

## **Industries, Investment Opportunities, and Corporate Governance Structures\***

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## **Industries, Investment Opportunities, and Corporate Governance Structures**

### **Abstract**

We provide an argument and present evidence that industry factors play an important role in corporate governance. In particular, an industry's investment opportunities, product uniqueness, competitive environment, information environment and leverage help explain its corporate governance structures. These factors can have quite different associations (in strength and direction) with the monitoring capabilities of the board of directors versus the shareholder orientation of corporate charter provisions. This suggests systematic differences in the relative costs and benefits of alternative monitoring mechanisms. A focus on firm influences within industries suggests that firm and industry factors can each explain up to half of the variation in governance structures. We also find evidence that firms' broad governance structures revert over time toward industry norms.

## **Industry, Investment Opportunities, and Corporate Governance Structures**

The separation of ownership and control in corporations can result in costly agency conflicts between owners and managers. Impediments to monitoring and the existence of transactions costs imply that contracts alone cannot resolve such conflicts, giving rise to the need for governance structures (Hart, 1995). The corporate governance structures that have developed in order to constrain management and help solve agency problems comprise a set of mechanisms, internal and external to the firm. As pointed out by Jensen (1993), John and Senbet (1998) and Shleifer and Vishny (1999), these internal (boards of directors, corporate charters) and external (market for corporate control, legal and regulatory rules, investor monitoring, labor and product markets) mechanisms interact to determine the governance environment in which a company operates.

The interactions among the mechanisms imply that a firm's corporate governance should be viewed as the set of mechanisms in place rather than individual components. The net effect of the mechanisms for a given firm depends not only on the control benefits the firm receives, but also on the costs of the mechanisms to managers and shareholders due to the frictions and constraints that the mechanisms impose. Because agency problems vary across firms, the costs and benefits of governance structures to control these problems also vary. Thus, the optimal cost-benefit tradeoff depends on a particular firm's environment, including its investment opportunities, and its competitive, information, and regulatory environments.

The fundamental question we address in this paper is the extent to which governance structures are related to firm and industry characteristics. We do so by developing and testing hypotheses regarding corporate governance structures. The null hypothesis is that corporate governance is irrelevant and governance structures do not

vary systematically across firms or industries, i.e., governance structures are completely random. The two alternative hypotheses assume that governance structures vary systematically across firms or industries. The difference between these two alternative hypotheses is the reason for the systematic variation. The first alternative hypothesis maintains that the systematic variation in governance structures is due to particular firm and industry characteristics. This hypothesis implies that the existence of particular governance mechanisms, such as board structures and corporate charter provisions, should be significantly related to characteristics that determine the costs and benefits of the mechanisms. Our second alternative hypothesis, which is mutually exclusive from the null hypothesis but not the other alternative hypothesis, is that governance structures may look similar across firm or industries, or within industries, but without apparent explanation (i.e., variation that is not easily explained by observable factors). For example, commonality in corporate governance could be influenced by benchmarking to industry peers, or by firms sharing common corporate governance advisors.

We test these hypotheses using a panel dataset of corporate governance mechanisms for a broad cross-section of more than 2,300 firms over four years. We investigate these firms' overall portfolio of governance mechanisms, including a set of board-related variables, a set of corporate charter provisions (e.g., antitakeover devices), and the choice of state of incorporation. We also separately analyze the sets of board variables and charter provisions. The analysis produces evidence of systematic variation in corporate governance, indicating that governance structures are not random. Moreover, we find evidence supportive of the hypothesis that governance structures vary with industry and firm characteristics. The results suggest that, at least in part, governance structures vary with the expected costs and benefits of different governance mechanisms.

Specifically, we find that investment opportunities, product uniqueness, the competitive and information environments of the industry, and the average industry leverage are associated with governance structures.<sup>1</sup> Although firm factors augment industry factors in explaining variation in corporate governance, the results suggest that industry factors tend to dominate firm factors in explaining the variance in our measure of overall governance structure. This result is not universal, however, because firm and industry influences each explain about the same amount (half) of the observed variation in board structures.

Importantly, we find that our indices of board and charter provisions exhibit quite different associations with different firm and industry characteristics. This suggests that viewing corporate governance in terms of just the features of the board, just the charter provisions, or as a combined single index, may mask important relationships between corporate governance structures and features of the contracting environment. We also find that governance structures are relatively stable over time; we observe only small governance changes during our four-year sample period. However, the governance changes we do observe exhibit mean reversion toward industry averages.

Several previous studies have also examined sets of corporate governance structures and have provided important contributions on some of the same issues we analyze (Danielson and Karpoff, 1998; Gompers, Ishii and Metrick, 2002; John and Kedia, 2002). We view the corporate governance structures as endogenous to the industry and environmental factors, an approach that differs greatly from the empirical papers by Danielson and Karpoff and Gompers, Ishii and Metrick. Beyond this

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<sup>1</sup> Two previous papers on corporate governance structures have provided some limited evidence on industry factors in these structures. Danielson and Karpoff (1998) find evidence of relations between board composition, ownership structure, and provision use, but conclude that the overall use of governance provisions is not systematically related to industry grouping. Gompers, Ishii, and Metrick (2001) provide preliminary evidence that provision use may be related to industry

difference, our primary focus is on industry effects, while their primary focus is on the individual firm level. We differ from John and Kedia in that we focus on empirical evidence, while they focus on theoretical evidence. Our results can be viewed as complementary to the previous papers.

In the following section, we discuss corporate governance structures. In Section II, we develop hypotheses for the determinants of such structures across industries. We describe the data in Section III and present evidence regarding industry determinants of corporate governance systems in Section IV. Section V examines firm determinants of governance while controlling for broad industry influences. We consider changes in corporate governance structures across our sample period in Section VI and provide concluding comments in Section VII.

## **I. Corporate Governance Structures**

In this paper we focus on explaining the components of a firm's governance structure that managers can affect, including board composition, corporate by-law and charter provisions, and state laws. (The last of these derives from the firm's choice of state for incorporation.)

The most prominent governance mechanism that managers can affect is the board of directors, whose duty is to represent the shareholders. Our two alternative hypotheses suggest that board characteristics should vary systematically across firms and industries, either because of systematic differences in costs and benefits, or because of some other commonality. Previous research suggests that the board characteristics affect the board's effectiveness and that the important characteristics are board size, independence, and composition (John and Senbet, 1998). For example,

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classification in that certain industry groups are prevalent among firms with provisions in shareholder interests versus manager interests.

communication and coordination problems with larger boards imply that smaller boards are more efficient (Jensen, 1993; Yermack, 1996), but for some industries, the benefits from a larger board may outweigh the increased communication and coordination costs. The independence of directors, considered important in determining the monitoring capabilities of a board (Fama and Jensen, 1983; Weisbach, 1988; Brickley, Coles and Terry, 1994; Borokhovich, Parrino, and Trapani, 1996), may be more important for some types of firms than others. Similarly, the independence of board monitoring committees, i.e., the audit, compensation, and nominating committees, although considered important by many regulatory bodies and investors (John and Senbet, 1998; Gillan and Starks, 2000; Deli and Gillan, 2000) may have more importance in some industries than others.<sup>2</sup>

Two other issues pertaining to board structure are the separation of the chief executive officer (CEO) and chairman of the board (COB) positions and the presence of a lead director. Although arguments have been made and evidence presented that separating the CEO and COB positions is in shareholders' interests (Jensen, 1993; Goyal and Park, 2002), Brickley, Coles and Jarrell (1997) provide contrasting evidence that the costs of separating the CEO and COB positions may exceed the benefits. Rather than separate the two positions, others advocate designating a lead independent director.<sup>3</sup>

In summary, existing research suggests that small boards with a majority of independent directors on the board and on its committees provide the strongest monitoring capabilities. Although the evidence is mixed on separating the CEO and chair positions or designating a lead director, doing so may improve the board's

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<sup>2</sup> For example, recent New York Stock Exchange listing standard changes requiring that board be comprised of a majority of independence directors and that audit, compensation, and nominating committees be composed solely of independent directors.

monitoring of corporate management. According to our null hypothesis, the benefits of these board structures would not be related to particular firm or industry characteristics. In contrast, our primary alternative hypothesis suggests that the benefits and costs of each of these structures would vary across industry and firm characteristics and that for some industries and firms, these structures would be more prevalent than for others.

The second major internal governance mechanism is a firm's corporate charter and bylaws, that is, the set of rules and procedures under which each firm operates. The importance of the charter and bylaw provisions and their effects as governance mechanisms is evidenced by shareholder proposals seeking amendments to such measures (e.g., Gillan and Starks, 1998; 2000). The provisions that have been identified as most important include dual-class share structures, in which there is a separation of cash-flow rights and voting rights, and certain amendments, such as blank-check preferred stock, classified boards, fair-price restrictions, limiting shareholder ability to call special meetings or act by written consent, poison pills, or supermajority voting requirements (see Appendix A for a more detailed discussion of each of these provisions). The announcements of the adoption of many of these amendments have been met with negative stock price responses, indicating shareholders perceive them as wealth-reducing. (See, for example, Jarrell and Poulsen, 1988a; 1988b.) Some of the amendments, however, are viewed as positive for the firm, for example, Bhagat and Brickley (1984) argue that the adoption of cumulative voting, which affords minority shareholders the possibility of board representation, is associated with enhanced corporate value. According to our alternative hypotheses, these amendments should vary systematically across industries, either because the benefits and costs vary

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<sup>3</sup> See CalPERS' US Corporate Governance Principles <http://www.calpers-governance.org/principles/domestic/us/page01.asp>.



because of industry characteristics or because there is some industry commonality such as the use of the same attorneys in constructing the corporate charter.

Finally, managers can affect their firm's governance structure through the choice of state of incorporation. State laws offer firms varying levels of antitakeover protection and may negate firms' need to adopt charter amendments. In fact, Bebchuk and Cohen (2002) find that states that offer stronger antitakeover protections are more successful in retaining local companies in their incorporations and in attracting out-of-state incorporations. Differences in firm or industry characteristics may lead some firms to incorporate (or reincorporate) in a particular state, while other firms do not perceive the benefits to outweigh the costs.

While these three broad sets of governance choices – board structure, corporate charter provisions, and state of incorporation – have been studied extensively, empirical work has generally focused on the effects of these mechanisms on firm value, performance, or specific corporate decisions (see reviews by Hermalin and Weisbach (2002) for boards of directors and Bittlingmayer (1999) for the market for corporate control). In contrast, we consider the endogeneity of the mechanisms themselves – that is, how governance mechanisms are associated with environmental factors. Theory suggests that board structure, corporate charter provisions, and state laws have costs and benefits that vary across firms depending on their characteristics and circumstances. If so, then we would expect to find associations between these governance choices and factors that influence their relative costs and benefits.

Our approach is similar to that of Hermalin and Weisbach (1998, 2002), who argue that boards of directors are an endogenous response to agency problems. It is also similar to that of Smith and Watts (1992) and Bushman, Chen, Engel, and Smith (2000). Smith and Watts suggest that the investment opportunity set and industry factors play a significant role in determining financial and governance policies. Bushman

et al. examine the relation between the timeliness of accounting earnings and governance systems. In addition, Kole and Lehn (1999) examine how some components of governance systems in the airline industry changed after deregulation.

In order to differentiate between our two primary alternative hypotheses of systematic variation in corporate governance structures, we need to develop additional hypotheses regarding which factors in a firm's environment are likely to affect managers' choice of governance mechanisms. There are two important considerations in the development of these additional hypotheses. The first is the difference between strong corporate governance and optimal corporate governance. The second is the degree of substitutability between different monitoring mechanisms.

Stronger corporate governance does not necessarily imply optimal monitoring because the costs of the stronger governance may outweigh benefits. For example, consider the role of independent directors on boards. According to many institutional investors and corporate oversight bodies, independent directors provide superior oversight as compared to directors with links to corporate management, implying that boards should consist of a majority of independent directors.<sup>4</sup> However, there also exist costs of having too high a proportion of outsiders on the board. Outside directors do not have the detailed information that inside directors possess from their involvement in firms. In addition, outside directors may not have the time or commitment of insiders given other responsibilities. In the extreme, a board consisting of exclusively outsiders could make poorer decisions than a board with insiders.

The second consideration is that some corporate governance mechanisms may serve as substitutes. For example, Hartzell (2001) finds that termination incentives can substitute for executive compensation being sensitive to firm performance. Similarly,

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<sup>4</sup> See, for example, TIAA-CREF Policy Statement on Corporate Governance, March 2000, <http://www.tiaa-cref.org/libra/governance/index.html>.

debt, as a self-enforcing governance mechanism, or product market competition, may substitute for board oversight. The issue of substitutability remains an empirical question, one that we address further in this paper.

## **II. Industry and firm determinants of governance**

The literature has long recognized the importance of environmental considerations in corporate finance and corporate governance. In firm-level studies, industry effects are apparent for compensation contracts (Murphy, 1998, and Aggarwal and Samwick, 1999), ownership structure – particularly for media and regulated firms (Demsetz and Lehn, 1985), and takeovers and restructurings (Mitchell and Mulherin, 1996). Moreover, CEO turnover is associated with industry heterogeneity (Parrino, 1997) and the level of product market competition (DeFond and Park, 2001). At the industry-level, Smith and Watts (1992) find evidence that the investment opportunity set is related to cross-sectional variation in corporate financing, compensation, and dividend policies. Such findings indicate that different aspects of governance, notably compensation contracts, managerial turnover, ownership structure, and the market for corporate control appear to be influenced by industry considerations. These findings also suggest that the relative magnitude of agency costs differs across firms and industries, which would be consistent with our first alternative hypothesis.

There also exists evidence consistent with our second alternative hypothesis that industry clustering of governance provisions and board characteristics can occur due to factors unrelated to the benefits and costs of such structures. For example, evidence, both anecdotal and academic, suggests that industry peer comparisons are common (e.g., Bizjak, Lemmon, and Naveen (2002) on executive compensation). This evidence implies that elements of competitive benchmarking may influence corporate governance.

According to both of our alternative hypotheses, firm and industry characteristics would influence the type and intensity of monitoring by corporate boards and the use of antitakeover measures. Such characteristics, or environmental factors, are likely to include investment opportunities, information uncertainty, product uniqueness, and the competitive nature of the product market. Managers facing attractive investment opportunities may have greater discretion in project selection than those facing less attractive investment opportunities, suggesting potentially high payoffs to board monitoring. Manager's discretion may also be affected by product uniqueness. Unique products can generate market power and the ability to earn quasi-rents. In such cases, it may be less critical if a mistake is made, thus the benefit from monitoring is lower.

In noisy environments, where managers face riskier outcomes to their decisions and monitoring costs for (outside) board members are high (Demsetz and Lehn, 1985), board monitoring by independent directors is relatively inefficient. Supporting this view, Hermalin and Weisbach (1998) show that with poorer information the option to fire management is less valuable. Consequently, the intensity of board monitoring declines. Noisier environments imply that firms' charter provisions will be more structured, because of the increased uncertainty.

The competitive environment can affect corporate governance structures in opposite directions. If product market competition disciplines managers, then the marginal benefit of additional governance would be low as competition would substitute for other mechanisms (Leibenstein (1966) and Hart (1983)). Alternatively, a competitive environment could raise the marginal cost of poor managerial decisions, resulting in a positive association between competition and internal governance strength. Thus, the direction of this relationship is an empirical question, which we address in the analysis.

Previous research suggests two other factors that could be expected to influence corporate governance on an industry basis: a regulatory environment and capital

structure. For example, Demsetz and Lehn (1985) argue that firms in regulated industries should require less internal monitoring because regulatory agencies and the government provide firm oversight. Thus, governance structures should be related to whether firms operate in regulated industries. Managers may also be constrained by firms' capital structures. Jensen (1986) and Hart (1995) argue that debt provides a self-governance factor for managers. Based on this argument, we would expect to observe industries with more debt in the capital structures to have similar, and less restrictive, corporate governance structures because leverage disciplines managers.

This set of additional hypotheses serves as a subset of our primary hypothesis that corporate governance structures are an endogenous response to environmental factors. The endogeneity itself, however, poses a serious challenge to researchers studying these issues. Thus, we first adopt an industry level focus to determine whether or not systematic or environmental factors influence governance structures. An industry-level analysis affords us several advantages. First, pooling the data eliminates firm idiosyncrasies that could influence the results, providing more reliable estimates. Second, industry aggregates are less affected by error-in-variables problems. Finally, this approach mitigates to some degree the endogeneity issues prevalent in firm-level analyses.<sup>5</sup> Following our industry-level analysis, we also conduct a firm level analysis to examine the extent to which firm level factors influence governance structures beyond industry factors.

### **III. Data and Construction of Governance Indices**

To examine our hypotheses regarding the endogeneity of firms' corporate governance structures, we focus on each firm's board of directors, corporate bylaw and charter provisions, ownership, state of incorporation, and firm characteristics during the

1997-2000 time period.<sup>6</sup> The sample includes the S&P Supercomposite 1,500 companies, and other large, publicly traded corporations. The firm characteristics data comes from COMPUSTAT, compensation data from Execucomp, institutional ownership data from Thomson Financial, and returns data from CRSP. To be included in the sample, the firm must have data from all sources for at least one year over the sample period.

Table 1 provides the descriptive statistics of these variables for the 2,341 sample firms. The sample firms have an average age of 45 years, which implies that they have had sufficient time to converge toward an appropriate corporate governance structure (ignoring shocks). The average return over the 1997-2000 period is 14.7%, with a majority of the firms earning between -7.2% and 30.9%. Our proxy for the firm's Tobin's Q ratio has a mean of 2.18 and a median of 1.49, reflecting the high market valuations during our 1997-2000 sample period.<sup>7</sup> The average book leverage is 21.8%.<sup>8</sup> The ratio of incentive compensation to total compensation for the top managers in Execucomp, which we define as (Black-Scholes Value of Options Granted + Value of Restricted Stock Granted + Long-term Incentive Plan Payouts) / Total Direct Compensation, averages 0.45. Institutions have a significant presence in our firms, with mean ownership of 56.1% of the outstanding shares. We also calculate a Herfindahl index of institutional ownership (as a percentage of outstanding shares) as a measure of the concentration of institutional ownership. The mean of this measure is 0.023. Finally, we

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<sup>5</sup> Durnev, Morck and Yeung (2001) make similar arguments.

<sup>6</sup> Investor Responsibility Research Center, *Corporate Takeover Defenses*, reports governance provisions for between 1,500 and 2,000 companies per year.

<sup>7</sup> We compute Tobin's Q as [Shares Outstanding (Compustat data item 25) \* Price (Compustat data item 24) + Total Assets (Compustat data item 6) - Common Equity (Compustat data item 60)] / Total Assets (Compustat data item 6)].

<sup>8</sup> We define book leverage as Long-term Debt (Compustat data item 9) / Total Assets (Compustat data item 6).

calculate the ratios of selling expenses and capital expenditures to sales, with respective means of 0.277 and 0.092.

Table 2 provides descriptive statistics for the governance structures of our sample. Panel A shows the structure of the board of directors for these firms. For most of the firms, board size ranges from seven to 11 directors, with an average of about nine directors. A little over one-quarter of the firms (27%) have separated the board chairman and CEO positions. Only one percent of the firms have designated lead directors. Across the firms an average of 59% of the directors are classified as independent.<sup>9</sup> In terms of the committee configurations for these firms, 100% have audit committees composed of an average of 82% independent directors; 99% have compensation committees with an average of 85% independent directors; 57% have nominating committees with an average of 71% independent directors and 23% have corporate governance committees.<sup>10</sup> These statistics show that by the late 1990s, most firms have boards composed of a majority of independent directors and their audit, compensation, and nominating committees are largely composed of independent directors.

Given the diversity in the governance structures across firms shown in Panel A, we form indices to capture this diversity into manageable statistics. For the board of directors characteristics, we assume that the following characteristics provide tighter monitoring capabilities: smaller boards (e.g., Jensen, 1993; Yermack, 1996), increased director independence (e.g., Fama and Jensen, 1983; Weisbach, 1988; Brickley, Coles and Terry, 1994; Borokhovich, Parrino, and Trapani, 1996), the existence of separate chairs and CEOs (Jensen, 1993), the existence of separate committees and more

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<sup>9</sup> We define an independent director as one that is neither an executive with the firm nor affiliated with the firm.

independent directors on the committees (Klein, 1998). For the individual board characteristics, we calculate percentile rankings where the high score indicates the direction of stronger monitoring. For each firm, we then average these percentile rankings to obtain the firm's board index. By design, then, the average board index across the firms is close to 50; in this case 49.08, with a median of 49.75.

We next examine the prominent governance provisions included in corporate charters. For each firm, we include a dummy variable indicating the presence of unequal voting rights in order to pick up any separation of cash flow rights and voting rights through dual-class shares or preferred shares with voting power. We also examine whether the voting rights allow for cumulative voting and whether the board is classified, requiring staggered elections. We then check for the existence of the following charter provisions: blank-check preferred, fair-price restrictions, limits on shareholders' ability to act by written consent and to call special meetings, poison pills, and supermajority voting requirement (see Appendix A for details). Panel B of Table 2 provides the descriptive statistics for these charter provisions. We find that relatively few firms have diluted their common shareholders' voting power with only about 13% having unequal voting rights. Similarly, only about 10% of the firms allow cumulative voting. On the other hand, classified boards are in existence at a majority of the firms, with 59% of the firms having such a measure. As the table also shows, a majority of firms have charter provisions allowing poison pills and blank-check preferred stock, while less than fifty percent of the firms have fair-price restrictions, limited shareholder ability to call special meetings or act by written consent, or supermajority voting requirements.

Similarly to our construction of the board index, we calculate an index to capture the diversity of the corporate charter provisions. Here, the presence of a provision is

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<sup>10</sup> Many companies have combined nominating and governance committees. Consequently, we focus on the existence and independence of nominating committees, and simply track the



considered to provide management with less restrictive governance (with the exception of the cumulative voting provision, which works in the opposite direction). Again, we employ percentile rankings of each provision and by design, the average charter provision index is nearly 50% because it is based on the average across each firm's percentile rankings for each provision. A firm with a high charter provisions index has fewer corporate governance provisions in place. Put another way, the higher the governance provisions index, the more the firm's governance is in shareholder rather than management interests.

The remaining major controllable factor in the firm's governance structure is the state of incorporation (see Bebchuk and Cohen, 2002, for an extensive study of state of incorporation). State laws can substitute for antitakeover charter provisions or supercede them. We employ seven indicators of the state governance laws: the presence of a control share acquisition statute, a fair-price statute, freeze-out restrictions, poison pill endorsement, a director duty provision, a short-term profit provision, and incorporation in Delaware (see Appendix B). The first six indicators are derived from Bebchuk and Cohen (2002) and Gartman (2000), while the seventh indicates considers incorporation in Delaware, given that state's prominence as a corporate domicile and extensive case law.<sup>11</sup> As in the previous governance indices that we construct, we also use a ranking for the state index. In this case, we again use percentile rankings in which each firm is ranked on the seven measures based on state

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existence of governance committees.

<sup>11</sup> Bebchuk and Cohen (2002) term the first five as standard antitakeover devices and number 6 as an extreme device (only Pennsylvania and Ohio have such a law). Bebchuk and Cohen also point out one other extreme measure in state laws – a required staggered board. Since we are using a measure of the existence of classified boards on a direct firm basis, we do not include that measure here.

of incorporation law, where the highest rank indicates the absence of the antitakeover provisions.<sup>12</sup>

Finally, we construct a total governance index for each firm by taking the average ranking for each firm across all of the governance provisions (rather than an average of the three separate governance indexes). We take the average across all of the provisions in order to avoid weighting one provision more than any other. We focus on three governance indices: the board index, the charter provision index, and the total governance index (which includes components of the board index, the provision index, and the state index). These indices differ from those of other researchers in both their construction and purpose. Gompers, Ishii and Metrick (2001) derive a governance index based on corporate charters in which they add up the existence of the 24 charter provisions they study. For our charter provision index, we focus on the eight most prominent charter provisions and rather than summing the provisions for an index, we use percentile rankings across firms. Further, Gompers, Ishii and Metrick examine different hypotheses than we do. Bebchuk and Cohen (2002) derive a state charter index that is similar to our state index, but we omit one of their indicators, a law requiring staggered boards, because we use that measure directly in our charter provisions index. We employ the state index in our total governance index, but we do not analyze the state index separately.

#### **IV. Empirical evidence on industry factors**

Our first step is to determine whether there is a systematic industry factor in the corporate governance measures adopted by firms. We categorize industries according to Fama and French (1997) and average the governance structures across the firms

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<sup>12</sup> If we omit Delaware as a separate state indicator, we derive an index with a correlation of over 90% with the index including Delaware separately.

within each industry. Appendices C and D provide the board and governance provisions by industry averages. Examining these statistics by industry shows substantial variation in board structures across industries. For example, the average percentages of independent directors on boards in the entertainment, beer and liquor, or textile industries are 43-44%, while the average percentages of independent directors on boards in the utilities, precious metals, or aircraft industries are over 70%.

In Table 3, we provide a formal test of whether these differences across industries are significant. The results of ANOVA tests of industry-factor significance are shown for the total governance index in Panel A, the board index in Panel B, and for the charter provision index in Panel C. For all three indices, the industry factor is highly significant in explaining companies' corporate governance structures. For the total governance index, a firm's industry explains between 5.8% and 8.8% of its variation, depending on the year. Similarly, for the board index, the industry explains between 8.3% and 11.6% of its variation, while for the charter provision index, industry explains between 3.5% and 6%.

Given that industry factors play a role in corporate governance structures, we next consider our hypotheses regarding whether industry characteristics can explain these results. As hypothesized in Section II, the predominant factors in an industry environment expected to affect constituent firms' corporate governance structures are factors that capture the investment, competitive, monitoring and information environments in which the firms operate. We use the industry's average Tobin's Q ratio as our proxy for the firm's investment opportunities.

To capture the self-governance monitoring provided by leverage, we average the book leverage measure across all sample firms in the industry. Some industries' production technologies may more easily support the use of debt, which may in turn lessen the need for other governance devices. Similarly, regulation may also substitute

for some governance mechanisms, so we measure the monitoring provided by a regulatory body with an indicator variable for regulated industries, defined as utilities, banks, insurance, and trading. We attempt to capture the competitive structure of the industry in two ways. First, as a proxy for the degree of product uniqueness, we use the industry's average ratio of Selling Expenses to Sales, following the Titman and Wessels (1988) argument that firms with unique products advertise more. Second, we calculate a Herfindahl index of the firms' market shares. Our measure of the information environment is the industry volatility of returns on the firms' common shares (expressed as the average standard deviation of monthly returns for firms in that industry). This measure captures the uncertainty that management faces, and the uncertainty that investors face in trying to determine the actions taken by management. We also incorporate a measure of compensation structure by calculating each industry's average proportion of compensation that is incentive based (*Incentive Pay / Total Pay*, as defined above). Finally, we use dummy variables for years 1998, 1999, and 2000 to control for time effects, and to determine if there are differences across the years in the sample.

For these industry characteristics to explain the industry clustering found in Table 3, there must be commonality across firms within an industry in these characteristics. Table 4 provides the results of ANOVA tests of industry-factor significance for three of our four hypothesized important characteristics: Tobin's Q ratio (in Panel A), product uniqueness (in Panel B) and stock return volatility (in Panel C). (We omit the Herfindahl index since it is calculated on an industry basis.) For all three, the industry factor tends to be highly significant, generally explaining from 16-28% of the variation in the characteristics. (The one exception is that in 2000 the industry factor for product uniqueness was not significantly different from zero.)

To test our hypotheses further, in Table 5 we focus on the results from a series of regressions in which the dependent variables are the governance indices and the

independent variable are proxies for industry common characteristics.<sup>13</sup> The dependent variables are the total governance index in model (1), the board index in model (2), and the charter provision index in model (3).<sup>14</sup> In addition to the coefficient estimates, the table presents t-statistics, where the estimated standard errors are robust to heteroscedasticity (see White, 1980), and corrected for clustering within industries over time. This correction implies that our degrees of freedom equal the number of industries (not industry-years) and our significance levels reflect this.

According to the results for model (1), the total governance index is related to the industry's investment opportunities (using our proxy, Tobin's Q), its product uniqueness, its degree of competition, and its average leverage. The total governance index is not significantly related to industry volatility, the presence of regulation, or to the structure of executive compensation.

Examining models (2) and (3) along with model (1) provides insights as to the effects of these variables by showing whether the significance of the coefficients on the total governance index derives from the board index or the provision index (or both). First, the effects of investment opportunities on the total governance index appear to stem from board structure rather than from governance provisions. This relation is consistent with the hypothesis that the benefits of board monitoring are higher in industries with greater growth or investment opportunities.

Partially offsetting the overall positive coefficient for Tobin's Q ratio is the negative relation between the total governance index and the industry's product uniqueness. This negative relation is driven largely by the relation between the board index and product uniqueness, implying that industries with unique products are less

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<sup>13</sup> In this set of regressions we omit the industry category "other" because we are examining systematic industry factors and the "other" category contains a diverse set of firms that cannot be otherwise categorized. Thus, we would not expect systematic factors to exist for this group.

likely to have stronger monitoring through their board of directors. This result is consistent with the idea that managers in some industries are allowed more flexibility in decision-making. Further, if one assumes that industries with unique products are those requiring more managerial initiative, this result is also consistent with the theory of Burkart, Gromb and Panunzi (1997) that excessive monitoring can harm managerial initiative.

The results show that an industry's governance structure is significantly related to its competitive environment. Firms in more competitive environments, as measured by the Herfindahl index of product market concentration, have governance structures that are less restrictive for management (a combination of weaker boards and more charter provisions in place). This result is consistent with the hypothesis that product market competition disciplines managers and may substitute for internal corporate governance structures.

Although the industry's information environment (based on the return volatility proxy) is significant in each of the constituent indices, industries with greater volatility have weaker board structures, but fewer charter provisions. The overall effect is no relation with the total governance structure. This is consistent with the argument that the board monitoring costs are higher in less stable or noisier environments.

Industries with greater financial leverage are, on average, associated with weaker governance structures. This result is driven by the relation between leverage and the board index, and is consistent with arguments by Jensen (1986) and Hart (1995) that leverage imposes discipline on the managers, reducing the need for a strong board of directors. We observe no significant relations between board structure or charter provision use and regulated industries.

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<sup>14</sup> Although the dependent variables have finite support, we use ordinary least squares regressions, as we do not have observations near the support limits of zero and 100.

Finally, the total corporate governance structure does not differ significantly across industries for the different years in the sample (1997-2000). However, there are significant differences in board structures and by-law and charter provisions across the years. The signs of the coefficients suggest that board structures are stronger in each of the years 1998-2000 as compared to the first year in the sample, but that charter provisions are weaker (from the shareholder perspective). Further F-tests for differences between the dummies indicate that the board structures became progressively stronger and the charter governance measures became progressively weaker.<sup>15</sup> These tests provide evidence on statistical significance; we explore the economic importance of these changes more thoroughly in later sections of the paper.

The results in Table 5 indicate that studying board structure or charter provisions by themselves would lead to very different conclusions as to how governance structure relates to the industry characteristics. This provides two particularly important insights into analyzing corporate governance structures. First, a complete analysis of governance structure should examine sets of similar controllable corporate governance structures rather than focusing only on individual governance components. Second, it is also important to consider related governance components separately (in this case our board and provisions indices). Our evidence suggests that combining the board and governance provisions into a single index masks relations between the component indices and characteristics associated with the relative costs and benefits of each. Aside from the implications for empirical researchers, this is important in the context of (a) single-number governance scores being developed in practice, and (b) mandated increases in board independence in recent regulatory changes.

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<sup>15</sup> The F-tests show that for the board index regressions all three annual dummy variables are significantly different from each other. For the provision index regressions, 1998 was significantly different from 2000, as was 1999, but 1998 and 1999 were not significantly different from each other.

## **V. Empirical evidence on firm factors**

In this section, we incorporate firm characteristics into the analysis to explore the relative importance of firm versus industry factors in explaining governance structure variation. The issue we address is that once we have controlled for industry factors, how are governance structures associated with firm-specific factors? Thus, in this analysis, we effectively replace the industry-level variables with firm-level variables. We omit the measures of industry concentration, selling expenses to sales and regulated industries and instead include industry-level dummy variables to capture these effects. We include the natural logarithm of assets as a measure of firm size, book leverage, and director and officer percentage equity ownership (to recognize that such ownership could affect board structure and charter provision use). We also incorporate the ratio of top-manager incentive compensation to total compensation. Two measures of institutional ownership are used. The first is total percentage of equity held by institutions. The second is a measure of institutional ownership concentration: a ranking of institutional ownership Herfindahls.<sup>16</sup> We incorporate the log of firm age and firm volatility (the standard deviation of monthly returns).

One industry-level factor that we still include in the firm-level regressions is a measure of investment opportunities. The rationale is that, although there is a systematic industry factor in investment opportunities, these opportunities can also vary across firms within an industry. A complicating factor at the firm level, however, is the possible endogeneity between our measure of investment opportunities, Tobin's Q, and the governance indices. Tobin's Q reflects market valuations and growth opportunities, thus, if investors value certain corporate governance structures (as suggested by Gompers,



Ishii, and Metrick, 2002), the valuation effects in Tobin's Q may lead us to inappropriate conclusions. To address this issue, we also use the ratio of capital expenditures to sales as an alternative measure in order to capture the growth opportunity implications of Q without the valuation effects.<sup>17</sup> Because of this and similar potential endogeneity problems, we view these firm-level tests as exploratory.

Table 6 reports the results of regression analyses examining the relation between the governance indices and firm-level characteristics. Dummy variables control for industry and year effects (the coefficients are not included in the table for the sake of brevity). The reported coefficients can be interpreted as estimating the effect of within-industry variation. The proxy for investment opportunities is Tobin's Q in Models (1), (3) and (5) and the ratio of capital expenditures to sales in Models (2), (4) and (6). Given that our findings are generally robust to the alternate specifications, we focus our discussion on the results using Q as the dependent variable, but discuss interesting aspects of the alternate specification.

The results in Table 6 suggest that firm-level relations between corporate governance structures and investment opportunities differ somewhat from those at the industry level. In the total index, model (1), Q does not appear to be related to governance structure, however, in model (3) we see that firms with high growth opportunities tend to have weaker boards, which is a result counter to what we found in the industry analysis. The difference is that in this analysis we are holding industry constant, while in the previous table we were taking averages within an industry. Thus, across industries, high growth opportunities are associated with stronger boards, but within industries, the higher-growth-opportunity firms tend to have weaker boards. There

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<sup>16</sup> We use a ranking of a Herfindahl index of institutional ownership concentration because of outliers in the percentage of institutional ownership variable. This approach is consistent with that of Hartzell and Starks (2002),

is no significant association between Q and the provisions index. In models (2), (4) and (6), we observe that CapEx to sales is negatively associated with the board index, but positively associated with the charter provisions index and the total index. Although the level of significance differs across the two specifications, the results are broadly consistent with the Gompers, Ishii, and Metrick (2001) finding that investment opportunities are positively correlated with more shareholder-friendly charter provisions.

Focusing on firm size shows that the total governance index is negatively related to firm size. Examining the components of the total governance index suggests that the relation is driven by the use of corporate charter provisions, as larger firms tend to use more charter provisions. We observe no relationship between firm size and the board index, *ceteris paribus*. In contrast to the industry-effects regressions, higher firm leverage is not associated with the board index, but strongly associated with increased provision use at the firm level.

The influence of directors and officers as measured by their equity ownership is significantly related to all three indices. Companies in which directors and officers have more power have weaker board structures, but less restrictive (more shareholder-oriented) charter provisions. The overall effect is that the total governance structure is weaker. Although one could interpret this effect as evidence that managers are entrenched, the lower level of antitakeover measures in such firms would appear inconsistent with such an interpretation.<sup>17</sup> An alternative interpretation is that directors' and officers' equity ownership provides its own incentive effects and that other elements of the board index provide few additional monitoring benefits.

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<sup>17</sup> In order to mitigate the effect of outliers, we exclude observations where capital expenditures are greater than sales.

<sup>18</sup> The net effect of fewer antitakeover amendments on managerial entrenchment would depend on whether director and officer ownership is significant enough to effectively block acquisition attempts.

Total institutional ownership generally lacks significance, however companies in which institutional ownership is more concentrated have stronger board structures. The association between institutional ownership concentration and the charter provisions index is not statistically significant. The relation between institutional ownership and stronger board structures is consistent with institutional shareholder activists and governance proponents advocating increased board independence.

Firm age is significantly positively related to the board structure index, implying that older firms have stronger board structures. This result may reflect the increased cost to younger firms of increased board monitoring (e.g., due to inhibiting managerial initiative) relative to older firms. In contrast, firm age is not significantly related to the total governance index. Since there is no significant relation between firm age and the charter provision index, the absence of significance from the board index to the total index is likely to be driven by an offsetting negative effect from the third component of our total governance index, the state index. Further analysis confirms this to be the case; there is a significant negative correlation between the state index and firm age. Older firms tend to be incorporated in states with more business-friendly provisions, consistent with the results of Bebchuk and Cohen (2002). This result is also consistent with the results of Field and Karpoff (2001) who find that seasoned firms are in more business-friendly states than are IPO firms.

Finally, we find a strong positive relation between a firm's corporate governance structure and its information environment (within the industry) as reflected in the return volatility. Interestingly, the lack of significance between volatility and the board index indicates that the relationship in the aggregate is driven by charter provisions. That is, firms with a more uncertain information environment have fewer charter provisions, consistent with the industry-level results of Table 5.

We test for the joint significance of firm-level variables in two ways. First, using F tests, we can reject the null that all the coefficients on the firm-level variables are jointly zero for all specifications, implying that the firm level variables add explanatory power after we control for industry and time effects. To estimate the economic significance of this increase in explanatory power, we also estimate a model (not tabled) regressing each index on only the industry and year dummies. The R-squareds from these models are at the bottom of Table 6. They show that for the Tobin's Q analysis in models (1), (3) and (5), industry and time explain 8.8% of the Total index, 10.4% of the Board index, and 6.1% of the Provisions index. Comparing these to the r-squared values for the full models in Table 6 of 10.5% (Total index), 20.3% (Board index) and 10.9% (Provisions index) provides a qualitative indication that both firm and industry influences are important in explaining the variance in governance structures. This is especially true for the two component indices, where industry and time account for roughly half of the variation in governance structures across firms. However, in the aggregate index, the firm-level factors add less explanatory power beyond those of time and Industry.

## **VI. Changes in corporate governance structures**

Because we have a four-year sample period, we can examine changes in our corporate governance structures over a short time frame. Table 7 shows the summary statistics for these changes. Recalling that each of the three indices (total governance index, board index, charter provision index) shown in the table has an average of about 49, the mean annual changes in governance indices are economically small. In fact, the median change for each of the indices is zero. The final two columns, which show the number of increases and decreases for each index, provide insight into the changes. While there are both increases and decreases in the overall governance index, these changes derive primarily from board structure rather than the provisions index. In fact,

the table indicates that there are very few changes in the provisions index. The table also indicates that there are changes in both directions, suggesting that while some boards are becoming stronger, others are becoming weaker. However, recall that the evidence in Table 5 showed that on an industry level, there have been trends in that boards in general were becoming stronger.

To examine whether there are any systematic determinants of the short-term changes in corporate governance indices, we regress the firm's change in index against firm-specific factors. One would expect that the short-term changes could be affected by recent firm performance, by how the firm's governance structure compares to other firms, and by institutional investor influence. We also include dummy variables for the particular year of the changes. Table 8 provides the results of this analysis.

We find that current or previous-year performance does not have an effect on changes in a company's corporate governance structure, at least for our sample period.<sup>19</sup> A significant factor is the relation between the firm's governance structure and other firms' structures in the preceding year. To measure this relative standing, we construct an *abnormal index* measure for each of our three indices, defined as the residual from a regression of the relevant index on industry and year indicator variables. We find a significant negative relation between changes in an index and the prior year's abnormal index. So, on average, firms with weaker governance structures given the industry and year experience strengthen their governance structure going forward, *ceteris paribus*. This mean-reversion effect holds for all three indices; firms with different total governance, board structures, or charter provisions from similar firms tend to change back toward the mean. This is consistent with our second alternative hypothesis

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<sup>19</sup> This does not imply that over a longer term there would not be a relation between performance and governance structure. Poorly performing firms are often pressured by institutional investors and others to change, including changes in boards and provisions (Smith, 1996).

that firms' governance structures are similar, e.g., by firms choosing governance provisions similar to those of their peers.

Of note is that total institutional ownership is associated with a move toward stronger board monitoring and lower use of charter provisions – an effect that is also reflected in the total index. This effect is consistent with institutional investors as a group paying increased attention to governance issues, however, there is no indication that institutional investors with more influence in a firm having an effect on governance structures during our sample period as institutional ownership concentration is not significantly related to any change in governance structures.

## **VII. Conclusions**

Corporate governance structures provide firms with the costs and benefits of monitoring management to mitigate the agency problems inherent in the corporate form. Since the agency problems between shareholders and managers vary across firms due to differences in the firms' environments, the costs and benefits of monitoring those problems would be expected to vary as well. Thus, in this paper we have examined the systematic relations between firms' controllable governance structures and factors in the firms' environments.

In an industry-level analysis, we find that the strength of the monitoring from the total controllable governance structure (including the board, the bylaw and charter provisions, and the state laws) is systematically related to the industry's investment opportunities, product uniqueness, competitive environment and leverage. In addition, the board and charter provision indices are each related to the industry's return volatility (as a proxy for information environment) with offsetting effects. These findings also provide support for the suggestion that governance structures are related to the relative costs and benefits of different governance mechanisms.

We also find some evidence of systematic variation in governance over time. We find that between industries, boards have moved toward increased monitoring, while corporate charter provisions have moved toward a more firm-friendly structure. Within industries, we find evidence of mean reversion for each of our governance indices. These results imply that governance structures that appear to be weaker in monitoring capability than predicted by a firm's industry and time are expected to strengthen in the future.

Our results have implications for policy makers and researchers alike. First, it is important to consider different elements of a firm's governance structure, and not just the use of board structures or governance provisions. Second, while aggregating governance structures into a single number allows one to examine systematic tendencies, the aggregation may also mask important relations between governance components and firm or industry characteristics. Finally, our results suggest that regulatory actions applying a one-size-fits-all criterion may be suboptimal, and increase contracting costs for some firms.

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**Table 1**  
**Summary Statistics**

This table provides descriptive statistics for the characteristics of the sample firms. The characteristics are obtained on an annual basis as of the end of the calendar year and are averaged for each firm across the 1997-2000 time period. The table reports the cross-sectional averages across the firms' times-series averages. *Incentive Pay / Total Pay* is defined as (Black-Scholes Option-Grant Value + Restricted Stock Grants + Long-term Incentive Payouts) / Total Compensation. *Total Inst'l Ownership* is a percentage of shares outstanding, and *Inst'l Ownership Herfindahl* is the sum of the squared fractional ownership of institutions. *Firm Volatility* is the standard deviation of monthly stock returns. *Selling Exp / Sales* and *Cap Ex / Sales* are ratios of Selling Expenses and Capital Expenditures to Sales, respectively.

<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>25th Percentile</b>	<b>75th Percentile</b>	<b>Standard Deviation</b>	<b>Number Of firms</b>
<i>Firm Age</i>	44.82	30.00	13.00	71.50	39.92	2,314
<i>Annual Return</i>	14.7%	11.0%	-7.2%	30.9%	51.8%	2,282
<i>Tobin's Q</i>	2.18	1.49	1.15	2.28	2.40	2,286
<i>Total Assets</i>	8,312	1,301	486	4,456	33,855	2,294
<i>Book Leverage</i>	21.8%	19.3%	6.1%	32.6%	18.8%	2,289
<i>Market Capitalization</i>	5,930	1,224	487	3,742	19,701	2,287
<i>Incentive Pay / Total Pay</i>	0.45	0.45	0.30	0.59	0.20	1,829
<i>Total Inst'l Ownership</i>	56.1%	58.9%	42.4%	72.0%	20.2%	2,316
<i>Inst'l Ownership Herfindahl</i>	0.023	0.017	0.009	0.027	0.039	2,316
<i>Firm Volatility (Monthly)</i>	14.4%	12.4%	9.4%	17.5%	7.5%	2,308
<i>Selling Exp / Sales</i>	0.277	0.217	0.122	0.330	0.428	1,844
<i>Cap Ex / Sales</i>	0.092	0.052	0.030	0.095	0.092	2,066

**Table 2**  
**Governance Provision Summary Statistics**

This table provides descriptive statistics for the governance mechanisms in the corporations: board of director characteristics in Panel A, the corporate by-law and charter provisions in Panel B, state index characteristics in Panel C and finally, the combined characteristics in Panel D. The construction of the each index is described in detail in the text, but in short each index is the average of the percentile ranks of the applicable governance features, where a larger score is associated with stronger monitoring and/or a more shareholder-friendly orientation. Appendices A and B provide detailed definitions of each provision and included state laws.

<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>25<sup>th</sup> Percentile</b>	<b>75<sup>th</sup> Percentile</b>	<b>Standard Deviation</b>	<b>Number Of firms</b>
<b>Panel A: Board of Directors</b>						
<i>Board size</i>	9.44	9.00	7.00	11.00	3.08	2,327
<i>Separate chair dummy</i>	0.27	0.00	0.00	0.50	0.39	2,327
<i>Lead director dummy</i>	0.01	0.00	0.00	0.00	0.10	2,327
% Independence of:						
<i>Board</i>	59.03	61.15	45.20	74.10	18.85	2,327
Existence of:						
<i>Audit committee</i>	1.00	1.00	1.00	1.00	0.04	2,327
<i>Compensation committee</i>	0.99	1.00	1.00	1.00	0.11	2,327
<i>Corp. Gov. Committee</i>	0.23	0.00	0.00	0.50	0.37	2,327
<i>Nominating committee</i>	0.57	1.00	0.00	1.00	0.48	2,327
% Independence of:						
<i>Audit committee</i>	82.47	90.00	70.03	100.00	21.50	2,325
<i>Compensation committee</i>	84.66	100.00	75.00	100.00	22.75	2,303
<i>Nominating committee</i>	71.10	75.00	70.85	100.00	26.93	1,413
<i>Board Index</i>	49.09	49.72	41.38	57.28	10.69	2,327
<b>Panel B: Corporate By-law and Charter Provisions</b>						
Existence of:						
<i>Unequal voting rights</i>	0.13	0.00	0.00	0.00	0.33	2,341
<i>Cumulative voting</i>	0.10	0.00	0.00	0.00	0.29	2,327
<i>Classified board</i>	0.59	1.00	0.00	1.00	0.49	2,327
<i>Poison pill</i>	0.53	0.75	0.00	1.00	0.48	2,341
<i>Blank-check preferred</i>	0.89	1.00	1.00	1.00	0.31	2,341
<i>Written consent</i>	0.36	0.00	0.00	1.00	0.47	2,341
<i>Special meeting</i>	0.37	0.00	0.00	1.00	0.47	2,341
<i>Supermajority</i>	0.26	0.00	0.00	0.67	0.43	2,341
<i>Fair-price</i>	0.23	0.00	0.00	0.00	0.42	2,341
<i>Provision Index</i>	49.77	49.89	42.48	56.83	10.24	2,300
<b>Panel C: State Index</b>	49.78	55.14	40.86	55.14	9.68	2,330
<b>Panel C: Total Governance Index</b>	49.54	49.55	45.94	53.11	5.37	2,288

**Table 3**  
**Tests of Governance Indices**  
**for Industry Factor Significance**

This table provides the results of a series of regressions of the governance indices against a series of industry dummies. Industry is defined using Fama and French (1997) classifications.

**Dependent variable: *Total Governance Index***

<b>Year</b>	<b>F-statistic</b>	<b>P-value</b>	<b>R-squared</b>	<b>N</b>
1997	2.91	0.000	0.088	1,448
1998	2.46	0.000	0.065	1,682
1999	2.29	0.008	0.058	1,757
2000	2.91	0.000	0.074	1,716

**Dependent variable: *Board Index***

<b>Year</b>	<b>F-statistic</b>	<b>P-value</b>	<b>R-squared</b>	<b>N</b>
1997	3.26	0.000	0.096	1,456
1998	3.33	0.000	0.083	1,749
1999	3.75	0.000	0.091	1,774
2000	4.81	0.000	0.116	1,734

**Dependent variable: *Provision Index***

<b>Year</b>	<b>F-statistic</b>	<b>P-value</b>	<b>R-squared</b>	<b>N</b>
1997	1.94	0.000	0.060	1,456
1998	2.03	0.000	0.054	1,892
1999	1.75	0.000	0.045	1,772
2000	1.31	0.084	0.035	1,729

**Table 4**  
**Tests of Characteristics**  
**for Industry Factor Significance**

This table provides the results of regressions of the characteristics against a series of industry dummies. Industry is defined using Fama and French (1997) classifications.

**Dependent variable: *Tobin's Q***

<b>Year</b>	<b>F-statistic</b>	<b>P-value</b>	<b>R-squared</b>	<b>N</b>
1997	9.86	0.000	0.242	1,471
1998	8.10	0.000	0.185	1,690
1999	7.14	0.000	0.163	1,734
2000	7.69	0.000	0.182	1,639

**Dependent variable: *Selling Expenses/Sales***

<b>Year</b>	<b>F-statistic</b>	<b>P-value</b>	<b>R-squared</b>	<b>N</b>
1997	9.57	0.000	0.283	1,161
1998	9.54	0.000	0.253	1,343
1999	11.65	0.000	0.287	1,382
2000	1.00	0.474	0.035	1,312

**Dependent variable: *Return Volatility***

<b>Year</b>	<b>F-statistic</b>	<b>P-value</b>	<b>R-squared</b>	<b>N</b>
1997	10.70	0.000	0.260	1,446
1998	4.99	0.000	0.121	1,711
1999	10.22	0.000	0.210	1,820
2000	11.44	0.000	0.241	1,702

**Table 5****Average Industry Governance Structures as a Function of Industry Characteristics**

This table shows the coefficients from a regression of the average governance indices for an industry against characteristics of the industry: investment opportunities (using *Tobin's Q Ratio* as a proxy), industry product uniqueness (using a proxy, *Selling Expenses/Sales*), industry average leverage based on book values (defined as long-term debt divided by total assets), a dummy for whether the industry is regulated or not, the industry Herfindahl concentration index (based on the market share of sales), and the average monthly return volatility for firms in the industry. *Incentive Pay / Total Pay* is defined in Table 1. The dependent variable is the total governance index in model (1), the board index in model (2), and the charter provision index in model (3). One, two, and three asterisks denote significance at the 0.10, 0.05, and 0.01 levels, respectively. Standard errors are robust to the presence of heteroscedasticity and control for clustering of observations within each industry over time. Industry is defined using Fama and French (1997) classifications, and industries with fewer than ten firms are excluded, as is the industry defined as "other."

	Dependent variable		
	<i>Total Governance Index</i>	<i>Board Index</i>	<i>Charter Provision Index</i>
	(1)	(2)	(3)
<i>Tobin's Q Ratio</i>	0.666* (1.77)	1.612* (1.80)	0.316 (0.94)
<i>Selling Exp/Sales</i>	-6.873*** (-3.58)	-11.809** (-2.13)	-2.050 (-0.61)
<i>Herfindahl Index</i>	-3.915*** (-3.56)	-4.629 (-1.24)	-4.394 (-1.62)
<i>Industry Volatility</i>	5.425 (0.73)	-43.901* (-1.96)	26.910*** (2.87)
<i>Leverage</i>	-7.722** (-2.54)	-17.373* (-1.85)	-5.683 (-1.49)
<i>Regulated Industry</i>	-0.330 (-0.36)	-2.477 (-1.03)	1.127 (1.22)
<i>Incentive/Total Pay</i>	2.007 (1.01)	0.207 (0.02)	-2.330 (-0.73)
<i>1998 Dummy</i>	0.034 (0.11)	2.255*** (2.76)	-1.015*** (-3.11)
<i>1999 Dummy</i>	0.263 (0.69)	3.433*** (3.65)	-1.217*** (-2.75)
<i>2000 Dummy</i>	0.451 (0.79)	5.918*** (4.25)	-2.043*** (-3.16)
Intercept	49.868*** (56.06)	56.052*** (16.20)	49.248*** (23.92)
R-Squared	0.470	0.288	0.273
Groups	136	136	136

**Table 6****Firm Governance Structures as a Function of Firm Characteristics**

This table shows the coefficients from a regression of the governance indices for firms against firm characteristics, controlling for the industry: investment opportunities (using *Tobin's Q Ratio* and *Cap Ex / Sales* as proxies), firm size as measured by the natural logarithm of total assets, leverage based on book values (the ratio of long-term debt to assets), two measures of managerial incentives – the percentage of shares held by directors and officers (*D&O Ownership*) and *Incentive Pay / Total Pay*, the natural logarithm of firm age (in years), two measures of institutional ownership (*Inst'l Ownership* and the rank of the *Inst'l Ownership Herfindahl* index), and the volatility of monthly stock returns for the year. Dummy variables for each year and each industry are included but not reported. The dependent variable is the total governance index in models (1) and (2), the board index in models (3) and (4), and the charter provision index in models (5) and (6). Variables are as defined in Table 1. One, two, and three asterisks denote significance at the 0.10, 0.05, and 0.01 levels, respectively. Standard errors are robust to the presence of heteroscedasticity and control for clustering of observations within each firm over time. Industry is defined using Fama and French (1997) classifications.

	Dependent variable					
	Total Governance Index		Board Index		Charter Provision Index	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Tobin's Q Ratio</i>	-0.019 (-0.38)		-0.228*** (-2.78)		0.124 (1.53)	
<i>Cap Ex / Sales</i>		-1.418 (-0.99)		-8.850*** (-3.41)		-0.281 (-0.11)
<i>Ln(Total Assets)</i>	-0.244** (-2.30)	-0.222** (-2.05)	0.038 (0.21)	0.043 (0.22)	-0.437** (-2.06)	-0.524** (-2.44)
<i>Book Leverage</i>	-0.920 (-1.09)	-0.893 (-1.05)	-1.058 (-0.68)	-0.091 (-0.06)	-2.498* (-1.64)	-2.506 (-1.64)
<i>D&amp;O Ownership</i>	-0.025*** (-3.14)	-0.029*** (-3.55)	-0.212*** (-12.57)	-0.210*** (-12.31)	0.110*** (7.62)	0.102*** (7.04)
<i>Incentive/Total Pay</i>	0.666 (1.48)	0.855* (1.88)	3.367*** (3.77)	3.536*** (3.83)	-2.119** (-2.52)	-1.590* (-1.87)
<i>Inst'l Ownership</i>	0.180 (0.28)	-0.450 (-0.69)	-0.077 (-0.06)	-0.263 (-0.21)	-1.169 (-1.00)	-1.919 (-1.62)
<i>Inst'l Own Herf</i>	0.0002*** (2.59)	0.0002*** (2.95)	0.00041*** (2.93)	0.00048*** (3.37)	0.0002 (1.63)	0.0002 (1.61)
<i>Ln(Firm Age)</i>	-0.215 (-1.54)	-0.320** (-2.22)	0.918*** (3.49)	0.889*** (3.22)	-0.127 (-0.44)	-0.218 (-0.72)
<i>Firm Volatility</i>	3.267** (2.41)	2.531** (2.07)	-0.985 (-0.45)	-0.928 (-0.42)	5.243** (2.00)	4.637* (1.81)
R-Squared	0.105	0.100	0.203	0.206	0.109	0.116
Groups	5,109	4,671	5,183	4,740	5,139	4,698
Industry and Year Dummies Only:						
R-Squared	0.088	0.079	0.104	0.101	0.061	0.066



**Table 7**  
**Changes in Firm Governance Indices**

This table shows the summary statistics for the changes in the individual firm governance indices across the sample period. The changes are provided for the total governance index, the board index and the provision index. The changes are averaged across firms within a year and then across years.

<b>Index</b>	<b>Mean</b>	<b>Median</b>	<b>25th Percentile</b>	<b>75th Percentile</b>	<b>Standard Deviation</b>	<b>Number Of firms</b>	<b>Number of</b>	
							<b>Increases</b>	<b>Decreases</b>
<i>ΔTotal Governance Index</i>	0.252	0.000	-0.833	1.500	2.451	4,455	2,022	1,629
<i>ΔBoard Index</i>	1.263	0.000	-1.500	4.500	6.628	4,573	2,129	1,529
<i>ΔProvision Index</i>	-0.433	0.000	0.000	0.000	2.554	4,490	118	336

**Table 8**  
**Determinants of Changes in Firm Governance Structures**

This table shows the coefficients from a regression of changes in firms' governance indexes against their current year's return, the previous year's return, an abnormal index in the previous period that captures how far they are from the average index, the percentage of shares held by all institutional investors, and the concentration of institutional ownership. Further control variables are dummies for each industry and for 1999 and 2000. The dependent variable is the change in the total governance index in model (1), the change in the board index in model (2), and the change in the provision index in model (3). One, two, and three asterisks denote significance at the 0.10, 0.05, and 0.01 levels, respectively. Standard errors are robust to the presence of heteroscedasticity and control for clustering of observations within each firm over time. All regressions include dummy variables for each industry (coefficients not reported).

	Dependent variable		
	$\Delta(\text{Total Governance Index}_t)$ (1)	$\Delta(\text{Board Index}_t)$ (2)	$\Delta(\text{Provision Index}_t)$ (3)
<i>Return<sub>t</sub></i>	-0.083 (-1.06)	-0.365** (-1.97)	0.036 (0.46)
<i>Return<sub>t-1</sub></i>	-0.038 (-0.75)	-0.126 (-0.95)	-0.060 (-1.24)
<i>Abnormal Gov Ind<sub>t-1</sub></i>	-0.103*** (-14.79)		
<i>Abnormal Board Ind<sub>t-1</sub></i>		-0.185*** (-18.86)	
<i>Abnormal Prov Ind<sub>t-1</sub></i>			-0.034*** (-9.18)
<i>Total Inst'l Own<sub>t-1</sub></i>	0.742*** (2.74)	3.413*** (4.63)	0.224 (0.79)
<i>Inst'l Own Herf Rnk<sub>t-1</sub></i>	0.00000 (-0.16)	-0.0001 (-1.23)	0.00000 (-0.07)
<i>1999 Dummy</i>	0.1770* (1.87)	0.4478* (1.82)	0.0390 (0.40)
<i>2000 Dummy</i>	0.325*** (3.63)	0.761*** (3.24)	0.185** (1.99)
R-Squared	0.069	0.105	0.034
Number of firm-years	4,222	4,324	4,250

## **Appendix A**

### **Governance Provision Definitions**

These are often presented from the perspective of how they entrench management. The typical management rationale for adopting such devices is that they force bidders to negotiate the terms of the deal with the board, which is in shareholders' interests]

**Blank Check Preferred.** Allows the issuance of new classes of preferred stock with dividend, voting, and other rights determined by the board. Could be used in connection with a poison pill, or the issuance of convertible preferred to a favorably disposed external party.

**Classified Board,** Also known as a staggered board. The board is split into roughly equal classes, say three, with only one class of directors up for election in a given year. As such, a dissident waging a proxy fight requires at least two years to acquire a majority of board seats.

**Cumulative Voting.** Each shareholder has votes equal to the votes per share multiplied by the number of directors up for election. Shareholders may cast all of their votes for a single director, or split their votes among all nominees. In a dissident proxy contest, cumulative voting may enable minority shareholders to obtain partial board representation.

**Fair Price Provision.** Requires that a minimum price be paid to remaining shareholders when a blockholder attempts to acquire the company.

**Limitations Shareholders' Ability to Call a Special Meeting.** Limiting shareholders right to call a special meeting precludes shareholders from circumventing management and forcing a vote in a proxy fight or takeover battle. Allows shareholders to act only at the annual meeting.

**Limit Shareholders' Action by Written Consent.** Written consent allows issues to be ratified by shareholders without holding a formal shareholder meeting. Limiting written consent precludes shareholders from circumventing management and forcing a vote in a proxy fight or takeover battle. Allows shareholders to act only at the annual meeting.

**Poison Pill.** Also known as a shareholder rights plan. Pills allow existing shareholders, but not the acquirer, to purchase shares of either the target or the acquirer at a steep discount. This dilutes the value of the acquirer's stake, and economically poisons them in the event they choose to pursue the transaction.

**Supermajority Vote Requirement.** In order to approve a merger the proportion of votes in favor is set at a very high level, for example, 75-80% votes eligible to be cast at the meeting.

**Unequal voting rights.** The existence of multiple classes of shares in the governance structure, including preferred and dual class stock, under which there is a separation of cash flow rights and voting rights.

## **Appendix B State Law Descriptions**

**Control share acquisition statute.** Requires hostile bidders to put an acquisition to a vote of the shareholders before proceeding. Exists in 27 states.

**Fair-price statute.** which requires a bidder to pay holdout shareholders in a freezeout the same price as in the original transaction in which a block was acquired. Exists in 27 states.

**Freeze-out restrictions.** which gives a bidder a minimum amount of time that must elapse between gaining control and engaging in a freezeout. Exists in 33 states.

**Poison pill endorsement.** which allows the use of poison pill. Exists in 25 states.

**Director duty provision.** which allows managers to take into consideration the interests of non-shareholders when voting on a merger. Exists in 31 states.

**Short-term profit provision.** which requires the recapture or disgorgement of short-term profits made by a hostile acquirer. Exists in 2 states.

**Incorporation in Delaware.**

## Appendix C Board Variables by Industry

Board variables are averaged across firms within each industry.

	% Independence of				Indicator for Separate			Board Size	Board Index	Number of complete firm-years
	Board	Audit Committee	Compensation Committee	Nominating Committee	Corp Gov Committee	Lead Dir	Chair			
Agriculture	60.99	91.25	85.42	26.30	0.00	0.00	0.30	9.30	49.39	20
Food Products	57.57	82.87	86.49	48.52	0.28	0.00	0.30	10.54	48.97	141
Candy & Soda	60.63	77.71	83.06	42.18	0.19	0.00	0.13	10.56	44.60	16
Beer & Liquor	44.33	66.51	93.33	32.89	0.20	0.00	0.13	11.33	39.70	15
Tobacco Products	71.22	94.09	91.52	85.60	0.55	0.00	0.09	11.00	56.44	11
Recreation	62.91	87.50	89.41	44.65	0.36	0.00	0.29	10.39	50.26	28
Entertainment	43.05	67.50	65.51	21.95	0.13	0.00	0.30	8.78	41.95	64
Printing and Publishing	60.27	85.91	83.80	56.52	0.33	0.00	0.22	11.13	48.74	105
Consumer Goods	58.82	82.40	80.48	49.77	0.40	0.00	0.32	9.88	49.92	145
Apparel	52.62	72.21	86.41	33.10	0.24	0.04	0.17	8.54	46.50	101
Healthcare	52.72	75.69	70.58	28.43	0.07	0.01	0.19	8.13	45.19	83
Medical Equipment	60.30	82.14	82.67	37.91	0.23	0.00	0.31	8.38	50.26	132
Pharmaceutical Products	58.86	79.44	84.92	41.73	0.26	0.01	0.28	9.00	49.42	230
Chemicals	66.44	88.18	91.53	68.91	0.46	0.04	0.27	10.04	54.94	194
Rubber and Plastic Products	67.80	83.24	91.34	50.49	0.33	0.06	0.16	9.29	52.37	51
Textiles	44.19	62.85	67.56	24.07	0.10	0.00	0.22	8.96	40.89	67
Construction Materials	64.01	85.39	91.30	46.56	0.28	0.00	0.27	9.34	51.26	169
Construction	54.71	82.38	83.68	39.99	0.18	0.00	0.25	9.32	48.52	72
Steel Works Etc	63.63	83.31	83.01	51.45	0.34	0.02	0.26	9.25	51.68	148
Fabricated Products	66.98	93.40	89.66	64.94	0.28	0.00	0.34	7.66	57.58	29
Machinery	67.07	85.86	89.58	46.03	0.25	0.00	0.25	8.89	52.48	228
Electrical Equipment	59.78	77.14	79.92	44.76	0.27	0.00	0.25	9.27	48.35	81
Automobiles and Trucks	61.41	81.21	86.25	51.76	0.24	0.02	0.18	8.94	50.36	143
Aircraft	70.17	87.96	93.59	81.66	0.67	0.00	0.19	12.67	54.67	36

Shipbuilding, Railroad Equipment	56.70	83.41	81.82	41.44	0.32	0.00	0.18	8.05	50.51	22
Defense	61.77	80.31	76.76	52.09	0.42	0.00	0.21	11.21	47.07	19
Precious Metals	71.21	73.92	93.63	56.77	0.29	0.00	0.35	10.29	52.79	17
Non-Metallic and Industrial Metal Mining	76.34	91.48	96.31	70.20	0.31	0.00	0.19	10.81	55.68	32
Petroleum and Natural Gas	61.04	84.55	83.85	47.23	0.25	0.03	0.22	9.26	50.18	257
Utilities	73.49	90.40	92.58	74.14	0.31	0.03	0.20	10.94	54.67	463
Communication	45.45	68.57	72.21	27.45	0.18	0.01	0.33	10.38	42.04	200
Personal Services	56.67	82.51	87.29	34.32	0.09	0.02	0.37	8.85	48.21	46
Business Services	56.80	82.21	85.37	29.87	0.17	0.02	0.27	7.83	49.51	573
Computers	63.56	88.27	86.99	39.96	0.20	0.03	0.40	7.84	53.83	215
Electronic Equipment Measuring and Control Equipment	58.84	83.24	85.70	28.87	0.17	0.03	0.33	7.55	51.02	346
Business Supplies	66.08	85.21	86.10	38.40	0.32	0.03	0.32	8.47	52.61	73
Shipping Containers	64.71	86.20	85.44	56.01	0.29	0.03	0.27	10.21	51.30	156
Transportation	41.85	70.65	66.45	33.63	0.14	0.00	0.18	10.57	40.04	28
Wholesale	58.04	76.33	79.16	30.84	0.18	0.00	0.19	9.31	45.68	192
Retail	59.73	85.50	86.09	47.81	0.28	0.01	0.32	9.62	50.49	253
Restaurants, Hotels, Motels	53.58	80.20	81.50	39.41	0.23	0.02	0.30	9.07	48.09	441
Banking	54.11	82.49	80.98	34.82	0.18	0.00	0.27	8.91	47.04	129
Insurance	65.63	84.98	86.92	49.43	0.27	0.01	0.17	14.34	46.75	423
Real Estate	57.72	81.74	80.33	42.79	0.19	0.01	0.26	10.36	46.93	355
Trading	49.89	64.74	65.77	51.51	0.46	0.00	0.46	9.31	46.97	13
Miscellaneous	48.93	82.94	82.75	31.82	0.15	0.00	0.32	10.76	44.26	123
	54.28	76.16	78.24	31.25	0.19	0.00	0.42	9.81	45.19	36

## Appendix D Governance Provisions by Industry

Indicators for the existence of each governance provision are averaged across firms within each industry.

	<i>Unequal voting rights</i>	<i>Poison pill</i>	<i>Blank-check preferred</i>	<i>Written consent</i>	<i>Special meeting</i>	<i>Supermajority</i>	<i>Fair-price</i>	<i>Classified board</i>	<i>Cumulative voting</i>	<i>Provision index</i>	<i>Number of complete firm-years</i>
Agriculture	0.250	0.375	0.833	0.042	0.125	0.042	0.000	0.550	0.250	57.889	20
Food Products	0.225	0.472	0.852	0.373	0.310	0.387	0.296	0.525	0.043	48.824	139
Candy & Soda	0.529	0.235	1.000	0.059	0.000	0.471	0.000	0.500	0.000	52.264	16
Beer & Liquor	0.467	0.267	0.733	0.000	0.000	0.000	0.267	0.533	0.000	55.296	15
Tobacco Products	0.182	0.091	1.000	0.455	0.091	0.091	0.364	0.455	0.000	52.737	11
Recreation	0.000	0.741	0.741	0.444	0.296	0.444	0.296	0.571	0.286	49.988	27
Entertainment	0.235	0.324	0.838	0.353	0.441	0.324	0.221	0.469	0.000	49.486	64
Printing and Publishing	0.636	0.346	0.879	0.393	0.262	0.336	0.355	0.600	0.076	46.937	105
Consumer Goods	0.110	0.593	0.828	0.345	0.331	0.352	0.345	0.655	0.055	48.171	142
Apparel	0.175	0.447	0.883	0.155	0.291	0.107	0.223	0.624	0.030	51.772	101
Healthcare	0.106	0.518	0.941	0.306	0.459	0.247	0.259	0.554	0.072	49.616	83
Medical Equipment Pharmaceutical Products	0.029	0.676	0.875	0.243	0.272	0.176	0.191	0.576	0.144	51.830	128
Chemicals	0.081	0.609	0.898	0.362	0.302	0.213	0.226	0.552	0.083	50.272	228
Rubber and Plastic Products	0.075	0.705	0.815	0.420	0.440	0.380	0.295	0.680	0.077	47.135	193
Textiles	0.078	0.725	0.961	0.412	0.431	0.412	0.314	0.667	0.118	46.347	49
Construction Materials	0.403	0.478	0.955	0.149	0.224	0.299	0.299	0.478	0.060	49.960	66
Construction	0.069	0.682	0.936	0.387	0.503	0.364	0.312	0.751	0.172	46.328	168
Steel Works Etc	0.056	0.444	0.833	0.417	0.528	0.333	0.111	0.778	0.056	48.753	72
Fabricated Products	0.020	0.662	0.947	0.291	0.371	0.245	0.199	0.723	0.095	49.345	145
Machinery	0.100	0.700	0.933	0.233	0.133	0.233	0.367	0.552	0.379	51.989	29
Electrical Equipment	0.087	0.680	0.887	0.338	0.429	0.281	0.212	0.645	0.145	49.133	226
Automobiles and Trucks	0.123	0.815	0.840	0.222	0.432	0.309	0.383	0.481	0.025	47.706	79
Aircraft	0.219	0.685	0.884	0.322	0.301	0.336	0.308	0.692	0.084	47.466	142
Shipbuilding, Railroad	0.114	0.486	0.914	0.629	0.686	0.200	0.714	0.667	0.083	44.359	34
	0.000	0.708	1.000	0.167	0.500	0.250	0.125	0.500	0.000	50.970	22

Equipment											
Defense	0.316	0.421	0.789	0.316	0.211	0.053	0.421	0.211	0.000	52.684	19
Precious Metals	0.000	1.000	1.000	0.389	0.778	0.556	0.444	0.529	0.176	42.725	17
Non-Metallic and Industrial Metal Mining	0.121	0.758	0.879	0.333	0.333	0.303	0.455	0.688	0.250	47.750	32
Petroleum and Natural Gas	0.091	0.694	0.947	0.502	0.479	0.294	0.340	0.553	0.051	46.669	255
Utilities	0.030	0.577	0.817	0.287	0.316	0.253	0.522	0.713	0.313	50.198	461
Communication	0.490	0.361	0.990	0.380	0.433	0.202	0.231	0.535	0.030	47.979	197
Personal Services	0.178	0.644	0.733	0.289	0.333	0.333	0.267	0.674	0.000	48.753	45
Business Services	0.098	0.517	0.929	0.395	0.348	0.222	0.098	0.550	0.028	50.402	562
Computers	0.077	0.622	0.905	0.468	0.423	0.158	0.167	0.442	0.205	50.935	213
Electronic Equipment	0.086	0.574	0.900	0.334	0.323	0.146	0.166	0.376	0.173	52.730	339
Measuring and Control Equipment	0.081	0.730	0.730	0.405	0.527	0.176	0.216	0.685	0.123	48.985	72
Business Supplies	0.152	0.620	0.873	0.272	0.285	0.373	0.354	0.724	0.167	48.354	153
Shipping Containers	0.000	0.607	0.857	0.321	0.179	0.036	0.143	0.857	0.000	51.222	28
Transportation	0.068	0.356	0.754	0.246	0.267	0.209	0.152	0.417	0.104	54.673	190
Wholesale	0.098	0.596	0.886	0.416	0.424	0.369	0.255	0.621	0.099	48.104	253
Retail	0.126	0.447	0.870	0.269	0.291	0.220	0.189	0.603	0.077	51.487	441
Restaurants, Hotels, Motels	0.062	0.620	0.860	0.357	0.333	0.279	0.333	0.636	0.093	49.052	128
Banking	0.096	0.560	0.927	0.335	0.474	0.330	0.303	0.712	0.113	47.841	419
Insurance	0.132	0.420	0.868	0.318	0.321	0.256	0.283	0.513	0.087	51.254	354
Real Estate	0.077	0.077	0.923	0.000	0.154	0.000	0.000	0.154	0.077	60.624	13
Trading	0.144	0.344	0.920	0.472	0.368	0.216	0.224	0.585	0.049	49.912	123
Miscellaneous	0.000	0.459	0.892	0.297	0.459	0.108	0.162	0.528	0.000	51.840	36