPS	Foreign sales/total sales
	Ineffective monitoring	*BDOUT*	The percentage of board members who are outside members
		AUDCOMM	A dummy variable where 1 = mention of oversight by an internal audit committee and 0 = no mention of oversight
		AUDCSIZE	The size of the audit committee
		IND	The percentage of audit committee members who are independent of the company
		EXPERT	Indicator variable with the value of 1 if audit committee includes no directors with financial expertise
	Organizational structure	*CEO*	Indicator variable with a value of 1 if the chairperson of the board holds the managerial positions of CEO or president; 0 otherwise
		TOTALTURN	The number of executives leaving the company in the two years prior to fraud

3.3. Rationalization Proxies

Rationalization is the third leg of the fraud triangle and the most difficult to measure. Extant research indicates that the incidence of audit failures and litigation increase immediately after a change in auditor (Stice, 1991; St. Pierre & Anderson, 1984; Loebbecke et al., 1989). Therefore, we include auditor change as a proxy for rationalization:

$AUDCHANG$ = A dummy variable for change in auditor where
1 = change in auditor in the 2 years prior to fraud
occurrence and 0 = no change in auditor

Beneish (1997), Francis and Krishnan (1999), and Vermeer (2003) argue that accruals are representative of management's decision-making and provide insight into their financial reporting rationalizations. Francis and Krishnan (1999) conclude that excessive use of discretionary accruals may

lead to qualified audit opinions. We include two variables to capture rationalizations related to managements' use of accruals:

$AUDREPORT =$ A dummy variable for an audit where $1 =$ an unqualified opinion with additional language

$TAcc =$ Total accruals divided by total assets, where total accruals are calculated as the change in current assets, minus the change in cash, minus changes in current liabilities, plus the change in short $-$ term debt, minus depreciation and amortization expense, minus deferred tax on earnings, plus equity in earnings

Table 4 summarizes the proxy variables we use as proxy measures for rationalization.

The full model we use to test H_0 is

$$
\begin{aligned}
FRAUD_i =\ & \alpha + \beta_1 GPM_i + \beta_2 SCHANGE_i + \beta_3 ACHANGE_i + \beta_4 CATA_i \\
& + \beta_5 SALAR_i + \beta_6 SALTA_i + \beta_7 INVSAL_i + \beta_8 LEV_i \\
& + \beta_9 FINANCE_i + \beta_{10} FREEC_i + \beta_{11} OSHIP_i + \beta_{12} 5\% OWN_i \\
& + \beta_{13} ROA_i + \beta_{14} RECEIVABLE_i + \beta_{15} INVENTORY_i \\
& + \beta_{16} FOPS_i + \beta_{17} BDOUT_i + \beta_{18} AUDCOMM_i \\
& + \beta_{19} AUDCSIZE_i + \beta_{20} IND_i + \beta_{21} EXPERT_i + \beta_{22} CEO_i \\
& + \beta_{23} TOTALTURN_i + \beta_{24} AUDCHANG_i \\
& + \beta_{25} AUDREPORT_i + \beta_{26} TACC_i + \varepsilon_i \qquad\qquad (2)
\end{aligned}
$$

We use both univariate analysis and logit regression to test the model.

4. SAMPLE SELECTION AND RESULTS

Rule 10(b)-5 of the 1934 Securities Act and Section 17(a) of the 1933 Securities Act define the Securities and Exchange Commission's (SEC) responsibility to identify firms that they believe have been involved in financials statement fraud. We examined the SEC Accounting and Auditing Enforcement Releases (AAERs) issued between 1992 and 2001 and identified 113 fraud firms. These firms comprise our initial sample of fraud firms. Next, we searched the LexisNexis SEC Filings & Reports website and COMPUSTAT for financial information related to the year of the alleged fraud as well as the two preceding years. This resulted in the elimination of

Table 4. Fraud Risk Factor Proxies for Rationalization.

Fraud Risk Factors	SAS No. 99 Categories	Proxies	Definition of Proxies
Rationalization	Rationalization	*AUDCHANG*	A dummy variable for change in auditor where 1 = change in auditor in the 2 years prior to fraud occurrence and 0 = no change in auditor
		AUDREPORT	A dummy variable for an audit where 1 = an unqualified opinion and 0 = an unqualified opinion with additional language
		TACC	Total accruals/total assets, where total accruals are calculated as the change in current assets, minus the change in cash, minus changes in current liabilities, plus the change in short-term debt, minus depreciation and amortization expense, minus deferred tax on earnings, plus equity in earnings

27 firms giving us a final sample of 86 fraud firms. Industry demographics of fraud firms are reported in Table 5. It is important to note that the sample in this study differs from sample found in Skousen and Wright (2008). Skousen and Wright do not make remove outliers or mean adjust their sample. In this study, we remove firms with significant outlier observations and mean adjust variables. This results in a "cleaner" sample.

Next, in order to develop a control set of no-fraud firms, we matched based on industry membership and size (total assets and net sales) (Beasley, 1996). We then searched the SEC AAERs to verify that none of the potential control firms had been the subject of SEC fraud-related actions. Table 6 reports sample statistics for the fraud and no-fraud firms including results of paired *t*-tests and Wilcoxon matched-pair sign-rank tests indicating no significant differences between the two groups of firms.

As an initial assessment of the proxy variables, we performed univariate analysis. This analysis identified eight pressure variables and five opportunity variables that differ significantly between the fraud and no-fraud firms. None of the rationalization proxy variables differed between the groups. The results of the univariate analysis for all variables are reported in Table 7.

The univariate analysis enabled us to drop number of explanatory variables from the model. We then performed logit regression analysis on a reduced model which included only explanatory variables that had

Table 5. Industry Representation of Fraud Firms.

SIC Code	Industry Title	Number of Fraud Firms	Percentage of Sample
13	Crude petroleum & natural gas	1	1.16
15	Operative builders	1	1.16
16	Heavy construction other than building construction	1	1.16
20	Food and kindred products	1	1.16
22	Knitting mills	1	1.16
23	Apparel & other finished products of fabrics	4	4.65
27	Periodicals: Publishing or publishing & printing	1	1.16
28	Chemicals & allied products	3	3.49
31	Footwear	1	1.16
34	Metal products	3	3.49
35	Computers & communication equipment	10	11.63
36	Electrical equipment	6	6.98
37	Truck & bus bodies, transportation equipment	2	2.33
38	Controlling, surgical, & photographic devices	7	8.14
50	Wholesale – Computers, electrical, & software	4	4.65
51	Wholesale – Drugs & petroleum products	2	2.33
53	Retail – Variety stores	1	1.16
56	Retail – Shoe stores	1	1.16
58	Retail – Eating places	1	1.16
59	Retail – Catalog, drug stores and proprietary stores	5	5.82
73	Services – Business, computer, & equipment	24	27.91
79	Services – Miscellaneous amusement and recreation	2	2.33
80	Services – Health services	4	4.65
	Total	86	100.00

a univariate *p*-value of 0.15 or less. The logit regression model is:

$$FRAUD_i = \alpha + \beta_1 GPM_i + \beta_2 SCHANGE_i + \beta_3 ACHANGE_i + \beta_4 SALAR_i$$
$$+ \beta_5 SALTA_i + \beta_6 FINANCE + \beta_7 DUMFIN_i + \beta_8 FREEC_i$$
$$+ \beta_9 OSHIP_i + \beta_{10} 5\%OWN_i + \beta_{11} INVENTORY_i$$
$$+ \beta_{12} BDOUT_i + \beta_{13} AUDCOMM_i + \beta_{14} AUDCSIZE_i$$
$$+ \beta_{15} IND_i + \beta_{16} EXPERT_i + \beta_{17} CEO_i + \varepsilon \qquad (3)$$

Table 8 lists, by type, the proxy variables that are used as explanatory variables in the logit regression analysis.

Table 9 reports the results of the logit regression analysis. The overall model is significant at $p < 0.01$ as indicated by the likelihood ratio of 62.1831.[1] Seven variables are significant at least at the 10 percent level.

Table 6. Sample Statistics.

| | ($ hundreds of thousands) | |
	Fraud Firms Mean [Median] (SD)	No-Fraud Firms Mean [Median] (SD)
Total assets	1,420.10 [108.52] (4,414.39) $n = 86$	797.91 [88.90] (2,892.58) $n = 86$
Net sales	1,627.76 [93.62] (5,537.39) $n = 86$	1,049.42 [93.21] (4,137.71) $n = 86$

Note: Paired *t*-tests and Wilcoxon matched-pair sign-rank tests indicated no significant differences ($p = 0.10$) between the fraud and no-fraud firms based on total assets and net sales.

Five of these variables are pressure variables (*ACHANGE* and *5%OWN* are significant at $p < 0.01$, while *FINANCE*, *FREEC*, and *OSHIP* are significant at $p < 0.05$) and two opportunity variables (*IND* and *CEO*, $p < 0.01$ and $p < 0.10$, respectively).[2] These results indicate that the AICPA was correct in concluding that pressure and opportunity are critical factors in detecting fraud. The fact that no rationalization variable is significant may indicate that rationalization is not critical. Alternatively, given the difficultly in identifying and measuring rationalization proxies, rationalization may be a critical factor, but one for which we have not been able to identify appropriate proxies for.

Next, we determine whether the significant variables from the logit regression analysis can be used to predict fraudulent activities. We used both cross-validation analysis and sensitivity analysis.

Cross-validation is a discriminant method that removes the first observation from the data set and finds a discriminant rule using the remaining observations (Jones, 1987; Hair, Anderson, Tatham, & Black, 1995; Kuruppu, Laswad, & Oyelere, 2003). This procedure develops a model from $n-1$ observations, and applies it to the observation not used in developing the model. The process is repeated until all the firms in the sample are used to assess the model's accuracy. The cross-validation method is effective at providing an unbiased estimate of a model's misclassification rate (Hair et al., 1995) and is particularly useful in studies with small sample

Table 7. Wilcoxon Sign-Rank Test.

Variable	No-Fraud Firms		Fraud Firms		*t*-Statistic		Wilcoxon *t* Approximation	
	Mean	SD	Mean	SD	*t-value*	Pr > |t |	Z-value	Pr > |Z|
Pressure								
GPM	0.633	1.257	0.642	1.706	−0.040	0.971	1.624	0.052
SCHANGE	1.027	1.972	1.473	2.132	−1.430	0.156	−1.612	0.053
ACHANGE	2.274	2.266	2.926	2.376	−1.840	0.067	−2.004	0.023
CATA	−1.096	1.586	−1.244	1.577	0.610	0.542	0.763	0.223
SALAR	1.847	0.960	1.670	1.008	1.180	0.241	2.063	0.020
SALTA	−0.001	1.078	−0.178	1.060	1.090	0.279	2.112	0.017
INVSAL	−1.787	1.440	−1.663	1.646	−0.530	0.599	−0.690	0.245
LEV	−2.227	2.025	−1.893	1.803	−1.140	0.256	−0.785	0.216
FINANCE	1.395	1.455	0.758	1.154	3.180	0.002	3.041	0.001
FREEC	1.112	1.671	0.696	1.601	1.670	0.097	2.677	0.004
OSHIP	0.227	0.199	0.200	0.186	0.950	0.345	1.069	0.143
5%Own	0.214	0.212	0.316	0.228	−3.040	0.003	−3.173	0.001
ROA	1.265	1.169	1.120	1.410	0.730	0.465	0.549	0.292
Opportunity								
RECEIVABLE	−1.657	2.114	−1.982	2.310	0.960	0.336	0.933	0.175
INVENTORY	−1.615	2.288	−1.248	2.184	−1.080	0.283	−1.253	0.105
FOPS	−0.016	0.373	0.036	0.176	−1.170	0.245	0.664	0.253
BDOUT	0.687	0.182	0.644	0.191	1.510	0.132	1.717	0.043
AUDCOMM	0.988	0.108	0.884	0.322	2.850	0.005	2.793	0.003
AUDCSIZE	2.837	0.992	2.640	1.292	1.130	0.262	1.173	0.120
IND	0.876	0.249	0.683	0.386	3.880	0.000	3.719	0.000
EXPERT	0.488	0.503	0.395	0.492	1.230	0.222	1.223	0.111
CEO	0.593	0.494	0.709	0.457	−1.600	0.111	−1.593	0.056
TOTALTURN	1.140	1.390	1.116	1.287	0.110	0.910	−0.061	0.476
Rationalization								
AUDCHANG	0.093	0.292	0.116	0.322	−0.500	0.621	-0.494	0.311
AUDREPORT	0.186	0.391	0.256	0.490	−1.030	0.304	−0.814	0.208
TACC	−0.805	1.454	−0.936	1.259	0.630	0.527	0.978	0.164

sizes since the entire sample can be used to cross-validate the results (Kuruppu et al., 2003). We used cross-validation to test the following model in order to determine its efficacy in predicting the fraud versus no-fraud classification of our sample firms.

$$FRAUD_i = \alpha + \beta_1 ACHANGE_i + \beta_2 FINANCE_i + \beta_3 FREEC_i$$
$$+ \beta_4 OSHIP_i + \beta_5 5\% OWN_i + \beta_6 IND_i + \beta_7 CEO_i + \varepsilon_i \quad (4)$$

When the procedure was applied using only significant variables from the Wilcoxon tests, we found that the model correctly classified fraud firms

Table 8. Fraud Risk Factor Variables ($p < 0.15$).

Fraud Risk Factors	Proxies	Fraud Risk Factors	Proxies
Pressure	*GPM*	Opportunity	
	SCHANGE		*INVENTORY*
	ACHANGE		*BDOUT*
	SALAR		*AUDCOMM*
	SALTA		*AUDCSIZE*
	FINANCE		*IND*
	FREEC		*EXPERT*
	OSHIP		*CEO*
	5%OWN		

Table 9. Logit Regression: Fraud Risk Factor from Univariate Analysis.

$$FRAUD_i = \beta_1 GPM_i + \beta_2 SCHANGE_i + \beta_3 ACHANGE_i + \beta_4 SALAR_i + \beta_5 SALTA_i$$
$$+ \beta_6 FINANCE_i + \beta_7 FREEC_i + \beta_8 OSHIP_i + \beta_9 5\%OWN_i + \beta_{10} INVENTORY_i$$
$$+ \beta_{11} BDOUT_i + \beta_{12} AUDCOMM_i + \beta_{13} AUDCSIZE_i + \beta_{14} IND_i$$
$$+ \beta_{15} EXPERT_i + \beta_{16} CEO_i + \varepsilon$$

Variable	Estimate	Standard Error	χ^2	$Pr > \chi^2$
Pressure				
GPM	−0.0115	0.1641	0.0049	0.9441
SCHANGE	0.0707	0.1027	0.4746	0.4909
ACHANGE	−0.2941	0.1045	7.9150	0.0049***
SALAR	0.0422	0.2002	0.0443	0.8332
SALTA	−0.1444	0.2358	0.3752	0.5402
FINANCE	0.4024	0.1664	5.8502	0.0156**
FREEC	0.2714	0.1377	3.8838	0.0488**
OSHIP	3.7899	1.4730	6.6194	0.0101**
5%OWN	−5.2238	1.2701	16.9168	<0.0001***
Opportunity				
INVENTORY	−0.1006	0.0959	1.1006	0.2941
BDOUT	−1.0013	1.1709	0.7312	0.3925
AUDCOMM	1.7204	1.3864	1.5399	0.2146
AUDCSIZE	−0.1577	0.2204	0.5123	0.4742
IND	1.9662	0.7370	7.1171	0.0076***
EXPERT	0.3833	0.4068	0.8877	0.3461
CEO	−0.7722	0.4098	3.5515	0.0595*
Likelihood ratio	62.1831***			

*$p<0.10$; **$p<0.05$; ***$p<0.01$. Based on two-sided tests.

69.77 percent of the time and correctly classified no-fraud firms 72.09 percent of the time. When we tested the model using the significant variables from the logit tests, we found that, the model correctly classified fraud firms 68.60 percent of the time and correctly classified no-fraud firms 76.74 percent of the time. These results are notable. Persons (1995) and Kaminski et al. (2004) developed fraud prediction models using financial ratios; however, their models suffer from high misclassification rates. Skousen and Wright (2008) classified fraud firms correctly 69.77 percent of the time. These prior studies misclassified fraud firms at a much higher rate than our study. The results and our analysis are reported in Tables 10 and 11.

4.1. Sensitivity Analysis

Next, we performed sensitivity analysis to assess the individual predictive ability of each explanatory variable in the model (i.e., *ACHANGE,*

Table 10. Discriminate Analysis and Fraud Prediction (Non-Parametric $p < 0.15$).

$$FRAUD_i = \beta_1 GPM_i + \beta_2 SCHANGE_i + \beta_3 ACHANGE_i + \beta_4 SALAR_i + \beta_5 SALTA_i$$
$$+ \beta_6 FINANCE_i + \beta_7 FREEC_i + \beta_8 OSHIP_i + \beta_9 5\%OWN_i + \beta_{10} INVENTORY_i$$
$$+ \beta_{11} BDOUT_i + \beta_{12} AUDCOMM_i + \beta_{13} AUDCSIZE_i + \beta_{14} IND_i$$
$$+ \beta_{15} EXPERT_i + \beta_{16} CEO_i + \varepsilon$$

	Cross-Validation Method		
	No-fraud (%)	Fraud (%)	Total error
No-fraud (%)	72.09	27.91	29.07
Fraud (%)	30.23	69.77	

Table 11. Discriminate Analysis and Fraud Prediction (Logit $p < 0.15$).

$$FRAUD_i = \alpha + \beta_1 ACHANGE_i + \beta_2 FINANCE_i + \beta_3 FREEC_i + \beta_4 OSHIP_i$$
$$+ \beta_5 5\%OWN_i + \beta_6 IND_i + \beta_7 CEO_i + \varepsilon_i$$

	Cross-Validation Method		
	No-fraud (%)	Fraud (%)	Total error
No-fraud (%)	76.74	23.26	27.33
Fraud (%)	31.40	68.60	

FINANCE, FREEC, 5%0WN, OSHIP, IND, and CEO). Sensitivity analysis can be used to test each variable's proportional relationship to the probability of being in the fraud group while holding the other variables in the model at their mean. Figs. 1–7 report the results of the sensitivity analysis.

The analysis of ACHANGE, indicates that when asset growth increases, the probability of being in the fraud group increases. When ACHANGE
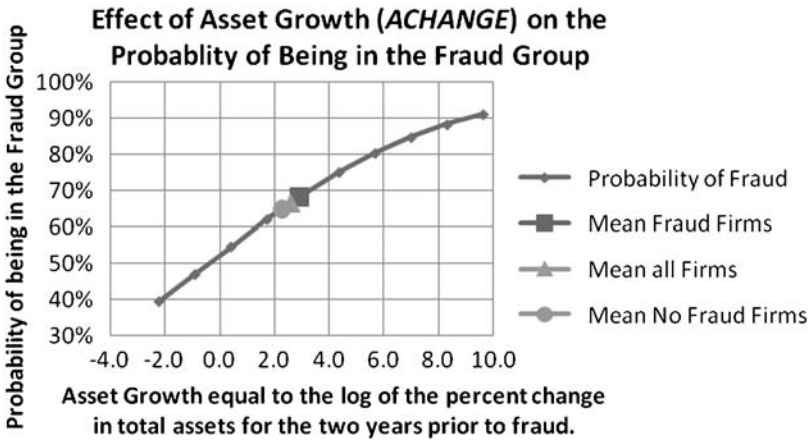

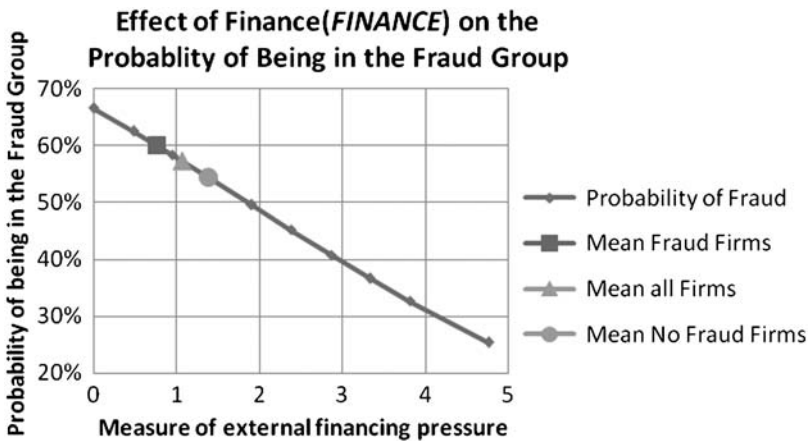Fig. 1.   Effect of Asset Growth on the Probability of Fraud.
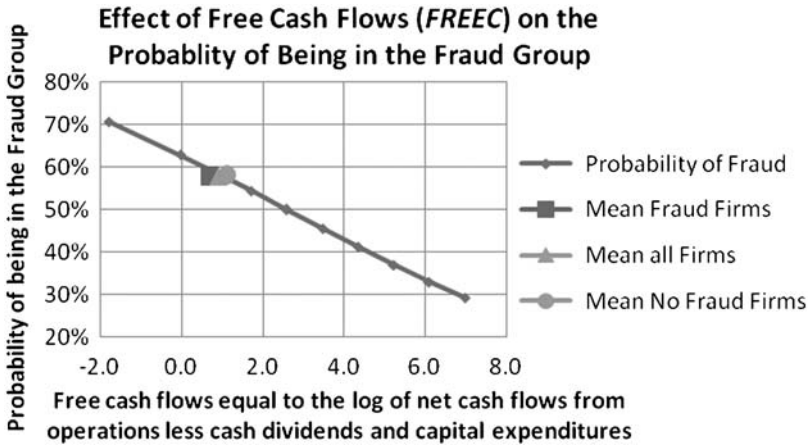

Fig. 2.   Effect of Finance on the Probability of Fraud.

Effect of Free Cash Flows (*FREEC*) on the Probablity of Being in the Fraud Group

Fig. 3. Effect of Free Cash Flows on the Probability of Fraud.

Effect of Inside Ownerhip (*OSHIP*) on the Probablity of Being in the Fraud Group
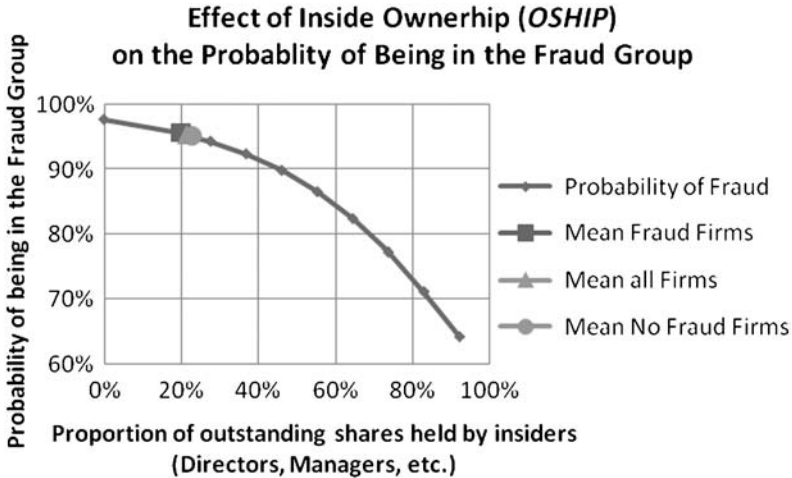

Fig. 4. Effect of Ownership on the Probability of Fraud.

increases to its mean value of approximately 2.6, the probability of being in the fraud group increases to 67 percent. The results appear in Fig. 1.

The analysis of *FINANCE*, indicates that when asset growth increases, the probability of being in the fraud group increases. When *FINANCE* increases to its mean value of approximately 1.08, the probability of being in the fraud
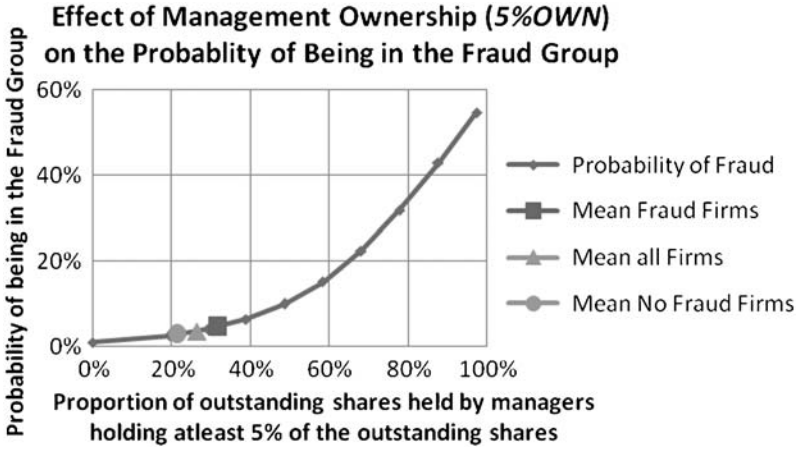
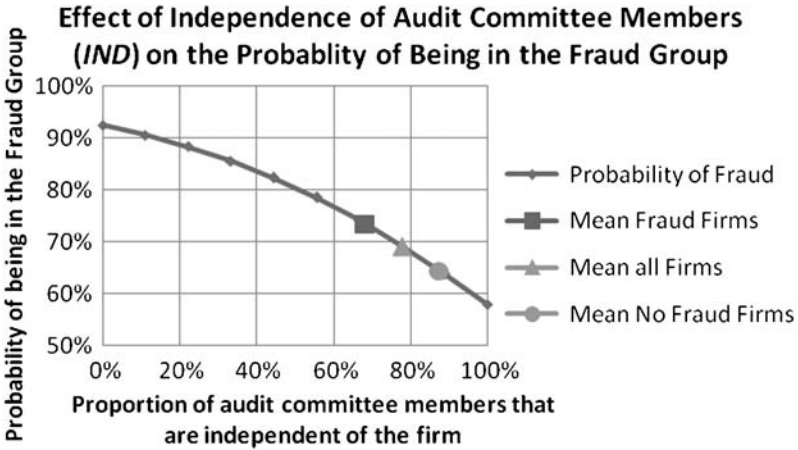*Fig. 5.* Effect of Management Ownership on the Probability of Fraud.

Fig. 6. Effect of Independent Audit Committee Membership on the Probability of Fraud.

group decreases to 57 percent. As the need for external financing increases (smaller values of FINANCE), the likelihood of being in the fraud group increases. The results appear in Fig. 2.

The analysis of *FREEC*, indicates that when free operating cash flows increase, the probability of being in the fraud group decreases.
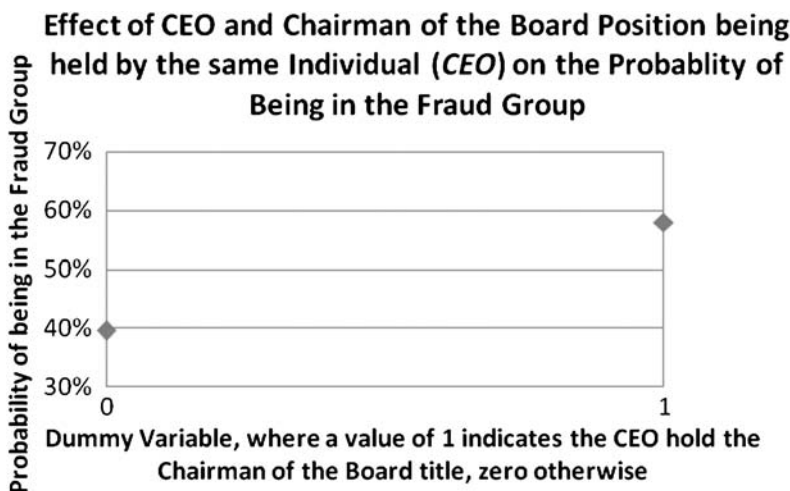
Effect of CEO and Chairman of the Board Position being held by the same Individual (*CEO*) on the Probablity of Being in the Fraud Group

Fig. 7. Effect of CEO/Chairman of the Board Positions on the Probability of Fraud.

When *FREEC* increases to its mean value of approximately 0.90, the probability of being in the fraud group decreases to 58 percent. As the firms free cash flows increase, likelihood of being in the fraud decreases. The results appear in Fig. 3.

The analysis of *OSHIP* indicates that when the proportion of insider ownership (management and directors) decreases, the probability of being in the fraud group increases. When insiders own 20 percent of the firm's outstanding shares, the probability of being in the fraud group is 95 percent. When *OSHIP* increases, the probability of fraud decreases. The results appear in Fig. 4.

The analysis of *5%OWN* reveals that a curvilinear relationship exists between the probability of a firm being in the fraud group and the proportion of managers who own more than 5 percent of the shares. When the proportion of ownership held by managers who hold more than 5 percent of the outstanding shares increases, the probability of fraud increases. When *5%OWN* is approximately 26 percent of the firm's outstanding shares, the probability of a firm being in the fraud group is approximately 4 percent. When *5%OWN* increases to 75 percent, the probability of being in the fraud group increases to approximately 30 percent. These results are reported in Fig. 5.

The analysis of *OSHIP* and *5%OWN* indicates that management ownership is a positive deterrence to fraud, so long as the ownership of

the remainder of the firm's stock is diffused. Thus, the larger the percentage of shares held by managers, the lower the likelihood of fraud occurring so long as individual managers do not hold a substantial portion of the firm's stock. In other words, when a large portion of a firm's outstanding shares are owned by management, the incidence fraud increases.[3]

The analysis of *IND* indicates that, as the proportion of audit committee members who are independent increases, the probability of financial statement fraud decreases. These results, as reported in Fig. 6, indicate that, when the independent audit committee members comprise 10 percent of the audit committee, the probability of a firm being in the fraud group is approximately 91 percent. However, when 78 percent of the audit committee members are independent, the probability of being in the fraud group decreases to 70 percent. As *IND* increases to 100 percent, the probability of being in the fraud group decreases to 58 percent. These results are consistent with Robinson (2002) and mandated changes to audit committee composition (Sarbanes–Oxley Act, 2002).

Fig. 7 reports the relationship between the incidence of fraud and situations where a single individual holds both the CEO and Chairman of the Board positions (*CEO*). When the CEO holds the Chairman of the Board position (*CEO* = 1), the probability of being in the fraud group is 58 percent; otherwise (*CEO* = 0) the probability of being in the fraud group is 40 percent.

5. CONCLUSION AND OBSERVATIONS

SAS No. 99 adopts Cressey's (1953) theory that pressure, opportunity, and rationalization in varying degrees are consistently associated with fraudulent behavior. While adoption of the fraud factor framework in *SAS No. 99* is broadly supported by accounting professionals, academics, and various regulatory agencies, there is little empirical evidence actually linking Cressey's fraud risk factor framework to financial statement fraud. This study seeks to fill that gap by empirically examining the effectiveness of the fraud risk factor framework in detecting financial statement fraud.

We develop a broad array of variables which serves as proxies for pressure, opportunity, and rationalization. We then test these variables using a sample of fraud firms (i.e., firms that were the target of SEC fraud enforcement) and a matched sample of no-fraud firms. Univariate analysis was then used to identify eight pressure variables and five of opportunity variables as being different between the two sets of firms at a $p \leq 0.15$ level.

These variables became explanatory variables in a fraud-detection model that we examined using logit regression analysis. Ultimately this process yielded five pressure variables (*ACHANGE, FINANCE, FREEC, OSHIP*, and *5%OWN*) and two opportunity variables (*IND* and *CEO*) as being significant in detecting fraud.

We next used these variables in a series of test to determine whether they were effective at actually predicting which firms were in the fraud versus the no-fraud groups. This involved both MDA and sensitivity analysis. MDA determines whether the model can be used to accurately categorize firms into the fraud and no-fraud groups. Using a cross-validation procedure, our models correctly classifies no-fraud firms between 72 and 77 percent of the time and correctly classifies fraud firms between 68 and 70 percent of the time. Overall, the models correctly classify firms between 70 and 73 percent of the time (the overall misclassification rate of the model is between 27 and 29 percent). These results represent a substantial improvement over other fraud prediction models that have had success rates of 30 to 40 percent (Persons, 1995; Kaminski et al., 2004). Bankruptcy prediction models using a similar approach yielded accuracy rates of between 40 and 50 percent (Kuruppu et al., 2003). Thus, we conclude that our model is robust at detecting fraud.

One of the weaknesses of the study is our inability to identify significant variables to serve as proxies for rationalization. *SAS No. 99* acknowledges the difficulty associated with isolating characteristics used as indicators of rationalization. Developing a better insight into firm characteristics that serve as effective proxies for rationalization is a topic for future research.

NOTES

1. In tests involving small to moderate samples, the likelihood ratio test is appropriate for determining overall fit (Greene, 2000).
2. Tests using all fraud risk factor proxy variables yielded similar results.
3. Among the proxies, *5%OWN* and *OSHIP* were the highest correlated variables at 55% level. None of the variables were significantly correlated.

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MANAGEMENT VIEWS ON CORPORATE GOVERNANCE AND FIRM PERFORMANCE

H. Kent Baker and Gary E. Powell

ABSTRACT

We survey top managers of Fortune 1000 companies to learn if industry practitioners agree with the findings of academic research on specific corporate governance issues. We focus on board composition and size, executive/director compensation and ownership, firm performance, and other issues. The results suggest that the views of responding managers appear at odds with other empirical evidence provided in the literature on the majority of the issues examined. In addition, respondents are often unable to offer an opinion about whether they agree or disagree with specific corporate governance issues.

1. INTRODUCTION

Corporate governance is a multi-faceted subject that has recently generated much interest among academics, practitioners, regulators, and the popular press. The importance of corporate governance became dramatically clear when entering the 21st century as a series of corporate meltdowns from managerial fraud, misconduct, and negligence caused massive bankruptcies,

lesser debacles, and immense losses of shareholder wealth. Corporate scandals shook the faith of investors in the capital markets and the efficacy of existing corporate governance practices in promoting transparency and accountability. The response of Congress and regulators to this crisis of confidence was to impose new corporate governance requirements on public companies such as the Sarbanes–Oxley Act of 2002.

Corporate governance is a set of processes, customs, policies, laws, and institutions that affect the way a corporation is directed, administered or controlled. Corporate governance mechanisms consist of internal and external systems and procedures used to ensure that the agent (the management of the corporation) runs the firm for the benefit of one or more principals (shareholders and other stakeholders). An important theme of corporate governance is to ensure the accountability of a corporation's management through mechanisms designed to reduce the agency problem between managers and shareholders. In the Anglo-American model of corporate governance, shareholder wealth maximization generally holds primacy as the firm's goal. Thus, governance devices attempt to align or ensure that managerial behavior and actions pursue this goal. Governance control mechanisms work through a broad array of layered and overlapping actions such as monitoring by the boards of directors, compensation systems, ownership structure, takeovers, and government regulations.

In this study, we examine management views on how corporate governance mechanisms affect a firm's financial performance and valuation. Although we focus primarily on the relation between two internal control mechanisms – the board of directors and executive/director compensation and ownership – and firm performance, we also examine other corporate governance issues. This study is an exercise of determining if industry practitioners agree with the findings of academic research on corporate governance. Specifically, we seek to learn how top managers from large U.S. corporations view the following questions:

(1) Are board characteristics such as board composition and size related to overall firm performance?
(2) Is there a relation between executive/director compensation or ownership and firm performance?
(3) What effect do weak shareholder rights have on a firm's operating or market performance?
(4) Does corporate governance affect a firm's dividend payout, takeover vulnerability, credit rating, recognition of write-offs, cost of debt financing, and takeover premiums?

Increased shareholder activism in the United States and elsewhere stems from the conviction that better corporate governance will deliver higher shareholder returns. Despite repeated attempts by academics to show an irrefutable link between the two, the results are largely inconclusive. Some empirical studies find important linkages between corporate governance and financial performance measures. Yet, other research into the association between specific corporate governance controls and firm performance reports mixed and often weak results.

Because extensive empirical evidence already exists on many corporate governance issues, we take a less traveled path to gain new insights about some of these issues. Specifically, we survey top managers of the U.S. Fortune 1000 firms to examine their views on how corporate governance affects firm performance as well as other issues. The survey approach offers a balance between large sample analyses and clinical studies. Our study complements what we already know from traditional studies on corporate governance. In conducting research, Bruner (2002, p. 50) notes, ''The task must be to look for patterns of confirmation across approaches and studies much like one sees an image in a mosaic of stones.'' Thus, our intent is to learn whether managerial perceptions mesh with other empirical evidence on specific corporate governance issues.

Our study contributes to the extant literature on corporate governance in several ways. First, although the corporate governance literature is rich with empirical tests of the relation between corporate governance and firm performance, little survey evidence exists on how managers view this relation. Perhaps the best known surveys on corporate governance are those conducted by McKinsey and Company (2002) to discover how shareholders perceive and value corporate governance. However, these studies do not focus on management views of corporate governance. To our knowledge, no other published study uses survey-based data to address the same issues contained in our study. Consequently, our results provide much unique information.

Second, by designing our survey instrument to incorporate various hypotheses and findings of empirical studies and then evaluating management responses to these research findings, our study helps to bridge the gap between theoretical research issues and the managerial ideas and practices that govern today's corporations. Thus, our survey results add new and complementary evidence to other empirical studies on governance issues. Third, understanding the perceptions of managers on these issues can provide valuable insights that may help predict the extent to which firms might improve certain corporate governance mechanisms that could benefit their shareholders.

The remainder of this chapter has the following organization. Section 2
provides an overview of some pertinent literature on corporate governance
and firm performance as well as other related issues. In Section 3, we discuss
our survey design and potential limitations. Section 4 provides a discussion
of our survey results and relates them to findings from other empirical
studies. The last section provides concluding observations.

2. LITERATURE REVIEW ON CORPORATE GOVERNANCE

During the past three decades, researchers have conducted hundreds of
studies of corporate governance. Because of the substantial volume of
literature on this subject, we highlight a limited number of studies on four
corporate governance topics: (1) board composition and size, (2) executive/
director compensation and ownership, (3) corporate governance and firm
performance, and (4) other corporate governance issues. Although the lines
between these categories are not perfectly distinct, they do provide a useful
categorization scheme for organizing a review of relevant empirical evidence
on corporate governance. For example, the sections on board composition
and size as well as executive/director compensation and ownership also
discuss some issues about firm performance. Since our survey data comes
from Fortune 1000 firms, we limit our review of corporate governance, with
minor exceptions, to studies of U.S. firms. Our review provides evidence on
whether the perceived relation between corporate governance and perfor-
mance rests on a sound empirical footing.

2.1. Board Composition and Size

The board of directors represents one type of internal control mechanism
available to balance the interests of multiple stakeholders and to deal with
some problems of corporate governance. In theory, effective monitoring by
the board of directors should enable it to safeguard invested capital given its
legal authority to hire, fire, compensate, and advise top management on
behalf of shareholders. In addition, the board should be able to take
corrective action to accomplish the corporation's goals. Jensen (1986)
offers an alternative view that the board can be ineffective in recognizing
problems facing the firm and also in confronting top management.

Although Denis (2001) notes that sufficient incentives may not be in place to motivate the average board of directors to do its job properly, a well-structured compensation system for directors could help mitigate this situation.

Although many empirical studies focus on the board of directors, one stream of research relevant to our study examines whether board characteristics relate to firm performance and market valuation. Two characteristics of the board of directions stand out in the literature as being of considerable interest: board composition (board independence of management as proxied by the number of outside directors) and size.

As Bhagat and Black (1999) note, the boards of directors of large American public companies have changed dramatically over the years. In the 1960s, most corporations had a majority of inside directors. Today, almost all have a majority of outside directors, and most have a majority of "independent" directors. Conventional wisdom suggests that outside directors play a larger role than inside directors in monitoring management to take appropriate governance actions. Outside directors are non-executives who do not have a direct business relationship with the firm. Consequently, activists often tout boards consisting largely of outside, independent directors as representing an essential component of good corporate governance. Although using outside directors typically provides for greater independence, it still may not solve the problem of effectively monitoring managers.

With respect to size, some observers such as Jensen (1993) and Lipton and Lorsch (1992) believe that a board's effectiveness may decline as board size increases above a moderate number. A popular view is that smaller boards are more effective than larger ones because they can hold more candid discussions, make decisions more quickly, and be less easily controlled by management than larger boards. Lipton and Lorsch maintain that large boards may be less effective than small boards because some directors may free ride on the efforts of others.

Reviews of the literature on boards of directors such as Bhagat and Black (1999) and Hermalin and Weisbach (2003) find several regularities emerging across these studies. Notably, they conclude that across these studies, board composition does not seem to predict overall firm performance. Bhagat and Black also review the evidence on whether board composition affects the board's behavior on discrete tasks such as firing the chief executive officer (CEO), making a takeover bid for another company, or accepting a takeover bid for one's own company. They note that a main weakness of this approach is its inability to indicate how board composition affects

overall firm performance. Although firms with majority-independent boards could perform better on particular tasks, they could perform worse on other tasks, leading to no net advantage in overall performance.

Researchers also examine board composition in terms of both the relative number of independent outside directors and the announcement of their appointment. Rosenstein and Wyatt (1990) find that increases in share price tend to accompany the appointments of outside directors to a firm's board. Yet, they caution against inferring that outside appointments are superior to inside appointments suggesting that a firm may have an ideal number for both types depending on its particular situation. Shivdasani and Yermack (1999) find that the stock market reaction to appointments of independent outside directors is more positive when the director selection process has relatively little CEO involvement. They reason that having the CEO in the process increases the tendency to select directors who are less likely to monitor the firm's activities aggressively.

Fogel and Geier (2007) examine 254 public companies across 50 industries and find inconclusive evidence that boards dominated by independent (outside) directors increase financial performance for shareholders. They conclude that despite existing regulations, the appropriate corporate model is for boards to have a minority of independent directors and a majority of shareholder-owners.

One role independent directors can play is to oversee the honesty of a firm's financial reporting. Beasley (1996) finds that firms committing fraud have fewer independent directors than matched control firms that did not commit fraud. In addition, firms have a greater chance of being sued for financial statement fraud when its directors serve on multiple boards. One implication of this study is that independent directors can help control financial fraud. Yet, managers who are prone to commit fraud may resist oversight by independent boards, so that manager fraud propensity drives both the likelihood of fraud and the degree of board independence. Ajinkya, Bhojraj, and Sengupta (2005) report that firms with more outside directors and greater institutional ownership are more likely to issue earnings forecasts, issue them more frequently, and issue forecasts that are more specific, accurate, and less optimistically biased.

Board size may materially affect the quality of corporate governance. On the basis of their review of the literature, Hermalin and Weisbach (2003) conclude that the weight of the evidence shows an inverse relationship exists between board size and firm value. This evidence suggests that some boards may be larger than optimal and that companies could benefit by reevaluating their optimal board size.

For example, Yermack (1996) finds evidence that firms with small boards have higher market valuations than firms with larger boards. Using Tobin's Q to approximate a firm's market valuation, he observes an inverse relationship between board size and firm value in a sample of 452 large U.S. corporations over the period 1984–1991. Yermack also finds positive abnormal stock returns around the announcement dates of reductions in the size of a firm's board of directors. He discovers that firms with small boards (eight or fewer members) exhibit higher profitability ratios and operating efficiency ratios, as measured by return on assets, return on sales, and total asset turnover, than firms with larger boards (more than 14 members). He also reports the highest valuation multiples are associated with firms which have eight or fewer directors, whereas those firms with more than 14 have the lowest valuation multiples. Finally, Yermack finds the largest fraction of lost value occurs as boards grow in size from small to medium.

Core, Holthausen, and Larcker (1999) examine the effects of the ''busyness'' of directors on the effectiveness of corporate governance. They define directors to be busy if they serve on more than three boards while employed full-time and more than six boards if they are retired. They report that boards with busy directors tend to have excessive CEO compensation and imply that these busy directors do not make substantial contributions to effective corporate governance. Fich and Shivdasani (2006) examine the operating performance of firms with busy boards, defined as boards of directors where a majority of outside directors hold three or more directorships. They associate busy boards with weak corporate governance and find that firms with busy boards exhibit operating underperformance. In particular, Fich and Shivdasani document that firms with busy boards have lower return on assets, lower asset turnover ratios, and lower operating return on sales. They also find that firms with busy boards have market-to-book value ratios that are 4.2% lower than other firms.

There is mixed evidence on the stock market reaction to the announcement of busy directors to a firm's board. Ferris, Jagannathan, and Pritchard (2003) find positive but statistically insignificant returns associated with the announcement of directors who already serve on multiple boards. Their results also show a positive and statistically significant stock price effect for a subsample of firms that do not already have busy directors who appoint a busy director for the first time. Perry (2000), however, reports a negative market reaction when firms announce the appointment of outside directors who are full-time executives at other firms and who hold three or more other board appointments.

Researchers debate whether the board chair and CEO should be separate positions. Jensen (1993) argues that having the same executive serve as both CEO and board chair results in greater agency problems with less monitoring of top management. Goyal and Park (2002) contend that replacing a poorly performing CEO is more difficult when combining the CEO and board chair duties, thus reducing the board's ability to address declines in the firm's performance. Yermack (1996) examines whether the market values of firms with combined CEO-chair positions differ from those firms with separate CEOs and board chairs. He finds that industrial firms with board chairs, who do not also serve as CEO, trade at higher price-to-book multiples.

Finally, Bozec (2005) argues that boards of directors are more effective when firms are exposed to competitive environments. By examining the combined effect of board characteristics, market discipline, and firm performance, he finds that competition has a positive and significant effect on firm profitability and productivity. Bozec suggests that market competition creates effective disciplinary mechanisms for managers and provides an appropriate environment for supporting the board–performance relationship.

2.2. Executive/Director Compensation and Ownership

Executive compensation is another type of internal control mechanism proposed to achieve alignment of interests between managers and shareholders. According to Denis (2001), two overriding issues of executive compensation focus on the level of executive pay and the sensitivity of pay to performance. The level of compensation is a factor in corporate governance based on the notion that a manager is presumably less likely to risk losing a job the greater the level of pay expected from that job. Yet, the sensitivity of compensation to financial performance is arguably more important given that corporate governance is basically about managements' incentives to act in shareholders' interests.

Surveys of the broad literature on executive compensation and incentives by Murphy (1999) and Core, Guay, and Larcker (2003) suggest that (1) the sensitivity of executive compensation to firm performance has increased over time; (2) much of this sensitivity comes through executive ownership of common stock and options on common stock; and (3) stock options are the fastest growing components of CEO compensation and equity ownership. Shivdasani and Zenner (2004) note that stock and options holdings link

a CEO's wealth to company performance and a large body of literature suggests that executive equity ownership typically increases shareholder value and promotes better decision making.

Another issue is whether remuneration, especially using options, is an important motivating factor for directors. Independent directors perform a crucial role in corporate governance. In theory, firms can align the interests of directors and shareholders by providing directors with a financial stake in the performance of the firm through incentive-based compensation. Perry (2000) documents a substantial increase in the use of incentive-based compensation for directors and finds that incentive compensation for directors influences the level of monitoring by the board. For example, when directors of independent boards receive incentive compensation, they replace the CEO more often following poor performance.

Cordeiro, Veliyath, and Neubaum (2005) examine the relation between stock options and stock grants compensation for directors and stock performance for a sample of 450 S&P 500 firms during the period 1995–1997. Their evidence shows a positive relation between stock options and stock grants for directors, both as a percentage of total compensation, and stock returns and Jensen alpha measures of firm stock performance.

Another compensation issue involves whether board size affects CEO compensation incentives. Using a model of pay-for-performance sensitivity of CEO compensation, Yermack (1996) finds that firms with small boards provide CEOs with stronger performance incentives from compensation than do firms with larger-sized boards.

Numerous studies examine the association between managerial ownership and performance. For example, in early studies Morck, Shleifer, and Vishny (1988) and McConnell and Servaes (1990) examine the effect of executive and insider ownership of stock and stock options on firm value. Both studies find that valuation multiples tend to be higher when executives and insiders own more of their firm's stock and stock options. This evidence suggests a positive relation between managerial ownership and firm value. Cho (1998), however, finds that corporate value affects ownership structure but not the reverse, which changes the interpretation of the association between ownership and corporate value. Reviews of evidence on inside ownership and performance by Murphy (1999) and Core et al. (2003) are mixed. Denis (2001) concludes that more recent work attempts to control for endogeneity and does not find any significant link between ownership and firm performance.

Finally, Tufano (1996) examines the connection between executive stock and stock option ownership and a firm's decision to hedge price risk.

He finds that gold mining companies hedge price risk more when executive stock ownership is high but less so when stock option ownership is also high. This discrepancy occurs because the price volatility that stockholders wish to avoid increases the value of stock options.

2.3. Corporate Governance and Firm Performance

According to Young (2003, p. 1), "the belief that governance best practices lead to superior firm performance is widespread." Not surprisingly, many research studies examine whether different governance mechanisms affect firm performance. As previously discussed, one stream of research examines the relation between board independence and overall firm performance. In general, studies report that valuation multiples and other financial metrics are typically comparable for companies with insider-dominated versus outside-dominated boards (see, for example, Hermalin & Weisbach, 1991; Mehran, 1995; Klein, 1998; Bhagat & Black, 2002). In contrast, Millstein and MacAvoy's (1998) empirical study of 154 firms based on 1991–1995 data demonstrates a substantial and statistically significant correlation between an active, independent board and superior corporate performance. In a recent study, however, Fogel and Geier (2007) find inconclusive evidence that boards dominated by independent directors increase financial performance for shareholders. The endogeneity of board composition may explain the lack of a cross-sectional result.

Although most studies do not find any direct link between board composition and overall firm performance, Bhagat and Black (1999) note that board composition may affect discrete tasks such as replacing the CEO or making or defending against a takeover. Perry and Shivdasani (2005) offer another example involving restructuring. They find that firms with outside-dominated boards undergoing asset restructuring exhibit subsequent improvements in operating performance.

Cremers and Nair (2005) examine the interaction between internal corporate governance mechanisms (shareholder activism) and external governance mechanisms (the market for corporate control) and how they affect firm performance. Internal governance measures include percentage share ownership by institutional blockholders and by public pension funds. Cremers and Nair create an index that measures the takeover vulnerability of the firm as an external measure. They base index values on three firm-specific factors: the presence of staggered boards, poison pill arrangements, and whether the firm has restrictions on shareholder voting

to call special meetings or act through written consent. Their results support the belief that internal and external corporate governance mechanisms are complements in being associated with long-term abnormal stock returns and accounting measures of profitability.

Gompers, Ishii, and Metrick (GIM) (2003) study the association between corporate governance mechanisms and a firm's operating performance and valuation. They construct a governance index (the GIM index) as a proxy for shareholder rights, which is based on 24 corporate governance provisions published by the Investor Responsibility Research Center. The value of the index is equal to the number of provisions a firm has that restricts shareholder rights. Common restrictions include golden parachutes, poison pills, supermajority requirements, and classified boards. Using a long-run event study test, Gompers et al. find a strong correlation between corporate governance and stock returns during the 1990s. Their results also show that firms with weaker shareholder rights have lower market values and earn lower returns for their shareholders than firms with stronger management power. Specifically, Gompers et al. document that strong governance firms (with the strongest shareholder rights) earn abnormal risk-adjusted returns of 8.5% per year more than weak governance firms (with the strongest management rights) during the period 1990–1999.

Gompers et al. (2003) also report that weak governance firms have lower operating performance measures with lower sales growth and net profit margins. Core, Guay, and Rusticus (2006) argue, however, that these measures can simply reflect differences in financing choices, product mixes, or in a firm's life cycle. Gompers et al. also find that the weaker governance firms have lower return on equity (ROE) measures, but this relationship is not statistically significant.

Intrigued by Gompers et al.'s (2003) finding that firms with weak shareholder rights exhibit significant stock market underperformance, Core et al. (2006) try to determine if the relation between poor governance and poor returns is causal. If causality exists, they expect that the market is negatively surprised by the poor operating performance of weak governance firms. Using the GIM governance index, Core et al. find that firms with weak corporate governance (high governance index values) exhibit significant operating underperformance. Specifically, they document that weak governance firms have lower industry-adjusted operating return on assets. Core et al. also examine the relationship between analysts' forecast errors and earnings announcement returns but find no evidence that this underperformance surprises the market. Moreover, their results suggest that any differences in the firm's likelihood of being taken over do not cause

these excess returns earned by firms with strong shareholder rights. Therefore, Core et al. conclude that weak corporate governance does not cause the operating underperformance.

Farber (2005) examines the link between the credibility of a firm's financial reporting system and the quality of its corporate governance mechanisms, which includes board composition. Using a sample of 87 firms that the Securities and Exchange Commission (SEC) identified as having fraudulently manipulated their financial statements, Farber finds that in the year before the fraud detection, these fraud firms relative to a control sample of firms tend to have fewer numbers and percentages of outside board members, fewer audit committee meetings, fewer financial experts on the audit committee, a smaller percentage of Big 4 auditing firms, and a higher percentage of CEOs who were also chairman of the board of directors. Farber also discovers that these fraud firms had taken actions to improve their corporate governance within three years of the fraud detection. Specifically, the firms have the same numbers and percentages of outside members on the board and have a higher number of audit committee meetings than the sample of control firms. These firms have superior stock price performance with investors apparently valuing the corporate governance improvements.

Researchers also examine corporate governance mechanisms for poorly performing firms or firms with deteriorating performance. For example, Shivdasani and Zenner (2004) report that companies typically react to deteriorating performance by adding outside directors to the board. Vafeas (1999) finds that a firm is likely to recover from a period of poor performance more quickly by increasing the frequency of its board meetings. His evidence shows that after years of an abnormally high frequency of board meetings, operating performance improves especially for the firms with poor performance beforehand.

As previously mentioned, one approach to studying the effect of board composition on firm performance involves studying discrete board tasks, such as replacing the CEO. Although this approach can provide insights into how different boards behave on particular tasks, it cannot offer insights on how board composition affects overall firm performance. For example, Yermack (1996) finds that as a firm's performance declines, firms with large boards tend to replace their CEOs more slowly than firms with smaller-sized boards.

According to Weisbach (1988), boards with at least 60% independent directors are more likely than other boards to fire a poorly performing CEO. Yet, Weisbach also finds that the economic significance of the additional firings by such boards is small. Weisbach's results could potentially apply to

a specific period of time because Mikkelson and Partch (1997) find no significant correlation between firm performance or board composition and CEO tenure during the low-takeover period 1989–1993. Perry (2000) reports that a firm exhibiting poor performance is more likely to quickly replace its CEO if the firm compensates its directors in the firm's stock and if the directors are independent.

There is mixed evidence on the overall rate at which different boards replace the CEO. For example, Weisbach (1988) finds no overall difference based on degree of board independence. Contrary to previous research, Geddes and Vinod (1997) find that boards with a greater proportion of outsiders have a positive effect on CEO tenure. That is, firms with a high proportion of outside directors replace CEOs at a higher rate than other firms (after controlling for other factors, such as age, that affect CEO replacement). On the basis of their review of the evidence on board composition and CEO replacement, Bhagat and Black (1999) conclude that these studies provide some evidence that independent directors behave differently than inside directors when they decide whether to replace the current CEO.

2.4. Other Corporate Governance Issues

Corporate governance may also affect a firm's dividend payout, takeover vulnerability, credit ratings, recognition of write-offs, cost of debt financing, and takeover premiums. According to White (1996), the payment of cash dividends could be an area of potential conflict between owners (shareholders) and agents (managers) due to differing goals and interests between these two groups. Agency theory predicts that outside shareholders prefer higher dividend payments because dividends reduce the opportunities for managers to squander cash. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) contend that firms will pay less (more) dividends in countries with stronger (weaker) legal protection to minority shareholders. Their examination of 4,000 firms from 33 different countries shows that firms operating in countries with stronger legal protection to minority shareholders pay higher dividends. Firm-specific factors may also influence the dividend expectation behavior of outside shareholders in the context of the agency problem. For example, if the internal corporate governance mechanism of a firm and the minority shareholder rights in an economy are strong, outside investors might be satisfied with lower dividend payments.

Core et al. (2006) examine whether any differences in the probability of becoming a takeover target exist between weak and strong corporate governance firms. They divide firms into these two groups using the GIM governance index measure. Core et al. discover that firms with weak corporate governance are taken over at about the same rate as strong governance firms. Specifically, they find weak governance firms have a slightly lower annualized takeover probability of 4.1% per year compared to 4.5% per year for their sample of strong governance firms.

Another research issue concerns whether corporate governance can affect a firm's credit rating. Ashbaugh-Skaife, Collins, and LaFond (2005) investigate whether firms that exhibit strong governance benefit from higher credit ratings relative to firms with weaker governance. After controlling for risk characteristics, they document that firms with strong corporate governance provisions have higher credit ratings. Their results also suggest that weak governance can result in firms incurring higher debt financing costs. Therefore, they conclude better governed firms receive better credit ratings.

Over the past several decades, write-offs have increased in popularity. One area of research interest involves understanding the mechanisms behind company write-offs. Using a comprehensive dataset, Minnick (2004) finds a close association between the quality of governance and the write-off decision. Specifically, Minnick reports that strong governance firms recognize write-offs earlier than poor governance firms. That is, poor governance companies wait to take write-offs until they become inevitable. Minnick finds negative abnormal returns accompanying the announcements of write-offs by poor governance firms but positive announcement day returns for the strong governance firms.

Another issue is whether corporate governance matters to bondholders, who are one of the firm's stakeholders. Klock, Mansi, and Maxwell (2005) examine the relation between the cost of debt financing and the GIM governance index containing various anti-takeover and shareholder protection provisions. Using firm-level data for the period 1990–2000, they report that anti-takeover governance provisions lower the cost of debt financing. Klock et al. then segment the data into firms with the strongest management rights (strongest anti-takeover provisions) and firms with the strongest shareholder rights (weakest anti-takeover provisions). They find an association between strong (weak) anti-takeover provisions and a lower (higher) cost of debt financing. Overall, their results suggest that the bond market favorably views anti-takeover governance provisions.

A final issue involves whether independent directors enhance target shareholder wealth during tender offers. Independent directors often hold appointments on multiple boards. Tender offers can result in conflicts of interests between managers and shareholders of target firms. Cotter, Shivdasani, and Zenner (1997) find that when the target's board is independent the initial tender offer premium, the bid premium revision, and the target shareholder gains over the entire tender offer period are higher. Boards with a majority of independent outside directors help to control agency problems between shareholders and managers when firms are targets of tender offer bids and also help to enhance target shareholder gains from tender offers.

3. SURVEY DESIGN

3.1. Survey Instrument

The survey instrument consists of two major sections. The first section includes three background questions providing information about the respondent's involvement in the firm's governance process, the respondent's current position or title, and the principal nature of the business. The second section contains 34 closed-end statements about corporate governance separated into four categories – (1) board size and composition, (2) executive/director compensation and ownership, (3) corporate governance and firm performance, and (4) corporate governance and other issues – drawn from empirical evidence contained in the literature. These categories are not mutually exclusive because we intentionally include some statements about corporate governance and firm performance in several categories.

The survey asks respondents to indicate their level of agreement or disagreement with each of the 34 statements about corporate governance in large, publicly held U.S. corporations (e.g., Fortune 1000) in general. The questionnaire uses a 5-point Likert scale where SA = strongly agree (+2), A = agree (+1), UND = undecided (0), D = disagree (−1), and SD = strongly disagree (−2). This technique presents respondents with a series of attitude dimensions, for each of which they are asked whether and how strongly they agree or disagree using one of a number of positions on a 5-point scale. Since the scale represents interval data, we calculate means and standard deviations for each statement. However, we analyze the results largely in terms of agree/disagree.

The Likert scale is one of the most commonly used forms of rating scale to address responses to a series of attitudinal dimensions. Yet, Brace (2004) notes that using Likert scales involves several interrelated issues. For example, such scales may involve an *order effect* in which a bias exists to the left on a self-completion scale (in our scale "agree") and *acquiescence* in which there is the tendency for respondents to agree rather than disagree with statements. An analysis of our data does not reveal evidence of either effect. For example, the means for 25 of the 34 statements (73.5%) are negative indicating, on average, disagreement. In addition, respondents to Likert scales may engage in *central tendency* in which they may be reluctant to use extreme positions. Our results show that 27 of the 34 t-values (79.4%) differ significantly from 0 (undecided) at the 0.05 level or greater. Thus, respondents do not appear to be averse to taking extreme positions often strongly disagreeing with specific statements. Finally, *pattern answering* may occur when a respondent falls into a routine of ticking boxes in a pattern. Our analysis shows no such pattern for the 65 respondents.

The end of the questionnaire contains an open-end question asking respondents to indicate what they believe is the most important step that a firm can take to ensure strong corporate governance. The survey instrument is available from the authors on request.

3.2. Response Rate

We mailed the survey instrument to the CEO of each Fortune 1000 firm in August 2007. Each mailing included a cover letter and a stamped return envelope. We identified corporate addresses and CEO names by using the www.finance.google.com website, which updates changes in CEO leadership and corporate addresses. The cover letter assured recipients that their answers would be completely confidential and released only in summary form. If the CEOs preferred not to respond to the survey personally, we asked them to give it to someone actively involved in their firm's governance process or to return the blank questionnaire. We also offered to provide an executive summary of our results to each respondent through email.

We received 44 responses to our first mailing. After sending a second mailing in early October to nonrespondents, we received another 21 responses. The 65 total responses represent a 6.5% response rate. In comparison, Graham and Harvey (2001) achieve a nearly 9% response rate on a survey. This response rate is not surprising given several factors. First, Fortune 1000 firms often have a corporate policy of not responding to

surveys. Second, managers may view some corporate governance issues as sensitive. Third, the length and detailed nature of the survey requires both time and effort to complete.

3.3. Potential Limitations

Before presenting the survey results, we address several potential limitations. First, our study focuses only on a few important issues of corporate governance. Therefore, our survey is not exhaustive given the multi-faced nature of corporate governance. Although our survey examines only a limited number of issues, it represents a step forward in expanding our understanding about how managers view certain aspects of corporate governance not previously examined using this methodology.

Second, we derive our results from responses of managers of large U.S. corporations. The Anglo-American model that underlies U.S. corporate law tends to give priority to the interests of shareholders. Thus, the board of directors represents a greatly dispersed group of shareholders and theoretically has the objective of shareholder wealth maximization. Although there are many different models of corporate governance around the world, we limit our discussion and analysis to large U.S. corporations.

Third, non-response bias could be an issue. We took the normal precautions to reduce this bias including guaranteeing confidentiality, using multiple mailings each with a pre-stamped return envelope, and offering a free report of the results as an incentive to complete the questionnaire. To test for non-response bias, we use an approach similar to that suggested by Moore and Reichert (1983) and compare characteristics of responding firms to those of non-responding firms. If the characteristics of the two groups are similar, this would lessen the concern about potential non-response bias.

As Table 1 shows, interpretation of the *t*-tests for differences in means suggests that the respondents closely correspond with the non-respondents on the following characteristics: total assets, sales, market-to-book ratio, dividend payout, and dividend yield. We use data from Compustat for this analysis. We find no statistically significant differences between the two groups for any of these characteristics at the 0.05 level. Consequently, we conclude that our statistical evidence suggests that our sample is representative of the overall universe of Fortune 1000 firms.

Accepting that non-response bias may be small, concerns may still exist about the survey data. For example, the respondents may not have answered

Table 1.   Firm Characteristics: Responding and Non-Responding
Firms.

Firm Characteristics	Responding Firms	Non-Responding Firms	*t*-Value
Total assets (logarithm, in millions)	3.82	3.81	0.12
	(*n* = 63)	(*n* = 928)	
Sales (in millions of $)	14,461.5	11,495.0	0.60
	(*n* = 63)	(*n* = 928)	
Market-to-book ratio	2.44	4.15	(1.50)
	(*n* = 63)	(*n* = 928)	
Dividend payout	0.330	0.200	1.11
	(*n* = 63)	(*n* = 928)	
Dividend yield	0.015	0.015	0.02
	(*n* = 63)	(*n* = 928)	

Notes: Certain firm characteristics for year-end 2006 for the responding and non-responding
firms are reported. The first column lists firm characteristics (total assets, sales, market-to-book
ratio, dividend payout, and dividend yield). The second and third columns list firm
characteristics for the responding and non-responding firms, respectively, with the number of
firms in parentheses next to the value. The data represent only 63 of the 65 responding firms
because two respondents marked out the company code used for identification purposes. The
sum of responding and non-responding firms does not equal 1,000 due to missing data. The last
column reports the *t*-value for the difference in means between the responding and non-
responding firms.

truthfully or carefully. Given that we guaranteed confidentiality to respon-
dents, we believe that this problem is minimal. Senior executives are unlikely to
complete this survey if their intent is to be untruthful. Another concern is that
respondents might not properly understand some questions and other
questions might not elicit the appropriate information. To lessen this potential
difficulty, we consulted experts in both survey design and corporate
governance when designing the questions on the survey. Although completely
eliminating potential criticisms of our data is unlikely, we feel confident that
the results provide insights unavailable by using other research methodologies.

4. SURVEY RESULTS

In reviewing the survey results reported in Table 2, we focus on those
statements having a mean response differing significantly from 0 (unde-
cided). A number in parentheses after a statement corresponds to the
numbering system used in Tables 2–5. The responses indicate how managers

Table 2. Corporate Governance Survey: Board Composition and Size.

Statement	Study	Agree % SA +2	A +1	% UND 0	Disagree % D −1	SD −2	N	Mean	SD	t-Value
1. Board composition tends to have a material impact on firm performance.	Bhagat and Black (1999); Hermalin and Weisbach (2003). Also see studies for statement 20 in Table 4.	10.8	67.7	4.6	10.8	6.2	65	0.662	1.020	5.233**
2. Firms with a small board of directors tend to have higher market valuation.	Hermalin and Weisbach (2003); Yermack (1996)	1.5	12.3	55.4	26.2	4.6	65	−0.200	0.775	2.081*
3. Firms with effective boards tend to be exposed to a competitive environment.	Bozec (2005)	3.1	31.3	34.4	28.1	3.1	64	0.031	0.925	0.268
4. A firm is more likely to be sued for financial statement fraud when its directors serve on multiple boards.	Beasley (1996)	0.0	3.1	20.0	58.5	18.5	65	−1.015	0.649	12.609**
5. Share price increases tend to accompany the appointments of independent directors to a firm's board.	Rosenstein and Wyatt (1990)	0.0	10.8	30.8	44.6	13.8	65	−0.615	0.861	5.759**
6. The stock market reaction tends to be more positive when firms announce a decrease in the size of their board.	Yermack (1996)	0.0	6.3	44.6	36.9	12.3	65	−0.523	0.812	5.193**

Table 2. (*Continued*)

Statement	Study	Agree % SA +2	A +1	% UND 0	Disagree % D −1	SD −2	N	Mean	SD	t-Value
7. The stock market reaction tends to be more positive when firms announce the appointment of directors who have at least three other board seats.	Perry (2000); Ferris et al. (2003)	0.0	0.0	24.6	56.9	18.5	65	−0.938	0.659	11.476**
8. The stock market reaction tends to be more positive when the CEO has little involvement in the appointment of independent outside directors.	Shivdasani and Yermack (1999)	0.0	30.8	23.1	27.7	18.5	65	−0.338	1.108	2.459*
9. Industrial firms tend to trade at higher price-to-book ratio multiples when the board chair is not also the CEO.	Yermack (1996)	0.0	12.3	29.2	44.6	13.8	65	−0.600	0.880	5.497**
10. Firms with small boards (8 or fewer members) tend to have higher return on assets than those with large boards (more than 14 members).	Yermack (1996)	0.0	13.8	53.8	23.1	9.2	65	−0.277	0.820	2.724**
11. Valuation multiples tend to be lower for firms as the number of board members increases above 14 compared to boards with 8 or fewer members.	Yermack (1996)	1.5	9.2	61.5	16.9	10.8	65	−0.262	0.834	2.553*

Statement	Reference						N			
12. Firms with more outside directors and greater institutional ownership tend to issue more specific, accurate, and unbiased earnings forecasts.	Ajinkya et al. (2005)	3.1	27.7	26.2	32.3	10.8	65	−0.200	1.064	1.516
13. Firms with busy boards (those in which a majority of outside directors hold three or more directorships) are associated with weak corporate governance.	Core et al. (1999); Fich and Shivdasani (2006)	4.6	20.0	18.5	46.2	10.8	65	−0.385	1.071	2.898**
14. Despite existing regulations, the appropriate corporate governance paradigm for boards of directors is to have shareholder-owners in the majority and independent directors in the minority.	Fogel and Geier (2007)	0.0	9.2	12.3	49.2	29.2	65	−0.985	0.893	8.893**

Notes: Management views of respondents from the Fortune 1000 on 14 statements (1–14) about board composition and size in large, publicly held U.S. corporations in general are reported. Respondents use a 5-point scale to record their views: SA, strongly agree (+2); A, agree (+1); UND, undecided (0); D, disagree (−1); SD, strongly disagree (−2). The *t*-value is a one sample, two-tailed test. Percentages may not add to 100 due to rounding.

*, ** denote significance at the 0.05 and 0.01 levels, respectively.

view the statement for large, publicly held U.S. corporations in general, not for their respective firms.

4.1. Profile of Respondents and Firms

Responses to the three background questions included in the first section of the survey yield the following results. First, all respondents indicate that they are actively involved in the governance process of their firms adding credibility to the responses. Second, the survey respondents hold high-level positions in their firms. For example, about 66% of the respondents are CEOs often combined with some other title such as chairman and president, and almost 28% hold positions as vice president, general counsel, and corporate secretary. Consequently, the responses represent the views of top executives. Third, the firms represent a wide cross-section of industry groups: manufacturing (26%), wholesale/retail (15%), utility/energy (15%), financial (14%), transportation (9%), service (8%), and other (8%).

4.2. Board Composition and Size

A key issue addressed in this study is whether board characteristics, such as composition and size, relate to overall firm performance. Table 2 contains the responses to 14 statements about board composition and size. As discussed in the literature review, all statements contained in Table 2 have empirical support but mixed empirical evidence exists for some statements. Yet, with a few exceptions (1 and 3), respondents generally disagree with each statement as indicated by a negative mean. In all but two statements (3 and 12), the mean response differs significantly from 0 (undecided) using a one-sample t-test.

Of the survey's 34 statements, the one with the largest mean response is that board composition tends to have a material impact on firm performance (1). In fact, this statement has both the highest percentage of agreement (78.5%) and the lowest percentage of undecided responses (4.6%) among the 34 statements. A common belief is that outside directors are an important internal governance mechanism that can positively affect firm performance. The empirical evidence on the board–performance relationship varies. On the basis of their reviews of the literature, Bhagat and Black (1999) and Hermalin and Weisbach (2003) conclude that no link exists between board composition and overall firm performance.

Here, a clear disparity exists between managerial views and empirical evidence on this relationship.

Respondents indicate a high level of disagreement (78.4%) with the statement that despite existing regulations, the appropriate corporate governance paradigm for boards of directors is to have shareholder-owners in the majority and independent directors in the minority (14). This response may reflect the intuitive appeal of having independent directors play a larger role in monitoring management.

Several statements relate to board size (2, 6, 10, and 11). Although between 44.6% and 61.5% of the respondents are undecided about these statements, the mean response is negative and differs significantly from 0 at normal levels. In general, the results suggest that respondents disagree with the notion that smaller board size is related to higher market valuation (2 and 11), a positive stock market reaction (6), and higher return on assets (10). As discussed in the literature review, empirical evidence lends support to each of these statements.

On other statements (4, 5, 7, 8, 9, and 13) about the board of directors, the respondents' views tend to diverge from the empirical evidence. Specifically, respondents tend to disagree with the following statements: a firm is more likely to be sued for financial statement fraud when its directors serve on multiple boards (4); share price increases tend to accompany the appointments of independent directors to a firm's board (5); the stock market reaction tends to be more positive when firms announce the appointment of directors who have at least three other board seats (7); the stock market reaction tends to be more positive when the CEO has little involvement in the appointment of independent outside directors (8); industrial firms tend to trade at higher price-to-book ratio multiples when the board chair is not also the CEO (9); and firms with busy boards are associated with weak corporate governance (13).

4.3. Executive/Director Compensation and Ownership

Another issue addressed by the survey concerns whether a relation exists between executive/director compensation or ownership and firm performance. Table 3 reports how managers view five statements (15–19) about executive/director compensation and ownership. The mean response for each of the five statements differs significantly from 0 (undecided). Except for one statement (15), the distribution of responses shows a relatively high percentage of undecided responses ranging from 29.2% to 53.1%.

Table 3. Corporate Governance Survey: Executive/Director Compensation and Ownership.

| Statement | Study | Agree % | | % | Disagree % | | N | Mean | SD | t-Value |
		SA +2	A +1	UND 0	D −1	SD −2				
15. A firm can better align the interests of its directors with its shareholders by compensating directors with stock options.	Perry (2000)	7.7	55.4	13.8	13.8	9.2	65	0.385	1.114	2.786**
16. Stock options relative to total compensation for directors tend to be positively related to future firm performance.	Cordeiro et al. (2005)	3.1	46.2	29.2	15.4	6.2	65	0.246	0.969	2.047*
17. Firms with small boards of directors tend to provide stronger CEO performance incentives through compensation than do firms with larger-sized boards.	Yermack (1996)	1.5	16.9	36.9	32.3	12.3	65	−0.369	0.961	3.096**
18. Valuation multiples tend to be higher when a firm's executives and insiders own more of the firm's stock and stock options.	Morck et al. (1988); McConnell and Servaes (1990); Cho (1998)	3.1	43.1	43.1	6.2	4.6	65	0.338	0.834	3.267**
19. A firm is less likely to hedge the price risk associated with transactions when executive stock option ownership is large.	Tufano (1996)	0.0	15.6	53.1	20.3	10.9	64	−0.266	0.859	2.477*

Notes: Managerial views of respondents from the Fortune 1000 on five statements (10–19) about executive/director compensation and ownership in large, publicly held U.S. corporations in general are reported.
*, ** denote significance at the 0.05 and 0.01 levels, respectively.

For three of the five statements (15, 16, and 18), the mean response is positive, which generally indicates agreement. The majority of the respondents (63.1%) agree that a firm can better align the interests of its directors with its shareholders by compensating directors with stock options (15). This response is consistent with empirical evidence by Perry (2000), who reports the increased use of director incentive plans by companies. Almost half (49.3%) of the respondents agree that stock options relative to total compensation for directors tend to be positively related to future firm performance (16), which is similar to findings reported by Cordeiro et al. (2005). Of the respondents, 46.2% agree that valuation multiples tend to be higher when a firm's executives and insiders own more of the firm's stock and stock options (18). Yet, 43.1% indicate that they are undecided. The relatively high percentage of undecided responses on this statement is not surprising given the mixed evidence about managerial ownership and firm performance (Morck et al., 1988; McConnell & Servaes, 1990; Cho, 1998).

The mean response for each of the remaining two statements (17 and 19) is negative, indicating disagreement. Almost 45% of the respondents do not believe that firms with small boards of directors tend to provide stronger CEO performance incentives through compensation than do firms with larger-sized boards (17). This view differs from the research findings of Yermack (1996). Finally, the majority of respondents (53.1%) are undecided about whether a firm is less likely to hedge the price risk associated with transactions when executive stock option ownership is large (13). Evidence by Tufano (1996) lends support to this statement.

4.4. Corporate Governance and Firm Performance

Table 4 presents additional survey evidence about the relation between corporate governance and firm performance. Of the nine statements (20–28), respondents, on average, agree with only two (20 and 25). Although the mean response differs significantly from 0 (undecided) on six statements (21, 22, 23, 24, 25, and 26), each response appears inconsistent with the empirical evidence except for one statement (25).

Compared with the more general statement that board composition tends to have a material impact on firm performance (1), a much lower percentage of respondents agree with the more specific statement that boards dominated by independent directors tend to increase financial performance for shareholders (20), 78.5% versus 35.4%, respectively. The mean response on the latter statement (20) is positive but not statistically significant.

Table 4. Corporate Governance Survey: Corporate Governance and Firm Performance.

Statement	Study	Agree % SA +2	A +1	% UND 0	Disagree % D −1	SD −2	N	Mean	SD	t-Value
20. Boards dominated by independent directors tend to increase financial performance for shareholders.	Hermalin and Weisbach (1991); Mehran (1995); Millstein and MacAvoy (1998); Klein (1998); Bhagat and Black (1999, 2002); Perry and Shivdasani (2005)	4.6	30.8	40.0	15.4	9.2	65	0.062	1.014	0.493
21. Corporate governance mechanisms are associated with long-term abnormal stock returns and accounting measures of profitability.	Gompers et al. (2003); Cremers and Nair (2005); Core et al. (2006)	0.0	8.2	49.2	31.1	11.5	61	−0.459	0.808	4.437**
22. Firms with weak shareholder rights tend to exhibit persistent stock market underperformance.	Gompers et al. (2003)	0.0	7.7	30.8	46.2	15.4	65	−0.692	0.828	6.738**
23. Firms with weak shareholder rights tend to exhibit persistent operating underperformance.	Gompers et al. (2003); Core et al. (2006)	0.0	14.3	27.0	46.0	12.7	63	−0.571	0.893	5.156**

Statement	Reference						N			
24. Firms that manipulate their financial statements but subsequently take actions to improve governance tend to exhibit superior stock price performance.	Farber (2005)	0.0	9.4	29.7	35.9	25.0	65	−0.766	0.938	6.584**
25. When a firm's performance has been deteriorating, the firm will be more likely to appoint outside directors to its board.	Shivdasani and Zenner (2004)	7.8	51.6	21.9	15.6	3.1	65	0.453	0.958	3.812**
26. A firm is likely to recover from poor performance more quickly by increasing the frequency of board meetings.	Vafeas (1999)	3.1	15.4	24.6	41.5	15.4	65	−0.508	1.033	3.965**
27. As performance declines, firms with large boards tend to be slower to replace their CEO than firms with smaller-sized boards.	Yermack (1996)	1.5	30.8	36.9	23.1	7.7	65	−0.046	0.959	0.378
28. When a firm exhibits poor performance, its board is more likely to quickly replace the CEO when directors are compensated in stock and the board is independent.	Weisbach (1988); Mikkelson and Partch (1997); Geddes and Vinod (1997); Perry (2000)	0.0	36.9	29.2	24.6	9.2	65	−0.062	0.998	0.497

Notes: Managerial views of respondents from the Fortune 1000 on nine statements (20–28) about the effects of corporate governance on firm performance in large, publicly held U.S. corporations in general are reported.

*, ** denote significance at the 0.05 and 0.01 levels, respectively.

Although some mixed evidence exists on the relation between boards dominated by independent directors and firm performance, Bhagat and Black (1999, p. 922) note

> However, studies of overall firm performance have found no convincing evidence that firms with majority-independent boards perform better than firms without such boards.

The majority of respondents (59.4%) agree that when a firm's performance has been deteriorating, the firm will be more likely to appoint outside directors to its board (25). This statement is consistent with evidence reported by Shivdasani and Zenner (2004). Despite the percentage of undecided responses being the lowest among the nine statements, almost 22% of the respondents express uncertainty about this statement.

Respondents, on average, disagree with five other statements (21, 22, 23, 24, and 26) whose means differ significantly from 0 (undecided). Two of these statements (22 and 23) address the relation between firms with weak shareholder rights and their operating or market performance. As previously discussed, empirical research tends to support each of these statements. Specifically, managers tend to disagree with the following statements: corporate governance mechanisms are associated with long-term abnormal stock returns and accounting measures of profitability (21); firms with weak shareholder rights tend to exhibit persistent stock market underperformance (22); firms with weak shareholder rights tend to exhibit persistent operating underperformance (23); firms that manipulate their financial statements but subsequently take actions to improve governance tend to exhibit superior stock price performance (24); and a firm is likely to recover from poor performance more quickly by increasing the frequency of board meetings (26).

Several statements (25, 27, and 28) relate to actions of the board during a period of declining corporate performance. The majority of respondents agree that when a firm's performance has been deteriorating, the firm will be more likely to appoint outside directors to its board (25). The responses to this statement differ significantly from 0 (undecided). Evidence by Shivdasani and Zenner (2004) supports the generally positive response from managers. Mean response on two statements (27 and 28) about CEO replacements when a firm experiences performance declines do not differ significantly from 0. Evidence by Yermack (1996) supports the notion that as performance declines firms with large boards tend to be slower to replace their CEO than firms with smaller-sized boards (27). A fairly even distribution of responses occurs among agree (36.9%), undecided (29.2%), and disagree (33.8%) for the following statement: when a firm exhibits poor

performance, its board is more likely to quickly replace the CEO when directors are compensated in stock and the board is independent (28). Other empirical studies show mixed results on the overall rate at which different boards replace the CEO (Weisbach, 1988; Mikkelson & Partch, 1997; Geddes & Vinod, 1997; Perry, 2000).

4.5. Other Corporate Governance Issues

The last topic addressed by the survey involves whether corporate governance affects a firm's dividend payout, takeover vulnerability, credit rating, recognition of write-offs, cost of debt financing, and takeover premiums. Table 5 presents the survey results for six statements (29–34) about other corporate governance issues. Five of these statements (29, 30, 31, 32, and 33) deal with effects associated with weak or strong governance firms. The mean response differs from 0 (undecided) on four of the six statements (29, 31, 33, and 34).

The majority of the respondents (55.4%) disagree that firms with weak shareholder rights tend to pay out higher dividends (29). Disagreement with this statement conflicts with evidence by La Porta et al. (2000) showing that firms with stronger corporate governance practices and hence stronger shareholder rights have higher dividend payouts. When shareholder rights are weak, shareholders have less ability to influence managers to pay out dividends.

On the issue of whether corporate governance affects a firm's credit rating, the majority of the respondents (56.3%) agree that strong governance firms tend to benefit more from higher credit ratings than do weak governance firms (31). This generally positive view is consistent with findings by Ashbaugh-Skaife et al. (2005).

Respondents, on average, disagree that the bond market tends to view firms with strong anti-takeover provisions favorably, resulting in a lower cost of debt financing (33). In fact, only 26.1% of the respondents agree with this statement. Evidence by Klock et al. (2005) suggests that the bond market favorably views anti-takeover governance provisions.

Only a small percentage of respondents (4.6%) agree that a takeover-target firm will typically command a higher premium for acquiring its shares when more of its directors hold multiple board appointments (34). However, a large proportion of respondents (43.1%) are undecided about the accuracy of this statement. Evidence by Cotter et al. (1997) lends support to the belief that target companies subjected to takeover negotiations extract

Table 5. Corporate Governance Survey: Other Corporate Governance Issues.

Statement	Study	Agree % SA +2	A +1	% UND 0	Disagree % D −1	SD −2	N	Mean	SD	t-Value
29. Firms with weak shareholder rights tend to pay out higher dividends.	La Porta et al. (2000)	1.5	3.1	40.0	46.2	9.2	65	−0.585	0.768	6.141**
30. Weak governance firms tend to be taken over more often relative to strong governance firms.	Core et al. (2006)	0.0	5.0	43.8	21.9	9.4	64	−0.156	0.912	1.368
31. Strong governance firms tend to benefit more from higher credit ratings than do weak governance firms.	Ashbaugh-Skaife et al. (2005)	4.7	51.6	21.9	15.6	6.3	64	0.328	1.009	2.600*
32. Strong governance firms tend to recognize write-offs earlier than do weak governance firms.	Minnick (2004)	1.6	45.3	31.3	12.5	9.4	64	0.172	1.001	1.375
33. The bond market tends to view firms with strong anti-takeover provisions favorably resulting in a lower cost of debt financing.	Klock et al. (2005)	1.5	24.6	35.4	29.2	10.8	65	−0.246	0.985	2.014*
34. A takeover-target firm will typically command a higher premium for acquiring its shares when more of its directors hold multiple board appointments.	Cotter et al. (1997)	0.0	4.6	43.1	36.9	15.4	65	−0.631	0.802	6.343**

Notes: Managerial views of respondents from the Fortune 1000 on six statements (29–34) about other corporate governance issues in large, publicly held U.S. corporations in general are reported.
*, ** denote significance at the 0.05 and 0.01 levels, respectively.

higher premiums for their shareholders due to independent outside directors.

The mean responses do not differ from 0 (undecided) on two statements: weak governance firms tend to be taken over more often relative to strong governance firms (30) and strong governance firms tend to recognize write-offs earlier than do weak governance firms (32). Both statements have a large percentage of undecided responses (43.8% and 31.3%, respectively). Core et al. (2006) report takeovers for weak governance and strong governance firms are about the same. Empirical evidence by Minnick (2004) shows a close relation between write-offs and corporate governance, with well-monitored companies taking write-offs immediately after a problem. Because good corporate governance companies act quickly, the write-offs are substantially smaller than the average charge.

4.6. Views on Strong Corporate Governance

The final question in the survey asks respondents to indicate the most important step that a firm can take to ensure strong corporate governance. In response to this open-end question, the vast majority of responses fall into two areas. More than half (58.6%) of the 29 respondents indicate that strong corporate governance relates to the board of directors. Specifically, respondents suggest placing considerable emphasis on having independent directors who are active, experienced, and qualified. In addition, several respondents suggest mandating or improving annual board assessments. Next, almost a third (31.0%) of the respondents point to the importance of creating and maintaining a strong ethical culture to ensure strong corporate governance. This requires setting the tone at the top and being open and honest. Other suggestions leading to good corporate governance include: following regulations, providing performance-based compensation, and concentrating on increasing shareholder value.

5. CONCLUDING OBSERVATIONS

This study surveys top managers of Fortune 1000 companies to learn their views about issues involving corporate governance especially those related to firm performance. Our survey concentrates on how two internal control mechanisms – the board of directors and executive/director compensation and ownership – affect firm performance. Within a firm, these are primary

mechanisms that influence the degree to which management represents shareholders' interests.

The discussion and analysis of the previous sections reveals some interesting and perhaps surprising results. Although the small sample warrants caution in making broad generalizations, the results provide new and useful insights about how management views corporate governance. The most striking observation is that substantial differences exist between respondents' views on specific corporate governance issues and empirical evidence on these issues. With some exceptions, the views of responding managers appear at odds with the evidence provided in the literature on the majority of issues addressed.

Another important observation concerns the high proportion of respondents who are unable or unwilling to offer an opinion about whether they agree or disagree with specific corporate governance issues. Our survey evidence shows that at least a quarter of the respondents choose "undecided" as their response on more than 70% of the issues contained in the survey. Several possible explanations exist for this level of uncertainly or lack of opinion. Perhaps the most likely reason is that they have not previously considered some issues or formed opinions about them. Another explanation is that there is inconclusive empirical or anecdotal evidence on some issues examined in this study, which could lead to uncertainty on the part of respondents. This explanation assumes, however, that managers are aware of at least some of the empirical evidence on corporate governance.

Regarding the issue of whether board characteristics such as composition and size affect firm performance, responding managers generally agree that board composition but not size affects firm performance and market valuation. Evidence suggests that board composition may affect how the board completes particular tasks such as replacing the CEO and responding to takeover bids. Yet, most empirical studies indicate that only board size has a significant positive effect on overall firm performance. The weight of the evidence suggests no conclusive link between increasing board independence and improved overall firm performance.

In addition, management views tend to be inconsistent with empirical evidence involving the association between weak shareholder rights and a firm's operating and market performance. Respondents generally disagree that firms with weak shareholder rights tend to exhibit persistent stock market and operating underperformance. Empirical evidence lends support to the notion that firms with weak shareholder rights underperform. Yet, these same managers correctly recognize that firms with weak shareholder rights do not pay out higher dividends.

On the other hand, management views involving the use of compensation as an internal control mechanism, especially stock options, and several other issues tend to be consistent with existing empirical evidence. For example, managers tend to agree that compensating directors with stock options can help a firm better align the interests of its directors with its shareholders. They also agree that valuation multiples tend to be higher when a firm's executives and insiders own more of the firm's stock and stock options. Consistent with the literature, managers generally agree that strong governance firms tend not only to benefit from higher credit ratings, but also to recognize write-offs earlier than do weak governance firms.

Overall, our findings underscore the fact that substantial differences exist between managerial views and academic evidence concerning certain governance issues. Given the scope of our study, much more work remains to be done on corporate governance. Although we identify some differences, we still do not know why respondents hold their views or how much knowledge respondents have about empirical findings. Survey-based research can add an important dimension to the existing evidence on corporate governance by providing new insights about managerial views. As Bruner (2002) observes, researchers must look for patterns of confirmation across approaches and studies.

ACKNOWLEDGMENTS

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BOARD MONITORING AND ACCESS TO DEBT FINANCING

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ABSTRACT

Board monitoring should affect a firm's access to debt financing because it improves firm performance and the board is ultimately responsible for the firm's debt. In this study, we show empirically that access to debt financing indeed benefits in two ways from board monitoring: directly from the monitoring and indirectly from improvement in performance. The methodological challenge is in separating the two effects from each other and from those of other drivers of debt financing.

1. INTRODUCTION

Board monitoring of management behavior improves firm operating income (e.g., Eisenberg, Sundgren, & Wells, 1998; Vafeas, 1999; Bozec, 2005) and could lower lenders' risk because interest is paid out of operating income. As a result, a firm's access to debt may be enhanced at least indirectly by the board's effective monitoring of management behavior. Access to debt may also be improved directly by board monitoring because, by law, the board must approve and is, thus, responsible for banking relationships and a firm's debt. In fact, lenders do look to board monitoring of management behavior

as protection against agency problems (Ferris, Jagannathan, & Pritchard, 2003; Pope, Young, & Lin, 2003). Thus, a firm's access to debt financing should be enhanced both directly and indirectly by board monitoring.

We examine this implication of effective monitoring by the board for access to bank debt using data from a recent survey of small business financing. As pointed out by Berger and Udell (1995), small business is an ideal setting for testing theories about the agency problems of debt financing because it is where information asymmetry is most serious. The results show that board monitoring improves the firm's access to debt financing both directly and indirectly as implied by the literature. These effects are in addition to those provided by signaling, bonding, and relationship, the agency cost control mechanisms commonly suggested as solutions to the lender–borrower agency problems.

This study makes several contributions to the board monitoring and small business financing literatures. First, as far as we are aware, this is the first study to examine empirically the influences of board monitoring on access to debt financing of small firms. Second, the study contributes to the empirical evidence on solutions to the agency problems between lenders and borrowers. Third, the study makes a contribution to the literature on debt financing of small businesses, which play an important role in the economy (Coleman, 2002; Cavalluzzo, Cavalluzzo, & Wolken, 2002).

The chapter is organized as follows: in Section 2, we discuss the background for the study. Data and methodology are introduced in Section 3, followed by Section 4 which presents and discusses the results. Conclusions are made in Section 5.

2. EFFECTS OF BOARD MONITORING ON ACCESS TO DEBT FINANCING

Debt financing has been extensively studied by finance scholars.[1] The literature follows two directions. One views debt financing as balancing the benefits of leverage against the costs of bankruptcy, while the other focuses on the debt-engendered agency problems between owners and lenders. The two streams complement each other because resolution of agency problems affects both the benefits and risks of debt financing. This section briefly discusses the agency problems between owners and lenders and the literature on the monitoring role of the board. The discussion serves as background for the empirical methodology employed.

2.1. Agency Problems and Firm Access to Debt Financing

The idea that agents may pursue their self-interests at the expense of principals may be traced back to Adam Smith (1776). Recent discourse about this agency problem typically cites Ross (1973) and Jensen and Meckling (1976). Theoretical developments have pinpointed information asymmetry as the source of the problem and expanded the concept to cover all contracting, including that between lender and borrower (Myers, 1977; Smith & Warner, 1979; Stiglitz & Weiss, 1981). Two general types of agency problems arise from the different configurations of asymmetric information. Adverse selection arises before contracting when there is asymmetric information about the contracting agent's type, for example, ability and commitment of the agent. However, moral hazard surfaces when the asymmetric information is about the actions of the manager after contracting. In terms of debt financing, the moral hazard problem manifests itself as the owner–borrower changing the probability distribution of the cash flows to lenders after receiving the loan while the adverse selection problem, following Akerlof (1970), is one of the lender systematically overvaluing the debt by underestimating the risk.

Credible signaling by the borrower could reveal the true type and screening by the lender could force the agent to do so; these are the commonly suggested tools for dealing with adverse selection (Harris & Raviv, 1991). Bonding (Smith & Warner, 1979) and monitoring by the lender are recommended as solutions for moral hazard problems (Harris & Raviv, 1991).

2.2. Board Monitoring and Firm Access to Debt Financing

Researchers have studied extensively the role of the board in monitoring management behavior (e.g., Byrd & Hickman, 1992; Brickley, Coles, & Terry, 1994; Hermalin & Weisbach, 1998; Peasnell, Pope, & Young, 2005). Board size (Yermack, 1996), board composition (Hermalin & Weisbach, 1988; Shivdasani & Yermack, 1999), board activity (Brickley & James, 1987; Eisenberg et al., 1998; Klein, 1998; Vafeas, 1999; Xie, Davidson, & DaDalt, 2003), a director's affiliation (Brickley, Coles, & Jarrell, 1997), incentive compensation for board (Hermalin & Weisbach, 1991), and intensity of board activities (Jensen, 1993; Vafeas, 1999) are some board monitoring issues receiving attention in the literature. Positive impacts on firm performance are interpreted as happening because the benefits derived from controlling moral hazard problems through board monitoring are higher than the costs.

Related to debt financing, the monitoring typically discussed in the agency literature is monitoring by the lender. Corporate law, however, stipulates that the board must approve and is, thus, responsible for banking relationships and a firm's debt. As a result, lenders look to board monitoring of management behavior for protection against agency problems (Ferris et al., 2003). If the board includes representatives of lenders, these representatives will monitor the relationship between the firm and its lenders as well as that between managers and owners (Booth & Deli, 1999). Thus, we should expect effective board monitoring to directly improve a firm's access to debt financing.

In addition, research (e.g., Eisenberg et al., 1998) shows that board monitoring is positively related to the firm's operating income. Since interest on debt must be paid out of a firm's operating income, increasing the operating income improves the firm's ability to service its debt. Thus, a firm's access to debt should also be enhanced indirectly by improved firm performance as a result of the board's effective monitoring of management behavior. Determining the significance of these direct and indirect effects of board monitoring on debt financing is the main objective of this study.

Following previous researchers (Jensen, 1993; Vafeas, 1999), we focus on board monitoring in terms of board meeting frequency. Ceteris paribus, more active monitoring by the board with respect to the well-being of the firm can be expected to include more scrutiny of the firm's continuing ability to service the debt. At the very least, a higher board meeting frequency implies more time available for such monitoring. As a result of the high cost of board meetings, however, especially in terms of executive time in preparation and attendance, it is reasonable to have fewer board meetings when the firm is performing well, despite their potential to improve firm performance (Jensen, 1993), and to have more meetings when the firm is not. Consequently, the observed board meeting frequency of a firm is both past performance- and monitoring-induced. Vafeas (1999) shows that this is indeed the case for large U.S. publicly traded firms. As a result, testing whether board meeting frequency affects debt financing requires the separation of the monitoring-induced component of board activities from the past performance-induced component. Only when accessibility to debt financing is positively affected by the monitoring-induced component can one conclude that the evidence shows board monitoring to be an effective moral hazard control mechanism.

The relationship between board meeting frequency and performance may be further complicated by the implications of the pecking order hypothesis (Myers & Majluf, 1984). The hypothesis implies that firm growth is

constrained by the availability of internally generated cash flow. This means that the better the current performance of the firm, the less the firm will be constrained in its growth plans. But the more the firm plans to grow, the more frequently the board may have to meet to evaluate and approve the plans.

To summarize, board monitoring of managers should enhance a firm's access to debt financing directly and indirectly. If monitoring is measured in terms of board meeting frequency, then the monitoring-induced frequency must be separated from the current and past performance-induced frequencies. In the next section, we describe the data and the procedures used to test whether monitoring induced board meeting frequency indeed enhances a firm's access to debt financing.

3. DATA, MODELS, VARIABLES, AND ESTIMATION

3.1. Data

Our data are extracted from a 2001 Industry Canada survey on Financing Canadian Small- and Medium-Sized Enterprises (SMEs): Satisfaction, Access, Knowledge and Needs. The population was Canadian small firms with fewer than 500 employees, excluding non-profit organizations, holding companies, franchises, and those involved in outsourced government administration services. The mail survey instrument was mailed to 10,020 of these companies. The data set with 2,116 firms includes a rich collection of variables dealing with the agency problems between lender and borrower. Thus, it is ideal for testing the relationship hypothesized in this study.

The most serious validity problem with using the data set is that the identities of the sample firms and firm owners are not available to us. So we are unable to verify independently the self-reported data. In terms of statistical methodology, the two most serious problems are missing data and some poorly designed questions. We avoided using data from questions that we considered ambiguous and, to deal with the statistical issues, we tested for missing data bias and estimated the models with alternative proxies.

3.2. Variables

In this section, we discuss how the dependent, independent, agency, and control variables are measured. Following Berger and Udell (1995),

we study debt financing in terms of the firm's line of credit because it is how most small firms access debt financing.

3.2.1. Dependent Variable – ACCESSIBILITY

The amount of debt that a firm has in its capital structure is not a good measure of accessibility because one cannot tell whether it is determined by demand or supply (Petersen & Rajan, 1994). Neither is approval or rejection of a loan application. Furthermore, how much a firm finances with debt is affected by the cost of servicing the debt; thus, measuring access by one or the other does not provide a complete picture of accessibility. Therefore, we decided to measure accessibility by a borrower's satisfaction with the amount approved relative to that requested, the interest rate imposed, and the fees charged.

The respondents were asked to rate their satisfactions with the amount, interest rate, and fees on separate five-point Likert scales. If a respondent is very or totally satisfied with all three elements, the variable ACCESSIBILITY is assigned a value of one. If a borrower is less satisfied or dissatisfied with any of the three elements, ACCESSIBILITY is set to zero. In other words, debt financing is considered accessible for a borrower only when the borrower is very or totally satisfied with the amount approved relative to the amount requested, the interest rate imposed, and the fees charged.[2]

The reasoning is as follows. When a borrower is satisfied with the amount, interest rate, and fees, it means that either the interest rate and fees are lower than or the amount is greater than that on the demand function. Thus, measuring accessibility by satisfaction with all the terms of the line of credit implies that the terms offered by the lenders are equal to or better than those the borrowers were willing to accept.

3.2.2. Independent Variable – MONITORING

As mentioned earlier, we follow previous researchers (Jensen, 1993; Vafeas, 1999) and measure board monitoring by board meeting frequency. Board meeting frequency is usually measured as a continuous variable by researchers who study large publicly held firms (e.g., Vafeas, 1999; Xie, Davidson, & DaDalt, 2003); but we measure it here using a binary variable indicating whether the firm's board met more than twice a year. Communications with the people who designed the survey questionnaire indicates that board meeting frequency was measured this way because their experience suggested that this would strike a good balance between the response rate and the information collected. Using two meetings as the

cut-off is valid for the following reasons. First, small firms are likely to discuss company affairs in informal gatherings and not consider it a board meeting (Eisenberg et al., 1998). Second, they will have fewer long-term policy and strategic issues for the board to consider (Eisenberg et al., 1998). Third, board meetings are more expensive relative to the resources of a small firm. Therefore, small firms are unlikely to hold as many formal board meetings as large firms.

As discussed earlier, testing whether access to debt financing is affected by board monitoring as proxied by board meeting frequency requires the separation of performance-induced board meeting frequency from the monitoring-induced board meeting frequency. Therefore, we separate MONITORING, the monitoring-induced board meeting frequency, from the financial performance-induced meeting frequency using the following model:

$$BMF_t = f(ROA_t, \ ROA_{t-1}, \ \text{control variables}) + \varepsilon_1 \qquad (1)$$

where BMF_t is the board meeting frequency in the current year, ROA_t the return on asset in the current year, ROA_{t-1} the return on asset lagged one period, and ε_1 the residual.

Since the residual ε_1 is free of the influences of past performance and other explanatory factors, it may be interpreted as a measure of MONITORING, the monitoring-induced board meeting frequency. Thus, we set:

$$MONITORING = \varepsilon_1$$

Vafeas' (1999) model also includes firm performance that lagged two years. His findings indicate, however, that performance lagged two years has a negligible effect on board meeting frequency in the current year. Therefore, excluding this variable should not affect the model's ability to separate monitoring-induced board meeting frequency from performance-induced board meeting frequency.

The control variables are: firm growth in total assets (CHLOGTA), firm age (AGEFIRM), industry dummies, whether the firm is home-based (HOMEBASED), and R&D expenditure (R&D). We use growth rather than firm size, measured by total assets, because a growing firm should have more decisions for the board to make. It is possible that the older the firm the more structured and formal may be its decision-making processes and, thus, the more frequently the board meets formally. Different industries may differ in the number of issues for the board to decide. If a business is home-based, it is more likely to make decisions informally and require fewer meetings of the board. R&D expenditure has been found to influence board

meeting frequency (Vafeas, 1999). The board's decisions with respect to R&D expenditures are part of its responsibilities in monitoring managerial behavior. By including this independent variable and, as a result, excluding the impact of such monitoring activities on our measure of monitoring-induced board meeting frequency, we refine our measure of MONITORING with respect to its role in monitoring the lender–owner relationship.

3.2.3. Control Variable – Financial Performance (FP)

Financial performance (FP) of the firm affects access to debt financing in two ways. First, it enhances access because a more profitable firm should be able to borrow more or on better terms. Second, as discussed earlier, it affects board meeting frequency. As a result, the performance variables were used twice in the analysis – first to segregate the monitoring-induced board meeting frequency from the performance-induced frequency and then as a control variable in testing the effect of board monitoring on debt access.

The equity shares of small firms are generally not publicly traded and, as a result, neither their equity market-to-book ratio nor equity value is available. Thus, the FP for a small firm is typically measured by its pre-tax operating income (e.g., Berger & Udell, 1995). This measure is superior to net income because it avoids the effects of financing and tax which, in the small business, may be confounded by the owners' personal tax planning. Therefore, we use the pre-tax return on asset (ROA) as the performance measure.

3.2.4. Control Variables – Lender/Owner Agency Variables

Aside from monitoring, firms rely on signaling and bonding to minimize the agency problems in debt financing (Harris & Raviv, 1991; Smith & Warner, 1979). For small firms, developing a long-term relationship with the lender is an additional means of solving these problems (Petersen & Rajan, 1995; Berger & Udell, 1995). Essentially, a long-term relationship reduces the information asymmetry between the lender and borrower, thus minimizing both adverse selection and moral hazard problems.

We include two proxies for signaling. The first (SIGNAL1) is whether the owner has used a personal line of credit to help finance the business during the past three years. We interpret this as a credible signal of the owner's personal commitment to the business. The other one (SIGNAL2) indicates whether a person other than the owner is in charge of financial and/or accounting matters in the firm. By having a third party in charge of financial matters and reporting, the owner sends the signal that financial information supplied by the firm is less susceptible to manipulation by the owner.

This is because the owner always runs the risk of the financial person resigning if the owner insists on manipulating the financial data. The extent to which this is a good measure of the credibility of the financial information given to the lender depends on the integrity of the unrelated financial/ accounting person. But the cost of resigning is, ceteris paribus, lower for the unrelated person than for the related person. This is because, for the related person, resigning will also affect the kinship relation. SIGNAL1 is a dummy variable assigned a value of one if the owner has financed the business with personal credit while SIGNAL2 has a value of one if the person in charge of finance and accounting is not related to the owner and zero otherwise.

Researchers frequently measure relationship by the length of the institutional relationship between the firm and the lending institution. While it can be argued that if the relationship is not to the satisfaction of both bank and firm, the relationship would cease, the quality of the relationship may not be indicated by the longevity alone. A firm may have a relationship with the same bank but cannot form a personal relationship with the account manager because of turnover. Furthermore, the firm may have few other alternatives, especially when the banking market is highly concentrated. As Stiglitz and Weiss (1981) argue, adverse selection makes it difficult for firms to switch lenders. Therefore, we measure the strength of the relationship between the lender and the firm by three variables. They are: (i) whether the bank supported the firm when times were difficult (RELATION1), (ii) whether the bank was willing to negotiate credit terms (RELATION2), and (iii) account manager turnover (RELATION3). All three relationship variables were measured using a five-point Likert scale.

Due to the serious asymmetric information problems in small firms, lenders tend to require guarantees for the debt (Petersen & Rajan, 1994; Coleman, 2002). Guarantees, similar to personal collateral (Berger & Udell, 1995), complement monitoring because it is not or not as dependent on the firm's performance. We interpret this as a bonding variable. BONDING is measured by the level of borrowers' satisfaction with the guarantees required by the lending institution on a five-point Likert scale.

3.2.5. Control Variables – Manager/Owner Agency Variables

Owner–manager agency problems can affect a firm's access to debt financing because it also affects the FP of the firm. Theory predicts that, because many of the costs of owner monitoring are fixed, a shareholder must hold a large ownership share to be willing to engage in monitoring. Hence, the firm with a dominant shareholder should have more monitoring by the owner and be exposed to lower owner–manager moral hazard problems.

If the owner also manages the firm or if the owner is the founder, we should expect further reduction in owner–management agency costs. The lower agency costs should improve firm performance and may be shared with lenders in the form of lowered risk, thus increasing accessibility.

The owner–manager agency variables used are whether there is a dominant shareholder (DOMINANT), whether the firm is owner-managed (MANAGED), and whether the owner is the founder (FOUNDER). DOMINANT is a dummy variable with a value of one if the dominant shareholder holds more than 50% of the shares; MANAGED has a value of one if the firm is managed by the owner; and FOUNDER has a value of one if the owner is also the founder of the business. Whether the owner is the founder could make a difference because the founder may be more committed to the survival of the business.

3.2.6. Control Variables – Default Risk

As discussed earlier, access to debt financing is also affected by the default risk of the borrower. The data set does not contain information about the credit worthiness of either the firm, the owners, or the managers. Therefore, aside from the performance variables, we added size, growth, age of the firm, the stage of development of the firm, and the industry as proxies for a borrowing firm's default risk. Size is measured by LNEMPLOYEE, the logarithm of the number of employees; past growth by CHLOGTA, the change in logarithm of total assets; future growth by R&D expenditure as a percent of sales, age by LNAGEFIRM, logarithm of the reported age of the firm; and stage of development by four dummy variables: STARTUP, SLOWGROW, FASTGROW, and MATURE.[3] Nineteen industry dummies are used to classify the industries in which the sample firms operated because the firms are divided into 20 industries by Industry Canada.

3.2.7. Other Control Variables

Aside from factors related to default risk and the resolution of agency problems, researchers find that there are other characteristics of the firm and firm owner that may affect the small firms' access to debt financing (Coleman, 2002). For firm characteristics, researchers have considered whether the small business is home-based to be important. HOMEBASED is one if the firm is a home-based business. It could be taken as a measure of the owner's business sophistication. The other firm characteristic that we included is METROPOLITAN, whether the firm is located in an urban area, in case debt markets are different for rural and urban areas.

The owner of a small firm can be expected to have a more direct impact on the firm's performance than the shareholders of a large publicly held corporation. As Carroll and Mosakowski (1987, p. 572) observe: "small firms are often the embodiment of their owner-managers." Thus, we include education of the firm owner (ELEMENTARY, HIGHSCHOOL, and PSECOND), the natural log of owner's age (LNAGEOWNER), the owner's years of experience in the firm (FIRMEXP), whether the owner belongs to a visible minority (MINORITY), the owner's gender (GENDER), and the owner's mother tongue (ENGLISH, FRENCH, other).

Finally, debt financing through some types of lenders may be more accessible than through others. The lender type variable (CANBANK) indicates whether the lender is a Canadian chartered bank.

3.3. Model

The model used to test whether board monitoring (MONITORING) improves a firm's access to debt financing is the following:

$$
\begin{aligned}
\text{ACCESSIBILITY} = {} & \gamma_0 + \gamma_1 \text{MONITORING} + \gamma_2 \text{FP}_t \\
& + \lambda_3 \text{lender/owner agency variables} \\
& + \gamma_4 \text{manager/owner agency variables} + \gamma_5 \text{default risk} \\
& + \gamma_6 \text{control variables} + \varepsilon_4
\end{aligned}
\tag{2}
$$

This study's main research question is tested by the sign for γ_1. We use the lagged value of FP because the contemporaneous performance value would not be known to the lender at the time the terms are set.

Signalling, bonding, and relationship are the commonly suggested solutions to the lender–borrower agency problems. By including them, the manager–owner agency variables, FP, default risk, and the control variables, the coefficient for MONITORING should measure its incremental impact on access to debt financing.

3.4. Estimation and Tests

Logit analysis was used to estimate the model used to separate the monitoring-induced board meeting frequency from the performance-induced components. If board meeting frequency has a past performance-induced component, we should observe a statistically significant and

negative coefficient for the lagged performance variable. And if board meeting frequency has a current performance-induced component, we should observe a statistically significant and positive coefficient for the contemporaneous performance variable.

Estimating the main model used to test the main research question was quite involved because of the design of the survey instrument. Respondents were asked whether they applied for a line of credit. They were asked to proceed to questions about approval only if they had applied. Similarly, only those firms for whom the line-of-credit application was approved were asked to answer the questions about their satisfaction with the amount, interest rate, and service fees approved.

These contingency relationships could produce biases in the coefficients estimated if not corrected. This is because the coefficients estimated would have failed to consider the characteristics of those firms, for example, that did not apply because they judged correctly that their chances of getting approval was low or zero. Similarly, the coefficients based on the firms that responded to the satisfaction questions would not have incorporated the characteristics of those firms that did not receive approval. An estimation technique for dealing with these potential biases is the multi-stage probit analysis.[4]

A three-stage probit analysis based on both contingent variables APPLY and APPROVAL was used. The Inverse Mills' ratios (IMR) for APPLY and APPROVAL were used to correct potential sample selection bias in ACCESSIBILITY. The second IMR was then incorporated into estimating the final model. The coefficients for the IMRs should be significant if potential biases existed.

4. RESULTS AND DISCUSSION

Table 1 presents the descriptive statistics for the sample firms. A total of 35% of the firms applied for a line of credit and 85% of those who applied were approved.[5] Again, 44.5% of the firms who received approval were totally satisfied about the amount approved relative to that requested, interest rate charged, and service fees imposed. Most of them (78%) arranged their line of credit with banks instead of trust companies and others. Also, 32.4% of the firms' boards met more than twice a year. ROAs were highly positively skewed; average ROA was 34.0% in 1999 (median = 10.0%) and 33.1% in 2000 (median = 9.4%).

Table 1. Descriptive Statistics.

Variables	Mean	SD	N	Variables	Mean	S.D	N
ACCESSIBILITY	0.44	0.50	918	HOMEBASED	0.24	0.42	2,095
Board meeting frequency	0.32	0.47	2,088	CHLOGTA	0.18	0.46	542
APPLY	0.54	0.50	2,106	EMPLOYEE	22.36	45.67	2,076
APPROVAL	0.85	0.36	1,137	METROPOLITAN	0.20	0.40	2,116
ROA_{1999}	34.0%	142%	505	STARTUP	0.05	0.22	2,072
ROA_{2000}	33.1%	164%	570	SLOWGROW	0.50	0.50	2,072
RELATION1	3.29	1.27	1,273	FASTGROW	0.22	0.41	2,072
RELATION2	3.26	1.19	1,265	MATURE	0.17	0.37	2,072
RELATION3	3.60	1.26	1,275	AGEOWNER	46.8	10.8	2,031
BONDING	2.96	1.38	1,291	MINORITY	0.07	0.26	1,990
SIGNAL1	0.58	0.49	2,097	FIRMEXP	2.8	1.44	2,101
SIGNAL2	0.30	0.46	2,078	HIGHSCHOOL	0.35	0.48	2,083
DOMINANT	0.33	0.47	1,538	PSECOND	0.61	0.49	2,083
MANAGED	0.89	0.32	2,088	GENDER	0.78	0.41	2,093
FOUNDER	0.84	0.37	2,095	FRENCH	0.27	0.44	2,092
TA_{1999} (in millions)	2.7	8.01	558	ENGLISH	0.58	0.49	2,092
AGEFIRM	15.0	15.6	2,074	CANBANK	0.78	0.42	2,104

A total of 58% had an unrelated person in charge of finance and/or accounting matters. Also, 30% of the owners used personal credit to help finance the business. Again, 89% were managed by the owner and 84% of the owners were the founders. Also, 33% had a dominant owner holding more than 50% of the ownership shares. Average scores for relationships with lenders were between 3.2 and 3.6 out of 5, slightly above the midpoint.

Average firm assets were $2.7 million in 1999 and $3.2 million in 2000. A total of 23.5% were home-based. Also, 20% were in metropolitan areas and 72% described themselves as growing, 17% as mature, and 7% as winding down. Only 7% of the owners belonged to a visible minority group. Of the respondents, 78% were male, 35% had high school education, and 51% had post-secondary education. Francophones comprised 27% and 58% were Anglophones. The average work experience in the firm was 2.8 years.

4.1. Estimating the Monitoring-Induced Board Meeting Frequency

Table 2 presents the results from estimating the model used to separate the monitoring-induced board meeting frequency from those induced by performance. The coefficient for ROA_{1999} is negative and statistically significant. This is consistent with previous research (Jensen, 1993;

Table 2. BMF and Performance.

	Coefficient	Standard Error
Constant	−2.168***	0.767
ROA_{2000}	−0.056	0.112
ROA_{1999}	−1.007**	0.507
CHLOGTA	0.305	0.300
HOMEBASED	−1.022***	0.314
R&D	0.585	1.067
STARTUP	3.066***	0.936
SLOWGROW	2.026***	0.664
FASTGROW	2.415***	0.680
MATURITY	1.267*	0.695
Industry dummies	None significant	
Number of observations	453	
Pseudo R^2	0.127	

***p < 0.01; **p < 0.05; *p < 0.10.

Eisenberg et al., 1998; Vafeas, 1999; Xie et al., 2003). It confirms that board members meet more frequently when past performance is poor. The coefficients for firm growth (CHLOGTA), whether the business is home-based (HOMEBASED), and variables measuring firm's stage of development are also significant and their signs as expected; that for growth is positive, the one for business type is negative, and those for firm's stage of development positive. As discussed in the Methodology section, the residuals from this model were then defined as the monitoring-induced board meeting frequencies (MONITORING).

4.2. Effect of Board Monitoring on Debt Access

Table 3 presents the results of testing whether the monitoring-induced board meeting frequency (MONITORING) positively affects a firm's access to debt financing. First of all, the IMR is highly significant; this shows that the coefficients estimated needed the correction to avoid bias.

The coefficient for MONITORING is positive and significant at the 5% level. This indicates that monitoring-induced board meeting frequency does improve a firm's access to line of credit.

The coefficient for ROA_{1999} is also positive and significant, implying that profitability does enhance access to debt. Bonding, signaling, and relationship all appear to improve small firms' access to debt financing.

Table 3. Three-Stage Model: Monitoring and Debt Accessibility.

	Coefficient	Standard Error
CONSTANT	−4.354	4.481
MONITORING	0.457**	0.209
ROA$_{1999}$	0.393**	0.194
SIGNAL$_1$	0.961	0.604
SIGNAL$_2$	0.387	0.539
RELATION1	0.332	0.344
RELATION2	0.043	0.327
RELATION3	−0.091	0.189
BONDING	0.628***	0.184
DOMINANT	0.357	0.529
MANAGED	1.103*	0.610
FOUNDER	−0.041	0.486
LNAGEFIRM	−0.073	0.168
LNEMPLOYEE	−0.041	0.155
STARTUP	1.379	1.455
SLOWGROW	−0.602	0.786
FASTGROW	−1.309	0.835
MATURITY	−1.571*	0.875
HOMEBASED	−0.781	0.570
METROPOLITAN	−0.123	0.365
LNAGEOWNER	−0.562	1.474
MINORITY	−0.818	1.040
HSCHOOL	0.628	0.913
PSECOND	−0.011	0.883
GENDER	0.269	0.541
FRENCH	0.151	0.552
ENGLISH	0.320	0.498
CANBANK	0.806*	0.425
IMR	6.788*	3.615
Industry dummies	Mixed[a]	
Number of observations	197	
Pseudo R^2	0.343	

***p<0.01; **p<0.05; *p<0.10.
[a]Industry 4 (Transportation, Warehousing and Couriers), Industry 9 (Educational Services), and Industry 16 (Mining and Oil and Gas Extraction) are significant at the 5% level, whereas Industry 14 (Agriculture) is significant at the 10% level. Other industries are not significant.

The coefficient for BONDING (guarantees) is positive and significant. It appears that SIGNAL1 (using personal credit to help finance the business) and SIGNAL2 (having an unrelated person in charge of the firm's finance and accounting functions) are not as credible signals. The first could be because the personal credit used would no longer be available to support the

personal guarantee. RELATION1 (lender flexibility) also adds to debt accessibility. This is consistent with the conclusions made by Petersen and Rajan (1994) and Berger and Udell (1995) that the relationship between lender and borrower enhances accessibility.

Two of the manager/owner agency variables, DOMINANT ownership and owner MANAGED have positive and statistically significant coefficients; FOUNDER does not. As discussed earlier, agency theory predicts that if the firm has a dominant shareholder holding a large percentage of the shares and if the owner also manages the business, the owner–manager moral hazard problems should be less severe and the FP better. But an improvement in FP should benefit lenders and improve the firm's access to debt financing only if such improvements are shared with lenders. Therefore, these three sets of results are also consistent with shareholders having to share with lenders the benefits of board monitoring and improvements in FP.

The lender type variable shows that Canadian banks are quite accessible to Canadian small firms. None of the firm owner variables are significant and, among the firm variables, only the stage of firm development significantly affects accessibility. It appears that both growth and mature firms are more likely to be dissatisfied with their accessibility to debt financing.

In summary, the results presented earlier show that board monitoring improves a firm's access to debt financing. This improvement is in addition to the effects of signalling, bonding, and relationship which have been suggested and shown by previous researchers to be effective tools for controlling the lender–borrower agency problems. The results also suggest that the benefits from improvements in firm performance as a result of board monitoring are shared with lenders.

4.3. Robustness Tests

We tested the results for robustness by using alternative proxies for access to debt financing and FP. For accessibility, we used the average score for the three dimensions of debt financing: amount, interest rate, and fees. We also tried different definitions of satisfaction with the terms. We found no qualitative change in the results. For FP, we also used return on sales and industry average-adjusted ROA. Again, there was no qualitative difference in the results.

To check for multicollinearity, we examined the variance inflation factors (VIF) for the independent and control variables. The VIFs are all under 10,

indicating that any multicollinearity problem is not serious. Finally, we examined the potential endogeneity problem in the main model. A high board meeting frequency may be caused by a large amount of debt financing, because the board of directors may have to make more decisions with respect to the investing the funds obtained. Alternatively, if debt financing results in higher leverage, the board may have to meet more to deal with the higher risk of bankruptcy. Including instrumental variables for the endogeneity problem and a maximum-likelihood heteroskedastic probit estimation for the possibility of heteroskedasticity did not result in qualitative changes.

5. CONCLUSIONS

Research on the role and efficacy of the board of directors in monitoring managerial behavior has focused mainly on controlling the agency problems between managers and shareholders. In this study, we argue that unless the board is able to appropriate all of these benefits for the shareholders, lenders should also gain from the improvement in FP. Therefore, competitive lenders will make debt financing more accessible to borrowers with more effective board monitoring.

Our results show that board monitoring does improve a small firm's accessibility to debt financing. This improvement is incremental to the benefits yielded by signaling, bonding, and relationship which are commonly suggested as the tools for controlling the lender–borrower related agency problems of small firms.

By indirectly showing the positive benefits of board monitoring to lenders, the results suggest that shareholders and their board are not able to expropriate all of the benefits from board monitoring; it appears that they have to share these with lenders although, on the surface, they are the ones who pay for board monitoring. Therefore, aside from confirming the predictions of agency theory as applied to corporate governance, this study introduces a new set of questions for future research regarding board monitoring. How are the benefits of board monitoring shared between shareholders and lenders? Do lenders get a free ride? Should lenders be benefiting from board monitoring? Are there ways that shareholders can exclude lenders from sharing in the benefits? Should they?

This study also adds to the small body of evidence about how governance affects the performance of a small firm. With few exceptions, research on board activities tends to focus on large publicly traded firms. Aside from

access to debt financing, board activity most likely has the potential to affect many other aspects of the small firm's performance.

NOTES

1. For a review, see Harris and Raviv (1991).
2. As discussed later, we also used the average rating in the robustness tests.
3. When all three are zero, the firm is in the winding-down stage.
4. For a discussion about multi-stage probit analysis and how it deals with the potential biases, see Green (2003).
5. This high percentage of approval suggests strongly that those who were likely to be rejected did not apply. This strengthens the case for using multi-stage probit.

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INSTITUTIONAL INVESTORS AND DIRECTOR REMUNERATION: DO POLITICAL CONNECTIONS MATTER?

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ABSTRACT

This study examines the relationship between institutional investors and director remuneration in Malaysia against an important institutional backdrop of political connection. Our panel analysis of 434 firms from 1999 to 2003 finds a negative relationship between institutional ownership and director remuneration suggesting the effectiveness of institutional monitoring. Although we find no evidence to suggest a politically determined remuneration scheme, the negative relationship between institutional ownership and remuneration becomes less in politically connected firms. This suggests that political connections mitigate institutional monitoring in relationship-based economies.

1. INTRODUCTION

Institutional investors play an important role in shaping today's firms' corporate governance. Their increasing equity share ownership (Cornett, Marcus, Saunders, & Tehranian, 2007) coupled with a fiduciary cause (Hawley & William, 1997) to contributors and the public makes them an ideal monitor for firms. Evidence suggests that institutional investors are successful in this role. Karpoff (2001) documents numerous event-type studies where institutional investors are successful in shareholders activism, prompting firms to act in accordance with investors' needs. Further, cross-sectional studies have shown via firm performance (Brickley, Lease, Clifford, & Smith, 1988; Cornett et al., 2007), corporate governance (Abdul Wahab, How, & Verhoeven, 2007), earnings management (Chung, Firth, & Kim, 2002; Koh, 2003, 2007) and director remuneration (Hartzell & Starks, 2002; Almazan, Hartzell, & Starks, 2005) that institutional investors are indeed effective monitors.

In Malaysia, institutional investors are in the limelight since the Asian Financial Crisis in 1997/1998, identifying them as a future major corporate governance player in terms of reducing the inherent agency problem in Malaysian firms stimulated by concentrated shareholdings (Claessens, Djankov, & Lang, 2000). In 1999, a Finance Committee on Corporate Governance (FCCG) suggested a watchdog group, referred to as Minority Shareholder Watchdog Group (MSWG). The Employees Provident Fund (EPF), a major Malaysian institutional investor was designated to lead the group. In 2001, MSWG was established with five institutional investors as founders: EPF, Permodalan Nasional Berhad (PNB), Lembaga Tabung Angkatan Tentera (LTAT), Pilgrim Fund Board or Lembaga Tabung Haji (LTH) and Pertubuhan Keselamatan Sosial (PERKESO).

Despite the "hype" of institutional reform, evidence on them mitigating agency costs is scarce, a view expressed by Claessens and Fan (2002). As such this study fulfils the gap by examining the relationship between institutional investors and director remuneration. Questionable top management remuneration is often cited as one of the series of possible reasons for the Asian Financial Crisis (Abdul Rahman, 2006), which might not truly reflect the financial illness faced by Malaysian firms.[1] Further, Hassan, Christopher, and Evans (2003) state the need for such study on director remuneration since board of directors is the first level of agent in the agency–principal relationship in a firm.

Director remuneration plays a fundamental role in attracting and maintaining quality managers and provides motivation for executives to

perform their duties in shareholders' best interest (Anderson & Bizjak, 2003). Further, it is argued that a remuneration scheme is an important corporate governance tool in resolving the managers–shareholders conflict (Dong & Ozkan, 2008). The literature suggests that institutional investors may help to reduce the agency conflicts between executives and shareholders and hence have an impact on remuneration policy (Hartzell & Starks, 2002; Khan, Dharwadkar, & Brandes, 2005; Dong & Ozkan, 2008).

An important aspect of our analysis is addressing the role of political connections as a determinant of director remuneration in Malaysian firms. Gomez and Jomo (1999) and Johnson and Mitton (2003) explain that the phenomenon of politically connected firms in Malaysia is rather unique compared to similar firms in capital markets around the world, due to their diverse ethnic ownership and were created to ensure a fair distribution of corporate wealth among the major ethnic groups. Further, Gomez (2002) argues that the multi-faceted relation between business and politics in East Asia (including Malaysia) attests to the notion of "relationship-based" (with political connections being an important form of relationship) or "crony" rather than "market-based" capitalism. In a cross-country study on corporate bailouts and political connection, Faccio, Masulis, and McConnell (2006) document that from 1997 to 2002, the number of politically connected firms in Malaysia is 81, second to the United Kingdom, which recorded 118 such firms. Considering the size of the Malaysian capital market relative to that in the United Kingdom, the proportion of politically connected firms in Malaysia is therefore staggeringly high. Our study also fulfils the gap highlighted by Miller (2004) who argues that cross-sectional cross-country level analysis suffers from noisy variables and correlated omitted variables. Miller (2004) suggests that a more focused study on a particular country would allow timely and proper testing of the problem at hand.

Since director remuneration is deemed to be another important corporate governance variable, politician should exert influence on them as a tool to monitor the directors. Therefore, we should see a negative relationship between political connection and director remuneration. Alternatively, since these politically connected firms in relationship-based economies are controlled or managed, directly or indirectly by politicians, we should observe that the directors themselves have control on the remuneration scheme, thus a positive relationship exist between political connection and director remuneration.

In addition, we address the element of investors' heterogeneity across institutional investors with respect to their relationship with the firms. Brickley et al. (1988), Chaganti and Damanpour (1991), Almazan et al. (2005) and Cornett et al. (2007) argue that institutional investor–firm relationship

affects the monitoring effectiveness of a particular institutional investor.[2] The findings of these studies suggest that institutional investors that do not have business relationships with the firms are effective monitors, since they are not being pressured by the firms' management to agree with their decisions.

Equally important, we explicitly examine the individual effect on director remuneration of large Malaysian institutional investors, namely EPF, PNB, LTAT, LTH and PERKESO. Examining their impact on director remuneration provides a useful insight on their governance effectiveness. Further, these institutional investors are either directly or indirectly managed/controlled by the government.

Finally, in addition to the unique representation of Malaysian institutional investors, which are highly dominated by government control or management, we examine the moderating effect of political connection and institutional investors with director remuneration. It is essential to examine such relationships since they would reflect the effectiveness of institutional monitoring in politically connected firms and thus on director remuneration.

To conduct our study, we incorporate information on 434 firms listed on Bursa Malaysia during the period 1999–2003. Using cash-based director remuneration, we find a negative relationship between institutional ownership and director remuneration suggesting that institutional investors do monitor the firms. However, we find the negative relationship only exists for executive remuneration. A positive relationship is found between institutional ownership and non-executive remuneration that suggests that institutional investors' could play an "indirect" monitoring role by providing incentives for the non-executive directors in seeking quality boards. However, the economic impact of the negative relationship between institutional ownership and director remuneration is minimal. An increase of one standard deviation of institutional ownership results in only a drop of 0.11 percent in total director remuneration.

Our further analysis finds a negative relationship between pressure-insensitive investors and director remuneration. Though we find no evidence that political connection is an important determinant for director remuneration, further analysis shows that politically connected firms with a high level of institutional ownership have a positive effect on director remuneration, suggesting politically connected firms mitigate the effectiveness of institutional monitoring.

In the next section, we provide a background on the Malaysian institutional investors followed by hypotheses development in Section 3. Research methods and data description are discussed in Section 4, and Section 5 presents the results. Section 6 concludes.

2. INSTITUTIONAL BACKGROUND

As at 2003, total institutional shareholdings in Malaysia stood at approximately 13 percent of the total market capitalisation of Bursa Malaysia. Although relatively low compared to those in developed countries, institutional shareholdings in Malaysia are high compared to most other nations in the region. This is a primary consequence of the 1970 New Economic Policy (NEP), which establishes Malaysian institutional investors, and aims to reduce equity ownership imbalance between the various ethnic groups[3] through increasing Bumiputera equity ownership in the capital market (Gomez & Jomo, 1999; Tan, 2004).[4]

EPF, a mandatory pension fund for all employees and run by the federal state (Akhtar, 2001), is easily the largest institutional investor in Malaysia. EPF has total assets in excess of US$50 billion, which is more than half of the nation's GDP (Thillainathan, 2000; Akhtar, 2001). An interesting feature of EPF is the presence of strong government control. For example, Malaysian law requires EPF to invest 70 percent of its funds in Malaysian government securities, whereas its investment in the domestic stock market cannot exceed 25 percent. EPF is also prohibited from making overseas investments (Thillainathan, 2000).

The next major institutional investor is PNB, established in 1972, the first unit trust ("ownership-in-trust") established in Malaysia to encourage savings by Bumiputeras. It started with a single unit trust called Amanah Saham Nasional (ASN) set up in 1981, but now has multiple unit trusts that cater for all groups of people such as the youths (e.g., Amanah Saham Didik) and the non-Bumiputeras (e.g., Amanah Saham Malaysia). These unit trusts act as savings schemes that pay competitive dividends (average of nearly 8 percent over the past 10 years) to the unit holders (Gomez & Jomo, 1999). As at the end of 2003, PNB managed over RM 15 billion worth of public and private equity in Malaysia, representing about two-thirds of its total investment (www.pnb.com.my).

Next is Lembaga Tabung Angkatan Tentera, better known as LTAT, established in August 1972 by an act of Parliament. LTAT serves as a superannuation fund for the Armed Forces of Malaysia. Similar to EPF, its objectives are to provide retirement and other benefits to members of the Armed Forces (compulsory contributors) and to enable officers and mobilised members of the volunteer forces in the service to participate in a savings scheme.

Lembaga Tabung Haji (LTH), established in 1962, aims to encourage Malaysian Moslems to save for a journey to Mecca for pilgrimage.

LTH's role has evolved from a mere saving depository to providing Malaysian Moslems some returns on their investment. Like other major institutional investors (EPF, LTAT and PNB), LTH's investment advisory board includes Islamic scholars who must make sure that all investments are in accordance with *syariah*.[5]

Finally, there is PERKESO established in January 1971 by virtue of another act of Parliament through the Social Security Act 1969. PERKESO serves as an insurance scheme for all Malaysian working in either the public or the private sector. PERKESO's main objective is to ensure and guarantee the timely and adequate provision of benefits in a socially just manner and to promote occupational health and safety. Similar to the other institutional investors mentioned above, PERKESO has an investment advisory board consisting of various representatives from the government, employers and employees.

As the domestic financial system grew around commercial banks, other institutional investors also began to play a part in the domestic financial system. Among these are foreign institutional investors such as California Public Employees' Retirement System (CalPERS), Teachers Insurance and Annuity Association-College Retirement Equities Fund (TIAA-CREF), United Nation Pension Funds and State of Ohio Retirement Scheme. Collectively foreign institutional investors account for approximately 1 percent of total institutional ownership in Malaysia.

3. HYPOTHESES DEVELOPMENT

Research contends that large, individual owners can effectively monitor agents and reduce agency costs because of their higher stakes and relatively lower coordination costs compared with more dispersed, individual owners (Shleifer & Vishny, 1997). Similarly, we argue that large institutional investors can and will monitor for several reasons. The increasing level of institutional investors' equity prompts them to monitor the firms more effectively and efficiently (Brickley et al., 1988; Cornett et al., 2007). In addition, these investors might face liquidity problems (Coffee, 1991; Maug, 1998) when it comes to disposing of their shares, thus initiate further incentives for them to monitor the firms. As large shareholders, institutional investors would be expected to implement a pay-setting procedure that would more closely align the interests of managers and shareholders. For example, they can do so by strengthening the pay–performance link and/or restraining the level of remuneration.

In the Malaysian capital market, especially after the Asian Financial Crisis, institutional investors are expected to play a major role in relation to shareholders' protection. This has been highlighted by the FCCG in their report stating the need of a minority shareholders watchdog group lead by institutional investors (FCCG, Chapter 6 paragraph 9.1). This event could be considered the results of pressure by the government that could lead to effective monitoring by institutional investors. Further, the institutional investors might be pressured by the media to act according to the best interest of shareholders (Wu, 2004).

Similarly, in terms of expertise, large institutional owners have stakes in many organisations, as well as experienced professionals to monitor their investments, and are therefore more effective than dispersed individual owners in influencing compensation arrangements (Shleifer & Vishny, 1997). Combining the agency theory arguments with concentration facets of institutional ownership, we expect that the greater the holdings of the largest institutional owners or the greater the number of blockholders, the greater their ability to rein in salaries, options and total compensation. In addition, evidence suggests that large institutional investors may negotiate privately with management to influence them in a manner consistent with the investors' interests (Carleton, Nelson, & Weisbach, 1998). Based on the arguments presented above, we posit a negative relationship between institutional ownership and director remuneration.

Cosh and Hughes (1997) examine the link between executive remuneration and firm characteristics in the UK and find no appreciable influence of institutional investors. Recently, examining the level of CEO compensation for a sample of 414 large UK companies, Ozkan (2007) finds that institutional ownership has a significant and negative impact on CEO compensation. Studying a sample of US firms, Hartzell and Starks (2002) find that institutional ownership is positively related to pay–performance sensitivity and negatively related to remuneration. Khan et al. (2005) find that a higher level of concentration is associated with a lower level of remuneration.

The above hypothesis, however, assumes that institutional investors are homogenous, which means they are of the same size, similar investment strategies and face similar limitations. Institutional investors are in fact heterogeneous in size and investment strategies. Thus they differ in their ability to monitor firms. Institutional investors such as pension funds and state-owned cooperations are known to be good monitors of the firms since they are big in size (Jennings, 2005), subject to fiduciary duties to their contributors (Hawley & William, 1997), have long-term investment plans (Bushee & Noe, 2000), and do not face liquidity needs (Maug, 1998).

Past studies have shown that these institutional investors are quick to respond to corporate governance needs of a firm (Smith, 1996) by voicing their worries either by voting or through media. Therefore, consistent with current literature (Brickley et al., 1988; Chaganti & Damanpour, 1991; Cornett et al., 2007), we classify these institutional investors as pressure-insensitive investors. Since these investors do not face any obstacle to monitoring and can act independently, we predict the negative relationship between institutional investors and director remuneration is stronger for pressure-insensitive investors.

However, institutional investors such as insurance companies, banks and financial institutions face liquidity problems due to the nature of their business (Bushee, 2001), and thus they usually invest a smaller volume in the firms. Since these institutional investors require quick returns to accommodate their business, they are usually subject to managerial pressure to agree with the firms' managerial decisions and to be inactive in monitoring the firms. We classify these institutional investors as pressure-sensitive investors. Since these investors face limitations in monitoring the firms and are subject to managerial pressure, we predict a non-directional relationship between pressure-sensitive investors and director remuneration.

Based on 1914 firms over the time period from 1992 through 1997, Almazan et al. (2005) find active institutional investors can provide more intense monitoring of corporate management.[6] In addition, they find pay-for-performance sensitivity is positively related to the concentration of active institutional investors.

3.1. Political Connection

Malaysia presents a unique racial-based political scene. The political environment relies upon a strong inter-racial unity between the majority of Bumiputeras,[7] Chinese and Indians, which ultimately form the current National Front that governs Malaysia. Furthermore, this shapes the capital market that is ethnically influenced since the introduction of National Economic Policy in 1970, primarily to eradicate wealth imbalance between the races in Malaysia. One result is that Bumiputera firms are given various forms of support ranging from financing to investment opportunities (Gomez & Jomo, 1999). The policy to support Bumiputera firms forms an important link between politics and business in Malaysia.

The main drive for political connection is strong evidence on political involvement in the capital market (Johnson & Mitton, 2003; Faccio et al., 2006).

The notion of political involvement over firms' decision making is important, especially in relation to corporate governance. There are two broad views on the effects of political connection. The first view, held by political theorists such as North (1990) and Olson (1993), generally contends that those in power share policy to stay in power and amass wealth. According to this (cynical) view, politician might use their influence to increase director remuneration, ignoring the needs of increasing share-holders' wealth. In the context of a ''relationship-based'' capitalism, as argued by Gomez (2002), it is logical for firms with political connections to have a *personal* dimension based on, for example, informal ties between firms and politicians. Politically connected firms might serve the politician's personal interests and might channel firms' resources to increase director remuneration, thus resulting in a positive relationship between political connection and director remuneration.

The second, more benevolent view of government is illustrated by Gerschenkron (1962), who argues that in some cases, economic institutions are not sufficiently developed for private institutions to play a crucial development role. This is further supported by Chang and Wong (2004) who state that political involvement in a firm is to pursue political interest and social objectives. In addition, their presence is merely to correct any market failures, which in this case would be the monitoring of director remuneration. Moreover, we argue that for the politician to shift the public's eye view on their involvement, they might take an active role and monitor director remuneration suggesting a negative relationship between political connection and director remuneration. Based on these arguments, we posit a non-directional relationship between politically connected firms and director remuneration.

Since most of the institutional investors in Malaysia are government controlled, they might be influenced by politicians. The main institutional investors in Malaysia have an investment advisory board that mainly consists of ministers or individuals elected by the ruling party to monitor the investment made by the institutional investors.[8] However, political presence in institutional investors is to improve social obligation (Chang & Wong, 2004), which in this case requires institutional monitoring of director remuneration. Further, politicians have an incentive to prevent controlling shareholders and managers from engaging in behaviour that reduces the amount of resources over which politicians have discretion (Brada, 1996). If the above arguments prevail, a negative relationship should exist between institutional investors in politically connected firms and director remuneration.

However, politicians might use institutional investors to pursue their own interest, thus channelling all available resources to justify their own needs. This view suggests a positive relationship should exist between institutional investors in politically connected firms and director remuneration. Therefore, based on the arguments presented above, we predict a non-directional relationship between institutional participation in politically connected firms and director remuneration.

4. RESEARCH METHODS AND DATA DESCRIPTION

The sample covers a 5-year period, 1999–2003, for 434 firms from the Bursa Malaysia Main Board Index. We have an unbalanced panel data with 1,875 firm-year observations. We include only cash-based compensation components for the sample period. Although disclosure for director remuneration in Malaysia has significantly improved following the incorporation of MCCG, the remuneration information is not available in electronic form and thus must be hand-collected from annual reports. The annual reports are available from Bursa Malaysia (www.bursamalaysia.com) and Mergent Online databases. This study uses period seemingly unrelated regressions (SUR) to handle both heteroskedasticity and contemporaneous correlations in each cross-section. We posit the following regression analysis, with the experimental variables in bold:

$$
\begin{aligned}
LN(\boldsymbol{DIRREM})_{it} = {}& a_0 + \boldsymbol{a_1 INSTOWN}_{it} + \boldsymbol{a_2 POLCON}_{it} \\
& + \boldsymbol{a_3 INSTOWN}_{it} * \boldsymbol{POLCON}_{it} + a_4 ROA_{it} \\
& + a_5 ROR\_MADJ_{it} + a_6 MANOWN_{it} + a_7 BOARDIND_{it} \\
& + a_8 MTBV_{it} + a_9 BETA_{it} + a_{10} DYIELD_{it} + a_{11} LNASSETS_{it} \\
& + a_{12} DEBT_{it} + a_{13} INDUSTRIES_{it} + a_{14} PERIOD_{it} + e_{it}
\end{aligned}
$$

4.1. Dependent Variable(s)

The main dependent variable for this study is total cash-based director remuneration (*DIRREM*), which consists of both executive and non-executive remunerations. Murphy (1999) draws a distinction between cash remuneration, which includes base salary and annual bonus and total remuneration, which also includes incentive components such as stock options and long-term incentive plans. The salary plus bonus remuneration

measure, which is applied in this study, has been widely used in prior research (e.g. Jensen & Murphy, 1990; Ozkan, 2007).

The executive director remuneration (*EXECREM*) consists of salary, fees and allowances, benefits and bonuses, whereas non-executive director remuneration (*NEDREM*) only consists of fees and allowances, benefits and bonuses.[9] All remuneration variables are based on logarithm transformations, since skewed distributions can weaken statistical relationship and lead to heteroskedasticity (Tabachnik & Fidell, 1996).

4.2. Independent Variables

The main independent variable for this study is institutional ownership (*INSTOWN*), based on the top five (5) institutional investors in each firm.[10] The motivation behind the usage of this variable is to capture the effectiveness of institutional monitoring (Hartzell & Starks, 2002). We operationalised the institutional ownership into several other measures, consistent with other studies (Brickley et al., 1988; Almazan et al., 2005; Cornett et al., 2007). The first measure is pressure-insensitive institutional investors' (*INSENSITIVE*), which consists of pension funds, state-owned corporations and the Pilgrim Fund Board, whereas the second measure is pressure-sensitive investors (*SENSITIVE*) consisting of insurance companies, banks and financial institutions. Finally, the third group/measure is of institutional investors that do not fall on either group mentioned earlier are classified as pressure-indeterminate (*INDETERMINATE*) institutional investors.

To capture the effect of political connection, we include *POLCON*; a dummy variable that is one if the firm is politically connected and zero otherwise. The list of politically connected firms, provided in appendix is derived from Johnson and Mitton (2003),[11] Mohamad, Hassan, and Chen (2006) and the Khazanah Berhad[12] website (www.khazanah.com.my). Further, we include an interaction variable (*INSTOWN*POLCON*) to capture the moderating effect of institutional investors' involvement in politically connected firms on director remuneration.

4.3. Control Variables

We include several control variables. The first control variable is managerial ownership (*MANOWN*). Directors with a low level of shareholdings are more likely to be motivated by incentives provided through remuneration

(Ozkan, 2007), and therefore we predict a negative relationship between *MANOWN* and *DIRREM*.

Jensen and Murphy (1990) show that directors in better performing firms receive greater levels of remuneration. Consistent with other studies (Anderson & Bizjak, 2003; Ozkan, 2007), we include firm performance measures as determinants for director remuneration which consists of both accounting and market measures of performance. Our accounting measure of performance is return on assets (*ROA*), which is total earnings before interest and tax divided by total assets while market-adjusted continuously compounded annual share return (*ROR_MADJ*) is our market measure of performance.[13] We predict a positive relation between performance measures (*ROA* and *ROR_MADJ*) and *DIRREM*.

We include a corporate governance variable, which is the board of director level of independence (*BOARDIND*), widely believed to play an important role in monitoring management. The non-executive directors who are not full-employees of the firm are believed to play a larger role in monitoring managers than executive directors (Ozkan, 2007). This is further supported by their role posited by MCCG in Part 2 para III, stating that independent directors need to make up at least one-third of the board of directors for them to be effective. Fama and Jensen (1983) argue that non-executive directors are likely to have an incentive to ensure the effective running of a company because independent directors are viewed to have less incentive to provide effective monitoring. We posit a negative relationship between *BOARDIND* and *DIRREM*. Ozkan (2007) finds a positive relationship between the proportions of non-executive directors with CEO compensation, suggesting that non-executive directors are less efficient in monitoring than executive directors.

Smith and Watts (1992) argue that firms with growth opportunities are likely to use incentive-based compensation since it is more difficult to observe action of managers in those firms. We use market to book value (*MTBV*) as a proxy for growth opportunities. In addition, we include market risk (*BETA*), which is measured as the beta coefficient obtained from a regression of monthly stock returns on monthly market returns using price data from 1995 to 2003. We argue that riskier firms are ready to provide higher remuneration for the directors.

Further, we include dividend yield (*DYIELD*) as another determinant for director remuneration whereby a positive relationship is predicted. Jensen and Murphy (1990) also argue that directors in larger firms earn higher remuneration, and thus we include natural logarithm of total assets (*LNASSETS*) to control for firm size effect. In addition, we argue that

highly levered firms are riskier and directors will seek higher remuneration to compensate such risk. Therefore, we include a leverage variable, *DEBT* which is the total debt divided over total equity.

Industry dummies that take a value of one for firms belonging to the construction (*CONSTRUCTION*), consumer (*CONSUMER*), finance (*FINANCE*), high technology (*TECHNOLOGY*) and other (*OTHER*) sectors and zero otherwise are included to control industry effects. Finally, we include year dummies (*PERIOD*) that take the value of one for each of the test years and zero otherwise for any unobserved effect during the test period.[14]

4.4. Descriptive Statistics

Table 1 reports the descriptive statistics for the sample of 434 Malaysian firms for the period 1999–2003. Panel A of Table 1 exhibits the descriptive statistics for director remunerations. Total director remuneration (*DIRREM*) averages Ringgit Malaysia (RM) 1.83 million, with a maximum of RM 67.60 million. Further, the mean (median) for *EXECREM* and *NEDREM* is RM 1.568 (RM 0.821) and RM 0.262 (RM 0.132), million respectively. The components for executive director remuneration (*EXECREM*), salary (*EXECSAL*), fees (*EXECFEES*), benefits (*EXECBEN*) and bonus (*EXECBON*) averages RM 1.309, RM 0.0609, RM 0.0535 and RM 0.0144 millions, respectively. However, *NEDFEES*, *NEDBEN* and *NEDBON* which are elements for non-executive directors averages RM 0.245 million, RM 7074.07 and RM 6548.095, respectively. The descriptive findings suggest the obvious that firms allocate more remuneration for executive directors than non-executive directors.

Panel B of Table 1 describes the institutional ownership data used in this study. The mean (median) top five (5) institutional ownership (*INSTOWN*) of sample firms is 12.645 (5.774) percent with a range between zero and 90.55 percent. Pressure-insensitive institutional investors (*INSENSITIVE*) hold on mean (median) 7.093 (2.123) percent while pressure-sensitive (*SENSITIVE*) and indeterminate (*INDETERMINATE*) investors hold on average 1.219 and 4.333 percent of shareholdings, respectively. On average, *PNB* holds the highest institutional shareholdings at 4.333 percent, whereas *EPF* is a close second at 2.568 percent. *LTAT*, *LTH* and *PERKESO* average 0.900, 0.870 and 0.051 percent, respectively. These five institutional investors hold, collectively 8.722 percent, which is 68 percent of the total institutional investment in Bursa Malaysia Main Board firms during the test period.

Table 1. Descriptive Statistics.

	Mean	Median	Maximum	Minimum	Standard Deviation
Panel A: Directors remuneration					
DIRREM (million)	1.830	1.059	67.597	0.000	3.831
EXECREM (million)	1.568	0.821	66.743	0.000	3.765
EXECSAL (million)	1.309	0.695	61.793	0.000	3.335
EXECFEES (million)	0.0609	0.000	7.050	0.000	0.288
EXECBEN (million)	0.0535	0.000	6.603	0.000	0.217
EXECBON (million)	0.144	0.000	31.639	0.000	0.909
NEDREM (million)	0.262	0.132	6.984	0.000	0.453
NEDFEES (million)	0.245	0.116	6.984	0.000	0.466
NEDBEN	7074.070	0.000	1.249	0.000	0.0420
NEDBON	6548.095	0.000	1.000	0.000	0.0561
Panel B: Institutional ownership					
INSTOWN	12.645	5.774	90.553	0.000	18.031
INSENSITIVE	7.093	2.123	78.566	0.000	13.286
SENSITIVE	1.219	0.000	74.254	0.000	4.043
INDETERMINATE	4.333	0.000	75.269	0.000	10.700
EPF	2.568	0.291	63.025	0.000	4.942
PNB	4.333	0.000	75.269	0.000	10.700
LTAT	0.900	0.000	74.545	0.000	5.649
LTH	0.870	0.000	29.713	0.000	3.078
PERKESO	0.051	0.000	2.944	0.000	0.228
Panel C: Firm characteristics					
MANOWN	7.359	0.439	79.773	0.000	14.085
ROA	4.891	4.581	140.162	−164.028	11.899
ROR_MADJ	−6.429	−5.371	169.764	−274.946	34.786
BOARDIND	0.363	0.333	0.857	0.000	0.128
MTBV	1.289	0.910	18.830	−15.650	1.841
BETA	1.124	1.127	3.045	0.126	0.353
DYIELD	2.284	1.660	38.480	0.000	2.646
ASSETS (million)	3007	576.0	159800	2.280	10820
DEBT	0.461	0.277	8.718	−6.436	0.861
POLCON	0.215	0.000	1.000	0.000	0.411

Notes: DIRREM is the total director remuneration. *EXECREM* and *NEDREM* are executive and non-executive director remuneration, respectively. *EXECSAL*, *EXECFEES*, *EXECBEN* and *EXECBON* are executive director salary, fees and allowances, and benefits and bonus, respectively. *NEDFEES*, *NEDBEN* and *NEDBON* are non-executive director fees and allowances, benefits and bonus, respectively. *INSTOWN* is the percentage shareholdings by the top 5 institutional investors. *INSENSITIVE*, *SENSITIVE* and *INDETERMINATE* are pressure insensitive, sensitive and indeterminate investors, respectively. *EPF*, *PNB*, *LTAT*, *LTH* and *PERKESO* denote Employees Provident Fund, Permodalan Nasional Berhad, Lembaga Tabung Angkatan Tentera, Lembaga Tabung Haji and Pertubuhan Keselamatan Sosial, respectively. *MANOWN* is the total percentage shareholdings of the board of directors. *ROA* is the earnings divided by total assets. *ROR_MADJ* is the continuously compounded annual market-adjusted returns. *BOARDIND* is the proportion of independent directors on board of directors. *MTBV* is the market to book value. *BETA* is the systematic risk (beta) obtained by regressing 5 years of monthly share returns against market returns. *DYIELD* is the dividend yield. *ASSETS* is the total assets. *DEBT* is the total debt over total equity. *POLCON* gives value to one if the firm is politically connected and zero otherwise.

Panel C of Table 1 reports the firms' descriptive statistics. The mean (median) managerial ownership (*MANOWN*) is 7.359 (0.439) percent of shareholdings with a range between zero and 79.773 percent. The mean (median) accounting firm performance (*ROA*) is 4.891 (4.581) percent whereas firm market performance (*ROR_MADJ*) is −6.429 (−5.371) percent.[15] The negative market-adjusted returns are the result of the Asian Financial Crisis aftermath. The mean (median) proportion of independent directors on the board (*BOARDIND*) is 0.363 (0.333) percent, which is slightly higher than the one-third required by the MCCG for listed firms. Market to book value (*MTBV*) is a proxy for investment opportunity and averages 1.289 whereas the market risk (*BETA*) averages 1.124, indicating firms are riskier than the market. Sample firms average RM 3.007 billion in total assets (*ASSETS*) with a range between RM 2.28 million and RM 159.8 billion. *DEBT* averages 0.461 and the negative figure of −6.436 indicate the inclusion of PN4 firms.[16]

5. RESULTS

5.1. Univariate Analysis

Table 2 presents both the Pearson and Spearman correlations for the test variables. When we observe Pearson correlations, *DIRREM* and *EXECREM* are negatively correlated with *INSTOWN*, but positive correlations are recorded with these variables using Spearman rank method. Both correlation methods, however, records a positive relationship between *NEDREM* and *INSTOWN*. The result shows that the measures of director remuneration are negatively related to *BOARDIND* providing initial support of board monitoring on director remuneration. No other correlations between variables are worth noting here.

Table 3 exhibits univariate analysis for the test variables between politically connected and non-politically connected firms. Results show that politically connected firms record significantly higher *DIRREM* than non-politically connected firms, with the exception of *EXECBEN*. The univariate analysis provides initial support for a positive relationship between *POLCON* and *DIRREM*.

Panel B of Table 3 reports the univariate test for institutional ownership. We observe that *INSTOWN* and *INSENSITIVE* are significantly higher in politically connected firms. Further, the results show that *EPF*, *LTAT* and *PERKESO* ownership is significantly higher in politically connected firms.

Table 2.   Correlation Matrix.

	DIRREM	EXECREM	NEDREM	INSTOWN	MANOWN	ROA	ROR_MADJ	BOARDIND	MTBV	BETA	DYIELD	ASSETS	DEBT
DIRREM	1.000	0.993**	0.203**	-0.042*	-0.008	0.090**	0.009	-0.032	0.054*	-0.063**	0.060**	0.143**	-0.032
EXECREM	0.920**	1.000	0.086**	-0.053*	0.000	0.087**	0.009	-0.031	0.050*	-0.058**	0.056*	0.134**	-0.036
NEDREM	0.442**	0.189**	1.000	0.090**	-0.067**	0.040	0.001	-0.007	0.038	-0.049*	0.047	0.101**	0.031
INSTOWN	0.086**	0.057*	0.150**	1.000	-0.187**	0.006	0.007	0.089**	0.022	-0.085**	0.112**	0.062**	-0.008
MANOWN	0.263**	0.276**	0.015	-0.230**	1.000	0.027	0.036	-0.033	-0.011	0.085**	-0.018	-0.019	-0.016
ROA	0.192**	0.172**	0.161**	0.068**	0.074**	1.000	0.042	-0.027	0.198**	-0.250**	0.199**	0.011	0.000
ROR_MADJ	0.030	0.036	0.052*	0.012	0.016	0.082**	1.000	-0.007	-0.034	-0.017	0.013	0.022	-0.032
BOARDIND	-0.201**	-0.195**	-0.048*	0.001	-0.136**	-0.068**	-0.009	1.000	0.006	0.095**	-0.046*	0.020	0.062**
MTBV	0.060**	0.019	0.098**	0.059**	-0.018	0.250**	-0.078**	-0.059**	1.000	-0.093**	-0.002	0.019	0.060**
BETA	-0.074**	-0.061**	-0.128**	-0.158**	0.080**	-0.331**	-0.022	0.083**	-0.152**	1.000	-0.307**	-0.064**	0.073**
DYIELD	0.198**	0.182**	0.182**	0.230**	0.015	0.376**	0.021	-0.060**	0.035	-0.432**	1.000	0.030	-0.071**
ASSETS	0.179**	0.128**	0.187**	0.183**	-0.127**	0.040	0.027	-0.028	-0.017	-0.091**	0.127**	1.000	0.008
DEBT	-0.050*	-0.065**	-0.012	0.011	-0.050*	-0.084**	-0.015	0.063**	-0.031	0.083**	-0.161**	0.206**	1.000

Notes: Pearson (in shaded area) and Spearman Rank correlations are reported in the table. *DIRREM* is the total director remuneration. *EXECREM* and *NEDREM* are executive and non-executive director remuneration, respectively. *INSTOWN* is the percentage shareholdings by the top 5 institutional investors. *MANOWN* is the total percentage shareholdings of the board of directors. *ROA* is the earnings divided by total assets. *ROR_MADJ* is the continuously compounded annual market-adjusted returns. *BOARDIND* is the proportion of independent directors on board of directors. *MTBV* is the market to book value. *BETA* is the systematic risk (beta) obtained by regressing 5 years of monthly share returns against market returns. *DYIELD* is the dividend yield. *ASSETS* is the total assets. *DEBT* is the total debt over total equity.

* and ** denote significance at the 5 and 1 percent level, respectively.

Table 3. Univariate Analysis of Differences in Director Remuneration, Institutional Ownership and Firm Characteristics between Politically and Non-Politically Connected Firms in Malaysia (1999–2003).

	Politic = 1 Mean	(*n* = 434) Median	Politic = 0 Mean	(*n* = 1582) Median	*t*-Test *p*-Value	Mann–Whitney *p*-Value
Panel A: Director remuneration						
DIRREM (million)	2.318	1.308	1.696	0.994	**0.003**	**0.000**
EXECREM (million)	1.933	0.945	1.468	0.784	**0.023**	**0.005**
EXECSAL (million)	1.608	0.788	1.227	0.678	**0.035**	**0.013**
EXECFEES (million)	0.0996	0.000	0.0504	0.000	**0.002**	0.913
EXECBEN (million)	0.0673	0.000	0.0498	0.000	0.137	0.281
EXECBON (million)	0.1579	0.000	0.141	0.000	0.724	**0.048**
NEDREM (million)	0.3859	0.190	0.228	0.1220	**0.000**	**0.000**
NEDFEES (million)	0.3539	0.167	0.215	0.1070	**0.000**	**0.000**
NEDBEN	11507.650	0.000	5857.779	0.000	**0.013**	**0.010**
NEDBON	11959.460	0.000	5063.561	0.000	**0.023**	0.627
Panel B: Institutional ownership						
INSTOWN	16.807	7.312	11.507	5.570	**0.000**	**0.023**
INSENSITIVE	12.013	5.407	5.747	1.754	**0.000**	**0.000**
SENSITIVE	0.916	0.000	1.302	0.000	**0.082**	0.480
INDETERMINATE	3.878	0.000	4.458	0.000	0.324	**0.005**
EPF	4.012	1.116	2.171	0.000	**0.000**	**0.000**
PNB	3.878	0.000	4.458	0.000	0.324	**0.005**
LTAT	1.916	0.000	0.621	0.000	**0.000**	0.174
LTH	0.730	0.000	0.908	0.000	0.285	**0.004**
PERKESO	0.074	0.000	0.045	0.000	**0.017**	**0.025**
Panel C: Firm characteristics						
MANOWN	5.094	0.069	7.981	0.612	**0.000**	**0.000**
ROA	3.194	3.126	5.356	5.042	**0.001**	**0.000**
ROR_MADJ	−8.831	−7.361	−5.775	−4.725	0.109	0.128
BOARDIND	0.371	0.333	0.360	0.333	0.127	0.164
MTBV	1.471	0.980	1.239	0.890	**0.020**	**0.020**
BETA	1.209	1.226	1.101	1.100	**0.000**	**0.000**
DYIELD	1.935	1.030	2.379	1.810	**0.002**	**0.001**
ASSETS (million)	6050	1020	2170	497.0	**0.000**	**0.000**
DEBT	0.590	0.372	0.426	0.257	**0.000**	**0.000**

Notes: Firms are formed based on their political connection, whereby *POLITIC* takes the value of 1 for politically connected firms and zero otherwise. *DIRREM* is the total director remuneration. *EXECREM* and *NEDREM* are executive and non-executive director remuneration, respectively. *EXEC_SAL*, *EXEC_FEES*, *EXECBEN* and *EXECBON* are executive director salary, fees and allowances, benefits and bonus, respectively. *NED_FEES*, *NEDBEN* and *NEDBON* are non-executive director fees and allowances, benefits and bonus, respectively. *INSTOWN* is the percentage shareholdings by the top 5 institutional investors. *INSENSITIVE*, *SENSITIVE* and *INDETERMINATE* are pressure insensitive, sensitive and indeterminate investors, respectively. *EPF*, *PNB*, *LTAT*, *LTH* and *PERKESO* denote Employees Provident Fund, Permodalan Nasional Berhad, Lembaga Tabung Angkatan Tentera, Lembaga Tabung Haji and Pertubuhan Keselamatan Sosial, respectively. *MANOWN* is the total percentage shareholdings of the board of directors. *ROA* is the earnings divided by total assets. *ROR_MADJ* is the continuously compounded annual market-adjusted returns. *BOARDIND* is the proportion of independent directors on board of directors. *MTBV* is the market to book value. *BETA* is the systematic risk (beta) obtained by regressing 5 years of monthly share returns against market returns. *DYIELD* is the dividend yield. *ASSETS* is the total assets. *DEBT* is the total debt over total equity. Significant *p*-values are bold.

We find *PNB* and *LTH* ownership is significantly lower (median) in politically connected firms.

As reported in Panel C of Table 3, politically connected firms' record significantly lower *MANOWN* and *DYIELD*. Contrary to the expectations that politically connected firms would report better performance because of some benefits they obtain from connections, results in Panel C of Table 3 indicate that *ROA* and *ROR_MADJ* of politically connected firms are significantly lower than that of non-politically connected firms. Connected firms might have to devote substantial resources to their rent-seeking activities, which may eliminate any advantages from the rents they received. Our univariate findings on lower accounting and market returns are consistent with Mohamad et al. (2006) and Faccio et al. (2006). However, politically connected firms recorded higher but insignificant board independence (*BOARDIND*), riskier (*BETA*), higher growth (*MTBV*), larger in size (*ASSETS*) and highly levered (*DEBT*).

5.2. Multivariate Analysis

The main drawback of univariate analysis is that it examines only one variable at a time. To the extent that the independent variables do interact with each other in affecting the dependent variable, multivariate analysis is more appropriate. This is the focus of this section. Table 4 provides regression results for the determinants of director remuneration measured by *DIRREM*, *EXECREM* and *NEDREM* remuneration. Column 1 of Table 4 presents the main thrust of this study. We find the coefficient of *INSTOWN* is negatively and significantly (-0.006, $t = -1.838$, $p < 0.10$) related to *DIRREM*, providing support to our hypothesis that institutional investors do monitor the director remuneration structure.[17] Therefore, our main finding is consistent with Hartzell and Starks (2002), Dong and Ozkan (2008) and Khan et al. (2005). Our extended analysis finds a stronger negative and significant relationship between *INSTOWN* and *EXECREM* (-0.009, $t = -2.896$, $p < 0.01$) suggesting institutional monitoring are more prevalent in relation to executive director remuneration. However, the economic significance is minimal. Our analysis implies that an increase of one standard deviation of *INSTOWN* is associated with a drop of *DIRREM* of 0.1082 percent of the sample mean, and a drop in *EXECREM* of 0.1622 percent of the sample mean.

In contrast, we find a positive and significant relationship (0.005, $t = 1.828$, $p < 0.10$) between *INSTOWN* and *NEDREM* as shown in

Table 4. Determinants of Director Remuneration (1999–2003).

	LN(DIRREM) 1	LN(EXECREM) 2	LN(NEDREM) 3
INSTOWN	−0.006	−0.009	0.005
	−1.838*	−2.896***	1.812*
POLCON	−0.024	−0.015	0.375
	−0.180	−0.111	3.183***
INSTOWN*POLCON	0.011	0.011	0.003
	2.283**	2.225**	0.705
ROA	0.014	0.015	0.009
	4.884***	4.894***	3.169***
ROR_MADJ	−0.001	−0.001	0.001
	−0.853	−1.102	0.939
MANOWN	0.004	0.005	−0.006
	1.324	1.767*	−2.147**
BOARDIND	−2.006	−1.572	−0.298
	−6.578***	−4.733***	−1.066
MTBV	0.008	0.039	−0.007
	0.382	1.755*	−0.351
BETA	0.183	0.108	−0.164
	1.415	0.801	−1.424
DYIELD	0.040	0.039	0.033
	2.883***	2.711***	2.401**
LNASSETS	0.136	0.137	0.106
	4.491***	4.372***	3.949***
DEBT	−0.018	−0.028	0.004
	−0.398	−0.587	0.082
CONSTANT	11.047	10.891	9.560
	16.045***	15.260***	15.662***
Period fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Adjusted R^2	0.152	0.133	0.134
F-statistic	17.837***	14.075***	14.724***
Cross sections	434	424	431
Total observations	1875	1705	1779

Notes: DIRREM is the total director remuneration. EXECREM and NEDREM are executive and non-executive director remuneration, respectively. POLCON gives value to one if the firm is politically connected and zero otherwise. INSTOWN is the percentage shareholdings by the top 5 institutional investors. MANOWN is the total percentage shareholdings of the board of directors. ROA is the earnings divided by total assets. ROR_MADJ is the continuously compounded annual market-adjusted returns. BOARDIND is the proportion of independent directors on board of directors. MTBV is the market to book value. BETA is the systematic risk (beta) obtained by regressing 5 years of monthly share returns against market returns. DYIELD is the dividend yield. ASSETS is the total assets. DEBT is the total debt over total equity. t-statistics are italicised.

*, ** and *** denote 10, 5 and 1 percent significance levels, respectively.

column 3 of Table 4. We provide two possible explanations for this relationship. First, the non-executive directors are often representatives of institutional investors, thus it is not unusual for institutional investors to provide incentives for their directors. Second, institutional investors could seek better monitoring mechanism by seeking quality boards including the non-executive directors.

We find evidence of a politically determined remuneration scheme only for *NEDREM*. This could suggest that non-executive directors not only play a monitoring role to the executive directors, but they serve a politically motivated role in the firm (Agrawal & Knoeber, 2001). Further, we find that politically connected firms with high levels of institutional ownership have a positive effect on *DIRREM*. The positive and significant coefficient (0.011, $t = 2.283$ $p < 0.05$) for the interaction variable (*INSTOWN*POLCON*) mitigates the negative and significant coefficient for *INSTOWN* (-0.006, $t = -1.838$ $p < 0.10$).[18] The previously documented negative relationship between *INSTOWN* and *DIRREM* has become less negative with the introduction of *POLCON*. These findings suggest that the nature of firm being politically connected reduces the monitoring effect of institutional ownership on director remuneration. This may also indicate that institutional investors in politically connected firms have a personal agenda and are more driven to fulfil political objectives rather than social objectives.

We find evidence that director remuneration is positively and significantly related to *ROA* but no similar finding for *ROR_MADJ*. Our findings suggest director remuneration schemes are tied to the firm's annual performance based on accounting returns, rather than on how the market perceives the firm's performance based on stock-adjusted returns (Jensen & Murphy, 1990).

As for *DIRREM*, we could not find support *MANOWN* determines director remuneration. However, as expected, we find a positive and significantly relationship between *MANOWN* and *EXECREM* but an inverse relationship for *NEDREM*. The findings indicate an increase of managerial ownership will lead to an increase of executive director remuneration but vice versa for non-executive directors. Further, we find no evidence that director remuneration is tied to the market risk of the firms. Riskier firms seem to compensate directors better. We find a positive and significant relationship between *DYIELD* and *DIRREM*, and as expected, we observe larger firms pay higher remuneration to directors.

Table 5 exhibits regression results for the determinants of director remuneration when institutional investors' heterogeneity is being considered. The results from column 1 of Table 5 show that *INSENSITIVE*

Table 5. Determinants of Director Remuneration for Types
of Institutional Investors (1999–2003).

	LN(DIRREM) 1	LN(EXECREM) 2	LN(NEDREM) 3
INSENSITIVE	−0.010	−0.013	0.007
	−2.362**	−2.945**	1.738*
SENSITIVE	−0.008	−0.014	0.001
	−0.810	−1.336	0.069
INDETERMINATE	0.004	0.000	0.008
	1.049	−0.003	2.091**
POLCON	0.033	0.039	0.450
	0.255	0.296	3.966***
*INSENSITIVE*POLCON*	0.013	0.013	−0.003
	1.978*	1.939*	−0.541
ROA	0.014	0.015	0.009
	4.933***	4.939***	3.222***
ROR_MADJ	−0.001	−0.001	0.001
	−0.798	−1.064	0.985
MANOWN	0.004	0.005	−0.006
	1.241	1.701*	−2.127**
BOARDIND	−2.030	−1.597	−0.285
	−6.657***	−4.803***	−1.016
MTBV	0.008	0.040	−0.006
	0.402	1.774	−0.325
BETA	0.204	0.126	−0.164
	1.578	0.929	−1.414
DYIELD	0.038	0.037	0.032
	2.770***	2.611**	2.331**
LNASSETS	0.143	0.144	0.110
	4.728***	4.599***	4.087***
DEBT	−0.022	−0.030	0.005
	−0.493	−0.623	0.112
CONSTANT	10.890	10.742	9.468
	15.857***	15.048***	15.527***
Period fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Adjusted R^2	0.155	0.134	0.133
F-statistic	16.569***	12.999***	13.411***
Cross sections	434	424	431
Total observations	1875	1705	1779

Notes: DIRREM is the total director remuneration. *EXECREM* and *NEDREM* are executive and non-executive director remuneration, respectively. *POLCON* gives value to one if the firm is politically connected and zero otherwise. *INSENSITIVE*, *SENSITIVE* and *INDETERMINATE* are pressure insensitive, sensitive and indeterminate investors, respectively. *MANOWN* is the total percentage shareholdings of the board of directors. *ROA* is the earnings divided by total assets. *ROR_MADJ* is the continuously compounded annual market-adjusted returns. *BOARDIND* is the proportion of independent directors on board of directors. *MTBV* is the market to book value. *BETA* is the systematic risk (beta) obtained by regressing 5 years of monthly share returns against market returns. *DYIELD* is the dividend yield. *ASSETS* is the total assets. *DEBT* is the total debt over total equity. *t*-statistics are italicised.
*, ** and *** denote 10, 5 and 1 percent significance levels, respectively.

investors negatively and significantly affect *DIRREM*. We find a negative relationship exists between *INSENSITIVE* and *DIRREM* and *INSENSITIVE* and *EXECREM*. This strongly suggests that pressure-insensitive investors exert substantial influence on director remuneration, and particularly so for executive director remuneration. Our evidence is consistent with Almazan et al. (2005) which find active institutional investors have a negative relationship with director remuneration. In contrast, we find a positive and significant relationship between *INSENSITIVE* and *NEDREM*. This result could indicate an alternative monitoring channel for institutional investors through non-executive directors. Another possible explanation is that the presence of institutional investors leads to an increase in non-executive director fees to promote quality boards.

Further, we provide evidence to suggest a positive relationship exists between the interaction variable (*INSENSITIVE*POLCON*) and *DIRREM* and *EXECREM*. Though earlier findings, and consistent with the extant literature, suggest pressure-insensitive investors do monitor the firms, the fact that a firm being politically connected diminishes the pressure-insensitive institutional monitoring.

5.3. Further Extension

We extend our analysis by examining large individual institutional investors that form the crust of Malaysian institutional investors' participation. In particular, we examine the impact of *EPF*, *PNB*, *LTAT*, *LTH* and *PERKESO* on director remuneration. Since they form a cumulative 68 percent of total institutional shareholdings, it is essential to empirically examine them.

In Table 6, we present the results after considering the individual large Malaysian institutional investors. We find no evidence to support that the individual investors' affects director remuneration. However, we find *EPF* in politically connected firms positively and significantly influence director remuneration. Since we do not know the nature and extend of the relationship between *EPF* and politically connected firms, we can only speculate that *EPF* might have members on the boards of directors and plays the role of political patron to these firms. As such, it is only obvious for the board of directors to positively influence their remuneration scheme. Finally, the directions of remaining variables remain similar to results in Tables 4 and 5.

Table 6. Determinants of Director Remuneration for Individual
Institutional Investors (1999–2003).

Variable	DIRREM				
	1	2	3	4	5
EPF	−0.012				
	−1.231				
PNB		0.000			
		0.064			
LTAT			−0.004		
			−0.364		
LTH				−0.006	
				−0.393	
PERKESO					0.280
					1.234
POLCON	−0.042	0.086	0.133	0.135	0.147
	−0.321	*0.741*	*1.173*	*1.191*	*1.296*
*EPF*POLCON*	0.048				
	2.518**				
*PNB*POLCON*		0.013			
		1.429			
*LTAT*POLCON*			0.005		
			0.300		
*LUTH*POLCON*				0.000	
				−0.003	
*PERKESO*POLCON*					−0.255
					−0.720
ROA	0.014	0.014	0.014	0.014	0.014
	4.791***	4.862***	4.782***	4.776***	4.840***
ROR_MADJ	0.000	0.000	0.000	0.000	0.000
	−0.141	*−0.092*	*0.016*	*0.026*	*0.006*
MANOWN	0.005	0.004	0.004	0.004	0.004
	1.592	*1.545*	*1.459*	*1.473*	*1.537*
BOARDIND	−1.896	−1.924	−1.891	−1.888	−1.875
	−6.390***	−6.455***	−6.332***	−6.323***	−6.296***
MTBV	0.001	−0.001	0.000	0.000	0.000
	0.051	*−0.044*	*−0.018*	*−0.022*	*−0.003*
BETA	0.160	0.192	0.171	0.168	0.171
	1.250	*1.485*	*1.322*	*1.303*	*1.327*
DYIELD	0.037	0.038	0.039	0.039	0.039
	2.715***	2.784***	2.865***	2.875***	2.850***
LNASSETS	0.142	0.137	0.141	0.141	0.140
	4.674***	4.511***	4.620***	4.634***	4.622***
DEBT	−0.026	−0.027	−0.024	−0.025	−0.025
	−0.583	*−0.606*	*−0.546*	*−0.554*	*−0.570*
CONSTANT	10.922	10.969	10.896	10.887	10.894
	15.855***	15.953***	15.799***	15.789***	15.858***

Table 6. (*Continued*)

Variable	DIRREM				
	1	2	3	4	5
Period fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.148	0.144	0.140	0.140	0.142
F-statistic	21.396***	20.708***	20.052***	20.071***	20.317***
Cross-sections	434	434	434	434	434
Total observations	1875	1875	1875	1875	1875

Notes: DIRREM is the total director remuneration. *EPF*, *PNB*, *LTAT*, *LTH* and *PERKESO* denote Employees Provident Fund, Permodalan Nasional Berhad, Lembaga Tabung Angkatan Tentera, Lembaga Tabung Haji and Pertubuhan Keselamatan Sosial, respectively. *POLCON* gives value to one if the firm is politically connected and zero otherwise. *INSTOWN* is the percentage shareholdings by the top 5 institutional investors. *MANOWN* is the total percentage shareholdings of the board of directors. *ROA* is the earnings divided by total assets. *ROR_MADJ* is the continuously compounded annual market-adjusted returns. *BOARDIND* is the proportion of independent directors on board of directors. *MTBV* is the market to book value. *BETA* is the systematic risk (beta) obtained by regressing 5 years of monthly share returns against market returns. *DYIELD* is the dividend yield. *ASSETS* is the total assets. *DEBT* is the total debt over total equity. *t*-statistics are italicised.
*, ** and *** denote 10, 5 and 1 percent significance levels, respectively.

6. CONCLUSION

This study examines the relationship between institutional investors and director remuneration, on a Malaysian political background. Based on a panel data set of 434 firms between 1999 and 2003, we find evidence to support that in an emerging market like Malaysia, the absence of strong legal systems that protect the rights of outside investors is being intermediated through institutional investors with significant bargaining power to enforce their rights in monitoring director remuneration. The institutional investors serve as in-expert intermediaries in verifying the level of director remuneration in accordance to the investors needs. In addition, we find no evidence to support that being politically connected is an important determinant to director remuneration with the exception of non-executive directors. However, our results suggest that politically connected firms with high level of institutional ownership positively and significantly related to director remuneration, and thus mitigate the effectiveness of

institutional monitoring. In a nutshell, political connection in relation-based economies does matter in mediating institutional monitoring and their impact should be accounted for.

This study is not without caveats. The most notable caveat for this study is the exclusion of stock-based compensation for the board of directors. Since the data could not be easily gathered, further research on stock-based remuneration is much warranted. In addition, the impact of institutional ownership on director remuneration is minimal since an increase in one standard deviation will result only a drop of 0.1083 percent of total director remuneration. Further, the list for the political connection firms is highly dependable on Johnson and Mitton (2003), Mohamad et al. (2006) and the Khazanah Berhad website. Further research could be done to investigate the exact nature of political connection. In addition, the nature of the relationship between institutional investors and firms should be closely examined. Such investigations could provide a useful insight on the role of institutional investors in reducing agency costs.

NOTES

1. Apart from questionable top management remuneration, Abdul Rahman (2006) argues possible reasons for the Asian Fina'ncial crisis are lack of control of the business activities, mismanagement of business and crony capitalism.

2. The effectiveness of institutional monitoring also depends on liquidity of their portfolios (Maug, 1998), fiduciary duties (Hawley & William, 1997) or free-rider problems (Shleifer & Vishny, 1986). See Ryan and Schneider (2003) for a thorough review on institutional investors' heterogeneity.

3. Malaysia has approximately 22.79 million people, of whom 65 percent are Bumiputera, 26 percent Chinese, 8 percent Indians and 1 percent others. Of the 65 percent Bumiputera, 82 percent are Malays and 18 percent are other indigenous people (Department of Statistics Malaysia, 2004).

4. The NEP has been very successful in that it has led to a significant increase in Bumiputeras' corporate ownership from 2.4 percent in 1970 to 20.3 percent in 1990 (Rasiah & Shari, 2001). However, such a figure still falls short of the NEP's 30 percent target. Since the country's economy surged by an average of more than 7 percent a year for most of the period, the Malay's advance did not come at the expense of other races. Within 20 years (1970–1990), Chinese equity ownership rose significantly from 27.2 percent in 1970 to 45.5 percent in 1990. In addition, the NEP had successfully reduced the dominance of foreign ownership and control of the economy from 63.3 percent in 1970 to 25.4 percent in 1990. However, the NEP's 30 percent of the Bumiputera ownership has yet to be met after replacing the NEP with the National Development Policy (NDP) in 1991.

5. Syariah refers to the body of Islamic law. It is the legal framework within which public and some private aspects of life are regulated for those living in a legal

system based on Moslem principles of jurisprudence. For example, Moslems are not permitted to be involved in gambling or any contracts involving future predictions or uncertainty.

6. Almazan et al. (2005) group investment advisers and investment companies as active institutional investors.

7. Bumiputeras (literally "sons of soil") are defined in official Malaysian literature and government policy documents as being Malays and other indigenous ethnic groups.

8. The Board and Investment Panel of Malaysia's major institutional investors are appointed by and report directly to the Ministry of Finance, with Bumiputeras typically holding the Chair position of the board (Asher, 2001; Norhashim & Abdul Aziz, 2005).

9. Director fees mainly involve directors meeting fees while benefits are pension contributions. Non-executive directors are not known to be given salary by the firm.

10. We do not consider institutional investors concentration as suggested by Gallagher, Smith, and Swan (2006) since we observed a high correlation (0.99) between the top five and total institutional ownership. The correlation result can be obtained from the authors.

11. Johnson and Mitton (2003) derive their data largely from Gomez and Jomo (1999) in which the definition of political connection comes from association with a well-known political party figure.

12. Khazanah Nasional Berhad is the investment-holding arm of the government of Malaysia to manage its commercial assets. It was incorporated in September 1993 and began operations in 1994. It is structured into a holding company that is a wholly owned entity of the Ministry of Finance (MOF), which is part of the Malaysian government.

13. $ROR\_MADJ = Ln(Price_t/Price_{t-1}) - Ln(Index_t/Index_{t-1})$ where *Price* and *Index* are the December (year-end) share price for the firm and Bursa Malaysia's Composite Index, respectively.

14. Specific industries and years effects are not reported. However, the results can be obtained from the corresponding author.

15. Since the KLSE Index is a broad-based capitalisation-weighted index of 100 firms, we would expect the market-adjusted returns to be negative since the sample firms are more likely to consist of the smaller and poorer performing firms.

16. PN4 or Practice Note 4: Criteria and Obligations Pursuant to Paragraph 8.14C of the Listing Rules was issued on 15 February 2001. Companies classified under PN4 are financially distressed and are required by the Exchange to regularise their financial affairs. The Bursa Malaysia uses the following four criteria as the basis of classifying firms into PN4: (i) when the firms have a negative adjusted shareholders' equity; (ii) appointment of receivers for the firms; (iii) auditors have given a "disclaimer opinion" regarding the companies outlook in latest accounts and (iv) a special manger has been appointed as provided for under the Danaharta Nasional Berhad Management Act 1998. Starting from 1 January 2005, it was replaced by PN17 that extends the criteria of PN4. The inclusion of PN4 firms is to avoid sample selection bias (Jennings, 2005).

17. We admit that institutional ownership could be an endogenous variable, thus violate the OLS assumption. However, after running instrumental variables tests and

subsequently the three-stage-least squares (3SLS), we find the instruments used are weak and the results will not yield desired outcome. The 3SLS regression results can be obtained from the corresponding author.

18. Owing to the nature of institutional ownership that is a continuous variable, we cannot add the coefficients.

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APPENDIX

List of Politically Connected Firms in Malaysia, 1999–2003.

Name	Name
1 Advance Synergy	33 Hong Leong Credit
2 Affin Holdings	34 Hong Leong Industries
3 Antah	35 Hong Leong Properties
4 Arab Malaysia Development	36 Hume Industries
5 Bandar Raya Development	37 Jaya Tiasa (Berjaya Textile)
6 Bank Islam Malaysia Bhd	38 Kedah Cement Holdings
Holdings	39 Kretam
7 BCB	40 Kumpulan Guthrie
8 Berjaya Group	41 Land and General
9 Berjaya Land	42 Landmarks
10 Berjaya Sports Toto	43 Leisure Management
11 Best World Land	(Magnum 4D)
(MultiVest)	44 Lion Corporation
12 Boustead Holdings	45 Magnum Corporation
13 Cahaya Mata Sarawak	46 Malakoff
14 Camerlin Group	47 Malayan Banking
15 Cement Industries of Malaysia	48 Malaysian Pacific Industries
16 Commerce Assets	49 Malaysia Airports Holdings
17 Cosway Corporation (Singer)	50 Malaysia International
18 Cycle and Carriage	Shipping Corporation
19 Daibochi	51 Malaysian Airlines System
20 Damansara Realty	52 Metacorp
21 DRB-Hicom	53 Metroplex
22 Edaran Otomobil Nasional	54 MRCB
23 Faber Group	55 Mulpha International
24 FCW Holdings (Bata)	56 Multi-Purpose
25 Fima Corporation	Holdings
26 Georgetown Holdings	57 Mycom
27 Goh Ban Huat	58 Naluri (MHS)
28 Golden Hope Plantation	59 Nanyang Press
29 Golden Plus (Dayapi)	60 New Straits Times
30 Granite Industries	61 OYL Industries
31 Ho Hup	62 Pantai Hospital
32 Hong Leong Bank	63 Park May

APPENDIX. (*Continued*)

Name	Name
64 Pharmaniaga	77 Tasek Corporation
65 Philleo Allied Bhd	78 Telekom Malaysia
	79 Tenaga Nasional
66 Prime Utilities	80 Time Engineering
67 Proton Holdings	81 UDA Holdings
68 PSC Industries	82 Union Paper (TH Group)
69 Rashid Hussain	83 Uniphone Telecommunication
70 RHB Capital	84 United Plantations
71 Sapura Telecommunications	85 Utusan Melayu
72 Setron	86 Wembley Industries Holdings
73 Sime Darby	87 Wijaya Baru (Pacific Chemicals)
74 Star Publications	88 YTL Cement
75 Taiping Consolidated	89 YTL Corporation
76 Tanjong	90 YTL Power

Sources: Johnson and Mitton (2003), Mohamad et al. (2006) and Khazanah Berhad website (www.khazanah.com.my).

LEGAL INSTITUTIONS, DEMOCRACY AND FINANCIAL SECTOR DEVELOPMENT

Mihail Miletkov and M. Babajide Wintoki

ABSTRACT

Conventional wisdom suggests that institutional development is a precursor to financial sector development. Using a panel of 122 countries over the period 1970–2000, we find that while there is a correlation between the quality of legal institutions and financial development, the relationship is not causal. Changes in the quality of legal institutions do not predict changes in the level of financial development. The results suggest that legal institutions and the financial sector develop simultaneously and are jointly determined by unobservable country-specific factors.

1. INTRODUCTION

In this chapter, we empirically examine the commonly held assumption that institutional development is a precursor to financial sector development by studying the relationship in a panel of 122 countries over the period between 1970 and 2000. Most of the earlier literature focuses on the cross-sectional

correlation between legal institutions and financial development rather than the variation *within*. Thus, any inferences may potentially be driven by omitted factors (unobservable heterogeneity) influencing both financial and institutional development. A causal link between institutional and financial development suggests that we should also see a relationship between changes in the quality of institutions and changes in financial development. Thus, our key research question is whether, or not, a given country (with its other characteristics held constant) will become more financially developed, if there is an *exogenous* improvement in the quality of its legal or democratic institutions. Although we find, as other studies have found, a strong correlation between financial development and the quality of a country's legal and democratic institutions, this relationship is not causal. The answer to our research question is "no".

A large and growing literature (e.g., Levine, 1999; Beck, Levine, & Loayza, 2000; Claessens & Laeven, 2003; Al-Khouri, 2007, among others) has established the causal relationship between financial development and growth. This literature has developed alongside a burgeoning literature that establishes a strong correlation between the quality of a country's legal and political institutions and the overall wealth of the country (Acemoglu, Johnson, & Robinson, 2001, 2002, 2005a; Acemoglu, Johnson, Robinson, & Yared, 2005b; Easterly & Levine, 2003; Rodrik, Subramanian, & Trebbi, 2004). One inference that is usually drawn from these studies is that institutional development is a precursor to financial development (see, for example, Mishkin (2007)). The conventional wisdom is that a well-developed institutional or democratic architecture must be put in place before a country's financial sector can develop to the point at which it may start to stimulate economic growth.

Fig. 1, which shows the correlation between the quality of legal institutions and the level of financial development forms the basis that usually underlies the assumption. The figure shows that as of the year 2000, the countries that had the highest quality of legal institutions generally had the highest level of financial development. Nevertheless, correlation does not imply causation, which is what we seek to establish in this chapter.

Our primary measure of financial development is PRIVATE CREDIT from the World Bank database and equals financial intermediary credits to the private sector divided by the gross domestic product. We measure the quality of a country's legal institutions using the Legal Structure and Security of Property Rights Index from the Economic Freedom of the World: 2006 Annual Report (Gwartney & Lawson, 2006).[1] Our base sample consists of a panel of 122 countries over the period 1970–2000. This panel

Fig. 1. Correlation between Legal Institutions and Financial Development in 2000. This Figure Shows the Correlation between the Size of the Financial Sector and the Quality of the Legal Institutions in Countries across the World as of the Year 2000. The Proxy for Financial Development is PRIVATE CREDIT from the World Bank Database. PRIVATE CREDIT is the Volume of Private Credit Divided by the Country's GDP. The Proxy for the Quality of Legal Institutions (LEGAL INSTITUTIONS) is the Legal Structure and Security of Property Rights Index from the Economic Freedom of the World: 2006 Annual Report (Gwartney & Lawson, 2006).

enables us to examine the causal relationship between changes in legal or democratic institutions, and subsequent levels of financial development.

Although we document a clear correlation between legal institutions and the size of the financial sector, we find that this relation is not causal. Institutions do not "cause" financial growth. This is illustrated in Fig. 2, which plots the relationship between the change in institutional development and the change in financial sector development over the period 1970–2000. While the size of the financial sector grew dramatically in countries with high levels of institutional development (e.g., New Zealand), the financial sector also grew impressively in countries that showed much slower changes in institutional development (e.g., Malaysia, Thailand and South Africa).

Over our sample period, changes in the quality of institutions do not predict changes in the level of financial development. We show that any
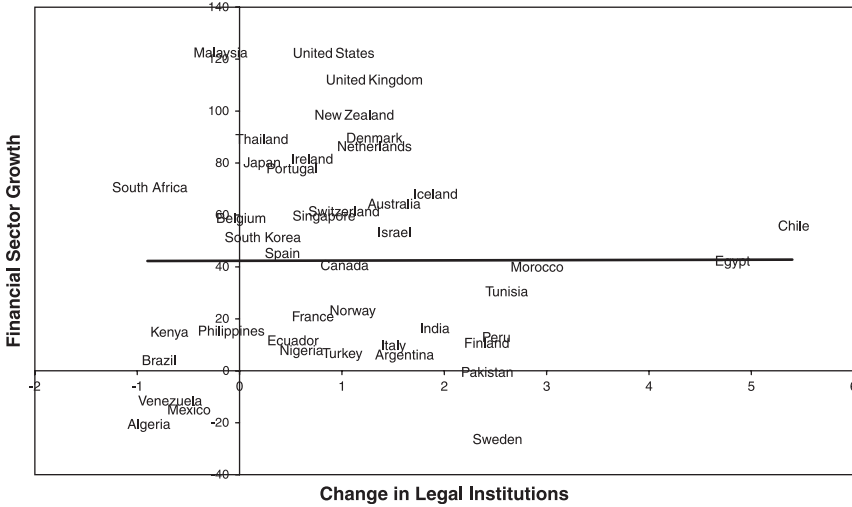
Fig. 2. Correlation between Change in Legal Institutions and Change in Financial Development during the Period 1970–2000. This Figure Shows the Relation between Change in Legal Institutions and Change in Financial Development during the Period 1970–2000. The Proxy for Financial Development is PRIVATE CREDIT from the World Bank Database. PRIVATE CREDIT is the Volume of Private Credit Divided by the Country's GDP. The Proxy for the Quality of Legal Institutions (LEGAL INSTITUTIONS) is the Legal Structure and Security of Property Rights Index from the Economic Freedom of the World: 2006 Annual Report (Gwartney & Lawson, 2006).

relationship between legal institutions and financial development disappears once we include country-fixed effects or other covariates that may jointly affect institutional and financial development. We also document that the lack of a causal relationship between institutional and financial development is robust to estimation in different sub-samples, and to the inclusion of different sets of covariates.

Our findings suggest that the relationship between legal institutions and financial development is a complex one. Although there is a clear association between the quality (or type) of legal institutions in a country and the size of the financial sector in that country, it is not clear whether the institutions are responsible for the level of development in the financial sector. Our results strongly suggest that the quality of legal and political institutions and the size of the financial sector develop endogenously, and are jointly determined by unobservable country specific factors.

From a policy perspective, this chapter contributes to the debate (most recently articulated by Easterly (2008)) on whether sustainable legal or political institutions develop in a "top-down" or "bottom-up" fashion. Although there is little doubt that a well-developed financial sector enhances economic growth, the key policy challenge is how to ensure that countries have a reasonably well-developed financial sector that can effectively channel resources to their most productive uses. Nevertheless, our results should certainly give pause to those who advocate exogenously imposed, "top-down" political or institutional change as a means of achieving the growth of the financial sector in less-developed countries. The findings echo the conclusion of the World Bank's 2002 World Development Report (2002, p. 4) which states that "Best practice in institutional design is a flawed concept".

The rest of the chapter is structured as follows. In Section 2, we review the literature and develop the hypothesis that we test in the paper. In Section 3, we discuss our primary measures of both financial sector development and the quality of legal institutions. In Section 4, we discuss our control variables and empirical estimation methodologies. In Section 5, we present and discuss our results. In Section 6, we explore alternative measures of the quality of legal and democratic institutions, and we conclude in Section 7.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The close association between law and finance was first clearly established in the literature in a series of articles by (La Porta, Lopez-de Silanes, Shleifer, & Vishny, 1997, 1998). These papers document a positive relationship between the legal protection of investors' rights and the development of a country's financial markets. The law and finance view developed in these papers emphasizes that the various securities are defined by the rights that they confer on their owners, rather than by just the type of cash flow stream associated with them. So, for example, a key distinction between debt and equity is not just that debt entitles its holders to a stream of fixed interest payments whereas equity entitles its owners to dividends, but that equity holders usually have the right to vote for the directors of companies while debt holders have the right to repossess collateral if the firm defaults on its interest payments (La Porta et al., 1998). The law and finance view holds that the extent to which the legal institutions protect

the rights of the investors determines the financiers' willingness to provide capital, and therefore, the level of the country's financial sector development. This view follows ''naturally from the contractual view of the firm, which sees the protection of the property rights of the financiers as essential to assure the flow of capital to firms'' (La Porta, Lopez-de Silanes, & Shleifer, 2008).

La Porta et al. (1997, 1998) further investigate which legal systems are more conducive to the protection of investors' rights, and document that the countries with a common-law legal origin have higher levels of investor protection, and are more financially developed than the countries with a civil-law legal origin. The authors attribute this result to the fact that, for historical reasons, English common law has typically provided much stronger protections for property and contractual rights than the French civil law system. In a more recent article, La Porta et al. (2008) review the evidence on the effects of legal origins, and develop the Legal Origins Theory which is based on ''the idea that legal origins – broadly interpreted as highly persistent systems of social control of economic life – have significant consequences for the legal and regulatory framework of the society, as well as for economics outcomes'' (p. 326).

Although there is compelling evidence from these studies of a strong correlation between the quality (or type) of legal institutions and the level of financial development, a commonly drawn inference from the law and finance literature is that certain legal institutions are a precursor to the development of the financial sector in a country. In other words, the conventional wisdom that is often drawn is that institutions ''cause'' financial development. This inference (which is sometimes implicit) forms the central motivation in a number of cross-sectional studies which employ some proxy for the quality of investor protection (as a measure of legal institutions), and examine its effect on some measure of financial sector development (Levine, Loayza, & Beck, 2000; La Porta, Lopez-de Silanes, & Shleifer, 2006; Djankov, La Porta, Lopez-de Silanes, & Shleifer, 2008).

These studies do not rely entirely on ordinary least squares (OLS) regressions for their conclusion of the causal effect of institutions on financial development, and generally use two-stage least squares regressions in which historical legal origin is often used as an instrument for the quality of the legal rules. However, the validity of this instrument is questionable if the historical legal origin, current quality of legal rules and the level of financial development are all determined by partially observable country-specific factors. Indeed, La Porta et al. (2008) re-examine the

appropriateness of the two-stage specifications and the use of legal origin as an instrumental variable, and conclude that ''we do not recommend such specifications since legal origins influence a broad range of rules and regulations'' (p. 294).

Another set of papers which suggest that institutional change precedes financial sector development examine the effect of legal reforms on changes in investor protection and financial development (Bushee & Leuz, 2005; Nenova, 2006; Djankov, McLiesh, & Shleifer, 2007; Musacchio, 2008). The study of reforms could potentially alleviate some of the endogeneity concerns, but the results are not easily generalizable outside of the few countries that undertook the reforms and are examined in the literature. Furthermore, even if the legal reforms precede the changes in financial development, it is still possible that the timing of the reforms is endogenous, and they occur in response to anticipated increases in the level of financial development.

In this chapter, we propose that the correlation between the quality of legal institutions and financial sector development arises not because institutions precede financial development, but because the institutions and the financial sector develop together. In other words, both the quality of legal institutions and the size of the financial sector are determined by numerous country-specific historical, political and socio-economic factors, many of which are only partially observable to the econometrician.

We base our central hypothesis on the framework developed in Miletkov and Wintoki (2008), which, in turn, is based on the model of institutional change advocated by Demsetz (1967, 2008) and North (1971, 1981, 2005). This model of institutional change asserts that institutional innovations emerge when the social benefits of the innovations exceed the costs. Changes in the environment, or technology shocks, change the benefit–cost possibilities of different institutional arrangements and stimulate the demand for new institutions or changes in existing arrangements. Since the financial sector is strongly associated with the legal and property rights institutions in a country, changes in the level of financial development change the costs and benefits of different legal institutional arrangements. We thus expect the legal institutions and the financial sector to evolve in concert, as opposed to institutions preceding financial development. Thus, our central hypothesis, stated in null form, is as follows: if we control for the observable and unobservable determinants of legal institutions and financial sector development, we should see no causal relationship between legal institutions and financial sector development.

3. MEASURES OF FINANCIAL DEVELOPMENT AND LEGAL INSTITUTIONS

Our primary measure of financial development is PRIVATE CREDIT from the World Bank database and equals financial intermediary credits to the private sector divided by the gross domestic product. The variable measures the claims on the private sector by financial intermediaries. There are, of course, alternative measures of financial development such as stock market capitalization, trading volume and ratios of the number of listed firms and the number of initial public offerings to the population. The main advantage of using the PRIVATE CREDIT measure is that it has a long time availability (1960–2007) and as we show in our subsequent analysis a long-time series enables us to determine the causal effect of property rights on financial sector development. Furthermore, prior studies (e.g., Levine et al., 2000; Rajan & Zingales, 1998; Claessens & Laeven, 2003; Beck, Demirguc-Kunt, & Levine, 2003; Bekaert, Harvey, & Lundblad, 2005) advocate the use of private credit as a reliable measure of financial development.

We measure the quality of a country's legal and democratic institutions (LEGAL INSTITUTIONS) using the Legal Structure and Security of Property Rights Index from the Economic Freedom of the World: 2006 Annual Report (Gwartney & Lawson, 2006). An important feature of the index is that it does not simply reflect laws on the books, but rather the overall legal environment as it relates to the protection of the property rights and the overall quality of the legal institutions. The index is assessed on a scale of 0 to 10, with 0 being the lowest and 10 being the highest. It is constructed from five key elements:

- *Judicial independence*. The judiciary is independent and not subject to interference by the government or parties in disputes.
- *Impartial courts*. A trusted legal framework exists for private businesses to challenge the legality of government actions or regulations.
- Protection of intellectual property.
- Military interference in rule of law and the political process.
- Integrity of the legal system.

This index is an unbalanced panel of 126 countries spanning the period 1970–2003. The index is part of the Economic Freedom of the World project. The Economic Freedom of the World index and/or its individual components have been previously used by La Porta, Lopez-de Silanes,

Shleifer, and Vishny (1999), La Porta, Lopez-de Silanes, and Shleifer (2002), Adkins, Moomaw, and Savvides (2002), Carlsson and Lundström (2002) and Dawson (2003), among others. There are alternative indices measuring the quality of legal institutions, an example being the index constructed by the Heritage Foundation. However, the benefit of using the index developed by Gwartney and Lawson (2006) is that it goes back to 1970; in contrast the index developed by the Heritage Foundation is available going back to 1995. Furthermore, de Haan and Sturm (2000) compare the two indices and find a close correlation between the two (close to 0.8) for 1995 when both indices are available. Nevertheless, in the robustness test, we use the political rights index developed by Freedom House (which is used by Barro (1999) and Acemoglu, Johnson, Robinson, and Yared (2005b), among others) as an alternative measure of the quality of legal and democratic institutions.

Table 1 shows a summary of PRIVATE CREDIT and LEGAL INSTITUTIONS. The data for legal institutions is available every five years between 1970 and 2000. The coverage of countries for which we have LEGAL INSTITUTIONS data increases from 48 countries in 1970 to 122 in 2000. Overall, we see that the mean (median) value of LEGAL INSTITUTIONS actually declines gradually over the sample period, probably owing to the fact that countries with weaker legal institutions were added to the sample over time. In contrast, there has been a slight increase in the mean (median) level of PRIVATE CREDIT over time.

The data for our time-varying control variables – which we discuss in Section 3 – (FOREIGN DIRECT INVESTMENT, FOREIGN AID, GDPPC, GOVERNMENT SPENDING) is taken from the World Bank database. The data for LATITUDE, TROPICAL, and ETHNIC FRACTIONALIZATION are from Beck et al. (2003). The data for the legal origin and religion variables are taken from Djankov et al. (2007).

Table 2 shows the correlation between LEGAL INSTITUTIONS and PRIVATE CREDIT, and between these variables and our control variables. The results show the strong correlation between LEGAL INSTITUTIONS and PRIVATE CREDIT that we illustrated in Fig. 1. Table 2 also shows the strong similar correlation of both property rights institutions and financial development with the legal, cultural and geographical factors that have been identified in other studies. For example, we see a strong negative correlation between LEGAL INSTITUTIONS (and PRIVATE CREDIT), and ETHNIC FRACTIONALIZATION, TROPICAL, and FRENCH legal origin. We also observe a strong positive correlation between LEGAL INSTITUTIONS (and PRIVATE CREDIT), and PROTESTANT and

Table 1. Summary Statistics of Private Credit and Legal Institutions.

Variable	N	Mean	Median	Minimum	Maximum	25 Percentile	75 Percentile
1970							
Legal institutions	49	5.86	6.20	1.10	8.30	4.40	8.00
Private credit	88	24.85	18.06	1.12	106.09	11.27	30.31
1975							
Legal institutions	49	4.76	4.90	1.10	8.30	3.70	6.20
Private credit	98	29.77	22.11	1.01	130.17	14.86	41.97
1980							
Legal institutions	89	4.98	4.90	1.80	8.30	3.20	6.60
Private credit	104	33.94	27.39	1.98	130.47	17.33	44.75
1985							
Legal institutions	109	5.08	5.30	1.70	8.30	3.50	6.30
Private credit	106	39.37	31.14	1.98	144.25	18.51	54.70
1990							
Legal institutions	110	5.28	5.30	2.00	8.30	3.50	6.80
Private credit	107	41.66	32.40	2.25	180.33	17.63	54.06
1995							
Legal institutions	122	5.86	5.55	2.20	9.30	4.80	6.80
Private credit	128	41.82	28.85	1.00	200.94	13.59	61.36
2000							
Legal institutions	122	5.82	5.70	2.00	9.60	4.40	6.90
Private credit	127	47.45	31.96	2.53	219.16	12.54	67.15

Note: Summary of the statistics for the measures of financial development and legal institutions. The proxy for financial development is PRIVATE CREDIT from the World Bank database. PRIVATE CREDIT is the volume of private credit divided by the country's GDP. LEGAL INSTITUTIONS is the Legal Structure and Security of Property Rights Index from the Economic Freedom of the World: 2006 Annual Report (Gwartney & Lawson, 2006).

LATITUDE. These correlations underlie the reason for the inclusion of the variables as control variables in our empirical specifications.

4. EMPIRICAL MODEL AND ESTIMATION

Our estimates are based on the empirical model, which we define as

$$y_{it} = y_{i,t-5} + \beta LI_{i,t-5} + \kappa \mathbf{X}_{i,t-5} + \gamma \mathbf{Z}_i + \eta_i + \mu_t + \varepsilon_{it} \tag{1}$$

The dependent variable, y is the level of financial development or size of the financial sector (PRIVATE CREDIT) in country i. The main variable of

Table 2.   Correlation Table of Key Variables.

	Private Credit	Legal Institutions	GDPPC	FDI	Foreign Aid	Government Spending
Private credit	*1.00*	*0.63*	*0.66*	*0.11*	*−0.12*	*0.25*
Legal institutions		*1.00*	*0.72*	*0.10*	*−0.21*	*0.36*
GDPPC			*1.00*	*0.10*	*−0.14*	*0.35*
FDI				*1.00*	−0.01	0.02
Foreign aid					*1.00*	*0.28*
Government spending						*1.00*
OPEC	−0.07	*−0.17*	0.03	−0.02	*−0.11*	−0.03
English	0.05	*0.11*	−0.05	−0.01	*0.11*	*0.08*
French	*−0.22*	*−0.35*	*−0.19*	0.02	0.05	*−0.19*
German	*0.37*	*0.26*	*0.27*	−0.02	*−0.10*	−0.03
Buddhist	*0.23*	*0.10*	0.08	0.07	−0.07	*−0.15*
Catholic	−0.02	−0.05	*0.18*	0.06	*−0.11*	*−0.15*
Muslim	*−0.19*	*−0.28*	*−0.28*	−0.08	*0.13*	−0.04
Orthodox	−0.06	−0.01	0.03	−0.00	−0.06	0.01
Protestant	*0.18*	*0.33*	*0.21*	−0.03	−0.09	*0.20*
Ethnic fractionalization	*−0.33*	*−0.32*	*−0.56*	−0.02	0.12	−0.09
Tropical	*−0.43*	*−0.45*	*−0.54*	−0.03	*0.16*	*−0.26*
Latitude	*0.47*	*0.62*	*0.70*	0.06	*−0.20*	*0.38*

Notes: The variables are defined as follows: LEGAL INSTITUTIONS is the Legal Structure and Security of Property Rights Index from Economic Freedom of the World: 2006 Annual Report (Gwartney & Lawson, 2006); PRIVATE CREDIT from the World Bank database equals financial intermediary credits to the private sector divided by the gross domestic product. The control variables are FOREIGN DIRECT INVESTMENT (foreign direct investment divided by gross domestic product); FOREIGN AID (gross foreign aid per capita); GDPPC (GDP per capita); GOVERNMENT SPENDING (government expenditure divided by gross domestic product); dummy variables for ENGLISH, FRENCH and GERMAN law as proxies for legal origins; LATITUDE; dummy variables for BUDDHIST, CATHOLIC, MUSLIM, ORTHODOX or PROTESTANT being the dominant religious group in the country; a dummy variable for TROPICAL if the country is classified as being in a tropical/equatorial region; ETHNIC FRACTIONALIZATION, the probability that two randomly selected individuals from a country are from different ethnic or linguistic groups; a dummy variable for OPEC if the country is a member of the Organization of Petroleum Exporting Countries. Items in italic are significant at the 10% level or higher.

interest is *LI*, which measures the quality of the legal institutions (LEGAL INSTITUTIONS). Thus our inference on the causal effect of institutional change on financial development will be based on estimates of β. We include the lagged dependent variable ($y_{i,t-5}$) to control for the persistence of financial development and to account for the convergence of financial

development across countries.[2] η_i represents country-specific fixed effects. Inclusion of the fixed effects are important since our aim is to test the causality from institutions to financial development; the fixed effects enable us to parse out the effects of long-term factors that may affect both institutional and financial development within a particular country. In our regressions, we include time dummies (μ_t) to account for any time-specific shocks as well as trends that have been common across countries.

We include two sets of control variables. The first set, **X** consists of time-varying variables, which might affect the level of private credit but may simultaneously impact the quality of a country's legal institutions. Thus **X** includes the following:

- FOREIGN DIRECT INVESTMENT – foreign direct investment divided by gross domestic product. Direct foreign investment could have a direct effect on the level of financial development, but foreign investors could demand a certain quality of legal institutions as a precondition for the financial inflows.
- FOREIGN AID – gross foreign aid per capita. Foreign donors (just like foreign investors) may not only have an impact on the level of financial development, but also demand legal and democratic reforms as a precondition for their aid. In addition, it is also possible that foreign aid may have the effect of entrenching a rent-seeking elite and actually retard the development of institutions.
- GDPPC – gross domestic product per capita. GDP per capita is closely associated with the level of financial development (see for example, Levine et al., 2000). However, wealthier countries can more easily afford the cost of setting up and maintaining higher quality institutions.
- GOVERNMENT SPENDING – total government expenditure divided by gross domestic product. La Porta et al. (1999) find that the quality of government institutions is positively associated with the size of government; however, it is possible that government's dominance over the economy could crowd out private financial exchange.

The second set of control variables, **Z**, includes variables that proxy for the time-invariant historical determinants of property rights, and may also simultaneously affect the level of financial development. Thus, **Z** includes the following:

- Dummy variables (which take a value of 1 if true, 0 otherwise) for ENGLISH, FRENCH and German law as proxies for legal origins. La Porta et al. (1997, 1998) suggest that legal traditions that emerged from Europe many centuries ago, were spread round the world via

colonization and imitation, and account for cross-sectional differences in property rights institutions. They argue that the quality of property rights institutions are higher in countries with the British (common law) legal tradition than in countries with the French (civil law) legal tradition, with German and Scandinavian law coming somewhere in between. More recently, Beck et al. (2003), Rajan and Zingales (2003) and Ayyagari, Demirgüç-Kunt, and Maksimovic (2008) also suggest that legal origin affects both the level of financial development and the quality of a country's institutions.

- LATITUDE, a measure of distance from the equator as proxy for endowment. Countries closer to the equator have a harsher climate and would have had higher levels of settler mortality if they were colonies in colonial times. This may have had the long-term or historical effect of retarding both institutional and financial development (Diamond, 1999; Acemoglu et al., 2001).
- Dummy variables (which take a value of 1 if true, 0 otherwise) for BUDDHIST, CATHOLIC, MUSLIM, ORTHODOX or PROTESTANT being the dominant religious group in the country as proxies for culture. Empirical evidence of the effect of religion on property rights and financial development is documented in La Porta et al. (1999) and Stulz and Williamson (2003).
- ETHNIC FRACTIONALIZATION, the probability that two randomly selected individuals from a country are from different ethnic or linguistic groups as a proxy for politics. Easterly and Levine (1997) suggest that political competition in ethnically heterogenous societies could retard both the institutional and financial development in a country.
- A dummy variable (which takes a value of 1 if true, 0 otherwise) for OPEC if the country is a member of the Organization of Petroleum Exporting Countries. The dependence of a country on a natural resource like oil could lead to an expansion of the financial sector, while simultaneously entrenching a rent-seeking elite and retarding the development of legal institutions.

In principle, it should be possible to carry out formal tests of causality by estimating Eq. (1) with vector autoregressive (VAR) techniques such as those proposed by Granger (1969) and operationalized by Sims (1972, 1980). According to Granger, LEGAL INSTITUTIONS cause PRIVATE CREDIT, if future values of PRIVATE CREDIT can be better predicted by using all available past information, including LEGAL INSTITUTIONS, than by using all available past information excluding LEGAL

INSTITUTIONS. Thus, if we write Eq. (1) as multivariate VAR:

$$\begin{pmatrix} y_t \\ LI_t \\ \mathbf{Z}_t \end{pmatrix} = \begin{pmatrix} a_{11}(L) & a_{12}(L) & a_{13}(L) \\ a_{21}(L) & a_{22}(L) & a_{23}(L) \\ a_{31}(L) & a_{32}(L) & a_{33}(L) \end{pmatrix} \begin{pmatrix} y_{t-1} \\ LI_{t-5} \\ \mathbf{Z}_{t-5} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{pmatrix} \qquad (2)$$

where $\mathbf{Z}_t$ contains all the other covariates in Eq. (1), besides LEGAL INSTITUTIONS and PRIVATE CREDIT, and $a_{ij}(L) = a_{ij}^1(L) + \cdots + a_{ij}^p(L)$. We can then assert that LEGAL INSTITUTIONS *do not Granger-cause* PRIVATE CREDIT if $a_{12}(L) = 0$.

However, as noted by Holtz-Eakin, Newey, and Rosen (1988), it would be inappropriate to apply standard VAR techniques to our panel data. Unlike macroeconomic applications, that often have an extensive time series, the available time series for each country in our panel is relatively short. In addition, as discussed above, individual country-level heterogeneity is a key feature of our empirical model; even VAR estimates will be biased if unobserved effects are correlated with our proxies for both financial development and legal institutions. Thus, our inference will be based primarily on dynamic panel estimates which are discussed later.

Although we start our analysis with OLS estimates of Eq. (1), OLS estimates may be of limited value because they generally ignore the effect of unobserved heterogeneity. Thus, a pooled OLS regression will not account for the effect of long-term unobservable country-specific factors that may affect both the quality of legal institutions and the level of financial development. However, standard fixed-effects ("within") estimation will be biased because (i) the lagged dependent variable $y_{i,t-5}$ is mechanically correlated with ε_{is} for $s < t$ and (ii) there is dynamic endogeneity in the sense that values of legal institutions at time t will probably be related to realizations of financial development at time $s < t$. Thus, in addition to OLS estimates, we estimate Eq. (1) using the system Generalized Method of Moments (GMM) estimator of Arellano and Bover (1995) and Blundell and Bond (1998). This procedure enables us to control for the unobservable heterogeneity, simultaneity and reverse causality (Beck et al., 2000).

The key assumptions we make are that (i) the time-varying variables (**X**) are predetermined, (ii) the static variables (**Z**) are strictly exogenous and (iii) there is no serial correlation in the errors. These assumptions can be summarized as follows:

$$E(\varepsilon_{it}|y_{i0},\ldots,y_{i,t-10},\mathbf{X}_{i0},\ldots,\mathbf{X}_{i,t-10},\mathbf{Z}_i) = 0 \qquad (3)$$

$$E(\varepsilon_{it}\varepsilon_{is}) = 0, \qquad \forall t \neq s \tag{4}$$

Following Arellano and Bond (1991), Eq. (3) suggests that level values of y and $\mathbf{X}$, lagged two periods or more can be used as instruments to carry out a GMM estimation of Eq. (1) in first differences. First differencing eliminates the unobservable heterogeneity.

However, it is possible that lagged levels of our variables may be weak instruments for the equation in first differences. To obtain more efficient estimates, the system GMM estimation procedure (Blundell & Bond, 1998) stacks the equations in levels with those in first-differences, and estimates the system with lagged differences of the time-varying variables as additional instruments for the equations in levels. Of course, leaving the equations in levels means that we still have to deal with the possible correlation between the unobserved country-specific effects and the endogenous variables. However, if the potential correlation between the endogenous variables and the unobserved country-level heterogeneity is constant over the sample period, we can use lagged differences as instruments for the GMM estimation of Eq. (1). The additional orthogonality condition is

$$E(\varepsilon_{it}|\Delta y_{i,t-5}, \Delta \mathbf{X}_{i,t-5}) = 0 \tag{5}$$

The system GMM estimator thus enables us to control for simultaneity, reverse causality and unobservable heterogeneity. As part of our analysis in Section 4, we carry out specification tests of each of the orthogonality conditions in Eqs. (3)–(5).

5. RESULTS

Before we present multivariate results based on Eq. (1) developed in the previous section, we examine the univariate relation between our measure of financial development (PRIVATE CREDIT) and our measure of the quality of legal institutions (LEGAL INSTITUTIONS).

A pooled OLS regression of PRIVATE CREDIT on contemporaneous values of LEGAL INSTITUTIONS over the sample period 1970–2000 yields the following:

$$\text{PRIVATE CREDIT} = \underset{(-7.43)}{-22.5882} + \underset{(19.70)}{12.5069} \times \text{LEGAL INSTITUTIONS}$$
$$N = 738, \; R^2 = 0.40$$

where the numbers in parentheses represent the t-statistics of the intercept and the coefficient estimate of LEGAL INSTITUTIONS, respectively. This simple univariate analysis would suggest a statistically significant correlation between the size of the financial sector and the quality of property-rights institutions. This correlation suggests that every unit increase in the quality of legal institutions (which is measured on a scale of 1 to 10) would increase the size of the financial sector by 12.5% of the country's GDP. This correlation is illustrated in Fig. 1, for 2000.

An OLS regression of *change* in PRIVATE CREDIT on *change* in LEGAL INSTITUTIONS, over the period 1970–2000, yields the following result, which is dramatically different from the previous one:

$$\Delta\text{PRIVATE CREDIT} = \underset{(5.02)}{42.3651} + \underset{(0.02)}{0.0798} \times \underset{N=42,\ R^2=0.01}{\Delta\text{LEGAL INSTITUTIONS}}$$

where the numbers in parentheses represent the t-statistics of the intercept and the coefficient estimate of ΔLEGAL INSTITUTIONS, respectively. This result (which we illustrate in Fig. 2) suggests that even with simple univariate analysis the relationship between a country's legal institutions and the size of its financial sector does not appear to be causal.

Next, we turn to the results from our multivariate analysis involving the estimation of Eq. (1) which we present in Table 3. Column (i) of Table 3 shows the results of a pooled OLS regression of PRIVATE CREDIT on lagged values of LEGAL INSTITUTIONS and other control variables. The data is sampled every five years between 1970 and 2000. As discussed in Section 3, we control for FOREIGN DIRECT INVESTMENT, FOREIGN AID, GDP (per capita) and GOVERNMENT SPENDING. The results suggest a positive relation between PRIVATE CREDIT and LEGAL INSTITUTIONS – the point estimate of the effect of LEGAL INSTITUTIONS on PRIVATE CREDIT is 1.5418 ($t = 2.24$). This result would certainly underlie the conventional belief that institutional development "causes" growth in the financial sector.

However, as discussed in Section 3, pooled OLS ignores the possible correlation between unobservable long-term factors and both financial and institutional development (i.e., it assumes that $E(\eta_i|LI_t) = 0$ in Eq. (1)). Column (ii) of Table 3, the system GMM estimate, explicitly relaxes this assumption and controls for the effect of unobservable heterogeneity on our estimates. The results show that LEGAL INSTITUTIONS has no significant effect on PRIVATE CREDIT; the point estimate of the effect of LEGAL INSTITUTIONS on PRIVATE CREDIT is 0.9591 ($t = 0.98$) which is not only smaller in magnitude than that obtained with OLS but is also

Table 3. Legal Institutions and Financial Sector Development: Regression Estimates.

Dependent Variable: Private Credit (t)	Pooled OLS (i)	System GMM (ii)	Pooled OLS (iii)	System GMM (iv)
Private credit ($t-5$)	0.9228*	0.8887*	0.8730*	0.8113*
	(20.77)	(12.31)	(17.31)	(10.21)
Legal institutions ($t-5$)	1.5418**	0.9591	1.2406***	0.7623
	(2.24)	(0.98)	(1.81)	(0.83)
Foreign direct investment ($t-5$)	0.0187	−0.0342	0.0412	0.0414
	(0.16)	(−0.30)	(0.34)	(0.26)
Foreign aid ($t-5$)	−0.0049	0.0147	−0.0042	−0.0039
	(−0.30)	(0.98)	(−0.19)	(−0.20)
GDPPC ($t-5$)	13.4362*	35.7507*	18.5586*	36.1462*
	(2.62)	(2.45)	(2.06)	(2.31)
Government spending ($t-5$)	−0.0122	−0.2478	−0.0605	−0.1624
	(−0.05)	(−1.50)	(−0.16)	(−0.96)
OPEC			−2.9783	−2.1183
			(−0.90)	(−0.31)
English			3.4009	11.5185
			(0.83)	(1.37)
French			−0.6348	7.4684
			(−0.16)	(0.74)
German			−4.4352	11.1291
			(−0.62)	(0.97)
Buddhist			5.6240	5.3740
			(1.21)	(0.81)
Catholic			1.3422	−1.6222
			(0.62)	(−0.51)
Muslim			3.6335**	2.2635
			(2.07)	(0.57)
Orthodox			−9.3964*	−22.7919
			(−3.06)	(−1.23)
Protestant			3.7874***	1.9765
			(1.86)	(0.52)
Ethnic fractionalization			−1.6113	1.0721
			(−0.52)	(0.27)
Latitude			5.1736	8.9498
			(0.75)	(0.80)
Country fixed effects	No	Yes	No	Yes
R^2	0.86		0.87	
AR(2) test (p-value)		[0.57]		[0.71]
Hansen test of over-identification (p-value)		[0.41]		[0.99]

Table 3. (*Continued*)

Dependent Variable: Private Credit (t)	Pooled OLS (i)	System GMM (ii)	Pooled OLS (iii)	System GMM (iv)
Difference-in-Hansen tests of exogeneity (p-value)		[0.94]		[1.00]
Number of observations	550	550	458	458
Number of countries	116	116	86	86

Notes: The dependent variable is PRIVATE CREDIT from the World Bank database and equals financial intermediary credits to the private sector divided by the gross domestic product at time *t*. The key explanatory variable is LEGAL INSTITUTIONS at time *t*–5 which is the Legal Structure and Security of Property Rights Index from Economic Freedom of the World: 2006 Annual Report (Gwartney & Lawson, 2006). The control variables are FOREIGN DIRECT INVESTMENT (foreign direct investment divided by gross domestic product); FOREIGN AID (gross foreign aid per capita); GDPPC (GDP per capita); GOVERNMENT SPENDING (government expenditure divided by gross domestic product); dummy variables for ENGLISH, FRENCH and GERMAN law as proxies for legal origins; LATITUDE; dummy variables for BUDDHIST, CATHOLIC, MUSLIM, ORTHODOX or PROTESTANT being the dominant religious group in the country; ETHNIC FRACTIONALIZATION, the probability that two randomly selected individuals from a country are from different ethnic or linguistic groups; a dummy variable for OPEC if the country is a member of the Organization of Petroleum Exporting Countries. The base sample is an unbalanced panel sampled every five years from 1970–2000. Year dummies are included in all specifications.
AR(2) is a test of second-order serial correlation in the first-differenced residuals, under the null of no serial correlation; Hansen test of over-identification is under the null that all instruments are valid; Difference-in-Hansen tests of exogeneity is under the null that instruments used for the equations in levels are exogenous.
The instruments used in the GMM estimation are as follows: for the differenced equations: $(y_{i,t-10}, y_{i,t-15}, \mathbf{X}_{i,t-10}, \mathbf{X}_{i,t-15}, \Delta \mathbf{Z}_{it})$ and for the level equations: $(\Delta y_{i,t-5}, \Delta \mathbf{X}_{i,t-5}, \mathbf{Z}_{it})$.
*, ** and *** are the significance at the 1%, 5% and 10% levels, respectively.

statistically insignificant. This result suggests that there is no causal relation between legal institutions and financial sector development.

Columns (iii) and (iv) of Table 3 examine the relation between institutional and financial development when other covariates are included. We include, as controls in these regressions, other factors that existing literature has identified as affecting both institutional and financial development. These include dummy variables (which take a value of 1 if true, 0 otherwise) for ENGLISH, FRENCH and GERMAN legal origin, LATITUDE (a measure of distance from the equator), dummy variables (which take a value of 1 if true, 0 otherwise) for BUDDHIST, CATHOLIC, MUSLIM, ORTHODOX or PROTESTANT being the dominant religious

group in the country as proxies for culture, a dummy variable (which takes a value of 1 if true, 0 otherwise) for TROPICAL if the country is generally classified as being in a tropical or equatorial region, ETHNIC FRACTION-ALIZATION (the probability that two randomly selected individuals from a country are from different ethnic or linguistic groups) and a dummy variable (which takes a value of 1 if true, 0 otherwise) for OPEC countries.

The pooled OLS regression of column (iii) shows a significantly positive correlation between LEGAL INSTITUTIONS and PRIVATE CREDIT; the point estimate of the effect of LEGAL INSTITUTIONS on PRIVATE CREDIT is 1.2406 ($t = 1.81$). However, once we control for unobservable heterogeneity, simultaneity and reverse causality in the system GMM estimate of column (iv), the magnitude of the relation between LEGAL INSTITUTIONS and PRIVATE CREDIT falls and becomes statistically insignificant; the point estimate is 0.7623 ($t = 0.83$). In fact, the only consistently significant determinant of growth in the financial sector is the country's GDP per capita (GDDPC). For example, in the system GMM estimate of column (iv) in Table 3, the point estimate of the effect of GDP per capita on PRIVATE CREDIT is 36.1462 ($t = 2.31$). The wealth and productivity of a country's citizens has a causal effect on financial activity, which the legal institutions do not.

Table 3 also shows the results of a number of post-estimation tests of the validity of the system GMM specification, as well as the validity of the instrument set that it uses. The first is a test of serial correlation. Table 3 shows the results of AR(2) tests of the null hypothesis of no second order serial correlation. For the GMM estimates, if the assumptions of our specification are valid, by construction the residuals in first differences should be correlated, but there should be no serial correlation in second differences (AR(2)). Results of these tests confirm that this is the case: the AR(2) test yields *p*-values of 0.57 and 0.71 in columns (ii) and (iv), respectively.

The second test is a Hansen test of over-identification. The dynamic panel GMM estimator uses multiple lags as instruments. This means that our system is over-identified and provides us with an opportunity to carry out the test of over-identification. Table 3 shows the results of the Hansen test for our GMM estimates. The Hansen test yields a *J*-statistic which is distributed χ^2 under the null hypothesis of the validity of our instruments. The results in Table 3 reveal *J*-statistics with *p*-values of 0.41 and 0.99 in columns (ii) and (iv), respectively, and as such, we cannot reject the hypothesis that our instruments are valid.

In Table 3, we also report the results from a test of the exogeneity of a subset of our instruments. As we discussed in Section 4, the system GMM estimator makes an additional exogeneity assumption: the assumption that any correlation between our endogenous variables and the unobserved (fixed) effect is constant over time (Eq. (5)). This is the assumption that enables us to include levels equations in our GMM estimates and use lagged differences as instruments for these levels. Bond, Hoeffler, and Temple (2001) suggest that this assumption can be tested directly using a difference-in-Hansen test of exogeneity. This test also yields a J-statistic which is distributed χ^2 under the null hypothesis that the subset of instruments that we use in the levels equations are exogenous. The results in Table 3 show p-values of 0.94 and 1.00 in columns (ii) and (iv), respectively, for the J-statistic produced by the difference-in-Hansen test. This implies that we cannot reject the hypothesis that the additional subset of instruments used in the system GMM estimates is indeed exogenous.

Overall, our empirical results suggest that while there is indeed a correlation between legal institutions and the size of the financial sector, the relationship is not causal. Exogenous changes in the level of institutional development do not predict changes in the size of the financial sector over the period 1970–2000 in countries across the world.

6. FROM DEMOCRACY TO FINANCIAL DEVELOPMENT?

A possible critique of our analysis in Section 5 is that our measure of the quality of legal institutions is not an accurate one. The LEGAL INSTITUTIONS index does indeed attempt to measure various aspects of legal and democratic institutions beyond just representative democracy, some of which could be subjective, and an argument could be made that there is measurement error in the LEGAL INSTITUTIONS variable.

To examine the possibility that this may be driving the apparent lack of causality in the relationship between institutional and financial development, we examine the direct effect of DEMOCRACY on PRIVATE CREDIT. The DEMOCRACY index is the political rights index created by Freedom House[3] and we sample this data every five years for the period 1973–2003. The index is assessed on a scale of 1 to 7, with 1 being the most democratic country and 7 being the least. For ease of exposition we turn this around so that as we move from 1 to 7 on the index, countries move from being less to more democratic.

Table 4 shows the results of OLS regressions of PRIVATE CREDIT on DEMOCRACY.[4] Column (i) of Table 4 shows a correlation between PRIVATE CREDIT and DEMOCRACY, if we do not include any covariates that may simultaneously affect both financial and institutional development. However, once we include different subsets of control variables, as we do in columns (ii) and (iii) of Table 4, the effect of DEMOCRACY on subsequent levels of PRIVATE CREDIT becomes statistically insignificant.

Overall, the results from the analysis of the effect of DEMOCRACY on PRIVATE CREDIT support the inferences from the previous section. Again, we find that while there may be a strong correlation between finance and democracy, financial development itself is not a causal outcome of exogenous changes in the level of democracy within a country.

7. CONCLUSION

In this chapter, we provide new evidence on the relationship between institutional and financial sector development. The conventional view holds that the development of a comprehensive legal and political rights system is a prerequisite for the development of the financial sector. This view asserts that countries which improve the quality of their legal and political institutions would see an increase in the level of their financial development. We test this hypothesis in a panel of 122 countries over the period 1970–2000, and document a strong positive correlation between institutional and financial development, but no evidence of causality. The *exogenous* changes in the quality of legal and political institutions during our sample period do not *cause* changes in the level of financial development. The evidence, therefore, does not support the conventional view, but rather an alternative view, which states that the quality of legal and political institutions and the size of the financial sector develop simultaneously and are jointly determined by unobservable country-specific factors.

Our findings do not mean that strong legal institutions are not essential for the functioning of the financial sector in a particular country; indeed it is difficult to conceive of an advanced financial sector without the underpinning of strong institutions that enforce contracts and protect property rights. However, there are at least four possible reasons why we do not observe a direct causal relationship from legal institutions to financial development.

First, our finding that any correlation between institutional quality and financial development disappears once we include country fixed-effects

Table 4.   Democracy and Financial Development.

Dependent Variable: Private Credit (t)	(i)	(ii)	(iii)
Private credit (t–5)	0.9923*	0.9479*	0.9263*
	(27.74)	(16.23)	(12.85)
Democracy (t–5)	0.8855*	−0.0102	−0.1498
	(2.64)	(−0.03)	(−0.39)
Foreign direct investment (t–5)		0.2347	−0.0763
		(0.99)	(−0.26)
Foreign aid (t–5)		0.0177	0.0046
		(0.99)	(0.21)
GDPPC (t–5)		9.8163***	14.4245***
		(1.91)	(1.77)
Government spending (t–5)		−0.1769	−0.0732
		(−1.32)	(−0.45)
OPEC			−4.9983
			(−1.40)
English			−2.5333
			(−0.37)
French			−7.3335
			(−0.99)
German			0.0781
			(0.33)
Buddhist			4.6813
			(0.77)
Catholic			0.5120
			(−0.24)
Muslim			2.5713
			(1.62)
Orthodox			−0.4090
			(−0.92)
Protestant			−1.7952
			(−0.78)
Ethnic fractionalization			−1.3351
			(−0.50)
Latitude			−1.3748
			(−0.14)
R^2	0.84	0.78	0.83
Number of observations	615	456	356

Notes: The dependent variable is PRIVATE CREDIT from the World Bank database and equals financial intermediary credits to the private sector divided by the gross domestic product at time t. The key explanatory variable is DEMOCRACY at time (t−5) which is the Political Rights Index from Freedom House. The control variables are FOREIGN DIRECT INVESTMENT (foreign direct investment divided by gross domestic product); FOREIGN AID (gross foreign aid per capita); GDPPC (GDP per capita); GOVERNMENT SPENDING (government expenditure divided by gross domestic product); dummy variables for ENGLISH, FRENCH and GERMAN law as proxies for legal origins; LATITUDE; dummy variables for BUDDHIST, CATHOLIC, MUSLIM, ORTHODOX or PROTESTANT being the dominant religious group in the country; ETHNIC FRACTIONALIZATION, the probability that two randomly selected individuals from a country are from different ethnic or linguistic groups; a dummy variable for OPEC if the country is a member of the Organization of Petroleum Exporting Countries. The base sample is an unbalanced panel sampled every five years from 1970 to 2000. Year dummies are included in all specifications.
*, ** and *** are the significance at the 1%, 5% and 10% levels, respectively.

suggests that there might be long-term unobservable factors that jointly affect both the level of institutional and financial development. Although we can include observable aspects of a country's culture such as religion or colonial history, it is virtually impossible to observe or measure every aspect of the people's attitude towards finance, law and private property. These unobservable factors also change very slowly over time.

Second, it is possible that the macro-, country-level indices of democracy or institutional development do not accurately measure the attitude of a country's residents (and ruling elites) towards law, property rights and financial development. Our measures of legal institutions or democracy may even be lagging indicators of the actual quality of the institutional environment within that country. For example, Glaeser, La Porta, Lopez-de Silanes, and Shleifer (2004) show that poor countries often experience economic growth under policies pursued by dictators and then improve their observable political and legal institutions. This implies that for some countries, the observable quality of legal institutions may indeed be measurably less than the actual quality of the institutions in that country.

Third, it may be the case that the causal effect of institutional change on financial sector development actually manifests itself over a much longer horizon than the one we consider in our empirical tests. Thus, it is possible that institutional change may cause financial sector growth at a horizon that is beyond the three decades over which we have the data that we analyze in our study.

Finally, there is a fourth possibility, for which we provide theory and empirical evidence in a companion paper (Miletkov & Wintoki, 2008). It is possible that financial development itself is a catalyst for institutional change. Higher levels of financial development stimulate the demand for higher quality institutions and causality actually runs from financial development to institutional development.

NOTES

1. In robustness tests, we also use the Political Rights index from Freedom House as a measure of the quality of legal and democratic institutions.
2. Thus, we measure the effect of the quality of legal institutions on financial development given the existing level of financial sector development.
3. This data is available from http://www.freedomhouse.org

4. We present only the OLS results because the DEMOCRACY index is slow-moving. This induces serial correlation in residuals across periods and complicates inference from regressions that include country fixed-effects.

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ON THE ROLE OF INSTITUTIONAL INVESTORS IN CORPORATE GOVERNANCE: EVIDENCE FROM VOTING OF MUTUAL FUNDS IN ISRAEL

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ABSTRACT

This chapter investigates voting decisions by mutual funds in a variety of management-sponsored proposals in Israel. Our main findings are that mutual fund managers tend to vote with management and oppose only about 30 percent of all potentially harmful proposals. Larger equity holdings by the fund manager and better prior performance by the firm are found to be negatively associated with the odds of voting against management. Also, mutual funds managed by banks are found to exhibit better monitoring than mutual funds managed by private investment companies. We find that bank fund managers are more likely to vote against *management than other mutual fund managers. We further find that non-bank funds tend to increase equity holding following the meeting regardless of their vote, whereas bank funds tend to follow the "Wall Street Rule" and reduce their equity holdings after voting against management.*

1. INTRODUCTION

Under the *duty of care*, institutional investors have a responsibility to attend shareholders' meetings and vote. Under the *duty of loyalty*, they have to vote according to the economic interests of their beneficiaries. While the evidence shows an increase in institutional investors' activism during the past decade (Del Guercio & Hawkins, 1999), there is little direct evidence on whether institutional investors attend shareholder meetings or on how they actually vote. Israeli Mutual Investment Law provides an opportunity for such detailed analysis, as it obligates mutual fund managers to vote and file a report on their vote with the Israeli Security Authority for every proposal, provided that the proposal has the potential to affect the wealth of fund beneficiaries.[1] This study provides evidence on the actual votes taken by mutual fund managers in 655 management-sponsored potentially harmful proposals (PHP) on a large variety of topics.

As good monitors, mutual fund managers are expected to act in the best interest of their beneficiaries and weigh the benefits as well as the costs of participating in the voting process. To the extent that they are owners of large blocks of shares, they have incentives to monitor management (Gorton & Kahl, 1999). However, being well-diversified will require mutual fund managers to vote on a large number of proposals in any given year. In view of the fact that careful investigation of each proposal and voting is not costless, mutual fund managers are expected to exercise their voting rights in some cases and free ride in others.[2]

This study investigates the factors that affect the vote by mutual fund mangers in a variety of proposals. These factors include the characteristics of the firm and the fund, as well as the topic of the proposal. We find that mutual fund managers vote against management in only about 30 percent of the proposals in our sample. This number is low considering that these proposals fall under the definition of the law as being potentially harmful to the fund beneficiaries, and include such topics as the approval of related party transactions, changes in firm charter, and compensation issues.

Following the cost-benefit line of thought, we use logistic regression to analyze cross-sectional variation in voting decisions across fund managers, proposals, and firm characteristics. The main findings are that larger equity holdings by the fund and better prior performance of the portfolio firm are negatively associated with votes *against* management. The effect of larger ownership on voting behavior is consistent with the evidence presented in

Hauser, Rosenberg, and Ofir (1999) suggesting management negotiations with large shareholders prior to the vote. The effect of prior corporate performance is consistent with Huson (1997) that finds previous poor performance to be a major factor in setting large pension funds' intervention strategy. We further find voting to be related to the topic of the proposal. Specifically, we find a greater probability of voting against a proposal to be associated with compensation and private issuing of options to a related party.

Agency theory suggests that considerations other than the best interest of the beneficiaries could be driving the decisions of institutional investors. However, institutional investors are not a homogeneous group.[3] The theory suggests that institutional investors with potential business relations with the firm are sensitive to pressure and are more likely to vote with management than institutions without such relations (Brickley, Lease, & Smith, 1988). We study bank and non-bank mutual fund managers under two alternative hypotheses: the first, in the view of Brickley et al. (1988) and others, is that bank mutual fund managers (presumably more pressure-sensitive) are less likely to vote against PHP than non-bank fund managers (the *Conflict of Interest Hypothesis*). An alternative view suggests that banks tend to have a comparative advantage in monitoring other financial investors, as they occupy a unique governance position given their monitoring role, control ability, and access to information (Gillan & Starks, 2000). Following this line of thought one might expect mutual funds managed by commercial banks to vote more frequently against PHP than non-bank managers (the *Good Monitor Hypothesis*).

The evidence regarding bank mutual fund managers presented in this chapter tends to support the *Good Monitor Hypothesis*. The main finding is that after controlling for fund size, holdings, and firm characteristics, mutual funds managed by banks are more likely to vote *against* PHP than mutual funds managed by private investment companies. Further analysis suggests that whereas all mutual fund managers' voting tends to be highly clustered by firm, bank fund managers tend to change their votes in any given firm more frequently than private investment managers. Using a sub-sample of proposals, we also investigate mutual fund ownership changes following the meeting. The investigation results provide further support for the *Good Monitor Hypothesis* regarding bank fund managers, as it suggests that bank mutual funds tend to reduce holdings after voting against and increase holdings after voting for PHP, whereas non-bank fund managers tend to increase holdings regardless of their vote.

2. THE DATA

Under Section 77 of the Mutual Investment Law of 1994, voting by mutual fund managers in Israel is mandatory, provided that the proposal has the potential to affect the wealth of fund beneficiaries.[4] Such proposals include, for example, the approval of related party transactions, changes in firm charter, and compensation issues. The report of the funds to the Israeli Securities Authority (ISA) contains the following information: the type of meeting (i.e., annual or special), the proportion of the firm's shares held by the fund at the time of the meeting, the topic of the proposal, and how the fund votes.

The initial sample includes 5,038 reports from October 1999 to December 2001. These reports cover 819 proposals in 482 shareholder meetings. For a proposal to be included in the sample, it must appear in more than one mutual fund manager's report (this requirement excludes 23 proposals and, obviously, the same number of voting events). An additional 4 proposals (8 voting events) are excluded because of incomplete data. We also exclude votes on proposals to appoint the accounting firm, proposals to approve the firm's annual reports, and proposals to pay dividends. These topics do not seem to qualify as potentially value decreasing. The final sample for this study consists of 655 Potentially Harmful management-sponsored Proposals (PHP) in 373 meetings of 265 public Israeli firms. As, in all cases, more than one fund votes on each proposal, the number of voting events (4,553) exceeds the number of proposals (655).

The distribution of proposals and voting by topic is outlined in Table 1. It shows that approximately 32 percent of the proposals are related to direct compensation (i.e., salary, bonuses, and loans) to insiders. The proportion of votes against such proposals is 32.7 percent, and it is significantly greater than the average of 30.1 percent for all proposals. It further shows that for all topics, the proportion of votes against is less than 40 percent, with a maximum of 38.7 percent in issuing of options and stocks to an insider and a minimum of 11.3 percent in restructuring of options held by insiders. The average proportion of abstain votes is 18.0 percent of the votes. The average percent in favor is 51.8 percent of the votes, with a high proportion of votes in favor of approval of restructuring of options held by insiders (69.4) and duality in the CEO–Chairman of the board position (65.0 percent).[5]

Data on assets and identity of a fund manager (i.e., a bank-owned or private investment company) comes from the fund's annual report and from the PREDICTA database. Data on the firm's ownership structure, accounting performance, capital structure, stock price, and market value come from the firm's annual report and from the TAKLIT-HON and PREDICTA databases.

Table 1. Voting of Mutual Fund by Topic of Proposal between 1999 and 2001.

Topic of Proposal	Number of Votes	Percentage of Votes "Against"	Percentage of Votes "For"	Percentage of Votes "Abstain"
Changes in firm charter	423	36.6	43.3	20.1
Approval of insider stock options plans	659	38.7	46.6	14.7
Approval of direct compensation to insiders	1,851	32.7	51.0	16.3
Approval of insurance against personal lawsuits for executives and directors	725	25.5	49.1	25.4
Approval of transactions with major shareholders	551	21.1	61.7	17.2
Approval of nomination and compensation of outside directors	41	19.5	58.5	22.0
Approval of duality in CEO/COB position	117	18.8	65.0	16.2
Restructuring of options held by major shareholders	186	11.3	69.4	19.3
All	4,553	30.1	51.8	18.0

Notes: The distribution of voting events on PHP by topic of the proposal and the proportion of votes "for", "against", and "abstain" in each topic is presented. The sample consists of 4,553 voting events of 38 mutual fund managers from October 1999 to December 2001.

3. EMPIRICAL RESULTS

3.1. Mutual Fund Voting – Logit Model

We use multinomial logit to analyze the factors that affect fund voting in PHP, and estimate a multinomial logit model:

$$\text{VOTE} = \beta_0 + \beta_1\text{FUHLD} + \beta_2\text{FUHLAS} + \beta_3\text{FUND} + \beta_4\text{FIRM} \quad (1)$$

The dependent variable VOTE has three categories, one for each voting option (i.e., for, against, and abstain). The independent variables include the proportion of corporate equity held by the fund FUHLD, the proportion of the fund managers' total assets invested in the firm FUHLAS, FUND that stands for fund characteristics such as size and bank manager, FIRM that stands for firm characteristics such as past accounting and market performance, ownership structure, and main operation industry. Detailed description of the variables used throughout the chapter is presented in Table 2.

Table 2.   Description of Variables.

Variable	Description	Average (Standard)
VOTE	Dependent variable including three categories: 1 – votes "for", 1 – votes "against", and 0 – "abstain" votes	0.261 (0.87)
AGAINST	Dependent variable equals one when the fund manager votes against and zero otherwise (not against includes votes for or abstain)	30.1% (44.96%)
METTYP	A dummy variable equals one when the meeting is a special meeting and zero otherwise (i.e., for annual meeting)	0.50 (0.50)
FUSIZE	The natural log of the fund manger's total assets at the time of the meeting	6.34 (1.79)
FUBANK	A dummy variable equal to one when the manager of the mutual funds is a commercial bank and zero otherwise	0.37 (0.48)
FUHLD	The proportion of firm equity held by the fund manager at the time of the meeting (maximum – 14.5%, minimum – 0.0001%)	0.45% (1.14%)
FUHLAS	The proportion of the fund managers' total assets invested in the firm (maximum – 5.8%, minimum – 0.001%)	0.35% (1.82%)
FISIZE	The natural log of the firm assets	14.08 (2.04)
FIMRTBK	The firm's market value of equity plus the book value of debt divided by the book value of assets	1.377 (1.619)
FISTRT	Adjusted for market stock return in the six-month period prior to the meeting	−7.59% (17.89%)
FIROA	The ratio of net earnings before taxes to the firm's total assets	1.90% (29.70%)
FIINSIDE	The proportion of firm stocks held by large shareholders (more than 5%), directors and top executives at the time of the meeting	64.73% (20.65%)
FIIND	Series of dummies for the firm's main industry by the stock market classification	–
PROPTOP	Series of dummies for the topic of the proposal by the categories presented in Table 1	–
YEAR	Series of dummies for the calendar year of the meeting	–
FUPREVREST	The average resistant of fund manager i all *previous* proposals in the firm j excluding the last one	

The estimation results of a multinomial logit model are shown in Table 3. Column one presents the coefficients of the voting "for" category relative to voting "against" and column two presents the coefficients of the "abstain" category relative to voting "against".[6] We find a positive relation between funds holding FUHLD and the odds of voting in favor of a proposal. Given that proposals in the sample are considered potentially harmful, this finding

Table 3. Multinomial Logit Analysis of Voting by Mutual Fund in 655 Potentially Harmful Management Sponsored Proposals.

Independent Variable	"For" Alternative[a] (1)	"Abstain" Alternative[a] (2)
INTERCEPT	−0.82***	−3.21***
	(0.01)	(<0.01)
FUSIZE	0.08*	0.12***
	(0.10)	(0.01)
FUHLD	0.06*	−0.10*
	(0.10)	(0.07)
FUHLAS	−0.04	−16.90**
	(0.97)	(0.03)
FUBANK	−1.52***	−0.96***
	(<0.01)	(<0.01)
METTYP	−0.26***	−0.10
	(<0.01)	(0.28)
FIMRTBK	−0.07	−0.30
	(0.53)	(0.13)
FISIZE	0.13***	0.18***
	(<0.01)	(<0.01)
FIROA	−0.50*	−0.58
	(0.07)	(0.17)
FISTRT	−0.21*	−0.10
	(0.08)	(0.50)
FIINSIDE	−0.36*	0.40
	(0.08)	(0.11)
FIIND	✔	✔
YEAR	✔	✔
N	4,389	
Pseudo R^2	0.153	

Notes: The dependent variable (*VOTE*) has three categories that represent the fund's voting decision: "for", "abstain" and "against". *P*-values are reported in parentheses. (***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.) Detailed description of the variables is presented in Table 2.
[a]The reference category is voting against.

is quite surprising, as we expected holdings to be the main factor in determining the fund's benefit from voting.[7] One possible explanation is that as equity holdings increase, the fund manager becomes a considerable factor in corporate decision-making process, and as such it is more likely to be addressed by the management of the firm in advance through private negotiation. In these cases, the proposal being raised has already been adjusted to the large fund's policy before the meeting, decreasing both the

potential value-diminishing of the proposal and the odds of their voting against it. This explanation is consistent with Hauser et al. (1999), that find positive relation between level of holdings in a firm by mutual funds and the probability of negotiating with management on proposals raised in shareholder meetings.[8]

The low coefficient of both FUHLD and FUHLAS in the first column and the negative and statistically significant high coefficient of both variables in the second column provides an interesting insight about abstaining, as they suggest that an increase in the fund's holdings (either as a proportion of outstanding shares or of all fund assets) is negatively associated with the odds of abstaining (i.e., not taking an active stand) compared to both voting in favor and against management-sponsored proposals. The negative coefficient of FUBANK in both ''for'' and ''abstain'' alternatives, presented in Table 3, suggests that mutual funds managed by commercial banks tend to vote against PHP more frequently than mutual funds managed by private investment companies. The negative coefficient of the FIROA variable and FISTRT in the first column suggests that the funds tend to vote more frequently against PHP in poorly-performing than in relatively good-performing firms. These findings are consistent with previous findings concerning the target selection of large public pension funds in the United States (Huson, 1997).

Under the voting regulations and Israeli Companies Law Section 275 (a), a special majority of one-third of the outside shareholders participating in the meeting is required. Abstaining votes are not included in the base count of the special majority rule. Consequently, any vote other than against is de-facto a vote in favor and it increases the odds of approving the proposal. Following this well-accepted interpretation of the law, we reduce the voting decision of the fund into a two-option decision: to resist or not to resist (i.e., vote for the proposal or abstain),[9] and estimate the following logit model:

$$\text{AGAINST} = \beta_0 + \beta_1 \text{FUHLD} + \beta_2 \text{FUND} + \beta_3 \text{FIRM} + \beta_4 \text{PROTOP} \quad (2)$$

The dependent variable AGAINST is a dummy variable that takes the value of one when the fund votes against a proposal and zero otherwise. The independent variables are the proportion of corporate equity held by the fund FUHLD, FUND that stands for fund characteristics such as size and bank manager, FIRM that stands for firm characteristics such as past accounting and market performance, ownership structure, and main operation industry, and the topic of the proposal PROTOP.

The estimation results of a logit model under two model classifications are reported in Table 4: the first column includes series of dummies to control

Table 4. Logistic Regression on Voting of Mutual Funds in 655 Potentially Harmful Management Sponsored Proposals.

Independent Variable	Model 1	Model 2
INTERCEPT	2.51***	1.66***
	(<0.01)	(<0.01)
METTYP	0.35***	0.33***
	(<0.01)	(<0.01)
FUND_DUMMY	✔	–
FUSIZE	–	−0.07***
		(0.01)
FUBANK	–	1.43***
		(<0.01)
FUHLD	−0.16***	−0.04*
	(<0.01)	(0.09)
FISIZE	−0.22***	−0.17***
	(<0.01)	(<0.01)
FIMRTBK	0.24*	0.24*
	(0.09)	(0.08)
FIROA	−0.39	−0.38
	(0.24)	(0.22)
FISTRT	0.03	0.10
	(0.79)	(0.37)
FIINSIDE	−0.28	−0.31
	(0.21)	(0.13)
FIIND	✔	✔
PROPTOP[a]	✔	✔
(1) Insurance against personal lawsuits for directors	−0.64***	−0.72***
	(<0.01)	(<0.01)
(2) Changes in firm charter	−0.28**	−0.28**
	(0.05)	(0.03)
(3) Related-party transactions	−0.53***	−0.44***
	(0.01)	(<0.01)
(4) Restructuring of options	−2.05***	−1.85***
	(<0.01)	(<0.01)
(5) Nomination/compensation to outside directors	−0.86***	−0.81***
	(0.01)	(<0.01)
(6) Duality in CEO/COB position	−0.24	−0.33*
	(0.26)	(0.09)
YEAR	✔	✔
N	4,535	4,535
Pseudo R^2	0.292	0.159

Notes: The dependent variable (AGAINST) is a dummy variable equal to one when the fund votes against a proposal and zero otherwise. *P*-values are reported in parentheses. (***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.) Detailed description of the variables is presented in Table 2.
[a]The missing category is compensation to insiders.

for funds. In the second column these dummies are excluded and two variables for the fund manager's size and identity are included. Consistent with previous findings such as Gillan and Starks (2000) and Romano (2002), the estimation results presented in Table 4 suggest that the fund voting varies across the topic of the proposal. We find that funds are more likely to vote against direct compensation issues (the missing category) and against changes in a firm's charter. Funds are less likely to vote against appointment and compensation to outside directors as well as against restructuring of options. The estimation results also suggest that the odds of voting against management-sponsored proposals are negatively related to firm size and positively related to market-to-book ratio.

3.2. Bank vs. Non-Bank Mutual Fund Voting

3.2.1. Hypotheses Development

Our sample includes two groups of mutual fund managers: banks and private investment companies. We analyze the voting of bank mutual fund managers under two alternative hypotheses: the *Conflict of Interest Hypothesis* and the *Good Monitor Hypothesis*.

Agency theory suggests that considerations other than the best interest of the beneficiaries could be driving the voting decision of institutional investors. Brickley et al. (1988) argue that institutional investors with potential business relations with the firm are more sensitive to pressure from management than others, and are therefore more likely to vote with management. Accordingly, they find a negative correlation between holdings by pressure-sensitive institutions and aggregate votes against anti-takeover amendments.[10] Payne, Millar, and Glezen (1996) focus on banks as one type of institutional investor that would be expected to have business relations with firms in which they invest. They examine interlocking directorships and income-related relationships between the bank and the firm, and find that when such relations exist, banks tend to vote with management-sponsored proposals on anti-takeover amendments. They further find that when such relations do not exist, banks tend to vote against the management proposals. Amzaleg, Ben-Zion, and Rosenfeld (2007) find the odds that mutual funds managed by commercial banks will participate in shareholder meetings to be negatively related to the corporation's bank debt level. Following this line of thought, one expects mutual funds managed by commercial banks (presumed to be more sensitive to pressure by corporate management) to vote more frequently with

management on PHP than mutual funds managed by private investment companies (the *Conflict of Interest Hypothesis*).[11]

However, an alternative hypothesis regarding bank fund managers' voting can also be developed. Kolasinski (2006), Kumpan and Leyens (2008), and many others argue that banks operate under some level of "Chinese Wall", which is a system (that may consist of rules, physical separation, software, etc.) designed to prevent confidential information leaking from one department of a financial institution to another. If this is the case, then conflict of interest is not driving banks' voting decisions. Moreover, it has been argued that banks are potentially better monitors than other institutional investors, as they have a comparative advantage in monitoring given their better access to inside information and control ability (Gillan & Starks, 2000). Furthermore, the banking industry is also known to be highly regulated, suggesting greater and more effective monitoring over the monitors (i.e., bank fund managers) compared to other non-bank mutual fund managers. In these tightly controlled conditions, bank fund managers are less likely than other private investment mutual fund mangers, to use their publicly known voting to promote other business with corporate management. Following this line of thought, one might expect mutual funds managed by banks to exercise voting rights more efficiently than other fund managers. Specifically we expect bank mutual fund mangers to vote more frequently against PHP than other private investment mutual fund managers (the *Good Monitor Hypothesis*). We further expect them to express their dissatisfaction with firm's management by "voting with their feet" and reducing equity holdings following the meeting.

3.2.2. Banks and Non-Banks Voting in Shareholders Meetings

To test these hypotheses, we compare both the active (i.e., actual voting in shareholder meetings) and the passive (i.e., "vote with their feet") "voting" of bank fund managers and non-bank fund managers.

We estimate a logit model where voting is the dependent variable, and a dummy variable for bank mutual fund managers is on the right hand side. Both the negative coefficient of the bank dummy variable in the multinomial logit estimation presented in Table 3 and the positive and statistically significant coefficient presented in Table 4 suggest that funds managed by commercial banks tend to appose PHP more frequently than funds managed by private investment companies. Specifically for Table 4, the coefficient of the bank variable is 1.43, suggesting that the odds of a bank voting against PHP are about 3.2 times greater than a non-bank fund manager.

We further propose another complementary indirect test for the effect of the relations between the firm and corporate management on the former's voting. A fund manager may have relations with some, but not necessarily with all, firms. If such relations between the fund and the management affect the fund's voting, then one can expect the odds of voting against PHP in firms with which the fund has such relations to be significantly lower than the odds of voting against PHP in other firms. If the fund manager votes by issue and not by firm, then holding everything else constant, the odds of voting against PHP should be similar across proposals and across firms. However, if other considerations (e.g., potential relations, corporate coverage in the daily newspaper, etc.) affect voting, then knowing how fund X voted on previous PHP in firm Y is valuable information. Specifically, if no such voting considerations exist, then knowing that fund X voted against one proposal raised in firm Y should neither increase nor decrease the expectation (odds) of voting against another PHP in the same firm. The null hypothesis is that the variation in voting of funds across different PHP in the same firm equals the variation of its voting between firms.

To test this hypothesis, we eliminate all proposals by funds that report fewer than two proposals in a specific firm. The sample for this test includes 3,142 voting events. We sort all proposals once by fund and then by firm, and do a separate ANOVA test for each fund. The results tend to support the *Good Monitor Hypothesis* as the estimation results of all 36 tests (not reported) show that, for most funds (30 out of 36), the variation of resistance between firms is significantly greater than the variation in resistance within a firm. However, such clustered voting might be explained by variations in corporate performance or ownership structure, as well as other firm specifics. Next, we control for variation in firms, funds, and topic of proposal in a logit regression model:

$$\text{AGAINST} = \beta_0 + \beta_1 \text{FUPREVREST} + \beta_2 \text{FUPREVREST}$$
$$^{*}\text{FUBANK} + \beta_i X_i \tag{3}$$

The dependent variable AGAINST is a dummy variable that takes the value of one when the fund votes against the proposal and zero otherwise. The independent variables are FUPREVREST the average resistance of the fund in all *previous* votes in the same firm, and an interaction between the FUPREVREST variable and a dummy variable FUBANK equals one for bank mutual funds and zero otherwise.[12] We control for firms, funds, type of meeting, and time. The estimation results are presented in Table 5. Sample size is reduced to 793 as we considered only voting records for which

Table 5. Logistic Regression on Voting of Mutual Funds in Potentially Harmful Management Sponsored Proposals.

Independent Variable	Coefficient (*P*-values)
INTERCEPT	36.39
	(0.90)
FUPREVRES	3.22***
	($<$0.01)
FUPREVREST * FUBANK	-0.96**
	(0.04)
METTYP	0.37**
	(0.05)
FUND_DUMMY	✔
FUSIZE	0.74***
	($<$0.01)
FUHLD	-21.64***
	(0.01)
FIRM_DUMMY	✔
FISIZE	-0.21***
	($<$0.01)
FIMRTBK	-0.11**
	(0.03)
FIROA	-0.80*
	(0.22)
FIINSIDE	-1.09**
	(0.04)
PROPTOP[a]	✔
YEAR	✔
FIIND	✔
N	793
Pseudo R^2	0.526

Notes: The dependent variable (AGAINST) is a dummy variable equal to one when the mutual fund votes against a proposal and zero otherwise. (***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.) Detailed description of the variables is presented in Table 2.
[a]The missing category is compensation to insiders.

previous votes existed (i.e., of the same fund manager in the same firm). The coefficient of the FUPREVREST is positive and statistically significant, suggesting that holding firm size, performance and ownership structure, and the voting of mutual funds is highly firm-oriented. Specifically, we find that the odds of voting against any given PHP increases (decrease) if the fund manager voted against (for or abstain) previous proposals by the same firm.

These results indicate that fund voting in shareholder meetings is driven by firm rather than by issue. The positive and significant coefficient of the interaction between the FUPREVREST variable and FUBANK variable suggests that bank funds tend to change their vote more frequently within a given firm, compared to funds managed by private investment companies. This finding supports the *Good Monitor Hypothesis* regarding banks compared to non-bank fund managers.

3.2.3. Banks and Non-Banks "Voting" with Its Feet

Agency theory suggests that a dissatisfied institutional investor tends to follow the *Wall Street Rule* and sell its shares. We study the relation between active voting (i.e., exercising voting rights in shareholder meetings) and passive voting (i.e., reduce equity holdings when dissatisfied with corporate management), by analyzing the percentage changes of bank and non-bank mutual fund managers' equity holdings following the voting action in shareholder meetings. The sample for this analysis consists of 793 pairs of fund-firm voting events in 212 shareholder meetings for which we were able to obtain holding data in two consecutive (about 200 days later) meetings.

The percentage changes in holdings of mutual fund managers following the meeting with respect to their previous vote and to manager's identity (i.e., banks and non-banks) are presented in Table 6. Its main focus is the average daily percentage changes in a fund manager's FUHLD and FUHLAS. For all fund managers we find a positive, although insignificant, daily percentage change in fund managers' holdings following the meeting regardless of their vote. This insignificant relation between voting and holdings strategy seems to be clearer when separating bank and non-bank fund managers. Specifically, we find that bank fund managers tend to reduce equity holdings (FUHLD) after voting against PHP by about 0.08 percent per a day and increase equity holdings after voting for (or abstaining) a PHP by about 0.16 percent a day on average, following the meeting. Both changes are found to be significantly different than zero at the five percent level. Non-bank fund managers, however, seem to increase equity holdings regardless of their votes. Specifically, Table 6 shows a daily and statistically significant increase of about 0.11 percent in non-bank fund managers' post-meeting equity holdings when they vote against management, and a significant increase of 0.17 percent when they vote with management. This finding provides further support for the *Good Monitor Hypothesis* regarding bank fund managers compared to non-bank fund managers. It suggests that banks tend to follow the *Wall Street Rule* and reduce equity holdings as a complementary monitoring mechanism (to voting against) when they are

Table 6. Daily Percentage Change in Holdings of Bank and Non-Bank Mutual Fund Managers Following Voting in Shareholders Meeting.

		Resist			Not Resist		
	All	All	Non-bank	Bank	All	Non-bank	Bank
FUHLD							
FUHLD in first meeting	0.46%	0.57%	0.18%	0.88%	0.43%	0.36%	0.58%
	(1.16%)	(1.28%)	(0.50%)	(1.60%)	(1.11%)	(1.02%)	(1.28%)
Daily percent change in FUHLD following the meetings	0.11%	0.16%	0.17%*	−0.08%**	0.13%***	0.11%***	0.16%***
	(0.69%)	(0.53%)	(0.77%)	(0.16%)	(0.48%)	(0.47%)	(0.50%)
FUHLAS							
FUHLAS in first meeting	0.37%	0.23%	0.36%	0.13%	0.42%	0.54%	0.16%
	(1.03%)	(0.83%)	(1.21%)	(0.19%)	(1.09%)	(1.28%)	(0.32%)
Daily percent change in FUHLAS following the meeting	0.02%	−0.02%	0.19%*	−0.11%***	0.07%	0.06%**	0.08%**
	(0.45%)	(0.58%)	(0.82%)	(0.20%)	(0.40%)	(0.44%)	(0.28%)
Days between the two meetings	201.4	191.7	175.7	204.5	204.7	209.8	193.7
	(181.2)	(183.2)	(174.9)	(188.6)	(180.4)	(182.7)	(175.0)
Number of voting events [original sample]	635	161	71	90	474	325	149
	[793]	[201]	[89]	[112]	[592]	[405]	[187]

Notes: The daily percentage change in fund manager holdings following the meeting with respect to the fund manager's identity (i.e., bank and non-bank) and to its vote (i.e., resist or not resist) on management sponsored PHP are presented. FUHLD represents the proportion of corporate equity held by the fund manager at the time of the meeting. FUHLAS represents the proportion of the fund managers' assets invested in the firm. The original sample of 793 pairs of voting events of fund manager *i* in firm *j* in two different dates was used to calculate all but the changes in holdings. To reduce the sensitivity of the tests to the effect of extreme values we cut of the top and bottom 10 percent of the voting events in each category and used, when investigating the changes in holdings, a reduced sample of 635 pairs of voting events. The average daily percent change in holding is calculated by subtracting the level of holdings at the second meeting from the level of holdings at the first meeting divide the outcome by the latter and then divide it by the number of days between the two meetings. Standard deviation is presented in parenthesis (***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively).

dissatisfied with corporate management. Non-bank fund managers, however, tend to increase holdings regardless of their vote.

4. CONCLUSIONS

Voting by institutional investors is an important issue in corporate governance. This chapter analyzes the voting of mutual fund managers in a sample of 4,553 voting events in 655 PHP raised in shareholder meetings. We find that in most cases mutual funds vote with management (about 51.8 percent of the proposals) and that they only vote against 30.1 percent of the proposals. Analyzing the factors associated with the voting decision of mutual funds using a logit model, we find the odds of voting against a proposal to be negatively related to fund holdings and positively related to corporate past performance. Our evidence also shows that after controlling for firm size, performance, and ownership structure, the voting of mutual funds tends to be highly clustered by firm. We find that the funds vote almost consistently with the management in some firms and not in others.

We further study bank fund managers' voting and trading strategy under two alternative hypotheses. The *Conflict of Interest Hypothesis* suggests that bank fund managers have other business relations with the company, which makes them more sensitive to pressure by corporate management compared to other fund managers, and thus they are less likely either to oppose management or to vote with their feet following the meeting. The alternative hypothesis regarding bank fund managers, the *Good Monitor Hypothesis*, suggests that banks are potentially better monitors than other institutional investors as they operate under a ''Chinese Wall'', in a highly regulated and controlled business environment with a comparative advantage in monitoring other fund managers, given their better access to inside information and control ability. The evidence presented in this chapter supports the *Good Monitor Hypothesis*. Controlling for the type of meeting, the fund and firm characteristics, and the topic of the proposal, we find that bank fund managers vote significantly more frequently against PHP than other private investment companies. Banks' voting is also found to be significantly less clustered than other funds. Investigating the trading strategy of both bank and non-bank mutual funds following the meeting, suggests that a bank tends to follow the *Wall Street Rule* and reduce equity holdings when it is dissatisfied with corporate management (i.e., voted against management) and increase holdings when it voted with management, whereas a non-bank fund tends to increase holdings regardless of its vote.

NOTES

1. In January 2003, the SEC adopted a new rule that made disclosure of proxy voting policies and procedures for U.S. mutual funds mandatory. For evidence on voting of mutual funds in the United States, see Rothberg and Lilien (2005) and Davis and Kim (2005). For a detailed comparison of the voting systems in several countries, including the United Kingdom, United States, Australia, and Germany, see Mallin (2001).

2. Black (1997) argues that institutional investors vote on thousands of proposals every year, but invest little effort on how to vote. The cost of voting against management includes the direct costs of studying the proposal, evaluating its economic value to the firm, attending the meeting, and indirect costs of bad relations with the management of the firm. Short and Keasey (1997) find that mandatory voting is unlikely to be effective.

3. Bushee and Neo (1999) find that some institutions have a longer-term focus than others. Del Guercio and Hawkins (1999) find that different pension funds have different intervention strategies in terms of target selection, publicity policy, and the definition of success. Woidtke (2002) and Ingley and van der Walt (2004) discuss the differences between institutional investors in terms of legal restrictions, interests, and agency relations that may influence the monitoring efficiency.

4. The Israeli market consists of approximately 600 mutual funds managed by about 40 mutual fund managers. Although we analyze the voting by fund managers, the term "fund" is used for simplicity.

5. Votes against dividend issues (103 voting events) and other regular proposals (351 voting events) average about 8.8 percent, and it is significantly less than for all other proposals (about 30.1 percent).

6. Due to problems of endogeneity in the explanatory variables and the influence of outliers (Bhagat & Jeffris, 2002), we suspect that the estimates might be biased and inconsistent. In all estimations presented, we use bootstrapping methodology as in Manski and Thompson (1986) to estimate the empirical distribution and confirm the significance of the explanatory variables. The significance levels of all coefficients (not presented) are qualitatively the same.

7. Carlton, Nelson, and Weisbach (1998) focus on the fifth largest fund in the USA, TIAA-CREF, and find institutional investors' greater ownership to be one of the major factors in choosing the target firm. Others, such as Gordon and Pound (1993) and Gillan and Starks (2000), find a positive correlation between institutional investors' ownership and the outcome of voting on institutional investors' proposals. Karpoff (1996) finds a positive correlation between the level of holdings by institutional investors and the probability of raising a proposal by an outside shareholder.

8. With the exception of some anecdotal evidence of CalPERS, TIAA-CREF, and other large pension funds from the United States, private negotiations and "behind the scenes" actions taken by active shareholders are generally excluded from academic literature and are known to be one major problem in measuring the effectiveness of shareholder activism. Notable exceptions are Carlton et al. (1998) from the United States and Hauser et al. (1999) in an Israeli study.

9. For a robustness check, we estimate the equation excluding all "abstain" votes. That is, the dependent variable equals one when fund managers vote against a proposal and zero when they vote for a proposal. The results (not reported) are not significantly different from those presented in the chapter.

10. Brickley et al. (1988) consider mutual funds as non-sensitive. However, they acknowledge that individual institutions within a category are likely to have different ties with the management. See also Hwang, Nachtmann, and Rosenfeld (1997).

11. However, Davis and Kim (2005) analyze the voting of the 10 largest mutual fund families in the United States, and find that funds are no more likely to vote with management at client firms than non-clients. Also Rothberg and Lilien (2005) provide an analysis of the proxy voting policies of the largest 10 fund families. Their results do not support the notion that conflicts of interest cause a difference in voting behavior.

12. The sample for estimating this model was generated in the following manner: we sorted all voting records by fund manager by firm and meeting date. First we excluded all voting records where the fund manager attended only one meeting during the sample period. For the remainder we used the average (sometimes there was more than one) voting resistance of the fund manager in the latest reported meeting date as the independent variable, and the average of all previous voting resistance of the fund manager (in the same firm) as the dependent variable.

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DOES CORPORATE GOVERNANCE MATTER? KOREAN BANKS IN THE POSTFINANCIAL CRISIS ERA

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ABSTRACT

The 1997 financial crisis in Asia has entailed significant changes and governance reforms in the Korean banking industry. This study investigates the impact of corporate governance on the risk and return of Korean banks during the 10 years that followed the financial crisis era. In particular, we investigate the ownership structure of banks, the extent of involvement of foreign institutions and investors in ownership and board membership of Korean banks, and the heterogeneity of board structure on bank performance. Our findings indicate that foreign ownership, the extent of external board involvement, and the presence of foreign directors on the board are associated with significantly higher bank returns. Although foreign ownership and the number of outside board directors are associated with lower risk, the involvement of foreign board members is positively associated with risk. The results are fairly robust to a battery of tests and control variables, and offer the first detailed empirical documentation of the Korean banking governance reform and its achievements since 1997.

1. INTRODUCTION

More than a decade has passed since the start of the Asian financial crisis in the middle of 1997. Korea was one of the countries that suffered painfully since the start of crisis in the country in November of that year, causing South Korea to go through extensive restructuring with a relatively high amount of bailout assistance, over $60 billion, from the IMF. For Korea, one could say that one of key factors associated with the crisis was the widespread decline of market equity values of corporations. Among other explanations is the lack of appropriate corporate governance that was considered as one of the weak links contributing to the crisis itself. Recently, there have been a few studies documenting that governance and performance are correlated in the pre and postfinancial crisis years (Johnson, Boone, Breach, & Friedman, 2000; Joh, 2003; Baek, Kang, & Park, 2007; Choi & Hasan, 2006). More recently, there is also some evidence on the positive effect of transparency and foreign involvement ownership on increased performance in the postcrisis era (Black, Jang, & Park, 2006).

The Asian crisis has significantly altered the financial industry.[1] The industry took a huge blow as five prominent banks were closed in the middle of 1998 and eventually restructured through assisted mergers to open for business. The acquiring banks received assistance and focused on getting high returns on the good assets while taking the responsibility of all existing liabilities. Additionally, regulators encouraged further consolidation even among banks that are not necessarily in distress and encouraged the creation of bigger institutions. The regulatory authorities focused extensively on the outdated and less transparent corporate governance system and backed substantial reforms in its corporate governance structure while focusing on broader objectives such as debt reductions. In a swift change of corporate governance, the authority required banks to nominate outside board members in addition to mandatory audit committees with two-thirds of the members as outsiders.

The early literature on the Korean banking crisis (Gilbert & Wilson, 1998; Hao, Hunter, & Yang, 2001; Choe & Lee, 2003), was focused on analyzing the efficiency, stability, and accounting performance of commercial banks, without focusing on the possible effects of ownership and corporate governance structure on performance. In most cases, the postcrisis analyses are focused on the non-financial sectors, and in some cases, inclusive of banks in the combined analyses of the Korean corporations (Jeon & Miller, 2000).

In recent years, a number of papers have shown a positive relationship between restructuring of governance and regulations and improved performance (Mitton, 2002; Lemmon & Lins, 2003; Baek, Kang, & Park, 2007;

Baek, Bae, & Kang, 2007). Kim and Kim (2007) however did not find strong results in all directions on such changes on larger firms (chaebol). Using a corporate governance index measure, Black et al. (2006) report positive changes in the quality of corporate governance in Korea. It was Hahm (2005) and Choi and Hasan (2006) who focused on the changes in the governance of the banking sector. Given the importance of banks, their intermediation role in economic growth and their provided macroeconomic efficiency and stability (Levine, 1997; Levine & Zervos, 1998), a better understanding of the changes in the governance system in banking institutions may be crucial. This study examines the impact of the initiatives to improve banking regulations and governance during the postcrisis period of 1998–2007, on the return and risk of Korean commercial banks. Specifically, we examine whether the involvement of foreign entities in the ownership structure, the exact composition of board members, independent outside and foreign director, have affected bank performance.

Our findings document a strong positive association between outside directorship, in general, foreign ownership, foreign directorship, and bank performance. The results suggest that even the mere existence of a foreign owner is important while the extent of foreign ownership has a significant positive effect on bank returns. We also find that outside directors have a positive marginal significant effect on performance, and that the involvement of foreign board members in the local board is associated with significantly higher returns as well. Finally, banks with a combination of foreign owners and directors on the board are associated with a strong positive and significant bank performance in most estimations. These results are robust to size, changes in bank regulation, year fixed effects, and other relevant specifications.

The rest of the chapter is organized as follows: Section 2 briefly outlines the history of the South Korean banking system and summarizes the relevant regulations on ownership and governance of South Korean commercial banks. Section 3 presents a brief review of the literature related to ownership and governance structures and firm performance. Section 4 describes the data and variables used in the estimation and presents summary statistics. Section 5 presents the empirical results. Concluding remarks are presented in Section 6.

2. FINANCIAL INTERMEDIATION AND CRISIS

The Korean central bank came to existence in 1950. In the pre-Word War II environment, the banking sector was dominated by Japanese banks and

although some privatization effort started in the 1950s, a wave of nationalization of banks swept through the country in 1960s and 1970s. The Korean government waged an export-oriented industrialization policy and banks were the conduit to this effort (Bank of Korea, 2002). In fact, in 1970s, such policy loans supporting government programs accounted for nearly 80% of the domestic credits (Hao, Hunter, & Yang, 2001). This decade was also characterized by more stringent interest rate controls and selective credit policies for certain heavy industries. It was in the 1980s and later that several deregulatory attempts gave the Korean commercial banks more autonomy in their business activities and managerial decisions.

During the post-1980s, the privatization effort took more tangible turn and the country has witnessed the privatization of Hanil Bank, Korea First Bank, Seoul Bank, Cho Hung Bank, and Kook Min Bank and such effort continued even up to the eve of the financial crisis of 1997. In between, many denovo banks entered in the market. These banks are Shinhan Bank and Hanmi Bank during the early 1980s, Dongwha, Dongnam, and Daedong banks during the late 1980s and Hana Bank, Boram Bank, and Pyongwha Bank in the early 1990s. Also, the previously exchange focused bank, Korea Exchange Bank, converted to a commercial bank during the late 1980s. The banks in Korea never had substantial profits during the 1980s as non-performing loans were as high as 7 percent in some years during the 1985–1990 although with ample explicit or implicit government support banks stayed open for business.

Excess involvement from the government, which created the belief that the *chaebols* were 'too big to fail' (Hahm, 2005; Claessens et al., 2001), had also created moral hazard problems for *chaebols* and banking institutions, causing deterioration in both financial and non-financial balance sheets during the 1990s. Banking institutions kept lending to these big firms assuming they would not be allowed to fail, thus in effect guaranteeing their loans. This led to excessive borrowing by the big firms (*chaebols*), which eventually resulted in high levels of non-performing loans at the onset of the financial crisis (Hahm, 2005).

Postcrisis bank reform efforts in Korea have aimed at reconstructing the banking system in which financial resources have started to be allocated according to market principles. When the financial crisis hit Korea in 1997, two of the largest banks – Seoul Bank and Korea First Bank – were the first banks to become insolvent. These were among the biggest banks and to the financial stability conscious government, they were too big to fail, resulting in their immediate nationalizition and recapitalizion by the government in January 1998. It was early 1998 when the Monetary Board of the Bank of

Korea reported that half of the other 24 Korean banks could not meet the 8% capital adequacy requirement mandated by the Bank of International Settlement (BIS).[2] The Financial Supervisory Commission (FSC) and the Monetary Board ordered 5 of the 12 banks to close businesses. These five banks – Daedong, Dongnam, Dongwha, Kyong Gi, and Chung Cheong – were in fact closed through the purchase and assumptions (P&As) by five relatively solvent commercial banks. The Kook Min Bank acquired Daedong Bank, Housing & Commercial Bank acquired Dongnam Bank, Shinhan acquired Dongwha Bank, Hanmi acquired Kyong Gi Bank, and Hana acquired Chung Cheong Bank. Later, Kook Min Bank also acquired Korea Long Term Credit Bank in December 1998. Sang Up Bank and Hanil Bank merged and created the new name – Hanvit Bank, which started operation in January 1999. Hana Bank and Boram Bank merged and became Hana Bank, which started to operate in January 1999. Cho Hung Bank acquired Chung Buk Bank, Kang Won Bank, and Hyundai Investment Trust Company. Newbridge Capital acquired Korea First Bank in December 1999 and Korea First Bank became the first commercial bank to be sold to a foreign capital group. Kook Min Bank and Housing & Commercial Bank merged together and became Kook Min Bank in 2000. In 2001, Hanvit Bank, Pyongwha Bank, Kwang Ju Bank, Kyong Nam Bank, and Hanaro Merchant Bank merged and became Woori Finance Holding, which was the first financial holding company in South Korea. Shinhan Bank became Shinhan Financial Group Company in 2001. In 2002, the Korean government approved the purchase of Seoul Bank by Hana Bank and it was completed by November 2002. On October 2002, the Korean government announced its sale of 80% ownership of Cho Hung Bank to the public and Shinhan Financial Group agreed to purchase these shares in 2003.

All the regulatory changes during the past decades are outlined in the Bank of Korea (2002) report. The General Banking Act was revised on December 1982 to give banks more discretion and to limit the amount of bank stocks, which could be held by a single shareholder. This limitation is to prevent the large company, especially chaebols, from controlling a bank for its own use. The ownership restriction in 1982 was 8% and was decreased to 4% under the revision of the General Banking Act of December 1994. The exception of this limitation was possible until 12%, but it was abolished by the revision of the General Banking Act of January 1998. Under the revision of 2002, the current ownership limitation is 10%, but it is required to notify the FSC if the ownership exceeds 4%. There are also a few exceptions allowed: the ownership by the government and the

Korean Deposit Insurance Corporation (KDIC) and regional banks (15%). The ownership restriction was applied differently for the foreigners and foreign financial institutions under the revision of 1998. However, the limitation is applied the same as for Korean investors: they can own up to 10% (15% for regional banks) and need to be approved if their ownership exceeds 10% (25%).

To strengthen the corporate governance structure of financial institutions, a number of related acts were revised. Under the revision of the General Banking Act of 2000 (passed in December 1999), banks are required to change the title of their non-executive directors to outside directors and establish an audit committee with two-thirds of its members being outside directors. Under the revision of 2000, the bank has to have at least three outside board members, and the number of outside board members should be at least 50% of total board members.

The newly private non-chaebol banks as well as other non-banks and banks started to take huge infusion of foreign capital. All these corporations and banks now have their majority of outstanding shares held by foreign investors. These institutions also have high disclosures and transparency as some are listed on exchanges abroad and subjected to U.S. GAAP or International accounting standards. Over time, these institutions started to bring in more independent outside and foreign directors (Kim & Kim, 2007). Driven by regulatory reform efforts, Korean banks have started to restructure their internal governance systems. It is noteworthy that, at least at the statutory level, the independence of the board and audit committees was substantially strengthened. Outside, non-executive directors started to take over 50% of the total board members and two-thirds of the total audit committee members. Also, the nomination committees are filled with more non-executive directors.

3. LITERATURE REVIEW

In the early literature on Korean banks, Gilbert and Wilson (1998) focus on the impact of deregulation in the 1980s on the productive efficiency of Korean private banks during the post-1980s to precrisis years, showing that deregulation did improve bank efficiency. Hao, Hunter, and Yang (2001) also focus on the precrisis period (1985–1995) and find that high growth institutions with vast geographical networks, and banks funded with retail deposits were the most efficient banks during that era. It should be noted however that even in the precrisis period, the paper revealed that a few

banks allowed foreign ownership and although the numbers were small, these banks were associated with higher bank efficiency.

In the postcrisis environment, Jeon and Miller (2000) examined the performance of Korean banks before, during, and immediately after the Asian financial crisis reporting that in general, sound banks, i.e., banks with higher capitalization, performed significantly better than inefficient institutions, i.e., banks with higher non-interest income. In event study analysis, Choe and Lee (2003) also examine the stock market reaction to the announcement of corporate governance reforms in the Korean banking sectors in the postcrisis environment and report a significant positive increase in abnormal stock returns (SR).

In a related study, Mitton (2002) examines the relationship between disclosure and crisis-period SR and finds support for a positive association between returns and improved performance. Lemmon and Lins (2003) report a strong relationship between ownership structure and crisis-period SR. Baek, Kang, and Park (2007) study both ownership and disclosure effects, revealing a positive impact on returns. Recently, Baek, Bae, and Kang (2007) report that while non-financial firms with weak governance suffered more losses in terms of accounting profits and larger drops in stock prices during the crisis period, in the postcrisis period, these firms (most with some changes in corporate governance) experienced a larger rebound in their equity prices. Their findings and intuition that controlling shareholders' incentives to expropriate minority shareholders went up (down) during the crisis (boom) period due to the fall (increase) in expected return on investment, is consistent with the view that controlling shareholders' expropriation incentives imply a link between corporate governance and firm value.

Kim and Kim (2007) report how Korean corporate governance has evolved since the Korean financial crisis with special focus on chaebol, claiming that although not all reform measures were successful or even had desirable effects, the overall impact has been positive. In their study, Kim and Kim document improved corporate transparency, managerial accountability, external monitoring, and oversight by the board as key developments in the postcrisis period. They report that the best governance practices are performed by newly privatized companies or large corporations run by professional management and banks with the majority of equity ownership in the hands of foreign investors.

Black, Jang, and Park (2005) and Black et al. (2006) show that there are tremendous changes in Korean corporate governance during the decade following the crisis. Authors in both papers compile a Corporate Governance Index (KCGI) reporting that in the postcrisis era there is a

dramatic increase in the quality of corporate governance. It is shown that for firms with assets greater than 2 trillion won (over 2 billion US dollars), the index had increased from 32.89 in 1998 to 68.93 in 2003. This index had a 0–100 score where a higher number represents higher quality and the scores are based on five equally weighted sub-indices: shareholder rights, board structure, board procedure, disclosure, and ownership parity. Overall, the results are consistent with causation running from good governance to higher market value. In fact, in Black et al. (2006), a worst-to-best change in *KCGI* predicts a 0.47 increase in Tobin's *q* (roughly a 160% increase in share price). They also find a strong connection between board composition and share price. Specifically, Korean firms with 50% outside directors have 0.13 higher predicted Tobin's *q* (roughly 40% higher share price). In addition, they show that better-governed firms appear to enjoy a lower cost of capital.

A recent paper by Hahm (2005) is primarily focused on the banking sector, reporting remarkable progress in all sectors of the Korean economy, including the banking sector in the postcrisis period. According to Hahm, not only there is an improvement in the corporate governance practices of Korean banks, but also a tangible impact on the banks' performance and soundness. Given the importance of banks as intermediaries, and their role in economic growth, macroeconomic efficiency and stability, the establishment of an effective governance system for banking institutions is not only critical for the competitiveness of the banks themselves, but also instrumental for developing a vigilant banking system that monitors corporate borrowers (Hahm, 2005).

The general literature on corporate governance is dominated by papers that are focused on the impact of managerial and board ownership structure on performance. However, there are few exceptions where the research questions deal with the impact of equity ownership by different groups on firm behavior. Early evidence on such research questions shows a significant positive association between Tobin's *q* and the fraction of shares owned by institutional investors (McConnell & Servaes, 1990) or foreign investors (Dahlquist & Robertsson, 2001). Several studies analyzing banks' performance across developing countries find that foreign ownership is associated with higher performance. Claessens et al. (2001) showed higher performance of banks with foreign ownership in Egypt, Indonesia, Argentina and Venezuela; Barajas, Steiner, and Salazar (2000) in Columbia; Yudaeva, Kozlov, Melentieva, and Ponomareva (2003) in Russia; Clark, Cull, Martinez, and Sánchez (2003) in Argentina; Hasan and Marton (2003) in Hungary; Bhattacharya, Lovell, and Sahay, 1997 in India; Bonin, Hasan,

and Wachtel (2005) in transition countries in Eastern and Central Europe and Berger, Hasan, and Zhou (2009) in China.

In general, the overall literature on corporate governance, focusing on the effect of board composition on firm performance is still mixed and inconclusive. On the one hand, there exists a documented positive relationship between firm performance and the existence of outside directors based on the agency theory (Fama, 1980; Fama & Jensen, 1983; Agrawal & Chadha, 2005; Cotter, Shivdasani, & Zenner, 1997; Gompers, Ishii, & Metrick, 2003) highlighting the board's effectiveness in monitoring and the role of outsiders and independent board members in improving firm performance. On the other hand, there is a negative (or no relationship) between firm performance and outside directors based on the managerial hegemony theory where outside directors depend on top management (Baysinger & Butler, 1985; Hermalin & Weisbach, 1988; Mehran, 1995; MacAvoy, Cantor, Dana, & Peck, 1983; Hermalin & Weisbach, 1991; Agrawal & Knoeber, 1996; Bhagat & Black, 2000). An additional concern with regard to the inconclusive and mixed results in literature is also raised by a survey article by Rhoades, Rechner, and Sundaramurthy (2000), who reports that one-third of the variation across board composition studies is the result of sampling error and does not reflect the true differences in the relationship between board composition measures and financial performance.

As we analyze the impact of ownership and board structure on bank returns and risk, we argue that it is plausible that foreign ownership is likely to create an environment where there is a transfer of knowledge and technology, by which learning and adapting a more competitive and transparent business strategy is translated to higher returns. In such scenarios it enables the local bank with more foreign ownership to outperform the other banks with limited exposure and experience. Independent outside directors may also be crucial to be shareholders' interest-enhancing monitoring. Since outside directors are not part of the organization's management team, they are not subjected to the same potential conflicts of interest that are likely to affect the judgments of the insider directors. Moreover, if the outside director is someone from a foreign group, it is more likely that such outside member will be more independent and will have less conflict of interests relative to even the local outside directors. Additionally, their experienced insights and understandings of markets and competition beyond the local environment may bring added perspectives to the local institutions (Choi & Hasan, 2006). It is also plausible to assume that the foreign directors would provide performance enhancing benefits causing higher firms value (Oxelheim & Randoy, 2003).

4. DATA AND METHODOLOGY

The sample data was taken from the annual business filing report, which all financial institutions are required to file with the Financial Supervisory Service (FSS), and from the Bankscope database for the sample period of 1998–2007. The Bankscope data is primarily for the year 2003–2007 and for the previous years, we depended substantially on the FSS information. The total number of banks varies from year to year due to the several mergers and acquisitions over the same period of time. In our sample, there were 21 commercial banks in 1998, 16 in 1999 and 2000, 15 in 2001, 14 in 2002, 12 in 2003 and 2004, 11 in 2005, 9 in 2006 and 2007. We exclude banks that do not have the all pertinent information and eventually end up with 128 bank observations. The sample primarily consists of two types of commercial bank: Seoul-based national banks with nationwide branch networks and regional banks based in different major cities with certain local focus.[3]

In measuring performance, we consider multiple measures of performance that are well used in the literature for similar proxies. We use return on asset (ROA) and return on equity (ROE) following, among others, Holderness and Sheehan (1988), Morck et al. (1988), Kang and Shivdasani (1995), and Qi, Wu, and Zhang (1998). A bank's ROA is defined as the firm's net income divided by total assets. A bank's ROE is defined as the firm's net income divided by its book value of equity. We also create some change (or difference) in performances of sample banks from the precrisis era to respective years by calculating earnings change for each institution from their 1997 earnings (ROADIFF97). Using stochastic frontier analysis, we estimate profit (X-Efficiency) efficiency (PEFF) for the sample banks. This stochastic frontier approach is widely applied in the banking literature where a performance measure is developed relative to best practiced sample institution.[4] Total profit is measured by net profit earned by the bank. Other necessary variables needed to measure the efficiency scores follows the standard procedure of such estimation (Berger, Hunter, & Timme, 1993; Berger & Mester, 1997). For a market-based performance measure, we use end of year SR of respective firms.

In measuring risk, we also consider two different measures. The book value measure is the PLLTL total loan losses to total loans (Liu & Ryan, 1995), and the market measures is the standard deviation of the average daily SR, STDSR (Anderson & Fraser, 2000). In total, we use five return – ROA, ROE, ROADIFF97, PEFF, and SR – measures and two risk – PLLTL and SIG – measures as our dependent variables. We formulate

a simple ordinary least squared model to measure the effect of ownership and governance structures on bank performance.

$$\text{Performance} = f(\text{foreign ownership, foreign director,}$$
$$\text{outside director, bank size, deregulation}) + \varepsilon \quad (1)$$

where *Performance* comprises (1) ROA = return on assets = net income to assets, (2) ROADIFF97 = sample year's ROA difference from the 1997 ROA, (3) ROE = return on equity = net income to equity, (4) PEFF = profit efficiency = relative performance measure, (5) PLLTL = provision for loan losses, (6) STDSR = standard deviation of stock returns, (7) SR = stock returns; the *Key Independent variables* are foreign ownership (FOSP) = percentage of foreign ownership, foreign director (FGONP) = percentage of foreign directors to total directors on the board, outside director (OUTBNP) = percentage of outside directors and *Control variables are* Size (LTA) = logarithm of total assets, deregulation (DEREG) = dummy variable for the postderegulator environment (i.e., 2000–2007 years with substantial deregulation initiatives undertaken in 1999), ε = error term.

The empirical investigation traces for possible correlations between the ownership and governance structures on different proxies for bank return and risk. Given our sample size is very small, we limit our consideration for control variables to a minimum – the log of total assets (LTA) and the postderegulation period (DEREG). Such practice of using limited control variable is not unusual in the corporate governance literature (Yermack, 1996). We however do use time fixed effects by introducing year dummy variables for the sample years in our model. We also use some alternative variables in our robustness check specifications to represent our key independent variables: foreign ownership, foreign director, and outside director. For these estimations, instead of using continuous variables for the focus variables (percentage of foreign ownership, percentage of foreign directors, and percentage of outside directors), we use the dummy variables. That means that we construct the foreign ownership variable with a dummy equals 1 if the bank has any foreign ownership and zero otherwise; the foreign directorship dummy equals 1 if the bank has at least one foreign director, 0 otherwise; and the outside board member dummy equals 1 if the banks has at least one outside member on the board, and 0 otherwise. In fact, the parameters of these dummy variables were quite similar to the reported continuous variables and in most cases they portrayed stronger results relative for their continuous counterparts. In turn, we have decided to report the relatively more conservative results. In our model, we also add some additional independent variables – interaction of

the key independent variables mentioned above – for a better understanding on the potential impact of such variables affecting bank performance.

Table 1 presents means, medians, maximums, minimums, and standard deviations of all the variables we use in the analysis. On average, there are

Table 1. Descriptive Statistics.

	Mean	Median	Maximum	Minimum	SD	Number of Observations
Percentage of foreign ownership (FOSP)	0.31	0.17	0.76	0.00	0.29	118
Percentage of foreign directors on board (FGONP)	0.18	0.15	0.75	0.00	0.15	118
Percentage of outside directors on board (OUTBNP)	0.57	0.50	0.88	0.36	0.06	118
Dummy for foreign ownership (DFOS)	0.31	1	0.82	0.00	0.29	118
Dummy for foreign directors on board (DFGON)	0.44	0.00	1.00	0.00	0.50	118
Dummy for outside directors (DOUTBN)	0.82	1.00	1.00	0.00	0.19	118
Total number of directors on board (BMN)	22.34	18.54	40.00	8.00	7.50	118
Return on assets (ROA)	−0.13	0.67	10.97	−10.45	2.41	118
ROA difference from the ROA in 1997 (ROADIFF97)	0.00	0.31	4.51	−6.01	0.03	118
Return on equity (ROE)	−0.10	0.13	7.81	−6.48	0.94	118
Profit efficiency score (PROFEFF)	0.71	0.64	0.98	0.29	0.32	118
Annual stock return (SR)	0.02	0.02	0.09	−0.08	0.04	102
Provision for loan losses to total loan ratio (PLLTL)	0.06	0.04	0.24	0.05	0.04	118
Standard deviation of stock return (STDSR)	0.12	0.09	0.43	0.04	0.07	102
Log of total assets (LTA)	27.02	27.34	29.39	22.03	2.39	118

Notes: Descriptive statistics for the variables investigates the impacts of the different ownership and governance structure on the Korean commercial bank performance. The sample consists of Korean commercial banks over the period of 1998–2007, which is the period after the financial crisis of the late 1997. BMN, total number of directors on the board; DFGON, the dummy variable for the foreign board of director; DFOS, the dummy variable for the foreign ownership; FOSP, the foreign ownership percentage variable; FGON, the number of foreign directors on the board; OUTBNP, the percentage of outside directors on the board; DOUTBN, the dummy variable for the outside directors on the board; ROA, the return on assets; ROADIFF97, the ROA difference from 1997 ROA; PROFEFF, the profit efficiency scores; SR, the annual stock returns; PLLTL, the ration of provision for loan losses to total loans; STDSR, the standard deviation of the daily stock returns and LTA, the natural logarithm of total assets.

22.34 board members associated with a sample organization. Over 80 percent of the sample banks have at least one outside board member and, on average, outside members constitute over 57 percent of the directors' positions. Over 44 percent of the sample banks have at least one foreign director and overall, foreign directors constitute 18 percent of the board. The foreign ownership consists of 31% of total equity with a range of 0–76%. On average, banks' provision for loan losses accounts for around 5%, but it varies from 1.5% to 17.9%. The average bank size is 54 trillion Korean won with an extensive variation between the smallest and largest banks. Although the average ROA and ROE show negative earnings, most banks are sound and profitable during the sample year. Profit efficiency scores are around 71, i.e., the banks have, on average, the possibility to improve almost 30 percent in order to compete at par with the best-practiced banks. The stock market return reflects robust earnings in the capital market by most banks.

We measure the correlation between variables to see if there is a real relationship between governance, ownership, and bank performance. Table 2 presents the correlation coefficients of all the possible variables discussed in this chapter. The evidence suggests that in most cases the governance and ownership variables are positively associated with performance and inversely associated with risk variables. Additionally, the correlations are stronger for the dummy variables representing the board structure relative to the continuous variables. Next, we employ the ordinary least squared regression analysis to estimate the effects of these ownership and governance variables on bank performance.

5. EMPIRICAL RESULTS

Given we have attempted to estimate our models with a large number of alternative dependent and independent variables, we limit our reporting of tables in the text to a minimum.[5] These key regression estimates of our proposed relationship between ownership and governance structures are reported in Tables 3–5. In most estimates, we find that there is a significant relationship between bank performance and the extent of foreign ownership. A number of interesting observations stand out in our estimations. In the ROA and ROADIFF97 regressions (Table 3), there is a statistically significant and positive relationship between the extent of foreign ownership, i.e., the percentage of foreign ownership (FOSP) and bank performance variables. The statistical significance of the FOSP parameters

Table 2. Correlation Coefficients.

	ROA	ROADIFF97	ROE	SR	STDSR	PLLTL	PROFEFF	DFOS	FOSP	DFGON	FGONP	OUTBNP	DOUTBN
ROA	1.0000												
ROADIFF97	0.7621	1.0000											
ROE	0.7124	0.4713	1.0000										
SR	0.0913	0.0318	0.1143	1.0000									
STDSR	−0.2644	−0.3083	−0.2057	0.2218	1.0000								
PLLTL	−0.3695	−0.4294	−0.4388	−0.0627	0.2845	1.0000							
PROFEFF	0.1756	0.2751	0.0619	0.1095	−0.0398	0.1082	1.0000						
DFOS	0.2876	0.0431	0.3745	0.2076	0.0761	−0.0524	0.2412	1.0000					
FOSP	0.5196	0.3522	0.3004	0.1097	−0.2097	−0.1456	0.2650	0.2764	1.0000				
DFGON	0.4975	0.2567	0.2647	0.1019	−0.1436	−0.1217	0.2415	0.3956	0.6421	1.0000			
FGONP	0.2763	0.1578	0.1906	0.0301	−0.1047	−0.0963	0.1895	0.2128	0.5055	0.6497	1.0000		
OUTBNP	0.0519	0.0073	0.0317	0.0268	0.0628	0.0310	0.1067	0.0793	−0.0233	0.1121	0.5561	1.0000	
DOUTBN	0.3823	0.3145	0.4432	0.1245	−0.1923	0.0182	0.2693	0.3245	0.5364	0.5466	0.4364	0.7571	1.0000

Note: Correlation coefficients among the sample variables are presented. The sample consists of Korean commercial banks over the period of 1998–2007, which is the period after the financial crisis of the late 1997. FGONP, the percentage of foreign directors on the board.

Table 3. Estimates from ROA and ROADIFF97 Regressions.

| Variable | Return on Assets (ROA) Regressions | | | | | | ROA Difference from the ROA of 1997 (ROADIFF97) Regressions | | | | | |
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
						Parameter estimates						
Intercept	-0.0178*	0.1318	0.0145	0.0286	0.0272	0.0286	-0.0023		-0.0018	-0.0011	-0.0011	-0.0011
	(-1.68)	(1.00)	(1.33)	(1.41)	(1.52)	(1.41)	(-0.96)		(-0.83)	(-0.80)	(-0.82)	(-0.02)
FOSP	0.0305***		0.0216***	0.0305***	0.0281***	0.0305***	0.0328**		0.02198**	0.0227**	0.0221**	0.0226**
	(3.21)		(2.94)	(3.21)	(3.16)	(3.21)	(2.47)		(2.31)	(2.24)	(2.20)	(2.21)
FGONP	0.0128*		0.0093	0.0092	0.0094	0.0087	0.0274**		0.0213***	0.0206**	0.0211**	0.0216**
	(1.75)		(1.60)	(1.53)	(1.61)	(1.52)	(2.31)		(2.68)	(2.63)	(2.62)	(2.59)
OUTBNP	0.0316		0.0216	0.0316	0.0382	0.0327	0.0427**		0.0319**	0.0422**	0.0459**	0.0441**
	(1.62)		(1.29)	(1.62)	(1.54)	(1.60)	(2.18)		(2.03)	(2.00)	(1.98)	(1.96)
FOSP*FGONP		0.0418***	0.0418***	0.0418***	0.0402***	0.0395***		0.0611**	0.0516***	0.0524***	0.0518**	0.0512**
		(3.71)	(3.71)	(3.71)	(3.68)	(3.75)		(2.02)	(1.97)	(2.06)	(2.01)	(2.05)
FOSP*OUTBNP		0.0154**	0.0154**	0.0154**	0.0107*	0.0122**		0.0052	0.0041	0.0039	0.0033	0.0033
		(1.97)	(1.97)	(1.97)	(1.93)	(1.88)		(1.63)	(1.61)	(1.57)	(1.53)	(1.54)
FGONP*OUTBNP		0.0503***	0.0487***	0.0503***	0.0461**	0.0468**		0.1196***	0.0831**	0.0822**	0.0819**	0.0823**
		(3.41)	(4.65)	(3.41)	(2.78)	(2.76)		(2.99)	(2.72)	(2.69)	(2.64)	(2.57)
LTA				-0.0131*		-0.0086*				-0.004		-0.006
				(1.74)		(1.73)				(1.15)		(1.08)
DEREG					0.0190***	0.0178***					0.0213***	0.0212***
					(3.05)	(2.96)					(4.07)	(4.01)
Adjusted R^2	0.2054	0.2634	0.3625	0.4076	0.3979	0.4473	0.0841	0.0417	0.09722	0.1426	0.1122	0.1496
F-Statistic	16.45***	15.64***	16.73***	14.90***	16.85***	15.83***	6.95***	3.10**	7.18***	10.23***	10.68***	10.68***
N	128	128	128	128	128	128	128	128	128	128	128	128

Notes: Regression results investigate the impacts of the different ownership and governance structures on the Korean commercial bank performance. The sample consists of Korean commercial banks over the period of 1998–2007, which is the period after the financial crisis of the late 1997. The dependent variable for the first six regression models (columns 1–6) is ROA where as the dependent variable is ROADIFF97 for the following six estimations (columns 7–12). The independent variables in regressions include the foreign ownership percentage variable (FOSP), the percentage of foreign board members (FGONP), the percentage of outside board members (OUTBNP), the percentage of the foreign board of director, the variable (FOSP*OUTBNP) is interaction between the percentage foreign ownership and the percentage of outside board members, the variable (FODP*FGONP) is interaction between the percentage of foreign ownership and the percentage of outside board members, the variable (FGONP*OUTBNP) is the interaction between the percentage of the foreign board of director variable times the percentage of outside board members, the natural logarithm of total assets (LTA), and finally the dummy variable for the regulation changes in year 2000. The year dummy variables are included but not reported.
***, **, * mean significant at 1%, 5%, and 10%, respectively.

Table 4. Profit Efficiency and Stock Returns Regressions.

Variable	Profit Efficiency (PROFEFF) Regressions						Stock Returns (SR) Regressions					
	Parameter estimates											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Intercept	0.2165***	0.1363**	0.1863**	0.1610**	0.1792**	0.1516**	0.0157***	0.0212**	0.0734***	0.0815**	0.0794**	0.0792**
	(4.77)	(2.64)	(2.51)	(2.35)	(2.44)	(2.36)	(2.61)	(2.02)	(2.45)	(2.29)	(2.49)	(2.33)
FOSP	0.0712**		0.0476**	0.0386**	0.0402**	0.0369**	0.0249*		0.0307*	0.0302*	0.0311*	0.0307*
	(2.12)		(2.03)	(1.97)	(2.00)	(2.00)	(1.79)		(1.92)	(1.93)	(1.90)	(1.88)
FGONP	0.0169*		0.0097*	0.0062*	0.0085*	0.0094*	0.0346**		0.0166*	0.0162*	0.0159*	0.0152*
	(1.90)		(1.75)	(1.71)	(1.73)	(1.73)	(2.23)		(1.94)	(1.93)	(1.91)	(1.92)
OUTBNP	0.1286*		0.0823*	0.0762	0.0802*	0.0791*	0.0268*		0.0216*	0.0220*	0.0216*	0.0221*
	(1.87)		(1.68)	(1.63)	(1.66)	(1.67)	(1.77)		(1.86)	(1.85)	(1.89)	(1.84)
FOSP*FGONP		0.0312**	0.0272*	0.0268*	0.0268*	0.0214*		0.0145*	0.0163*	0.0159*	0.0160*	0.0154*
		(1.99)	(1.93)	(1.77)	(1.86)	(1.89)		(1.83)	(1.80)	(1.79)	(1.77)	(1.82)
FOSP*OUTBNP		0.0522	0.0465	0.0416	0.0419	0.0431		0.0346**	0.0311**	0.0302**	0.0308**	0.0311**
		(1.42)	(1.33)	(1.31)	(1.30)	(1.25)		(2.31)	(2.29)	(2.20)	(2.25)	(2.24)
FGONP*OUTBNP		0.0612*	0.0606*	0.0512	0.0595*	0.0612*		0.0429**	0.0418**	0.0426*	0.0403*	0.0417*
		(1.78)	(1.72)	(1.61)	(1.70)	(1.70)		(1.96)	(1.95)	(1.90)	(1.93)	(1.92)
LTA				-0.0145		-0.0121				-0.0129*		-0.0127*
				(1.26)		(0.63)				(1.86)		(1.85)
DEREG					0.0299*	0.0306*					0.0207**	0.0219**
					(1.71)	(1.72)					(2.23)	(2.15)
Adjusted R^2	0.0521	0.0762	0.0966	0.1276	0.1017	0.1295	0.0316	0.0295	0.0493	0.0585	0.0613	0.0782
F-Statistic	5.29***	6.45***	6.10***	7.33***	6.83***	8.02***	3.14**	2.98**	3.75***	4.92***	4.28***	5.40***
N	128	128	128	128	128	128	107	107	107	107	107	107

Notes: Regression results that investigate the impacts of the different ownership and governance structure on the Korean commercial bank performance. The sample consists of Korean commercial banks over the period of 1998–2007, which is the period after the financial crisis of the late 1997. The dependent variable for the first six regression models (columns 1–6) is PROFEFF (profit efficiency estimated using a stochastic frontier estimation). The dependent for the following six estimations (columns 7–12) is the annual stock return (SR). The independent variables in regressions include the foreign ownership percentage variable (FOSP), the percentage of foreign board members (FGONP), the percentage of outside board members (OUTBNP), the variable (FODP*FGONP) is interaction between the percentage foreign ownership and the percentage of the foreign board of director, the variable (FOSP*FGONP) is the interaction between the percentage of foreign ownership and the percentage of outside board members, the variable (FGONP*OUTBNP) is the interaction between the percentage of the foreign board of director variable times the percentage of outside board members, the natural logarithm of total assets (LTA), and finally the dummy variable for the regulation changes in year 2000. The year dummy variables are included but not reported.
***, **, * mean significant at 1%, 5%, and 10%, respectively.

Table 5. Estimates from PLLTL and STDSR Regressions.

	PLLTL Regressions						STDSR Regressions					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Intercept	0.2165***	0.1786***	0.2013***	0.1610***	0.1813***	0.1549***	0.0157***	0.0212**	0.0612*	0.0629*	0.0799*	0.0727*
	(3.29)	(2.95)	(3.03)	(2.99)	(2.56)	(3.02)	(1.36)	(2.63)	(1.75)	(1.80)	(1.78)	(1.80)
FOSP	−0.0316***		−0.0314***	−0.0356***	−0.0416***	−0.0372***	−0.0657		−0.0621	−0.0700	−0.1277	−0.1201
	(2.95)		(2.89)	(2.87)	(2.44)	(2.90)	(0.80)		(0.89)	(0.91)	(1.56)	(1.63)
FGONP	0.0169*		0.0158*	0.0151*	0.0095*	0.0159*	0.0096**		0.0121*	0.0107*	0.0159*	0.0161*
	(1.90)		(1.84)	(1.77)	(1.76)	(1.72)	(1.96)		(1.93)	(1.86)	(1.91)	(1.92)
OUTBNP	−0.0518**		−0.0499**	−0.0392**	−0.0401**	−0.0421**	−0.0581**		−0.0552**	−0.0441**	0.0766	0.0723
	(2.06)		(2.02)	(2.14)	(1.99)	(2.07)	(2.38)		(2.36)	(2.31)	(0.83)	(0.80)
FOSP*FGONP		−0.0375*	−0.0301*	−0.0324	−0.0315	−0.0301		−0.0241	−0.0237	−0.0226	−0.0221	−0.0208
		(1.90)	(1.86)	(1.89)	(1.92)	(1.80)		(1.62)	(1.57)	(1.59)	(1.53)	(1.47)
FOSP*OUTBNP		−0.0353*	−0.0324*	−0.0326*	−0.0379*	−0.0318*		−0.0415*	−0.0389*	−0.0396*	−0.0347*	−0.0331*
		(1.83)	(1.87)	(1.80)	(1.76)	(1.77)		(1.71)	(1.68)	(1.66)	(1.75)	(1.70)
FGONP*OUTBNP		−0.0098*	−0.0176*	−0.0163*	−0.0146*	−0.0176*		−0.0021	−0.0019	−0.0013	−0.0011	−0.0012
		(1.72)	(1.69)	(1.71)	(1.74)	(1.73)		(1.15)	(1.12)	(0.99)	(0.97)	(0.93)
LTA				−0.0276**		−0.0265**				0.0320***		0.0313***
				(2.65)		(2.50)				(2.96)		(2.98)
DEREG					0.0165*	0.0157*					0.0217**	0.0220**
					(1.73)	(1.70)					(2.34)	(2.37)
Adjusted R^2	0.0926	0.0877	0.1019	0.1798	0.1851	0.0326	0.0964	0.0203	0.1108	0.1481	0.1352	0.1505
F-Statistic	5.76**	3.93***	4.07***	6.48***	4.09***	6.64***	4.75***	2.99*	5.04***	4.90***	4.75***	5.86***
N	116	116	116	116	116	116	107	107	107	107	107	107

Notes: Regression results that investigate the impacts of the different ownership and governance structure on the Korean commercial bank performance. The sample consists of Korean commercial banks over the period of 1998–2007, which is the period after the financial crisis of the late 1997. The dependent variable for the first six regression models (columns 1–6) is PLLTL (the Provision for Loan Losses to Total Loan). The dependent variable for the following six estimations (columns 7–12) is standard deviation of stock return from monthly stock return estimation. The independent variables in regressions include the foreign ownership percentage variable (FOSP), the percentage of foreign board members (FGONP), the percentage of outside board members (OUTBNP), the variable (FODP*FGONP) is interaction between the percentage foreign ownership and the percentage of the foreign board of director, the variable (FOSP*OUTBNP) is the interaction between the percentage of foreign ownership and the percentage of outside board members, the variable (FGONP*OUTBNP) is the interaction between the percentage of the foreign board of director variable times the percentage of outside board members, the natural logarithm of total assets (LTA), and finally the dummy variable for the regulation changes in year 2000. The year dummy variables are included but not reported.
***, **, * mean significant at 1%, 5%, and 10%, respectively.

is higher for the ROA regressions (all at 1 percent significance levels) than the ROADIFF97 regressions (significant at 5 percent significance level). The percentage of foreign board membership (FGONP) does not show statistical significance in ROA estimations except for model 1. But the FGONP parameters in models 2–6 reveal a positive sign with significance level closer to the acceptable levels. However, for the ROADIFF estimations, the FGONP variable reveals that higher foreign board involvement does help the banks earn higher levels of return relative to their 1997 earnings, as all parameters are significant at the 5 percent level. In addition, for the percentage of outside board member (OUTBNP), the ROA regressions do not provide any significant result, but in the ROADIFF97 estimations the OUTBNP variable do show a significant positive impact. We also observe that the DEREG variable of banks in the post-1999 period is associated with better performance compared with the prederegulation period, as reflected in the ROA and ROADIFF97 models. In the ROADIFF97 estimations, bank size (LTA) does not explain the variation of bank performance and is insignificant overall, although marginally significant for the ROA regressions, where larger firms were associated with lower ROAs.[6] However, we document stronger positive impact of FOSP, FOGNP as well as OUTBNP for the Profit Efficiency (PROFEFF) and SR estimations (Table 4).

We next examine the relationship between the ownership variables and bank risk proxies, i.e., provision for loan losses and standard deviation of SR. Table 5 reports results consistent with these findings. Similar to the previous regressions, the coefficients of FOSP variable are negative and highly significant in most PLLTL regressions but not for STDSR estimations. The percentage of outside board members (OUTBNP) is also found to be inversely associated with risk taking. Interestingly, FGONP report a positive and marginally significant impact on PLLTL and STDSR regressions. Also, in the postderegulatory environment, Korean banks are portrayed as more risky as the DEREG dummy is found to be positive and significant. On the other hand, banks with larger asset size (LTA) are not the ones involved with higher risky positions in all estimations on both risk dependent variables.

So far, we have investigated the effect of foreign ownership, foreign directors, and outside directors on bank performance, individually controlling for ownership, and other control variables. In addition to the tests outlined earlier, we also define variables to measure interaction effects between the ownership variables, denoted as FOSP*FGONP, FOSP*OUTBNO, and FGONP*OUTBNP. FOSP*FGNOP is constructed

by the interaction between the percentage of foreign ownership and the percentage of foreign directors. FOSP*OUTBNP represents the interaction between the percentage of foreign ownership and the percentage of outside directors on board. Finally, the FGONP*OUTBNP interaction variables is constructed by interacting the percentage of the foreign director dummy and the percentage of outside directors on the board. The regression results show a positive relationship between the interactive variable of percentage of foreign ownership and foreign directors (FGON*FGONP) and bank performance for ROA, ROADIFF97, PROFEFF and SR estimations. Unlike in performance regressions, we do not find any significant relationship between this interactive variable and risk-dependent variables, especially for STDSR. In the PLLTL equations, we have observed some significant inverse relationship in models 2 and 3. We note that the interactive variable of the percentage of foreign directors and the percentage of outside board members (FGONP*OUTBNP) provides significant positive impact on all performance variables in Tables 3 and 4. However, in the risk regressions, the inverse significance is limited to the PLLTL models but not the STDSR regressions in Table 5. Finally, the percentage of foreign ownership and percentage of outside board members interaction variable (FOSP*OUTBNP) has a positive and significant impact on the ROA and SR estimations, but not on the ROADIFF97 and the PROFEFF-dependent variables. In the risk estimation in Table 5, this variable has significant inverse relationship in all models for PLLTL and STDSR.

These results indicate that an increase in foreign ownership level is positively and significantly associated with an improvement in bank performance, regardless of size and changes in bank regulations effects. The findings are consistent in the risk estimates, i.e., in the PLLTL and SIG regressions with the expected sign and statistical significance. We find similar results for increased foreign ownership and the existence of a greater number of outside board members being associated with better performance, however, only foreign ownership is associated with reduced risk, whereas foreign board membership is positively associated with risk. For the increased foreign board member and higher outside board members variables, we see strong results in a positive, statistically significant effect on the ROA and ROADIFF dependent variables, and to some extent for the PROFEFF models but not in the SR estimations. In addition, we do not find any significance of this interaction variable (FOSP*OUTBNP) for STDSR.

In sum, the estimations reported above are relatively robust under different specifications. Even though all estimations are not reported in the text or in the appendix, the overall results are robust with respect to changes

in the methodology and inclusions of alternative control variables. We are aware of the fact that the endogeneity problem associated with ownership variable in a performance–ownership regression (Himmelberg, Hubbard, & Palia, 1999) may be a potential caveat to make any conclusive comments on this issue. Data limitations did not help us to correct the problem to the extent we have hoped for, however, in some cases we did take attempts to resolve some other issues such as considering time fixed effects. Also the paper may suffer from self selectivity bias as the banks that suffered the most from governance problems in the precrisis period were the ones in which governance reforms were mostly mandated and again lack of data did not give us the opportunity to provide further detailed robustness tests. We merely attempt to correct this selection bias problem by using the ROADIF97 or change in performance variable and the results are very close to those of the ROA regressions. Therefore, we emphasize that it is hard to say anything too conclusive with regard to such a small sample size, however, we believe that the simple association of these variables in both univariate and multivariate estimations provides a reasonably clear understanding of the role of ownership and governance in the Korean market.

6. CONCLUSIONS

The year 1997 was marked with a huge financial crisis in Asia with a start in Thailand in May, which quickly involved into several other countries, including Korea. This crisis witnessed multiple business and bank closures. In Korea, it prompted a substantial overhaul of banking regulations. Banks were asked to make substantial changes in their corporate governance in order to survive and compete at the international level. By observing the lack of initiatives in understanding the effects of such changes on performance, we focus on the experience of Korean commercial banks during the 1998–2007 period, and examine the effect of such changes, represented by ownership and board characteristics especially, foreign ownership, foreign board members, and overall outside board members on bank return and risk.

Evidence indicates that there is a positive and significant association between the percentage of foreign ownership variable as well as the percentage of foreign director variable with different bank performance measures. We also observe that these two variables inversely impact our risk measures in most estimations. Interestingly, the results are different for the percentage of outside board members, and indicate that an increase in foreign board membership is associated with greater, rather than less risk. Finally,

banks with a combination of increased foreign ownership levels and a presence of foreign directors on the board or a higher number of outside board members, in general, help banks achieve better return and reduced risk. These results are relatively robust to size effects, bank regulatory changes, year fixed effects, and other relevant specifications and control variables. Interestingly, the postderegulatory years are associated not only with better return but also with higher risk. One needs to have more detailed analyses in a multi-country level to verify whether such case study is true under other circumstances, which is an important task we leave for future research.

NOTES

1. See Kim (1998) for the details on the causes of the crisis.
2. These banks were Cho Hung, Hanil, Korea Exchange, Sang Up, Dongwha, Dongnam, Daedong, Pyongwha, Chung Cheong, Kyong Gi, Chung Buk, and Kang Won Banks.
3. Appendix lists some of the commercial banks and indicates the ownership structure as of December 2002 and 2007.
4. See Aigner, Lovell, and Schmidt (1977) and Kumbhakar and Lovell (2000) for the econometric details and Berger and Mester (1997) for a thorough discussion on its applications to banking.
5. All additional estimations discussed in the chapter without being reported in the text are available on request.
6. We observe that ROE estimations provide evidence similar to the estimations outlined in ROA regressions and are therefore not reported in the text.

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APPENDIX. LARGE SHAREHOLDERS OF KOREAN INDIVIDUAL BANKS AS OF DECEMBER 2002 AND DECEMBER 2007

Bank Name	2002	2007
Kookmin Bank	Korean government (9.64%), Bank of New York (ADR, 7.59%), GS Capital (6.82%) – Foreign (71.11%)	Citibank N.A. (ADR department) (14.71%), Euro pacific Growth Fund (5.46%), ING Bank NY (4.06%) – Foreign (13.14%)
Cho Hung Bank	Korean government (KDIC, 80.05%) – Foreign (0.33%)	Not found
Korea First Bank	KFB Newbridge Holdings Limited (50.99%), Korean government (KDIC, 45.92%) – Foreign (50.99%)	Since 2005, its name is Standard Chartered First Bank of Korea
Hanvit Bank	Korean government (100%)	Current name Woori Bank
Korea Exchange Bank	Commerzbank (23.62%), Korean government (BOK, EIBOK – 17.78%, 18.15%) – Foreign (34.13%)	LSF–KEB Holdings (51.02%), Hana Financial Group (13.6%), Export–import Bank of Korea (6.25%), Bank of Korea (6.13%) – Foreign (51.02%)

APPENDIX. (*Continued*)

Bank Name	2002	2007
Hana Bank	Allianz AG (11.82%), IFC (6.64%), Kolong Group (5.83%) – Foreign (52.02%)	Hana Financial Group (100%)
Hanmi (KORAM) Bank	KAI (17.9%), Samsung Group (14.6%) – Foreign (53.23%)	In 2004, KorAm was renamed as Citibank Korea
Shin Han Bank	DaeKyo (1.23%), Alpomae Corp. (0.23%) – Foreign (40.37%) as of 1quarter of 2001, after that Shinhan Financial owns 100%	Shinhan Financial Group (100%)
Daegu Bank	Samsung (8.08%) – Foreign (3.77%)	SSB-small Capital (8.00%), Samsung Life Insurance Company Limited (7.36%) – Foreign (6.61%)
Pusan Bank	Lotte Group (14.03%) – Foreign (10.64%)	Lotte Confectionery Co., Ltd. (14.11%), Small Capital World Fund Inc (7.99%) – Foreign (12.2%)
Kwangju Bank	Korean government (99.99%)	Woori Finance Holdings Co., Ltd. – Woori Financial Group (99.99%)
Kyungnam Bank	Korean government (99.99%)	Woori Finance Holdings Co., Ltd. – Woori Financial Group (99.99%)
Jeonbuk Bank	Samyangsa (10.91%) – Foreign (0.05%)	Samyangsa Co., Ltd. (11.35%), Korea National Pension Fund (9.46%), ABN AMRO Bank NY Singapore Branch (7.87%), Oppenheimer Developing (5.42%) – Foreign (7.87%)
Cheju Bank	Korean government (95.74%)	Shinhan Financial Group (62.4%), Korea Deposit Insurance Corporation (31.96%)

MANAGERIAL STABILITY AND PAYOUT POLICY: DOES STATE REGULATION MATTER?

Liang Song and Haizhi Wang

ABSTRACT

In practice, it is increasingly common for companies to use NON-COMPETITION covenants in employment contracts that put restrictions on post-employment activities. Making use the variation of legal enforcement of NON-COMPETITION agreements in different states (NON-COMPETITION index) across the U.S., this chapter empirically examines whether and to what extent labor market concern will affect firm payout policy when managers are bound to their firms by NON-COMPETITION agreements. We find that the likelihood for a firm to pay DIVIDEND or conduct repurchasing is positively related to NON-COMPETITION index. We directly measure PAYOUT RATIO and find a significant positive relation between firm PAYOUT RATIO and NON-COMPETITION index. Our results indicate that managers with increased stability and reduced job opportunity in the external labor market are more likely use cash payout as a pre-commitment device and send a signal that they will not entrench themselves.

1. INTRODUCTION

There is a long debate among finance academics on what determines a firm's payout policy. Empirical evidences find a strong relationship between corporate governance and payout policy (John & Knyazeva, 2006; Officer, 2006; Pan, 2006), and suggest the role of corporate payout in mitigating potential agency problem (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 2000). As Fama (1980) pointed out, labor market can be a strong disciplinary device to align the interests of executives to shareholders because managers are concerned about their long-term value conveyed by managerial labor market. However, little attention has so far been paid to whether and to what extent managerial labor market concern will affect a firm's payout policy. Our chapter intends to fill this void, and empirically investigate corporate payout policy when managers are bound to their firms by legal enforcement of NON-COMPETITION contracts, hence face limited opportunity in the external labor market.

It is a common practice that companies use covenants in employment contracts to put restrictions on post-employment activities. Typically, covenants not to compete contract prevent (key) employees from competing with employers "within a geographic region for a specified length of time after the relationship has been ended" (Whitmore, 1990). The direct effect of such restrictive contracts is that NON-COMPETITION clauses can be a powerful binding mechanism, which lead to higher level of managerial stability (Garmaise, 2005).

The legal enforcement of covenants not to compete varies widely across jurisdictions in the U.S. For example, a majority of states show sympathetic to the NON-COMPETITION clauses as long as there are "reasonable and necessary", while in California, such covenants of contractual restraining are almost forbidden. Thus, the variation of legal enforcement of NON-COMPETITION agreements in the U.S. provides a natural setting to apply the insight of the law and finance literature (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997, 1998; Levine, Loayza, & Beck, 2000).

Although there is a large literature investigating the possible determinants of firms' cash payment, there is no existing literature exploring the potential disciplinary role of labor markets and investigate managerial behaviors on making payout decisions when managers are bound to their firms. This chapter examines the relation between managerial stability induced by NON-COMPETITION contracts and payout policy for a large number of U.S. industrial firms over the period 1991–2003. We employ three dependent variables in our regression analysis including two dummies for paying

DIVIDEND and repurchasing, and PAYOUT RATIO measured by total cash payout including DIVIDEND and REPURCHASE divided by book value of total assets. Garmaise (2005) developed an index to capture the strength of legal enforcement of NON-COMPETITION agreements in different states. We use NON-COMPETITION enforceability index as our main explanatory variables throughout the analysis while controlling for other factors used in prior research. Our findings point out that the strength of legal enforcement of NON-COMPETITION clauses is positively related to firms' cash payout. We provide empirical evidences that the likelihood for a firm to pay DIVIDEND or conduct repurchasing is positively related to the enforceability index. We further analyze the effects of legal enforcement of NON-COMPETITION covenants on the total PAYOUT RATIO and document a positive relationship. Our results suggest that managers, when they are tightly bound to their firms, are more likely to distribute cash to shareholders and signal that they will not entrench themselves and thus will act in the interests of shareholders. These findings are generally consistent with the idea that cash payment is used as a pre-commitment device to mitigate the potential agency problems.

The rest of the chapter is organized as follows. In Section 2, we provide some legal background on CNCs, and then review related literatures. In Section 3, we describe our data collection procedure and provide some summary statistics of our sample. Section 4 reports our empirical results. Section 5 summarizes and concludes.

2. RELATED LITERATURE

2.1. Background Information on Covenants not to Compete (CNCs)

Human capital has long been recognized as a core asset of most firms, which contribute much to the continuous business success. Human capital is in substantial part of the consequence of deliberate investment (Schultz, 1961). Standard analysis of firm-specific human capital holds the view that employer and employee share the cost and return of the investment (Becker, 1962; Hashimoto, 1981). However, the inalienability of human capital (Hartford, Mansi, & Maxwell, 2008) is generally accepted as a basic personal right, which may potentially impose loss on the return of the employer when the relationship is terminated at employee's will. Firms will have no incentive to make any investment on human capital which they cannot exercise full ownership. As a consequence, NON-COMPETITION

clauses, also known as covenants not to compete (CNCs), are widely used in restricting the post-employment activities of an employee.

Covenants not to compete (CNCs) generally forbid the employee to form competing with the employer, either through working for the competitors or start one's own businesses, within a certain geographic region for a specified length of time. Such contracts may also restrict the contractual behavior of employee with the employer's customers. Economic explanations for NON-COMPETITION clauses can be multi-folds. NON-COMPETITION agreements can prevent net loss of firms' investment on human capital, protect trade secret and confidential information, and even function as a mechanism to self-select employees who are willing to enter into such contracts (Hertog, 2003). These explanations are plausible and may co-exist. Nonetheless, the direct effect of competition agreements is to bind employees to a firm and to increase managerial stability. In U.S., the legal enforcement of such contractual agreements varies widely across jurisdictions.

2.2. Prior Research

The objective for managers to maximize the market value of the outstanding shares is generally believed as the main principles of corporate finance. However, managers of publicly traded firms may pursue their own private benefits, which are not necessarily in line with those of shareholders, when they are not closely monitored. Managers may make wasteful investment in unprofitable mergers and acquisitions (Baumol, 1959; Morck, Shleifer, & Vishny, 1990; Williamson, 1975) or make decisions that generate short-term gains at the cost of the long-term interests of the shareholders (Narayanan, 1985).

Existing literature strongly emphasizes the role of a firm's payout policy in addressing potential agency problem. The central idea of agency explanation is that corporate payout reduces the excess cash under managers' discretion, which in turn lower the agency cost and minimize suboptimal managerial behavior (Easterbrook, 1984; Fama & Jensen, 1983). Moreover, cash distribution also force managers to seek external financing through capital market. Consequently, managers are subject to the screening of outside investors more frequently. Prior literatures also suggest that payout policy can be part of the corporate governance system. In ex post, corporate payout reduces the free cash flow and reduces the probability of wasteful investment. Therefore, payout policy can function

as a substitute for other governance mechanisms in order for managers to establish a reputation that they will act in the interests of shareholders (La Porta et al., 2000). In ex ante, managers may sometimes find that it is in their interests to restrict their own opportunistic behavior, and lower the potential agency cost (Pan, 2006; Zwiebel, 1996). In this case, corporate payout is used as a pre-commitment device to make sure that managers will not entrench themselves.

In general, empirical evidences are equally mixed and appear to support both substitution hypothesis and pre-commitment hypothesis. For example, Fenn and Liang (2001) document that fewer managerial stock options holdings are significantly associated with higher DIVIDEND and total PAYOUT RATIOs. In another study, Hu and Kumar (2004) report that when there is a high likelihood of managerial entrenchment and high agency cost, the likelihood and level of DIVIDEND payout also increase. There are also evidences that governances measures are positively associated with cash holdings (Dittmar & Mahrt-Smith, 2007; Hartford et al., 2008). Pan (2006) provides evidences that the propensity to pay DIVIDENDs is positively related to his measures of managerial entrenchment based on indexes of anti-takeover charter provisions and further argue cash payment can be used a substitute to other governance mechanisms. John and Knyazeva (2006) report their findings that DIVIDEND and total payouts are significantly higher when internal and external governance measures indicate weak governance, which they interpret that cash payment is used as a pre-commitment device.

One omission of existing literature is the role of labor market as a disciplinary device and its consequence on managerial decision about payout policy. As suggested by Fama (1980), labor market can function as a powerful disciplinary device to force managers to care about the consequences of their decisions. Outside labor market will seek for executives with good records to maximize firm value and act in the interests of shareholders. In practice, covenants are widely used in employment contracts that put restrictions on post-employment activities. NON-COMPETITION clauses are generally believed to protect the firm's investment on human capital and proprietary information (Rubin & Shedd, 1981). Moreover, NON-COMPETITION agreements can function as a powerful mechanism to bind employees, especially senior managers, to a firm and substantially reduce managerial mobility (Garmaise, 2005).

In our study, we intend to draw a link between managerial stability and a firm's payout policy, and make use of the variation of legal enforceability across different states in U.S. to empirically test the effects of managerial stability on firms' payout policy. Essentially, NON-COMPETITION clauses

are imbalanced contracts that only put restrictions on management side. Because of the imbalanced nature of NON-COMPETITION contracts, there is possibility that managers who sign such contracts will also have incentives to entrench themselves in order to secure their job positions. In this case managers will be less likely to distribute cash to shareholders when good investment opportunities are not available. However, if labor market does function as a disciplinary mechanism, managers who sign NON-COMPETITION agreements will have more incentives to be responsible for their decisions for a longer period of time, and can be entrusted to make long-term decisions that are better in line with shareholders' interests. In this sense, managers should be less likely to make wasteful investment, which will be detrimental to their own human capital. Therefore, it is possible for managers, who are tightly bound to their firms, to distribute cash to shareholders when there are no good investment opportunities. It is also plausible the managers who sign the NON-COMPETITION contracts use cash payout to send the message that they will not entrench themselves and thus can be better entrusted. Hence, the real effect of legal enforceability of covenants not to compete on firms' payout policy is an empirical question and needs to be further explored.

3. DATA AND SAMPLE DESCRIPTION

We rely on Compustat as our main source to collect data and construct our sample. We include all Compustat firms from 1991 to 2003 except those in the regulated utility industries and financial sectors (SIC 4900–4999 and 6000–6999). Only NYSE, NASDAQ, and AMEX firms that have securities with CRSP share codes 10 or 11 are considered to ensure that those firms are publicly traded. We require our sample firms to be incorporated in the U.S. and have available information on our measures of firms' payout and firm-level control variables. To make sure that small firms do not bias our results, firms with book equity below $250,000 or total assets below $500,000 are excluded. Following the above criteria, we finally obtain a sample with 3,546 unique firms and 24,890 firm-year observations.

We use three dependent variables in our analysis including PAYOUT RATIO and two additional dummy variables for DIVIDEND payer and share repurchasing. DIVIDEND dummy takes the value 1if a firm pays DIVIDEND for a certain year, and zero otherwise. REPURCHASE dummy takes the value 1 if a firm chooses share REPURCHASE for a certain year, and zero otherwise. Following John and Knyazeva (2006), we

define PAYOUT RATIO as total cash payment including DIVIDEND plus share REPURCHASE divided by book value of total assets.

Our intention is to test the relationship between managerial stability and firms' payout policy, and use the legal enforcement of NON-COMPETITION contracts as a natural setting. Since different states in the U.S. vary widely in terms of the enforcement of such labor contracts, we intend to use an index to gauge the intensity of the enforceability.

Malsberger (2004) provided detailed information on NON-COMPETITION law in the 50 U.S. states and the District of Columbia. Garmaise (2005) analyzes the 12 questions proposed by Malsberger, and assigns a score of one to each jurisdiction for each question if the jurisdiction's enforcement of that dimension of NON-COMPETITION law exceeds a given threshold.[1] Therefore, the score ranges from 0 to 12. Table 1 presents the NON-COMPETITION enforceability score (NON-COMPETITION) for each state in the U.S., and this index is our key explanatory variable throughout the chapter.

Other control variables are the same as used by DeAngelo, DeAngelo, and Stulz (2006). We use earned/contributed capital (RE/TE) ratio to account for the lifecycle argument. We use return on assets (ROA) as a proxy of profitability. We include ASSETS GROWTH and SALES GROWTH.[2] We further control for the growth potential, which is proxied by firm market value divided by book value of total assets. We use natural log of firm market capitalization to control for the SIZE effect. Moreover, for all regressions, we control for timely trend by adding year dummies, and industry effect by adding industry dummies at 2-digital SIC code level.

In Table 2, we report our sample distribution by year and by the firms' payout characteristics. Panel A presents the distribution of DIVIDEND payer and non-DIVIDEND payer for each year between 1991 and 2003. The results are consistent with the prior findings by Fama and French (2001), the fraction of firms paying DIVIDEND declines over our sample years from 49% in 1991 to 27% in 2003. However, as indicated in Panel B, for firms choosing to REPURCHASE their shares, the fraction does not show any trend there.

In Table 3, we report some descriptive statistics as well as Pearson's correlation matrix of our sample. For all firm-year observations, around 32% firms pay DIVIDEND and 38% firms choose share REPURCHASE. Average PAYOUT RATIO is 0.02 with a standard deviation of 0.06. Our NON-COMPETITION enforceability index has a mean of 3.88 with a standard deviation of 2.25. According to other variables, firm SIZE has a mean of 19.13 (total assets in natural logarithm form) and a standard deviation of 2.05. On average, the ASSETS GROWTH is 5% with a

Table 1. NON-COMPETITION Enforceability Index.

State	Score	State	Score
Alabama	5	Missouri	7
Alaska	3	Montana	2
Arizona	3	Nebraska	4
Arkansas	5	Nevada	5
California	0	New Hampshire	2
Colorado	2	New Jersey	4
Connecticut	3	New Mexico	2
Delaware	6	New York	3
District of Columbia	7	North Carolina	4
Florida 1992–1996	7	North Dakota	0
Florida 1997–2004	9	Ohio	5
Georgia	5	Oklahoma	1
Hawaii	3	Oregon	6
Idaho	6	Pennsylvania	6
Illinois	5	Rhode Island	3
Indiana	5	South Carolina	5
Iowa	6	South Dakota	5
Kansas	6	Tennessee	7
Kentucky	6	Texas 1992–1994	5
Louisiana 1992–2001, 2004	4	Texas 1995–2004	3
Louisiana 2002–2003	0	Utah	6
Maine	4	Vermont	5
Maryland	5	Virginia	3
Massachusetts	6	Washington	5
Michigan	5	West Virginia	2
Minnesota	5	Wisconsin	3
Mississippi	4	Wyoming	4

Data Source: Garmaise (2005).

standard deviation of 0.4, whereas the average SALES GROWTH is 33% with a standard deviation of 3.99. We also provide correlation matrix for the variables used in our analysis in Table 3.

4. EMPIRICAL RESULTS

In this section, we report our empirical results based on three sets of regressions. As we have discussed in the section of data collection, we intend to use the enforceability index developed by Garmaise (2005) to capture the variation of legal enforcement of NON-COMPETITION contracts across

Table 2. Sample Description.

Panel A: Fraction of DIVIDEND Payers			
Year	Number of firms	Number of non-payers	Number of payers	Percentage of payers
1991	860	437	423	49.19
1992	1,177	651	526	44.69
1993	1,301	754	547	42.04
1994	1,474	907	567	38.47
1995	1,601	1,011	590	36.85
1996	1,776	1,164	612	34.46
1997	1,962	1,337	625	31.86
1998	2,115	1,456	659	31.16
1999	2,223	1,543	680	30.59
2000	2,446	1,748	698	28.54
2001	2,602	1,916	686	26.36
2002	2,639	1,978	661	25.05
2003	2,714	1,980	734	27.04
Total	24,890	16,882	8,008	32.17

Panel B: Fraction of Share REPURCHASE			
Year	Number of firms	Number of non-REPURCHASE	Number of REPURCHASE	Percentage of REPURCHASE
1991	860	547	313	36.40
1992	1,177	826	351	29.82
1993	1,301	918	383	29.44
1994	1,474	1,017	457	31.00
1995	1,601	1,087	514	32.10
1996	1,776	1,170	606	34.12
1997	1,962	1,239	723	36.85
1998	2,115	1,202	913	43.17
1999	2,223	1,169	1,054	47.41
2000	2,446	1,352	1,094	44.73
2001	2,602	1,485	1,117	42.93
2002	2,639	1,610	1,029	38.99
2003	2,714	1,700	1,014	37.36
Total	24,890	15,322	9,568	38.44

states in the U.S., and conduct our empirical analysis. One important concern is whether the enforceability index can be treated as exogenous. For example, firms can choose their locations for headquarters, and thus there will be an endogenous match between the location of company headquarter

Table 3. Descriptive Statistics and Correlation Matrix.

Variable Name	Mean	SD	1	2	3	4	5	6	7	8	9	10
1 DIVIDEND	0.32	0.47	1									
2 REPURCHASE	0.38	0.49	0.27	1								
3 PAYOUT RATIO	0.02	0.06	0.24	0.33	1							
4 NON-COMPETITION	3.88	2.25	0.12	0.06	0.02	1						
5 SIZE	19.13	2.05	0.46	0.25	0.12	0.05	1					
6 ASSETS GROWTH	0.05	0.40	0.02	−0.02	−0.08	0.00	0.11	1				
7 SALES GROWTH	0.33	3.99	−0.04	−0.03	−0.02	−0.01	−0.05	0.05	1			
8 ROA	−0.01	0.30	0.19	0.13	0.08	0.07	0.25	0.42	−0.05	1		
9 RE/TE	0.19	5.52	0.07	0.04	0.02	0.02	0.08	0.25	−0.01	0.26	1	
10 MKT-BK	2.10	2.50	−0.09	−0.07	0.07	−0.07	−0.12	0.09	0.07	−0.13	0.00	1

Notes: Table reports descriptive statistics as well as Pearson's correlation of sample. Our final sample includes 24,890 firm-year observations. DIVIDEND is a dummy when a Compustat firm pays DIVIDEND for a certain year, and zero otherwise. REPURCHASE is a dummy when a Compustat firm chooses share REPURCHASE for a certain year, and zero otherwise. PAYOUT RATIO is the total cash payment including DIVIDEND plus share REPURCHASE divided by book value of total assets. NON-COMPETITION is an index describe in Table 1. SIZE is the total market value of the firm in natural logarithm form. ASSETS GROWTH is the percentage change of firm assets with respect to current year total assets. SALES GROWTH is the percentage change of firm sales with respect to firm sales of prior year. ROA is the return on total assets. RE/TE is the ratio of earned vs. contributed capital. MKT-BK is the market value of the firm assets divided by book value of total assets.

and its desire for the NON-COMPETITION enforcement. However, prior business location literature has identified natural resources, supply of skilled labor, unionization levels state taxes (Bartik, 1985), and energy cost will make firms has very little flexibility to change their locations. It is unlikely that the NON-COMPETITION enforceability is the first-order determinants of business location. Therefore, following prior literature (Garmaise, 2005), we treat the enforceability index as exogenous throughout our analysis.

4.1. Regressions Relating the Likelihood of Paying DIVIDEND to NON-COMPETITION Index

In Table 4, we report our results using the DIVIDEND dummy as our dependent variable. The key explanatory variable is the NON-COMPETITION enforceability index. In addition, we control for firm SIZE (natural log of total assets) and firm profitability (return on total assets). We further use market-to-book ratio to proxy for firm growth potential, and retained earnings scaled by total equity (RE/TE) to proxy for firm's ability to

Table 4. Regression Relating the Likelihood of Paying DIVIDEND to
NON-COMPETITION Enforceability Index.

| | Dependent Variable: DIVIDEND | | | |
| | LOGIT REGRESSION | | MARGINAL EFFECT | |
	Model 1	Model 2	Model 1	Model 2
Constant	−1.2265***	−16.5114***	−0.2750***	−2.2218***
	(0.0290)	(0.2715)	(0.0063)	(0.04672)
NON-COMPETITION	0.121***	0.1094***	0.02718***	0.0147***
	(0.0062)	(0.0079)	(0.0014)	(0.0011)
SIZE		0.5882***		0.0792***
		(0.0103)		(0.0018)
GROWTH		−1.7170***		−0.2310***
		(0.0936)		(0.0134)
ROA		5.7704***		0.7765***
		(0.2529)		(0.0295)
RE/TE		1.4277***		0.1921***
		(0.0415)		(0.0046)
MKT-BK		−0.3607***		−0.0485***
		(0.0169)		(0.0023)
INDUSTRY DUMMIES	YES	YES	YES	YES
YEAR DUMMIES	YES	YES	YES	YES
Observations	24,890	24,890	24,890	24,890
χ^2	388.23***	9710.05***	359.27***	7494.11***
Log-likelihood	−15404.827	−10659.06	−15404.82	−10659.06

Notes: Table reports regression results relating to the likelihood of paying DIVIDEND to
NON-COMPETITION enforceability indexes. Columns 1 and 2 are derived from logit
regression. Columns 3 and 4 report marginal effects using STATA command (dlogit2) based on
the logit regression. The fir *DIVIDEND* is a dummy when a Compustat firm pays DIVIDEND
for a certain year, and zero otherwise. *NON-COMPETITION* is an index describe in Table 1.
SIZE is the total market value of the firm in natural logarithm form. *Growth* is the percentage
change of firm assets with respect to current year total assets. *ROA* is the return on total assets.
RE/TE is the ratio of earned vs. contributed capital. *MKT-BK* is the market value of the firm
assets divided by book value of total assets.
***, **, and * denote statistical significance level at 1%, 5%, and 10%, respectively.

generate retained equity to account for the stage in firm's lifecycle
(DeAngelo et al., 2006). Finally, we, control for firm growth measured by
percentage change of total assets with respect to current year.

Columns 1 and 2 in Table 4 report our basic results using a logit model. In
both model specifications, the coefficient of NON-COMPETITION index is

positive and statistically significant at 1% level, which means that firms located in states with strong legal enforcement of NON-COMPETITION contracts are more likely to pay DIVIDEND. Since the coefficients of logit regression do not have a direct interpretation, we also reports marginal effects on NON-COMPETITION enforcement index derived from the same model specifications, using a STATA command (dlogit2). Dlogits2 estimates the marginal effects of independent variable at their means by default. The coefficient reported in column 4 with all control variables indicates that, at the mean value of NON-COMPETITION index, which is 3.88, an increase of one standard deviation will increase the probability to pay DIVIDEND by 4%, which is economically significant. As we have discussed before, the imbalanced contracts that only put restrictions on the management side may give managers incentives to entrench themselves. Here, our evidence does not support that management in firms located in states with high legal enforcement of NON-COMPETITION covenants are more likely to entrench themselves. Instead, increased managerial stability leads to increased propensity to distribute cash to their shareholders. Our results are consistent with the notion that cash payment is used as a pre-commitment device (John & Knyazeva, 2006) to send the signal that managers care about the consequences of their long-term decisions and will not make wasteful investment.

With regard to other control variables, we find consistent results with prior research. The likelihood of paying DIVIDEND is associated with large and more profitable firms. Firms with higher ASSETS GROWTH and higher growth potential are less likely to pay DIVIDEND. Consistent with DeAngelo et al. (2006), firms are more likely to pay DIVIDENDs when retained earnings are a large portion of total equity.

4.2. Regressions Relating the Likelihood of REPURCHASE to NON-COMPETITION Index

As a second step, we use the same model specification to estimate the effects of state regulation of NON-COMPETITION contracts on the likelihood of a firm to REPURCHASE. Table 5 reports our results and our dependent variable is a repurchasing dummy.

We actually find quite similar results as Section 4.1. The likelihood for firms to REPURCHASE is also positively associated with the state legal enforcement of NON-COMPETITION contracts. Columns 1 and 2 are based on logit regression, whereas columns 3 and 4 report marginal effects

Table 5. Regression Relating the Likelihood of Repurchasing to
NON-COMPETITION Enforceability Index.

| | Dependent Variable: REPURCHASE | | | |
| | LOGIT REGRESSION | | MARGINAL EFFECT | |
	Model 1	Model 2	Model 1	Model 2
Constant	−0.6675***	−6.4486***	−0.1593***	−1.5227***
	(0.0265)	(0.1837)	(0.0062)	(0.0431)
NON-COMPETITION	0.0508***	0.0344***	0.0121***	0.0081***
	(0.0058)	(0.0062)	(0.0014)	(0.0014)
SIZE		0.2346***		0.0554***
		(0.0071)		(0.0017)
GROWTH		−1.1083***		−0.2617***
		(0.0632)		(0.0149)
ROA		1.5545***		0.3670***
		(0.1008)		(0.0237)
RE/TE		0.1037***		0.0245***
		(0.0133)		(0.0031)
MKT-BK		−0.1147***		−0.0271***
		(0.0095)		(0.0022)
INDUSTRY DUMMIES	YES	YES	YES	YES
YEAR DUMMIES	YES	YES	YES	YES
Observations	24,890	24,890	24,890	24,890
χ^2	76.21***	2427.51***	74.59***	1924.22***
Log-likelihood	−16498.76	−15204.39	−16498.76	−15204.397

Notes: Table reports regression results relating the likelihood of repurchasing to NON-COMPETITION enforceability indexes. Columns 1 and 2 are derived from logit regression. Columns 3 and 4 report marginal effects using STATA command (dlogit2) based on the logit regression. *REPURCHASE* is a dummy when a Compustat firm chooses share REPURCHASE for a certain year, and zero otherwise. *NON-COMPETITION* is an index describe in Table 1. *SIZE* is the total market value of the firm in natural logarithm form. *Growth* is the percentage change of firm assets with respect to current year total assets. *ROA* is the return on total assets. *RE/TE* is the ratio of earned vs. contributed capital. *MKT-BK* is the market value of the firm assets divided by book value of total assets.
***, **, and * denote statistical significance level at 1%, 5%, and 10%, respectively.

of independent variables at mean value derived from STATA command dlogit2. State regulation of NON-COMPETITION contracts has an economically and statistically significant effect on the firm decision to REPURCHASE. Also, the coefficients of other control variables are quite similar as the results reported in last section.

Table 6. Regression Relating PAYOUT RATIO to
NON-COMPETITION Enforceability Index.

| | Dependent Variable: PAYOUT RATIO | | | |
| | OLS REGRESSION | | TOBIT REGRESSION | |
	Model 1	Model 2	Model 1	Model 2
Constant	0.0189***	−0.1097***	−0.0305***	−0.3750***
	(0.0008)	(0.0063)	(0.0014)	(0.0009)
NON-COMPETITION	0.0006***	0.0006***	0.00032***	0.0024***
	(0.0011)	(0.0001)	(0.0003)	(0.0003)
SIZE		0.0049***		0.0136***
		(0.0003)		(0.0003)
GROWTH		−0.0264***		−0.0579***
		(0.0102)		(0.0011)
ROA		0.02501***		0.0543***
		(0.0085)		(0.0026)
RE/TE		0.0001		0.0068***
		(0.0001)		(0.0004)
MKT-BK		0.0018***		−0.0009***
		(0.0005)		(0.0003)
INDUSTRY DUMMIES	YES	YES	YES	YES
YEAR DUMMIES	YES	YES	YES	YES
Observations	24,890	24,890	24,890	24,890
F-statistics	12.88***	76.21***		
χ^2			106.39***	3365.73***

Notes: Table reports regression results relating PAYOUT RATIO to NON-COMPETITION enforceability indexes. Columns 1 and 2 are derived from OLS regression. Columns 3 and 4 report results based on tobit regression. *PAYOUT RATIO* is the total cash payment including DIVIDEND plus share REPURCHASE divided by book value of total assets. *NON-COMPETITION* is an index describe in Table 1. *SIZE* is the total market value of the firm in natural logarithm form. *Growth* is the percentage change of firm assets with respect to current year total assets. *ROA* is the return on total assets. *RE/TE* is the ratio of earned vs. contributed capital. *MKT-BK* is the market value of the firm assets divided by book value of total assets. ***, **, and * denote statistical significance level at 1%, 5%, and 10%, respectively.

4.3. Regressions Relating the *PAYOUT RATIO* to *NON-COMPETITION* Index

Table 6 presents our empirical results linking firms' PAYOUT RATIO to the legal enforcement of NON-COMPETITION index. We define the PAYOUT RATIO as total cash payment including DIVIDEND and REPURCHASE divided by book value of firm total assets (John &

Knyazeva, 2006). Columns 1 and 2 are based on OLS regressions. Since the PAYOUT RATIOs of many firms are left censored at zero, we also use Tobit regression to account for the censored distribution of PAYOUT RATIO and report our results in columns 3 and 4.

In general, we find that the proportion of cash payment over total assets is positively related to the NON-COMPETITION enforceability index at 1% significance level for all model specifications. This result is consistent with our prior findings and indicates that firms located in states with high enforcement of NON-COMPETITION contracts distribute more cash to their shareholders, holding other factors constant. We also find quite similar results in terms of other control variables.

4.4. Robustness Check

In addition to our basic findings, we perform several additional tests. We add more control variables to account for different characteristics of firm risk, leverage, and assets intangibility and obtain consistent results. We divide our sample into several groups according to market capitalization, following Fama and French (2001). We run the same regression for different groups and obtain similar results. In unreported results, we control for some governance characteristics, following John and Knyazeva (2006), and the results do not change materially.

5. SUMMARY AND CONCLUSION

In this chapter, we intend to investigate the managerial decision on payout policy when firm managers are bound to their firms by NON-COMPETITION contracts. Taking the law and finance perspective, we empirically test effects of state regulation on NON-COMPETITION covenants on firm payout policy, making use the variation of legal enforcement of such contracts across different states in the U.S. Our research provides strong evidences that state regulation on NON-COMPETITION contracts do affect firms' payout policy.

Our evidence shows that when the strength of legal enforcement of NON-COMPETITION clauses is higher, managers are more likely to distribute cash to their shareholders. Specifically, the likelihood for a firm to choose paying DIVIDEND or REPURCHASE is positively related to the NON-COMPETITION enforceability index. PAYOUT RATIO is positively related to the strength of legal enforcement of such contracts. We

control for firm SIZE, growth, profitability, growth potential, and the stage in their lifecycle. Also, we control the timely trend and industry differences by adding year dummies and industry dummies. Finally, we perform several further tests and conclude our results are robust.

NON-COMPETITION contracts are designed to increase managerial stability, which allows current employees to be entrusted and make better long-term decisions. Legal enforcement of such contractual agreements also significantly reduces the job opportunities of employees in the outside labor market. Fama (1980) emphasized the important disciplinary role played by managerial labor market. We take the law and finance perspective and examine the relationship between labor market concern and firm payout policy when firm management is bound to the firm by NON-COMPETITION contracts. We provide evidence that firms located in states with high legal enforcement are more likely to distribute cash to their shareholders through either DIVIDEND or share REPURCHASE. We argue our empirical findings are consistent with the idea that cash payment is used as a pre-commitment device to mitigate potential agency problem.

NOTES

1. See Garmaise (2005) for a detailed discussion on how to construct the NON-COMPETITION enforcement index.
2. We only use ASSETS GROWTH in our regression, though SALES GROWTH provides qualitatively the same results.

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