How Important is Corporate Governance?

David F. Larcker

Scott A. Richardson

İrem Tuna

The Wharton School
University of Pennsylvania
Philadelphia, PA 19104-6365

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Abstract

We examine the relation between a broad set of corporate governance indicators and various measures of managerial decision making and organizational performance. Using a sample of 2,106 firms, we distill 39 structural measures of corporate governance (e.g., board characteristics, stock ownership, institutional ownership, activist stock ownership, existence of debt-holders, mix of executive compensation, and anti-takeover variables) into 14 governance constructs using principal components analysis. We find that these 14 constructs are related to future operating performance, have a somewhat mixed association with abnormal accruals, Tobin's Q, and future excess stock returns, and little relation to class action lawsuit and accounting restatements.

How Important is Corporate Governance?

1. Introduction

Corporate governance generally refers to the set of mechanisms that influence the decisions made by managers when there is a separation of ownership and control. Some of these monitoring mechanisms are the board of directors, institutional shareholders, and operation of the market for corporate control. The importance of this topic is obvious from an examination of the considerable growth in the empirical literature on corporate governance across accounting, economics, finance, management, and corporate strategy literatures.[1] Typical research studies examine whether different corporate governance structures impact or constrain executive behavior and/or have an impact on organizational performance. Examples of these types of studies are Morck, Shleifer, and Vishny (1988), Byrd and Hickman (1992), Brickley, Coles and Terry (1994), Yermack (1996), Core, Holthausen, and Larcker (1999), Klein (2002), Gompers, Ishii, and Metrick (2003), and Core, Guay, and Rusticus (forthcoming).[2]

Although prior work has provided some insight into the role of corporate governance, the results of similar studies are frequently contradictory and a consistent set of results is yet to emerge regarding the importance of corporate governance for

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[1] There are also many organizations that sell governance ratings (e.g., GovernanceMetrics International, Institutional Shareholder Services, Investor Responsibility Research Center, *Standard & Poors*, and The Corporate Library). The growth in this type of service offerings attests to the perceived importance of corporate governance issues. Although the precise computation of these ratings is proprietary, the scores seem to be based on board independence, distribution of ownership, and other structural characteristics. Despite considerable claims by these organizations, we are not aware of rigorous evidence regarding the ability of these ratings to predict managerial behavior or organizational performance (with the possible exception of Gompers, Ishii, and Metrick, 2003; but note the discussion in Cremers and Nair, 2003, and Core, Guay, and Rusticus, forthcoming, regarding the fragile nature of the Gompers, Ishii and Metrick results).

[2] Reviews of the extensive corporate governance literature have been provided by Shleifer and Vishny (1997), Bhagat and Black (2002) and Bushman and Smith (2001).

understanding managerial behavior and organizational performance. There are at least

seven features of prior research that make it difficult to draw substantive conclusions.

First, most studies use a small set of convenient (easy to collect) indicators for corporate

governance, rather than developing a more comprehensive set of governance variables.

Second, each study tends to use a different set of governance variables which makes

integration across studies extremely difficult. Third, there is very little analysis regarding

the measurement properties for the selected indicators of corporate governance (e.g.,

assessments of reliability and construct validity are not commonly reported). Moreover,

we do not have detailed insight into the number of dimensions (or constructs) that are

necessary to provide a comprehensive assessment of corporate governance. Fourth,

single indicators are used as measures for ill-defined and complex corporate governance

constructs (e.g., percentage of external board members). Such single indicators are likely

to have substantial measurement error for the construct of interest (e.g., board

independence) which will bias the estimated coefficients in typical methodological

approaches.[3] Fifth, the sample size and specific firms included in the sample vary

considerably across studies depending on the dependent variable examined and the

source of the governance variables. These differences make it problematic to compare

results across studies. Sixth, most studies focus on the statistical significance, as opposed

to the incremental explanatory power, of the governance indicators. While statistical

significance is necessary, it is also crucial to demonstrate explanatory power in order to

draw substantive conclusions about corporate governance. Finally, the methodological

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[3] It is important to note that in a multiple regression analysis the inconsistent parameter estimates caused by measurement error in the governance variables does not necessarily attenuate the estimates or result in conservative assessments of statistical significance.

approach used is typically restricted to some type of linear model where complex

interactions among governance structures are not considered. Since empirical

governance research is at an early stage in its evolution, it would be desirable to use more

exploratory methods as a complement to traditional linear model approaches.

The purpose of this paper is to develop new measures for corporate governance

from a comprehensive set of indicators and then apply these new measures to a large

sample of firms and across a wide range of dependent variables. We pay particular

attention to developing governance indices that mitigate measurement error and provide a

parsimonious structure for our tests. The results of our principal component analysis

indicate that 14 factors characterize the dimensionality of our 39 individual governance

indicators (e.g., board size, directors that are members of other boards or busy, multiple

dimensions of anti-takeover devices, etc.).   Although 14 factors is a complex outcome,

this might be expected, because corporate governance is likely to be a complicated,

multidimensional construct.[4]

The 14 constructs derived from the principal component analysis are then used to

determine the importance of corporate governance for accrual choices, class action

lawsuits, accounting restatements, Tobin's Q, future operating performance, and future

excess stock returns.   These measures of managerial decision making, firm performance

and valuation provide a much more comprehensive assessment for the substantive

importance of corporate governance than prior research. Moreover, since we examine

multiple dependent variables using the same set of governance constructs and the same

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[4] For example, it is interesting to note that governance practices that relate to anti-takeover provisions do not load on the same factor. From a measurement perspective, this raises serious questions about the use of a simple aggregation of anti-takeover provisions into a single metric (e.g. the "G Score" proposed by Gompers, Ishii, and Metrick, 2003).

set of firms, we are able to determine whether similar governance constructs are important across different settings.

Using both traditional multiple regression and exploratory recursive partitioning, we find that our corporate governance constructs have some association with measures of managerial decision making and firm performance and valuation. Based on the signs of the estimated coefficients and the total and incremental explanatory power for the governance constructs, we find that these 14 constructs are related to future operating performance, have a somewhat mixed association with abnormal accruals, Tobin's Q, and future excess stock returns, and little relation to class action lawsuit and accounting restatements. Thus, the typical *structural* indicators of corporate governance used in academic research and institutional rating services have some ability to explain managerial decisions and firm performance and valuation. The overall interpretation of our results is contingent on the researcher's view concerning the (i) appropriate structural model for estimation, (ii) necessary level of explanatory power to conclude that the results have a substantive, as opposed to a strictly statistical, interpretation, and (iii) the relative frequency of statistically significant coefficients with the correct sign versus an incorrect sign. The remainder of the paper is divided into six sections. Section 2 describes the sample selection and the governance indicators used in the study. Section 3 presents the principal component analysis of the governance indicators and develops our 14 construct measures for corporate governance. Section 4 describes the methodological approach used to assess the importance of corporate governance for explaining measures of managerial decision making and firm valuation. The results for each dependent variable are presented in Section 5. Section 6 provides a discussion of how our results

might be affected by using a cross-section of data that coincides with Sarbanes Oxley Act

of 2002 and an attempt to control for some of the potential econometric problems that are

induced by the endogeneity of our governance constructs. A summary of the results and

the conclusions from the research are presented in Section 7.

2. Sample Selection and Corporate Governance Indicators

2.1 Sample

Our sample was generated from the overlap between two comprehensive data sets.

The first data set consists of the companies covered during 2002 and 2003 by

www.SharkRepellent.net which is a product offering by TrueCourse, Inc. that provides

data on anti-takeover provisions (n = 3,651). The anti-takeover data covers only U.S.

incorporated companies that are included in the major indices (e.g., *Fortune* 500,

Standard & Poors Super 1500, etc.), amended their poison pill since 2001, and/or

completed a firmly underwritten IPO since 1999. The second data set consists of

companies covered by Equilar, Inc. whose fiscal year ends between June, 2002 and May,

2003 with complete data on board, board committees (audit and compensation), and

equity ownership by executives and board members (n = 3,000).

After merging the SharkRepellent and Equilar data, we have a final sample of

2,106 individual firms with complete data. Our sample spans many sectors of the

economy and has a distribution of firms that is very consistent with the composition of

the complete Compustat file (see Table 1 panel A). Our sample represents approximately

70 percent of the market capitalization of the Russell 3000 as of the end of 2003.[5] Panel

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[5] Our sample only covers one year and this limits our ability to generalize the results. However, this single
year of data covers a very recent time period and prior work involving large samples also is restricted to a

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B of Table 1 compares sample firms with all other Compustat firms along selected

dimensions. Our sample consists of larger and more profitable firms with lower Book-to-

Market and more following by analysts.[6]

2.2 Corporate Governance Indicators

We collect indicators of corporate governance in seven general categories:

characteristics of the board of directors, stock ownership by executives and board

members, stock ownership by institutions, stock ownership by activist holders, debt and

preferred stock holdings, compensation mix variables and anti-takeover devices. Our

board of director, compensation mix and executive and board ownership data are

obtained from Equilar, stock ownership by institutions and activists is collected from

Spectrum data files (13F filings), debt and preferred stock data are obtained from

Compustat, and anti-takeover data are collected from SharkRepellent.

Drawing on prior studies (e.g., Klein, 1998, Bhagat and Black, 2002, Core,

Holthausen and Larcker, 1999, Ferris, Jagannathan and Pritchard, 2003, and others), our

board of director variables are the number of meetings for the audit committee,

compensation committee, and the total board (denoted as *# AC Meetings*, *# CC Meetings*,

and *# Board Meetings*, respectively), number of directors serving on the compensation

committee, audit committee, and the total board (denoted as *CC Size*, *AC Size*, and *Board*

Size, respectively), fraction of board comprised of insider (executive) directors (denoted

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single year (e.g., Bhagat, 2004, Brown and Caylor, 2004, and Ashbaugh, Collins, and LaFond, 2004). We provide further analysis and discussion about the impact of this research design choice in Section 6.1.

[6] Since one of our data sources (TrueCourse, Inc.) covers firms that are included in major indices, the observation that our sample consists of large firms is expected. To the extent that larger and more visible firms have better or more appropriate governance structures, this will tend to reduce the power of our empirical tests. The extensions to our study discussed in Section 6.2 provide an explicit attempt to address the role of firm size and visibility on our results.

as *% Board Inside*), fraction of the compensation committee and audit committee that is comprised of affiliated directors (denoted as *% CC Affiliated* and *% AC Affiliated*, respectively)[7], indicator variables equal to one if the chairperson of the compensation committee and audit committee is affiliated and zero otherwise (denoted as *CC Chair Affiliated* and *AC Chair Affiliated*, respectively), the fraction of outside directors and affiliated directors that serve on four or more other boards, and the fraction of inside directors that serve on two or more boards (denoted as *% Busy Outsiders*, *% Busy Affiliated*, and *% Busy Insiders*, respectively), fraction of outside, affiliated, and inside directors that are older than 70 (denoted as *% Old Outsiders*, *% Old Affiliated*, and *% Old Insiders*, respectively), an indicator variable equal to one if there is a lead director (an outside director that can call meetings of all outside directors in executive session) on the board and zero otherwise (denoted as *Lead Director*), an indicator variable equal to one if an internal executive holds the position of chairperson of the board and zero otherwise (denoted as *Insider Chairman*), and the fraction of affiliated and outside directors that were appointed by existing insiders (denoted as *% Affiliated Appointed* and *% Outsiders Appointed*, respectively).[8]

Consistent with prior research (e.g., Ashbaugh, Collins, and LaFond, 2004, Bhagat, 2004, and Klein, 1998)**,** the typical board meets seven times a year, has about nine members with one or two internal executives, the chairman of the board is usually an internal executive, and there is typically no lead director (see Table 2). Most of the

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[7] We use the definition of affiliated (or "grey") directors developed by Equilar (which is a combination of SEC, NYSE, and NASD guidelines). Any outside directors that were mentioned in the "certain transactions" section or a former executive was classified as affiliated.

[8] This variable is measured by comparing the term of an existing board member to the maximum term for the set of insider directors. If there were no affiliated directors, this variable is set equal to zero.

members of the compensation and audit committee are outsiders, but there is some evidence that the chair of these committees is an affiliated director. In contrast to insiders, outside or affiliated directors are generally not classified as busy. Most boards are not composed of old directors, but a high percentage of the affiliated and outside directors were appointed by existing inside directors.

Our board and executive ownership variables are the fraction of outstanding shares held by the average outside director (denoted as *% Outsiders Own*)[9], fraction of outstanding shares held by the top executive (denoted as *% Top Exec Own*), fraction of outstanding shares held by the average executive director after excluding the holdings of the top executive (denoted as *% Executives Own (Excl. Top)*), and fraction of outstanding shares held by the average affiliated director (denoted as *% Affiliated Own*). Similar to prior work, the median board and executive group owns less than one percent of the outstanding equity (e.g., Hall and Liebman, 1998). However, there is considerable skewness with these measures as evidenced by the mean being substantially larger than the median.

Institutional ownership is measured as the fraction of outstanding shares owned by block-holders (denoted as *% Block Own*), number of block-holders (denoted as *# Block*), and shareholding of the largest institutional owner (denoted as *% Largest*).[10] The average company in our sample has two block-holders that own 16 percent of the outstanding shares (with the largest block-holder owning about nine percent of the outstanding shares).

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[9] We exclude stock option holdings in our board and executive ownership computations.

[10] A block-holder is defined as a shareholder who holds more than five percent of outstanding shares.

The activist variables are measured using the number of activist institutions holding shares (denoted as *# Activists*) and the fraction of outstanding shares held by activist institutions (denoted as *% Activists Own*). Activist institutions are identified using the information contained in Cremers and Nair (forthcoming).[11] The average company in our sample has approximately seven activists holding a total of about two percent of the outstanding shares.

The role of debt as a governance mechanism is measured using the ratio of book value of debt (Compustat data item 9 plus data item 34) to the market value of equity (Compustat data item 199 * data item 25) and ratio of book value of preferred equity (Compustat data item 130) to the market value of equity (Compustat data item 199 * data item 25). These two leverage ratios are denoted as *Debt to Market* and *Preferred to Market*, respectively. The median company has a book value of debt that is approximately 25 percent of market capitalization and preferred stock that is approximately zero percent of market capitalization.

Compensation mix is measured by two variables. First, we measure the fraction of total annual CEO compensation that is comprised of expected long-term payments from performance plans, stock options and restricted stock grants (*% Long Term Mix*).[12]

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[11] The following public pension funds are classified as activists (Spectrum manager number): California Public Employees Retirement System (12000), California State Teachers Retirement (12100 and 12120), Colorado Public Employees Retirement Association (18740), Florida State Board of Administration (38330), Illinois State Universities Retirement System (81590), Kentucky Teachers Retirement System (49050), Maryland State Retirement and Pension System (54360), Michigan State Treasury (57500), Montana Board of Investment (58650), Education Retirement Board New Mexico (63600), New York State Common Retirement Fund (63850), New York State Teachers Retirement System (63895), Ohio School Employees Retirement System (66550), Ohio School Employees Retirement System (66610), Ohio State Teachers Retirement System (66635), Texas Teachers Retirement System (82895 and 83360), Virginia Retirement System (90803), State of Wisconsin Investment Board (93405).

[12] Salary and annual bonus are valued based on actual payments, performance plans are valued using the target payout, stock options are valued using the Black-Scholes model, and restricted stock is valued using the stock price at the date of grant.

Second, we measure the fraction of total annual CEO compensation that is earned by exceeding accounting targets in performance plans and annual bonus (*% Accounting Mix*). Data for compensation mix are obtained from Equilar. The average firm pays slightly more than half of total CEO pay in the form of long term incentive payments, and about sixteen percent in the form of accounting based incentive payments.

Our anti-takeover variables are measured using indicator variables regarding whether a firm has a staggered (or classified) board of directors (denoted as *Staggered Board*), requires a supermajority vote for a business combination (denoted as *Supermajority*), is incorporated in a state (PA, OH, MA or WI) with relatively greater protections to incumbent management (denoted as *State Incorporated*), has unequal voting rights across shareholders or dual classes of stock (denoted as *Unequal Voting*), and has a poison pill or where stock purchases can be made at substantial discounts by existing shareholders if a hostile takeover attempt is made on the firm (denoted as *Poison Pill*).[13] Sixty three percent of our sample has a staggered board, 24 percent requires a supermajority vote for takeovers, 8 percent are incorporated in management friendly states, nine percent have dual classes of stock, and 51 percent have a poison pill.

3. Corporate Governance Constructs

3.1 Methodology

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[13] The SharkRepellent data includes 15 individual anti-takeover provisions. Rather than attempting to analyze this extensive set of variables, we restrict our attention to a smaller subset of key anti-takeover variables (similar to Gompers, Ishii and Metrick, 2004 who focus on dual class companies and Bebchuk and Cohen, 2004 who focus on the presence of a staggered board). One provision that is commonly used in prior work is blank check preferred (e.g., Daines and Klausner, 2001). We drop this provision because 92 percent of the SharkRepellent sample has blank check preferred, thus there is little variance in this variable across our sample.

In order to develop our corporate governance constructs, we use exploratory principal component analysis (PCA) to identify the underlying dimensions or structure of corporate governance and determine which indicators are associated with each factor.[14] We retain all factors with an eigenvalue greater than unity.   This results in 14 factors that retain 61.7 percent of the total variance in the original data. This reduced solution is then rotated using an oblique rotation that allows the retained factors to be correlated in order to enhance interpretability of the PCA solution. These 14 factors represent the underlying dimensions of corporate governance (see Table 3).

To interpret the factors, it is necessary to determine which indicators have a statistical and substantive association with each factor. We associate each factor with those variables that have a loading (or the correlation between the factor and an indicator) that exceeds 0.40 in absolute value and are statistically different from zero at conventional levels. Statistical significance is determined using traditional bootstrapping methods (1,000 samples with replacement) for the rotated 14 factor solution. The resulting variables that are associated with each factor are summarized in Table 3.

Each factor (or construct) is assigned a name based on the characteristics of the indicators that are related to the factor. Several of the factors are associated with indicators that one might expect *ex ante* to be highly correlated *(e.g., Meetings* and *Board Size*), and thus it is simple to name these factors. However, the naming of other factors with multiple indicators can be more delicate. For example, the first factor has three relevant indicators that are measures of stock ownership with two of the indicators related

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[14] Our approach contrasts with common practice of arbitrarily selecting a set of single indicators for some assumed governance constructs. We do not use this approach because it does not provide any insight into the underlying structure of corporate governance. Moreover, the use of a single indicator for a complex construct is almost certainly associated with considerable measurement error (i.e., low reliability).

to activist institutions and a third indicator with a negative loading related to ownership by outside directors. Thus, this governance factor is named "Active" and high scores on this factor are associated with activist interest but low outside director interest. The third factor has four indicators that are all related to affiliated directors holding important positions on the audit and compensation committees. Thus, this governance factor is named "Affiliated." We use this general approach to name the other factors described in Table 3.

The PCA results in Table 3 produce a very interpretable solution (e.g., there are no significant cross-loadings or situations where the same indicator is associated with more than one factor). However, since corporate governance is a complex general construct, it should not be surprising to find some unexpected results in the PCA solution. For example, *% Affiliated Own* loads (negatively) on the factor that we name "Anti-Takeover I." The primary indicators of this factor measure the extent of anti-takeover provisions adopted by the firm via poison pills and the presence of a staggered (or classified) board and we use these associations to name this factor. Although somewhat speculative, *% Affiliated Own* may load on this factor because there is not a need in these organizations for affiliated directors to take an equity position to protect against takeover threats.

With the exception of Active, Anti-Takeover I, Compensation Mix and Lead Director, the governance construct scores are computed using the average equal-weighted sum of the *standardized* indicators associated with each factor (Grice and Harris, 1998). The four factors mentioned above (the exceptions) contain either substitute mechanisms or exhibit a combination of positive and negative loadings. To compute factor scores for

these four factors we explicitly incorporate this substitutability across components. For example, the factor Active exhibits a negative association between stockholdings of outside directors and equity ownership by activist funds. We compute the Active factor as the sum of the standardized *#Activists* and *% Activists Own* less standardized *% Outsiders Own*, divided by three. The remaining three factor scores are calculated using the respective standardized components as follows to reflect the substitutability: Anti-Takeover I is the sum of *Staggered Board and Poison Pill* minus *% Affiliated Own*, divided by three. Compensation Mix is *% Accounting Mix* minus *% Long Term Mix*, divided by two. Lead Director is *Lead Director* minus *Insider Chairman*, divided by two. The descriptive statistics for the computed factors scores are presented in Table 4 (Panel A). Since these scores are weighted combinations of standardized variables, the mean governance score is equal to zero.[15] These aggregate scores for the governance constructs should have considerably less measurement error than any individual governance indicator. This reduction in measurement error should substantially improve the econometric properties of our estimates for the association between corporate governance and managerial decision making and organizational performance.

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[15] There is evidence of construct reliability (or the inverse of measurement error) based on the computation of Cronbach coefficient alphas for indicators associated with each governance construct. For the multi-item scores, coefficient alpha ranges from 0.196 to 0.893 (mean = 0.570 and median = 0.530). Although Busy Directors, Anti-Takeover II and Lead Director have relatively low alphas (which is not uncommon for measurement development during the early stages of research), the remaining constructs exceed the minimum reliability levels suggested by Nunnally (1967). Moreover, none of the confidence intervals for correlations among the 14 governance constructs include unity at conventional levels of statistical significance (Table 4, Panel B). These results suggest that our governance constructs are statistically distinct and exhibit construct validity. While many of these correlations between factors are statistically significant at conventional levels, the absolute value for most of these bivariate correlations is small in magnitude. With regard to some of the larger correlations (Spearman denoted as r_s, Pearson as r_p), we observe that companies with activist shareholders tend to be associated with companies with larger boards ($r_s = 0.356$, $r_p = 0.301$) and busy directors ($r_s = 0.372$, $r_p = 0.325$). Firms with insider appointed boards tend to have considerable power concentrated within the firm ($r_s = 0.346$, $r_s = 0.270$). Finally, firms with affiliated directors serving on key board committees tend not to adopt anti-takeover provisions ($r_s = -.317$, $r_p = -0.245$).

3.2 Expected Associations

We classify Board Size, Affiliated, Insider Appointed, Insider Power, Anti-Takeover I, Anti-Takeover II, Old Directors and Busy Directors as increasing in "bad" governance. Prior research provides some evidence that firms with larger boards perform worse than firms with smaller boards (Yermack, 1996). The presence of affiliated directors on the board and various committees is often argued as compromising the independence of the board/committee (Klein, 1998). The presence of a dual CEO-Chairperson (Yermack, 1996) and outsiders and/or affiliates who have been appointed by incumbent management also is assumed to erode the independence of the board. Both anti-takeover factors capture measures that are designed to reduce the power of the market for corporate control in disciplining the firm. Finally, old and busy directors are likely to be less active monitors relative to younger and less busy directors (e.g., Core, Holthausen and Larcker, 1999).

Compensation mix is increasing in remuneration paid on the basis of accounting numbers and decreasing in remuneration paid in stock options and restricted stock. Accounting based compensation plans may create perverse incentives for management to be myopic in their decision making with subsequent adverse consequences for firm value. Conversely, others have argued that the option intensity of executive compensation packages has created perverse incentives for managerial decision making (e.g., Erickson, Hanlon and Maydew, 2004 and Peng and Roell, 2003). Therefore, we classify Compensation Mix as weakly increasing in "bad" governance due to the focus of this measure on maximizing accounting performance as opposed to stock price.

Active, Block, Meetings, Debt, and Lead Director are classified as increasing in "good" governance. The presence of a large, and/or active block-holder is typically argued to be beneficial through the monitoring benefit of a financially sensitive shareholder (Shleifer and Vishny, 1997). The number of meetings held by the board and committees should be evidence of monitoring activity. The presence of debt-holders also offers additional monitoring benefit via external capital providers who have the incentive and ability to monitor firm activity to protect invested principle. The appointment of a non-executive director as a lead director is expected to create additional monitoring benefit on incumbent management.

4. Methodological Approach

4.1 Multiple Regression

The methodological approach used in most prior work examining the impact of corporate governance on various dependent variables utilizes a multiple regression of the following general form:

$$\text{Dependent Variable}_t = \alpha + \Sigma\gamma\text{Controls} + \Sigma\beta\text{Governance Factors}_t + \varepsilon_t$$

One important feature in this structure is that the governance factors are assumed to have no impact on the controls (and thus no *indirect* effects of governance on the dependent variable). As a result, this structure may result in conservative estimates for the impact of governance on the dependent variable. In our subsequent analysis we also estimate a regression which only includes governance factors as independent variables. This structure would be appropriate if governance impacts the control variables and both the governance and control variables impact the dependent variable (i.e., the estimated

regression coefficients for the governance variables will capture the total effect or the sum of the direct effect and the indirect effect through the controls). We provide both sets of regression estimation in our analysis and compute the total R^2 for the governance constructs and separate incremental R^2's for governance and the controls.[16]

4.2 Recursive Partitioning

One problem with the traditional regression approach is that a simple linear structure cannot capture the likely complex nonlinearities and interactions among the independent variables. Moreover, interactions are exceedingly difficult to specify *a priori* and tend to produce high levels of multi-collinearity between the main effects and interaction variables. As an alternative methodological approach, we also analyze our data with exploratory recursive partitioning using the well-known CHAID (or Chi-square Automatic Interaction Detection) algorithm in our analysis (e.g., Kass, 1980, Biggs, de Ville, and Suen, 1991). Recursive partitioning models are constructed by successively splitting the data into increasingly homogeneous subsets. At each step, the independent variables are examined and the one that gives the "best" split is selected. The splitting process is terminated based on selected traditional "stopping rules." Recursive partitioning ultimately produces a tree-like structure that allows nonlinear and interactive

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[16] As with all studies of this type, endogeneity is a potential problem because most (perhaps all) of the governance constructs are choice variables. This econometric problem will produce inconsistent estimates for both the coefficients and standard errors. As discussed in Larcker (2003) and Larcker and Rusticus (2005), it is not clear how to resolve this problem unless exogenous instruments can be identified and n-stage least squares methods are used in the estimation. We acknowledge that our results are limited by the endogeneity of our independent variables. We provide some analysis of the impact of endogeneity on our results in Section 6.2.

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associations between the dependent variable and a set of independent variables.[17]

Although recursive partitioning has an exploratory nature, it is important to use multiple

analysis methodologies for complex research problems in order to insure that the results

produced by multiple regression are not simply due to method variance.

For our continuous (discrete) dependent variables, F (χ^2) tests similar to

traditional analysis of variance are computed to determine the best independent variable

for a split and the number of categories in the split. Continuous independent variables are

initially divided into ten intervals with approximately an equal number of cases in each

interval. Exhaustive search is then used to merge categories that are not statistically

different ($p > 0.05$, two-tail).[18] Once the best independent variable (and associated

categories) is determined, the selection process is repeated in order to find the next best

independent variable. Eventually, the recursive partitioning process stops when there are

no remaining variables that are statistically significant or the sample size at the split being

considered becomes smaller than a predetermined limit.[19] The explanatory power of the

recursive partitioning model with a continuous dependent variable is computed as one

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[17]Another advantage of recursive partitioning is that it is more straightforward to uncover whether governance constructs appear to be complements and substitutes for explaining the dependent variable. Prior research has attempted to look at such complementarities across governance structures in a variety of settings. Examples include Brickley, Coles and Terry (1994), Malette and Fowler (1992), Sundaramurthy, Mahoney and Mahoney (1997) who find board characteristics relate to the adoption of anti-takeover devices, and Conyon and Florou (2004) who find that CEO compensation and stock holding of directors impacts investment decisions made by managers close to retirement age.

[18] Since multiple correlated comparisons are used in the recursive partitioning, Bonferroni adjustments are used to set the overall type I error rates.

[19] Our stopping criteria requires that the node being split (i.e., the parent node) has at least 50 observations and the nodes produced (i.e., the child nodes) have at least 25 observations. We require relatively large samples in each node in order to avoid extreme over-fitting of the data. We also limit our empirical analysis to six levels with the recursive partitioning technique. In order to gauge the impact of these somewhat arbitrary choices on the results, we also developed the recursive partitioning model requiring a parent node to have at least 100 observations and a child node to have at least 50 observations. The results were not substantively affected by this choice.

minus the ratio of the within-node variance about the mean of the node to the total variance of the dependent variable (i.e., one minus the ratio of error variance to total variance). For models with a discrete dependent variable, we report the classification accuracy (or "hit rate") as our measure of explanatory power. Similar to the regression analysis, we estimate and test our model using the same set of data and consequently our measures of explanatory power are likely to be overstated. Thus, the explanatory power that we report from recursive partitioning analysis is likely to be the *maximum* level for the governance variables.

As with our regression analysis, we examine two specifications for each dependent variable: governance constructs alone and the combination of both governance constructs and economic determinants. A key benefit of the recursive partitioning technique is its ability to examine non-linear interactions between the various independent variables. This is especially powerful for analyses of structural measures of governance because it is often argued that the impact of various governance structures is context specific. If this claim is true, and we measure the relevant settings correctly with our dependent variables and include all economic determinants, then the recursive partitioning is flexible enough to examine the context-specific aspects of corporate governance.

5. Results

In this section, we present the results of our empirical analyses examining the relation between the governance factors and six dependent variables grouped into two categories: (i) several measures reflecting the quality of managerial decision making (abnormal accruals, earning restatements, and class action lawsuits) and (ii) firm level

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valuation measures (future operating performance, *inverse* of Tobin's Q, and future excess stock returns). For each dependent variable, we briefly review the prior research related to typical control variables and the prior results associated with governance variables. We then present the statistical significance and explanatory power for the governance factors both before and after including various control variables. This comparison allows us to assess a lower and upper bound for the explanatory power of the governance factors.[20]

We expect a negative (positive) relation between governance constructs that are hypothesized as "good" ("bad") and our dependent variables that are increasing in "bad" outcomes. Similarly, we expect positive (negative) relation between governance constructs that are hypothesized as "good" ("bad") and our dependent variables that are increasing in "good" outcomes. We consider abnormal accruals, class action lawsuits, earnings restatements, and inverse of Tobin's q to be increasing in "bad" outcomes and ROA and Alpha to be increasing in "good" outcomes. Abnormal accruals are increasing in accrual choices that deviate from a "normal" level, inverse of Tobin's Q is increasing in poor corporate performance, ROA is increasing in future operating performance, and Alpha is increasing in future excess stock returns (using the four factor Fama-French model). Our nominal variables, Class-action Lawsuit and Earning Restatement, are equal to one if the firm has experienced the respective extreme bad outcome and zero otherwise.

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[20] The correlations across our dependent variables are generally small. The largest correlations are observed between 1/Q and ROA_{t+1} ($r_p = -0.195$, $r_s = -0.364$), Lawsuit and Restate ($r_p = 0.130$, $r_s = 0.130$), and ROA_{t+1} and Abnormal Accruals ($r_p = 0.174$, $r_s = 0.124$). Consistent with the approach used for the governance variables, it is possible to apply principal component analysis to the set of *dependent* variables and use the resulting factors instead of the individual outcome variables. Unfortunately, this substantially reduces the sample size with non-missing values for all six dependent variables.

For each dependent variable examined, we conduct standard OLS regression analysis along with the recursive partitioning analysis described in section 4.2. We describe the recursive partitioning analysis in detail for the abnormal accrual variable, but for the sake of brevity, we summarize the recursive partitioning results for the remaining dependent variables. In each table, we report the sign and statistical significance for each variable in the regression or logistic models. For the recursive partitioning models we report the variables that are statistically significant and note whether these variables have a linear or non-linear association with the dependent variable. If the association is linear, we report the sign of the association, but the sign will be indeterminate if the association is nonlinear.

5.1 Measures of Managerial Decision Making

5.1.1 Abnormal Accruals

Accruals, Control Variables and Prior Literature

Measures of abnormal accruals are typically used as surrogates for earnings quality (e.g., Klein, 2002 and Frankel, Johnson and Nelson, 2002). The flexibility afforded through accrual accounting makes the accrual component of earnings less reliable than the cash flow component and therefore a potentially useful measure for examining the quality of financial reports. As is standard in the literature, we are interested in identifying the "unexpected" (also called discretionary or abnormal) component of total accruals. Jones (1991) is the standard technique used for this decomposition. Total accruals are regressed on variables that are expected to vary with "normal" accruals. We use a cross-sectional (as opposed to time series) version of the

Jones model due to its superior specification and less restrictive data requirements (DeFond and Subramanyam, 1998 and Bartov, Gul and Tsui, 2001). Limitations of this measure are the standard criticisms associated with any expectation model. Deficiencies in the set of independent variables and the functional form can lead to mis-classification of normal accruals as abnormal and vice versa (e.g., Bernard and Skinner, 1996).

We use an accrual model which builds on the modified Jones model of Dechow, Sloan and Sweeney (1995). The modified Jones model assumes that the change in revenues less the change in accounts receivable is free from managerial discretion (i.e., credit sales are assumed to be abnormal) and that capital intensity drive normal accruals. We include two additional independent variables that have been shown to be correlated with measures of unexpected accruals. First, we include the book-to-market ratio (*BM*). *BM* is measured as the ratio of the book value of common equity (Compustat item 60) to the market value of common equity (Compustat item 25 x item 199). *BM* is included as a proxy for expected growth in the firm's operations. We expect to see large positive accruals for growing firms (see also McNichols 2000, 2002). Second, we include a measure of current operating performance. Previous research has shown that measures of unexpected accruals are more likely to be mis-specified for firms with extreme levels of performance (Dechow, Sloan and Sweeney., 1995). We therefore include current operating cash flows, *CFO* (Compustat item 308), as an additional independent variable. The advanced model is estimated as follows:

$$TA = \alpha + \beta_1(\Delta Sales - \Delta REC) + \beta_2 PPE + \beta_3 BM + \beta_4 CFO + \varepsilon$$

Total Accruals (TA) is the difference between operating cash flows (Compustat item 308) and income before extraordinary items (item 123) as reported on the statement

of cash flows. ΔSales is the change in sales (item 12) from the previous year to the current year, ΔREC is the difference in accounts receivable (item 302) from the start to the end of the year, and PPE is the end of year property, plant and equipment (item 7). All variables are scaled by the average of total assets using assets from the start and end of the fiscal year (item 6). The residual value from this model is labeled *Abnormal Accruals*, the estimate of unexpected or abnormal accruals from our extended Jones model. Independent variables in the accrual model are all winsorized to be no greater than one in absolute value, with the exception of BM that is winsorized at the 2nd and 98th percentiles. We estimate the model for each two-digit SIC group separately with the requirement that there be at least 10 firms in each group. This leaves a sample size of 1,484 firms for the abnormal accrual analysis.

Consistent with prior research, we find a positive coefficient on *(ΔSales-ΔREC)* and a negative coefficient on *PPE* (the traditional parameters in the modified Jones model). We also find that *BM* and *CFO* are both negatively associated with total accruals. We assume that weak governance structures create an incentive to engage in income increasing earnings management, and thus we focus on raw (or signed) measure of unexpected accruals

Previous research has found only weak associations between measures of corporate governance (such as the composition of the board and audit committees, financial expertise of board and committee members, and stock ownership of board members) and measures of abnormal accruals (e.g., Klein, 2002). It is, however, not clear how robust these patterns are to more recent and larger samples, inclusion of a more

complete set of governance factors and whether the results are driven by directional or non-directional accrual measures.

Abnormal Accruals and Governance Factors

Table 5 reports our results on the association between measures of abnormal accruals and our 14 governance factors. For our sample of 1,471 firms the mean abnormal accrual is close to zero and the mean absolute value of abnormal accruals is about six percent of average assets.[21] These numbers are similar to prior research (e.g., Larcker and Richardson, 2004).

Active, Block, Insider Appointed, Compensation Mix, and Insider Power are statistically significant for the abnormal accrual measure. Three of these variables have the expected sign, but the sign for Active and Block are opposite to our expectation. The regression model has an adjusted R^2 of 1.90 percent. Although this level of explanatory power is perhaps low, this result is consistent with prior research (e.g., Klein 2002, Jenkins 2002 and Xie, Davidson, Dadalt, 2002). Absent a rigorous benchmark, it is difficult to assess whether this level of explanatory power is substantively important. However, given the complexity of the research question, we interpret these results as providing at least some evidence that governance structure has the expected impact on managerial accrual choices.

Since recursive partitioning allows nonlinear and interactive associations between the dependent variable and a set of independent variables, it is not surprising that this

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[21] The sample size used to estimate the regression is 1,471 as opposed to the total sample of 1,484 observations with complete data. The difference in sample size is caused by the deletion of observations in the regression where the absolute value of the studentized residual is greater than four. This approach is used in all of our analyses. Less than one percent of the observations are affected by this methodological choice.

analysis yields somewhat stronger results (R^2 of 4.51 percent). As discussed earlier, exploratory recursive partitioning can uncover complex interaction and nonlinear associations between the economic and governance variables and the dependent variable. In particular, recursive partitioning can identify whether the governance variables are only important when other governance or economic variables have certain values.

The recursive partitioning results for abnormal accruals are presented in Figure 1. We find that Anti-Takeover II is an important governance factor in explaining abnormal accruals (level one in Figure 1). This is the first variable in the partitioning and the decision model brings out the interactions between the variables in the further levels of the diagram. Abnormal accruals are higher for companies that have supermajority voting provisions and that are incorporated in Pennsylvania, Ohio, Wisconsin, or Massachusetts.[22] For the remainder of the companies, Active is an important governance factor in explaining abnormal accruals (level two in Figure 1). For companies that have lower Anti-Takeover II (no supermajority provision and not incorporated in one of the aforementioned states) with higher number of activist shareholders, higher percentage of activist and a lower percentage of outsider holdings, abnormal accruals are higher (contrary to what one would expect if abnormal accruals is a bad outcome and activists are expected to provide additional monitoring). As we move further down the figure, Board Size is a significant governance factor that explains abnormal accruals, but only for sub-sample of firms with lower Anti-Takeover II and higher Active values (level three in Figure 1). For such firms, abnormal accruals are non-linearly associated with Board Size. Abnormal accruals are higher for medium Board Size, and lower for low and

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[22] These are the indicators that comprise the construct that we label as Anti-Takeover II.

high Board Size in this sub-sample of firms. Of the firms that belong to high Board Size sub-sample, Insider Appointed is significantly associated with the level of abnormal accruals for those with high Board Size (level four in Figure 1). Again, this association is non-linear. Finally, Old Directors is statistically significant, but with a non-linear association.

The recursive partitioning reveal that Active, Insider Appointed, Old Directors, Board Size, and Anti-Takeover II are able to explain cross-sectional variation in our abnormal accrual measure. However, Insider Appointed, Old Directors, and Board Size have a *non-linear* association with abnormal accruals and Active again is positively associated with abnormal accruals.[23] Overall, the recursive partitioning and regression results share two variables in common (Active and Insider Appointed) and exhibit a reasonable level of explanatory power. Thus, there is some evidence that corporate governance is associated with the managerial choice of accruals.

5.1.2 Earnings Restatements

Earnings Restatements, Control Variables and Prior Literature

Earnings restatements are often claimed to be the result of weak governance and there has been considerable accounting and finance research recently examining the impact of various measures of governance on the likelihood of observing earnings restatements or fraud (e.g., Farber, 2004 with board and audit committee characteristics, Dechow, Sloan and Sweeney, 1996, Beasley 1996 with measures of board characteristics, block-holders and CEO duality, and Peng and Roell, 2003 and Erickson, Hanlon and

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[23] It is important to highlight that regression analysis assumes that the *same* model is applicable to the entire sample of firms, whereas the recursive partitioning identifies a specific set of explanatory variables for each sub-sample. For example, Insider Appointed is relevant for only 761 of the total sample of 1,471 firms.

Maydew, 2004 for measures of executive compensation). We reexamine these findings with a sample of earnings restatements across our broad set of governance constructs.

We obtain data on earnings restatements from Huron Consulting (both 10-Q and 10-K restatements that are identified through amended SEC filings). We use an indicator variable, Earnings Restatement, which we set equal to one if the firm reports an earnings restatement related to the fiscal year (or a subsequent fiscal period) for which we have governance data, and zero otherwise. For example, firm XYZ has a December 31, 2002 fiscal year end. If XYZ restates its earnings for any of the fiscal periods from January 1, 2002 onwards the Earnings Restatement is set equal to one. For other firms the indicator variable is set equal to zero with the exception that firms who restate earnings in an earlier fiscal period are dropped from the analysis. For example, if firm XYZ had a restatement prior to January 1, 2002 we exclude that observation from our analysis. This leaves us with a sample of 2,094 firms of which 118 restate earnings. We exclude the restatements prior to January 1, 2002 because we cannot be sure that the governance structures we measure have changed in response to the restatement.

Prior research has examined the prediction and the economic consequences of earnings restatements and SEC enforcement actions (e.g., Dechow, Sloan and Sweeney 1996). We incorporate the findings of this prior research to select our control variables that include BM (book-to-market, defined above), Leverage (calculated as total debt (item 9 + item 34) divided by total assets (item 6)), External Financing is the total net external financing from debt-holders and shareholders during the fiscal period that was restated (calculated as net equity financing, item 108 – item 115 – item 127, plus net debt financing, item 111 – item 114 + item 301, all deflated by beginning market value of

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equity), Log of market value of common equity, Free Cash Flow (measured as the difference between operating cash flows, item 308, and average capital expenditures over the 3 prior years, item 128) and Acquisitions (calculated as total cash spent on acquisitions during the fiscal period restated, item 129, deflated by beginning market value of equity). BM, Leverage, and Log(Market Cap) are all measured prior to the fiscal period which is restated. All control variables are winsorized at the 2nd and 98th percentiles.

Earnings Restatements and Governance Factors

In our analysis of restatements, we exclude Meetings because the board could be meeting more frequently due to the upcoming earnings restatement. The results in Table 6 indicate that Debt and Insider Power are the only two governance factors that are associated with the likelihood of earnings restatements (pseudo-R^2 is 1.8 percent). When we include the control variables, Debt and Insider Power are still the only two governance factors that are associated with the likelihood of earnings restatements. In both specifications, Debt is positively associated with the dependent variable (opposite of our expectation) and Insider Power has the expected positive sign. The control variables contribute an additional 1.1 percent pseudo-R^2 to the explanatory power beyond the governance factors, whereas governance factors contribute an additional 2 percent pseudo-R^2 beyond the control variables. Since we have a dichotomous dependent variable, we also report "hit rates" for five cut-off probabilities (0.1, 0.2, 0.3, 0.4, and 0.5). As might be expected in a setting where the non-restatement sample is much larger than the restatement sample, the logistic model accurately classifies non-restatement

observations, but the classification accuracy for the restatement observations is quite poor.

In the recursive partitioning analysis, Debt and Board Size are the two significant governance factors in the specification that only includes the governance factors. However, both variables exhibit signs opposite to our expectations. When we include the control variables, Insider Appointed (Debt) has an unexpected negative (positive) association with restatement. The other statistically significant variables, Insider Power and BM, have a non-linear association with restatements. Thus, the logistic and the recursive partitioning results in Table 6 are very similar. Overall, there is very modest substantive evidence that restatements are associated with corporate governance.

5.1.3 Class Action Lawsuits

Class Action Lawsuits, Control Variables and Prior Literature

In recent years, considerable attention has focused on the link between perceived governance problems and class action lawsuits. For example, poor governance may cause earnings restatements and fraudulent management activity, resulting in a precipitous stock price decline, and ultimately some type of class action lawsuit. To assess the potential impact of governance structures on the likelihood of a class action lawsuit we utilize data from the Securities Class Action Clearinghouse database to develop our outcome variable. The Clearinghouse provides detailed information relating to the prosecution, defense, and settlement of federal class action securities fraud litigation. They maintain an Index of Filings of 2,087 issuers that have been named in federal class action securities fraud lawsuits since passage of the Private Securities Litigation Reform Act of 1995.

Lawsuit is an indicator variable equal to one if the firm has a class action lawsuit filed during or after the year for which we have available governance data, and zero otherwise. For example, firm XYZ has a December 31, 2002 fiscal year end. If XYZ is named in as defendant in a class action lawsuit from January 1, 2002 onwards Lawsuit=1. Firms that are subject to a class action filing in the period prior to the fiscal period we examine are excluded from the analysis. For example, if firm XYZ had a class action filed prior to January 1, 2002 we exclude that observation from our analysis. This leaves us with a sample of 1,838 firms of which 196 experience a class action suit. Prior research on class action lawsuits has found that the key determinants include measures of risk, firm size, current operating performance, firm age, auditor identity and measures of aggressive accrual choices (e.g., Ducharme, Malatesta and Sefcik, 2002, Frankel, Joos and Weber, 2003, Lu, 2003 and Dechow, Sloan and Sweeney, 1996). Our control variables are therefore BM (book value of common equity (item 60) divided by market value of equity (item199 * item 25)), Negative Earnings (indicator variable that is equal to 1 if the firm has reported a loss, 0 otherwise), Big Auditor (indicator variable that reflects whether the company has a brand-name auditor), SIZE (measured as the log of total assets (item 6)), Total Accruals (measured as the net change in net operating assets deflated by average total assets), ROA (calculated as income before extraordinary items (item 18) scaled by average total assets), and Age (logarithm of the number of months that the firm has been listed on a US exchange as reported in CRSP). All control variables are winsorized at the 2nd and 98th percentiles.

Class Action Lawsuits and Governance Factors

The results of logistic regression analysis for Class Action Lawsuits are presented in Table 7. For the model only including governance factors, there are three statistically significant coefficients. Active and Debt have an unexpected positive association and Compensation Mix has an unexpected negative association with the likelihood of a class action lawsuit. The pseudo R^2 of this model is 7.6 percent. When we include the control variables, Active is no longer significant and the control variables, Size, ROA, and Age are significant. Consistent with our expectations, large firms, low-profitability firms and young firms are more likely to be subject to class action lawsuits. We gain 4.3 (4.9) percent incremental explanatory power by including the control variables (governance factors) in our regression.[24] However, it is important to note that all statistically governance factors have *unexpected* signs. Hit rates indicate that the models for class-action lawsuits exhibit little ability to correctly classify *both* the absence of and occurrence of earnings restatements. When low cut-off values are used, the model is unsuccessful in accurately classifying non-class action lawsuit observations, but high cut-off values are unable to accurately classify the class action lawsuit observations.

The recursive partitioning results reveal that Active is positively and Compensation Mix is negatively associated with the likelihood of class action lawsuits, while Debt has a non-linear association (governance only specification). Once again, the sign of Active is in the direction opposite to our expectation. When we also include the control variables, Compensation Mix is the only governance factor that is significant (with an unexpected negative sign). The signs for the significant control variables are

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[24] Since the samples used in the governance only, controls only, and governance and controls specifications are different, the R^2s are not directly comparable. When we use the same sample for all three specifications, the pseudo R^2 of the governance and controls specification is 11.5%. The incremental pseudo R^2 by including the control (governance) variables is 4.5% (3.7%).

somewhat mixed. BM and Negative Earnings have negative sign, Size has a positive

sign, and Total Accruals and ROA have non-linear associations with class-action

lawsuits. The logistic and recursive partitioning results in Table 7 are very similar.

Overall, there is very modest substantive evidence that class action lawsuits are

associated with corporate governance.

5.2 Firm valuation and performance measures

5.2.1 Future Operating Performance

One way to assess the impact of governance structures on firm value is to

examine an accounting based measure of future operating performance. We use return on

assets as operating income (Compustat item 178) deflated by average total assets as our

measure of operating performance (ROA). Unfortunately, there is not a well-defined and

accepted model of expected operating performance. Prior research has shown that

measures of operating performance are very persistent (e.g., Ohlson and Penman, 1992

and Fama and French, 2000). Thus, the natural candidate for expected future operating

performance is current operating performance. However, to the extent that governance

structures determine the operating, investing and financing activities of the firm, the

inclusion of current operating performance is likely to remove the impact of governance

structures that we are trying to estimate. Rather than using current ROA as an

expectation model for future performance, we use industry affiliation and firm size for

our benchmark (e.g., Gompers, Ishii and Metrick, 2003 and Core, Guay and Rusticus,

forthcoming). We use the Log (Market Cap.) as our measure of firm size and the median

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two-digit industry ROA as our measure of industry performance. Industry-adjusted ROA is computed by subtracting the median industry ROA from the firm ROA.

The results for our future operating performance analysis are presented in Table 8. In the governance factors only specification, we find that Active, Compensation Mix, Insider Power, Board Size, and Anti-Takeover II have a positive association, whereas Anti-Takeover I and Debt have a negative association with future operating performance. The adjusted R^2 for this specification is 14.2 percent which is fairly high. However, it is important to note that this level of explanatory power includes four factors that have unexpected signs (Debt, Insider Power, Board Size, and Anti-Takeover II).[25] The problem with the specification that only includes governance variables is that the implicit benchmark for ROA is simply the mean ROA across the sample of observations. A potentially more sophisticated benchmark may be produced when we control for industry and Log (Market Cap.). In this expanded specification, we find that Block, Compensation Mix, Lead Director, and Anti-Takeover II are positively associated with future ROA and Board Size and Busy Directors are negatively associated with ROA. With the exception of Anti-Takeover II, each of these governance factors has the expected sign. The inclusion of the control variables increases the explanatory power by an additional 5.9 percent, whereas the inclusion of the governance variables to a controls only specification increases the explanatory power by 4.7 percent.[26]

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[25] The sign on Compensation Mix is somewhat ambiguous when operating performance is the outcome variable. We assume that "bad" governance is increasing in Compensation Mix (more accounting-based compensation and less stock-based compensation). However, if an executive is paid based on accounting performance, we would expect the executive to take actions to increase accounting performance (perhaps at the cost of decreasing stock price). Thus, our expectation for the sign of Compensation Mix is positive when operating performance is the outcome variable.

[26] Again, we use different samples for the results tabulated in Table 8 for the governance only, controls only, and governance and controls specifications, due to data availability of the necessary variables.

The results from the recursive partitioning analysis (with and without controls) are similar to the regression results. The explanatory power of the governance only specification is 16.2 percent with Active and Compensation Mix (Debt) being positively (negatively) associated with future ROA. Similar to the regression results, the sign for Debt is opposite to our expectation.[27] Overall, the results indicate that at least Active and Compensation Mix (and possibly Block, Lead Director, Board Size, and Busy Directors) have the expected substantive association with future ROA.[28]

5.2.2 Tobin's Q

Q, Control Variables and Prior Literature

A common measure that is used to evaluate the impact of governance on overall firm value is Tobin's Q. Prior research has examined the association between Q and governance variables such as board size (Yermack, 1996), insider stock ownership (Morck, Shleifer and Vishny, 1988) dual CEO-chair (Yermack, 1996), and board structure (Bhagat and Black, 2002). Recent work has started to examine broader sets of governance variables against a variety of measures of firm value (e.g., Brown and Caylor,

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Therefore, the tabulated R^2s are not directly comparable. When we use the same sample for all three specifications, the R^2 of the governance and controls specification is 20.5%. The incremental R^2 by including the control (governance) variables is 5.0% (4.9%).

[27] Since the samples used in the governance only, controls only, and governance and controls specifications are different, the tabulated R^2s are not directly comparable in recursive partitioning analysis, either. When we use the same sample for all three specifications, the R^2 of the governance and controls specification is 33.88%. The incremental R^2 by including the control (governance) variables is 17.58% (4.36%).

[28] It is not clear that industry-adjusting ROA and including Log (Market Cap.) is the correct benchmark for future operating performance. In additional analyses, we also include industry-adjusted *current* ROA in specifications. In both regression and recursive partitioning analyses, this variable is highly significant (as should be expected). Furthermore, upon our inclusion of this variable in the regression analysis, the only significant governance factor is Meetings, which is positively associated with future ROA. Recursive partitioning results indicate that Debt is negatively associated with future ROA and Active and Lead Director have a non-linear association with future ROA. Our concern with these weaker results for governance factors in this specification is that current ROA itself is potentially a function of governance factors. Therefore, controlling for current ROA in the analysis absorbs the effect of governance factors.

2004 examine Q and profitability) but there is very little evidence to suggest that these governance measures are able to explain much of the cross sectional variation in firm value. We measure Q as the sum of book value of debt (Compustat item 9 + item 34) and the book value of equity (item 60) deflated by the sum of the book value of debt and the market value of equity (item 25 * item199). Note that we have measured Q as book value relative to market value; hence our predicted signs will be opposite to some prior research that has used the market to book version of this variable. We have chosen the reciprocal due to its statistical properties (i.e., normality). The mean (median) Q for our sample is 0.71 (0.70).

Control variables include Size (measured as the log of total assets (item 6)), Log(Age) (log of the number of months that the firm has been listed on a U. S. exchange as reported in CRSP), SP500 (an indicator variable equal to one if the firm is a member of the S&P 500 index and zero otherwise), RD (is research and development expenditure (item 46) divided by total assets (item 6)), # Segments (is the number of segments as reported on Compustat), and ROA (return on assets measured as net income (item 18) deflated by average total assets). Control variables were selected based on the prior specifications used by Morck, Shleifer and Vishny (1988), Yermack (1996), Shin and Stulz (2000), Daines (2001), Morck and Yang (2001) and Gompers, Ishii and Metrick (2003). All control variables are winsorized at the 2nd and 98th percentiles. Similar to prior research, we also include a vector of industry fixed effects (two digit SIC).

Q and Governance Factors

Table 9 reports regression results for our analysis where the inverse of Tobin's Q is used as the dependent variable. Active, Block, Compensation Mix, Meetings, Debt and Anti-Takeover II are statistically associated with 1/Q in the governance factors only specification. However, Block, Meetings and Debt have signs that are unexpected. The adjusted R^2 for the specification with only governance constructs is 5.10 percent. When we include the control variables, Active, Block, Insider Appointed, Meetings, Anti-Takeover I, Old Directors, and Insider Power are significant, with Block, Meetings, Old Directors and Insider Power in the unexpected direction. The incremental explanatory power from the control variables is 6.20 percent, whereas the governance factors add only 2.30 percent additional explanatory power beyond the control variables. The control variables are significant in the expected directions, with the exception of # Segments and lagged ROA variables. Larger firms have lower Tobin's Q ratios. Younger firms, firms listed on the S&P500, and research active firms have higher Tobin's Q ratios and more profitable firms tend to have higher Tobin's Q ratios.

Recursive partitioning results indicate that Active, Board Size, and Busy Directors have a negative, Block has a positive, and Debt has a non-linear association with 1/Q. Although the explanatory power of the governance factors alone is 19.37 percent, only Active has an expected sign. When we include the control variables, Debt and Busy Directors are statistically significant, but both governance constructs have unexpected signs. The control variables of size and current ROA are negatively associated with 1/Q and the sign on size is unexpected. The control variables provide a 1.61 percent incremental explanatory power beyond the governance factors alone, whereas the governance factors provide a 1.31 percent incremental explanatory power beyond the

control variables alone.[29] Overall, the results provide mixed support for the existence of a substantive association between corporate governance and Tobin's Q. Although the estimated models have reasonable explanatory power, many of the signs on the governance constructs are unexpected.

5.2.3 Future Excess Stock Returns

The final outcome variable in our analysis is Alpha (future excess stock returns), measured as the intercept from a regression of monthly firm excess returns (excess over the risk free rate) on the monthly factor returns (MKT, SMB, HML, and UMD). The excess returns were computed from one month after then end of the fiscal year until December, 2004 (or a maximum of 30 months). Since the dependent variable is excess returns, the benchmark returns are already included in the computation and we do not include any additional control variables. Obviously, our analysis of future abnormal stock returns rests on an important assumption about market efficiency. If stock prices incorporate beliefs about the potential benefit of certain governance structures, we should observe no association between our governance factors and future excess stock returns. For governance structures to be related to future excess returns, there must be (i) an inefficiency in the ability of market participants to price governance benefits and costs or (ii) systematic unexpected shocks to future operating performance from these governance structures. Core, Guay and Rusticus (forthcoming) examine the second possibility in

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[29] Due to data restrictions, the samples used in the governance only, controls only, and governance and controls specifications are different both for OLS and recursive partitioning analysis. Therefore, the R^2s are not directly comparable across the models. When we use the same sample for all three specifications, the R^2 of the governance and controls specification is 19.4% for the regression. The incremental R^2 from including the control (governance) variables is 3.8% (14.6%).

considerable detail using measures of shareholder rights and find very little evidence consistent with this explanation. The appropriateness of our analysis also assumes that we are appropriately measuring risk. To the extent that we have not adequately capture risk in our measure of excess returns any association that we find may simply reflect differential risk characteristics.

The regression analysis for future excess stock returns is presented in Table 10. Insider Appointed, Compensation Mix, Lead Director, Debt and Insider Power are significantly associated with Alpha, but only Lead Director and Insider Power exhibit the expected signs. The adjusted R^2 is 2.0 percent and is similar to the explanatory power of other studies that use future excess stock returns as the dependent variable (e.g., Sloan, 1996). Recursive partitioning results are generally consistent with the regression results. The main differences are that Block is also significant (and has a non-linear association), and Debt and Insider Power are no longer significant. The explanatory power from the recursive partitioning analysis is 2.7 percent. Overall, there is mixed support for a substantive association between corporate governance and excess returns.

6. Extensions

6.1 Limited Sample Period

One potential problem with our analysis is that we use only one year of data and that time period is coincident with significant regulatory reform (e.g., Sarbanes Oxley Act and new exchange listing requirements). This observation raises concerns about the power of our statistical tests and the ability to generalize our results. To assess the impact of these regulatory changes we obtained time series data for various subsets of our

governance measures and examine the change in these measures over time. It was not possible for us to examine all of the data obtained from Equilar Inc. and True Course Inc. as these entities only collected the necessary data from 2002 onwards. Instead, we examined other data sources to look at changes in a variety of governance structures from the 1990s into the early 2000s.

Our first analysis examines the persistence of the governance index developed by Gompers, Ishii and Metrick (2003). This index is comprised of 24 indicators reflecting the quality of shareholder rights and is increasing in the weakness of these rights. For the 649 firms that are covered on all seven IRRC reports (1990, 1993, 1995, 1998, 2000, 2002 and 2004) the mean index is very stable starting at 10.3 in 1990 and only slowly decreasing to 9.1 in 2004. Furthermore, the correlation over time between reports is 0.98, and the correlation between the 2000 and 2004 reports is 0.91. If we restrict our analysis to the 1,260 firms covered on the 2000, 2002 and 2004 IRRC reports, the over time correlation between 2000 and 2004 is 0.91 and between 2002 and 2004 is 0.97.[30] Since anti-takeover and shareholder rights provisions are very stable inter-temporally, our results for similar variables should not be confounded with regulatory changes.

As a second analysis, we examined the persistence of various board specific measures including the size of the board and audit and compensation committees along with the composition of the board and those committees. This data is available from IRRC for the years 1996 to 2002 for the full board and from 1998 to 2002 for the various sub-committees of the board. For the sample of 733 firms that had data in all years,

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[30] This result is perhaps not surprising given that a large number of the components of this governance index were set at the time a company was incorporated (e.g., super-majority requirements and staggered board classifications).

board size has remained very stable through time (the average board in 1996 had 10.7 directors and in 2002 this was 10.4 directors). The over time correlation in board composition (i.e., the fraction of the board that is comprised of independent outside directors) is 0.85 and similar stability is found with the size and composition of both the audit and compensation committees. These results suggest that our analysis of board variables is not likely to be confounded by regulatory changes.

Finally, we obtained analyst ratings of board effectiveness from The Corporate Library (TCL) for 1,504 firms in 2002, 1,712 firms in 2003 and 1,934 firms in 2004. The over time rank correlation in the ratings is 0.93 between 2003 and 2004 suggesting that even qualitative assessments of governance quality are temporally stable in the most recent years. However, the over time rank correlation between 2002 and 2003 is only 0.40. We also obtained data from GovernanceMetrics International for the *Standard and Poors 500* firms in 2002, 2003 and 2004. In contrast to the TCL data, there is a lower over time rank correlation in the ratings between 2003 and 2004 (0.63) and a higher over time rank correlation between 2002 and 2003 (0.64). The low correlation for the TCL ratings from 2002 to 2003 is caused by a change in the algorithm that TCL uses in generating their board effectiveness rating, rather than changes in the underlying structural indicators of governance (especially as our analysis above of the IRRC data of board structures and shareholder rights suggest that these measures are very stable year over year). Our conversations with TCL and other rating agencies (such as ISS and GMI) suggest that the algorithm used to generate overall ratings is modified in response to feedback from the analysts generating the reports. These modifications either alter the

weight of sub-categories of governance measures or change the set of included/excluded measures from year to year.

Our analysis of the stability in governance is very consistent with the recent study by Linck, Netter and Yang (2005) that examines 6,931 corporate boards over the period 1990 to 2004. In general, they find that board structure has been extremely stable over the last 15 years. For example, the fraction of executive directors on a board has decreased for about 37 percent in 1990 to 34 percent in 2001 to about 31 percent in 2004. This decrease is not economically significant given that the mean board size over the period is about eight members. Linck, Netter and Yang (2005) also find that board size has remained very stable at about eight directors for their full sample, and that the fraction of firms with a dual CEO-Chair has remained relatively constant at around 55 percent. Linck, Netter and Yang (2005) do, find evidence of increased director turnover around the Sarbanes Oxley Act. However, it is important to note that most of the observable/structural indicators of governance (e.g., board composition, board size and dual CEO-Chair) do not change. Overall, the structural indicators of governance that are the focus of our empirical analysis have not changed significantly over time or around the Sarbanes Oxley Act. Thus, our analysis of governance data for the single time period from June, 2002, to May, 2003, is likely to be representative of earlier time periods. Moreover, we do not believe that firms made substantial changes or improvements in the governance structure during the time period of our data. Thus, our statistical are likely to have power to detect the association (if they exist) between structural measures of corporate governance and managerial and firm performance outcomes.

6.2 Endogeneity

Our methodological approach essentially involves assessing the relation between an outcome variable (e.g., a managerial decision or firm performance) and a set of choices for organizational structure (i.e., the governance constructs). Since the regressor variables are endogenous choice variables, the exogenous determinants of these choice variables are also likely to affect the outcome variable. If the determinants of the regressor (or right-hand-side) variables are not included in the statistical model being estimated, the regressor variables are correlated with the true (but unobserved) error term in the equation. In this setting, ordinary least squares (or logistic) parameter estimates will be inconsistent due to the well-known correlated omitted variables problem. Most empirical accounting research is confounded to at least some degree by the endogenous nature of the predictors in the statistical model.

The standard textbook solution to endogeneity is to implement some type of instrumental variables estimation procedure. In particular, a set of variables that are assumed to be exogenous is selected and then n-stage least squares estimation is used to estimate the coefficients in the regression model. This solution to endogeneity works if the researcher can find instrumental variables that are correlated with the endogenous regressor, but uncorrelated with the error in the structural equation. In most applied settings, it is extremely difficult to identify such instrumental variables. Moreover, Larcker and Rusticus (2005) analytically and numerically show that ordinary least squares estimates typically exhibit better statistical properties than two-stage least squares estimates when the selected "instrumental variables" do not precisely conform to the textbook definition for instrumental variables (i.e., the instrumental variables are weak

predictors of the endogenous variables and the instrumental variables are themselves partially endogenous). As a result, it will be difficult to use instrumental variable methods to address concerns about endogeneity.

Another problematic aspect with regard to endogeneity is that if all firms are completely optimizing with respect to their governance choices, there should be no statistical association between performance and our governance measures after controlling for the exogenous determinants that explain the governance choice (e.g., Demsetz and Lehn, 1985). However, it is difficult to believe that "everybody optimizes all the time" in the real world. Thus, we do not adopt this extreme perspective in our attempt at dealing with endogeneity.

An alternative perspective is that firms are dynamically learning and moving toward their optimal governance structure (i.e., most firms deviate from the optimal choice at a point in time). As discussed in Ittner, Lambert, and Larcker (2003), this implies that observed cross-sectional differences in governance structure provide a means for assessing the performance consequences of this organizational choice. We implement this general approach as a way to provide some insight into the impact of endogeneity on our prior results.

We assume that two of the primary variables that determine governance structure are firm size (measured as the natural logarithm of the market value of equity) and industrial classification (measured using two-digit SIC codes). Each governance variable is regressed on firm size and industry and the OLS residuals for each of the 14 governance constructs are retained. The mean (median) adjusted R^2 for these regressions is 13.7 percent (9.0 percent) and regression coefficients for the firm size are statistically

significant (p < 0.01, two-tail) for 12 of the 14 regressions (the coefficients for Old

Directors and Insider Appointed were not significant). For the statistically significant

coefficients, six were positive (Active, Meetings, Anti-Takeover I, Board Size, Anti-

Takeover II, and Busy Directors) and the remaining six coefficients were negative (Block,

Affiliated, Compensation Mix, Lead Director, Debt, and Insider Power).

We estimate the statistical association of each outcome variable with a variable

that takes on the value of the residual if it is positive and a value of zero otherwise

(governance$^+$) and another variable that takes on the value of the residual if is negative

and a value of zero otherwise (governance$^-$). We separate the residual into two variables

in order to allow for a different impact of firms that have higher or lower governance than

similar firms. For example, less governance relative to the benchmark may produce poor

performance, but more governance than the benchmark may have no relation with

performance.[31] We estimate six regressions (one for each outcome variable) with 28

variables for the 14 governance constructs.

Under this dynamic learning view of organizational design, the expected

association between the governance residuals and the outcome variables will depend on

both the nature of the outcome variable and the nature of the governance variable. For

the variables that are increasing in "bad" outcomes (accruals, restatements, lawsuits, and

the inverse of Q), we expect to see negative coefficients on both the negative and positive

residuals of governance variables that are "good" (Active, Block, Meetings, Lead

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[31] The interpretation of the governance "residuals" depends critically on whether the Demsetz and Lehn (1985) equilibrium notion of organizational design is appropriate. Under this view, the systematic part of the regression model represents the appropriate governance choices for a firm, and therefore the residuals should exhibit negative associations with firm performance and valuation (or positive associations with accrual, restatements, and lawsuits). As discussed in the text, we believe that the notion that "all firms are optimizing" is too strict for a complex phenomenon such as the choice of governance structure.

Director, and Debt) and positive coefficients on both the both the negative and positive

residuals of governance variables that are "bad" (Affiliated, Insider Appointed,

Compensation Mix, Anti-Takeover I, Old Directors, Insider Power, Board Size, Anti-

Takeover II, and Busy Directors).

This is best illustrated with an example for a "good" governance variable (e.g.,

Active) and a "bad" governance variable (e.g., Insider Appointed) for one outcome

variable (e.g., Accruals) where Active^{+} captures positive residuals and Active^{-} captures

negative residuals. As Active^{+} increases the firm has more "good" governance which

would be associated with less "bad" behavior in the dynamic learning view (negative

association with Accruals is therefore expected). Likewise, as Active^{-} decreases the firm

has less "good" governance which would be associated with more "bad" behavior (again

a negative association is expected). Conversely, for Insider Appointed we would expect

opposite associations (Insider Appointed $^{+}$ captures positive residuals and Insider

Appointed $^{-}$ captures negative residuals). As Insider Appointed^{+} increases the firm has

more "bad" governance which would be associated with more "bad" behavior (positive

association), and as Insider Appointed^{-} decreases the firm has less "bad" governance

which would be associated with less "bad" behavior (again a positive association).

Obviously, the opposite is expected for the variables that are increasing in "good"

outcomes (ROA and Alpha).

For the accrual analysis, the expanded regression has an adjusted R^{2} of 3.00

percent which exceeds the adjusted R^{2} of 1.90 percent reported in Table 5. The positive

residuals for Active ($\beta = -0.017$), Affiliated (-0.010), Insider Power (0.009), and Busy

Directors (0.010) and the negative residuals for Insider Appointed (0.013), Compensation

Mix (0.023), Lead Director (0.028), and Busy Directors (-0.021) are statistically significant (p < 0.10, two-tail). Thus, eight of the 28 possible coefficients are statistically significant and five of the coefficients have the expected sign. These results are similar to those in Table 5, especially for Active, Insider Appointed Compensation Mix and Insider Power. However, we now find some evidence that Affiliated, Lead Director, and Busy Directors are significant but all with unexpected signs.

The restatement analysis produced a pseudo R^2 of 3.50 percent which exceeds the 1.80 percent pseudo R^2 in Table 6 (governance only specification). Three of the 28 coefficients were statistically significant (the positive residuals for Old Directors (-0.576) and Debt (0.237) and negative residual for Old Directors (1.066)). The result for Debt is similar to Table 6 and the results for Old Director are new. However, only the sign for the negative residual for Old Directors has the expected sign.

The litigation analysis exhibits a slightly higher pseudo R^2 of 8.60 percent than the pseudo R^2 of 7.6 percent in Table 7. Five of the 28 coefficients were statistically significant (the positive residuals for Compensation Mix (-0.375), Debt (0.359), and Busy Directors (0.323) and the negative residuals for Compensation Mix (-0.746) and Debt (1.323)). Three of these five coefficients exhibit the expected sign. The Debt and Compensation Mix results are similar to those in Table 7, but we observe a new result for Busy Directors.

The analysis of future operating performance produced an adjusted R^2 of 9.50 percent which is somewhat below the adjusted R^2 of 14.20 percent in Table 8. Eighteen of the 28 coefficients are statistically significant and 11 of these 18 coefficients exhibit the expected sign. The positive residuals for Active (-0.025), Block (-0.012),

Compensation Mix (0.022), Debt (-0.016), Insider Power (0.012), Lead Director (-0.029), and Anti-Takeover II (0.028) and the negative residuals for Active (0.017), Block (0.041), Compensation Mix (0.030), Meetings (-0.017), Anti-Takeover I (-0.016), Debt (0.071), Insider Power (-0.038), Board Size (-0.028), Lead Director (0.089), Anti-Takeover II (-0.056), and Busy Directors (-0.098) are statistically significant. Most of these results are similar to those in Table 8, but the results for Block, Meetings, Lead Director, and Busy Directors are new. One interesting outcome produced by this expanded analysis is that most of the negative residuals for the governance constructs are statistically significant and have the expected sign. This indicates that future operating performance is lower for firms that have governance that is below the structure implied by a benchmark derived from firm size and industry.

For the analysis of Q, the expanded regression has an adjusted R^2 of 6.30 percent which exceeds the adjusted R^2 of 5.10 percent in Table 9. The positive residuals for Active (-0.073), Block (0.039), Affiliated (-0.025), Debt (0.067), Anti-Takeover II (0.050), and Busy Directors (-0.032) and the negative residuals for Block (0.030), Affiliated (0.067), Insider Appointed (0.037), Meetings (0.068), Old Directors (-0.113), Debt (0.139) and Anti-Takeover II (-0.089) were statistically significant. However, only the positive residuals for Active and Anti-Takeover II and the negative residuals for Affiliated and Insider Appointed exhibit the expected signs (i.e., 13 of the 28 coefficients are statistically significant, but only 4 of these 13 coefficients have the expected sign). The results for Affiliated, Old Directors, Insider Appointed, and Busy Directors are new.

Finally, for the analysis of Alpha, the expanded regression has an adjusted R^2 of 2.30 percent which exceeds the adjusted R^2 of 2.0 percent in Table 10. The positive

residuals for Block (-0.003), Compensation Mix (0.005), Debt (-0.006), Insider Power (-0.004) and the negative residuals for Block (0.006), Insider Appointed (0.004), Debt (0.007), Lead Director (0.014), and Busy Directors (0.007) are statistically significant. The positive residual for Insider Power and the negative residuals for Block, Debt and Lead Director have the expected signs and the other five significant coefficients have unexpected signs. The results for Insider Appointment, Lead Director, Debt, Compensation Mix and Insider Power are similar to those reported in Table 10. However, the Block and Busy Director results are new.

Overall, the residual analysis provides results that are very consistent with those in Tables 5 – 10 and in some cases the results are more supportive of corporate governance having a substantive association with the outcome variables. Although the use of firm size and industry to develop benchmark models for corporate governance does not completely resolve concerns about endogeneity, this approach does provide at least some evidence that our earlier results are not completely confounded by econometric problems induced by endogeneity of the regressor variables.

7. Summary and Conclusions

The relation between corporate governance and managerial behavior and organizational performance is of fundamental importance to practitioners, academics and policy makers. Assumptions and strongly held beliefs about the importance of governance are shaping the current regulatory climate for the design of governance structures. To date, prior work has generated a set of contradictory results and a consistent set of results is yet to emerge from the academic literature.

In this study, we undertake a comprehensive analysis of governance structures to develop sophisticated measures of corporate governance and relate these measures to a variety of outcomes designed to capture managerial decision making and organizational performance. Using both traditional multiple regression and exploratory recursive partitioning, we find that our corporate governance constructs have some association with measures of managerial decision making, and firm performance and valuation. In order to identify the structure of corporate governance, we use principal component analysis to derive 14 constructs from 39 individual governance indicators. Based on the signs of the estimated coefficients and the total and incremental explanatory power for the governance constructs, we find that the 14 constructs derived are related to future operating performance, have a somewhat mixed association with abnormal accruals, Tobin's Q, and future excess stock returns, and little relation to class action lawsuits and accounting restatements.

Overall, the typical *structural* indicators of corporate governance used in academic research and institutional rating services have some ability to explain managerial decisions and firm performance and valuation. However, the interpretation of our results is contingent on the researcher's view concerning the appropriate structural model for estimation, required level of explanatory power to conclude that the results have a substantive, as opposed to a strictly statistical, interpretation, and the necessary relative frequency of statistically significant coefficients with the expected sign versus an unexpected sign.

As with all studies of this type, it is important to be explicit about the inherent limitations of our research. First, we only analyze a single year of data and this

potentially restricts our ability to generalize to other periods. Although our data are

current, the time period of data collection coincides with the Sarbanes-Oxley Act and

changes in exchange listing requirements. If these regulatory changes caused firms to

adopt greater conformity in governance mechanisms, this will reduce cross-sectional

variation in our measures and decrease the power of our statistical tests. However, our

analysis of other related governance data does not indicate substantial changes in

corporate governance in the time period surrounding the Sarbanes Oxley Act. Thus, we

believe that our statistical analysis has sufficient power to detect the association between

corporate governance and our outcome measures.

Second, corporate governance characteristics and managerial behavior are

endogenous variables and this has the potential to produce a variety of serious

econometric problems. Absent clear theory and the identification of strictly exogenous

instruments, it is very difficult to appropriately incorporate the endogenous relations into

our analysis. We attempt to mitigate concerns about endogeneity by using the

governance residuals estimated using firm size and industry as predictor variables.

Although this approach does not completely resolve concerns about endogeneity, this

expanded analysis generates results that are similar to the results without any control for

endogeneity.

Third, our empirical analysis may not adequately capture economic determinants

and/or we may not have accurately captured managerial behavior through some of our

measures such as abnormal accruals. Thus, our results are subject to the standard

criticism of omitted variables and measurement error. However, to the best of our ability

we have included all variables from prior research that have been shown to be associated

with each of our dependent variables. Nevertheless, there is an unknown degree of

measurement error and omitted variables in our empirical analysis. Finally, although we

have attempted to develop a comprehensive set of governance indicators, some of the key

dimensions of this complex construct may be missing from our analysis.

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Figure 1

Recursive partitioning analysis for accruals
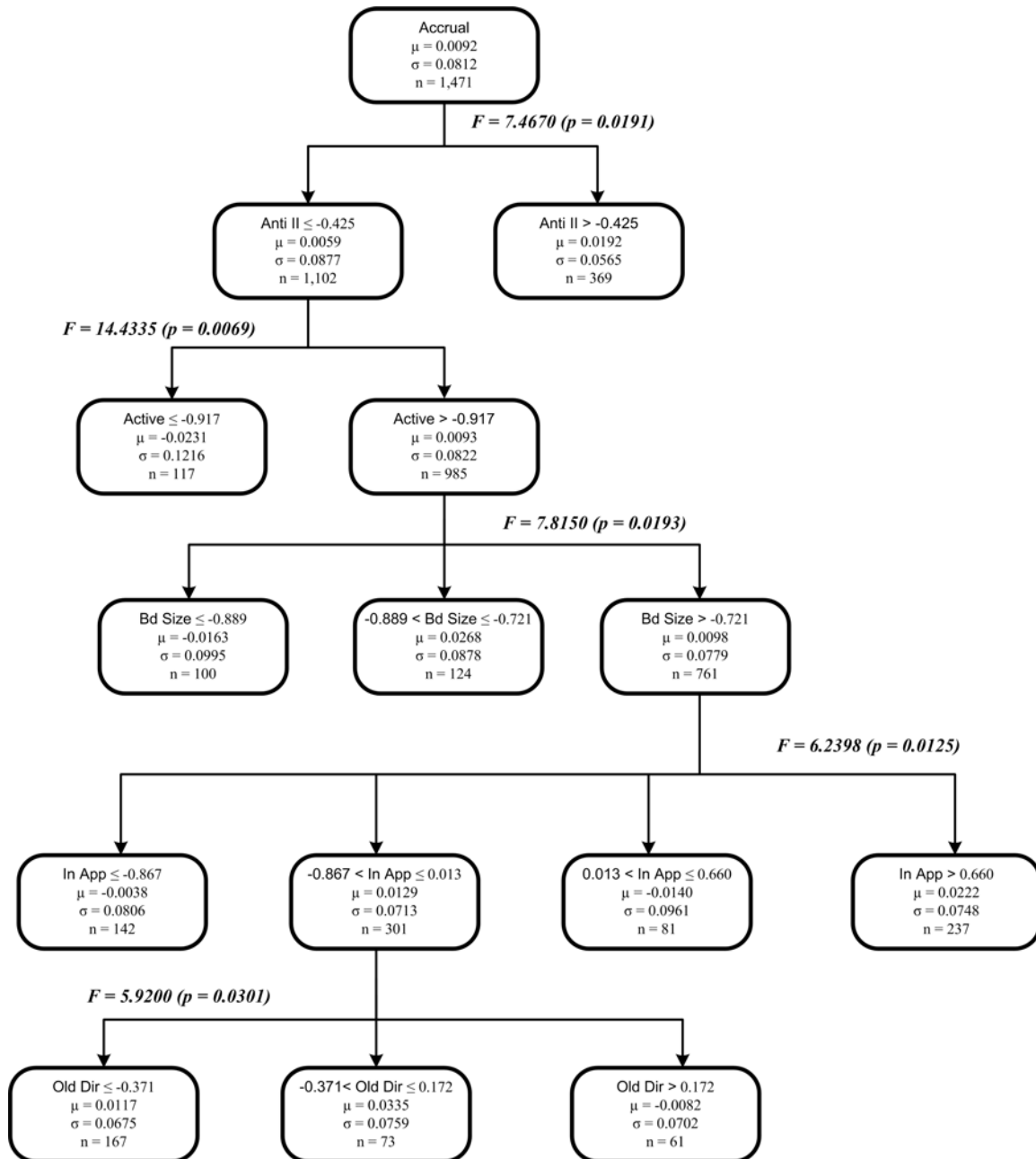
Table 1

Industry composition and comparison of our sample of 2,106 firm observations for the fiscal year ending 06/30/2002 through 05/31/2003 for which we are able to obtain corporate governance information from Equilar and Shark Repellent.

Panel A: Industry Composition

Two-digit SIC	Industry	Number	Percent of Sample	Compustat Composition
1	Crops	2	0.1	0.2
7	Agriculture Services	2	0.1	0.1
10	Ores	6	0.3	1.2
12	Coal	5	0.2	0.2
13	Oil & Gas	55	2.6	4.0
14	Quarry	5	0.2	0.2
15	Building – Light	9	0.4	0.6
16	Building – Heavy	4	0.2	0.2
17	Construction	3	0.1	0.3
20	Food	21	1.0	1.9
21	Tobacco	5	0.2	0.1
22	Textile Mill	6	0.3	0.7
23	Apparel	10	0.5	0.9
24	Lumber	11	0.5	0.4
25	Furniture	10	0.5	0.5
26	Paper	17	0.8	0.8
27	Printing	25	1.2	1.2
28	Chemicals	186	8.8	5.0
29	Petroleum	12	0.6	0.4
30	Rubber	15	0.7	1.1
31	Leather	6	0.3	0.2
32	Stone	9	0.4	0.6
33	Metal Work – Basic	29	1.4	1.1
34	Metal Work – Fabrication	22	1.0	1.4
35	Industrial	96	4.6	5.2
36	Electrical	127	6.0	5.5
37	Transport – Equipment	39	1.9	1.6
38	Instruments	106	5.0	4.7
39	Misc. Manufacturing	17	0.8	1.0
40	Railroad	8	0.4	0.2
42	Motor freight	12	0.6	0.6
44	Water Transport	8	0.4	0.3
45	Air Transport	15	0.7	0.6
47	Transport – Services	11	0.5	0.3
48	Communications	69	3.3	3.8
49	Utilities	75	3.6	3.0
50	Durables – Wholesale	31	1.5	2.3

Two-digit SIC	Industry	Number	Percent of Sample	Compustat Composition
51	NonDurables – Wholesale	17	0.8	1.4
52	Garden	5	0.2	0.2
53	General Stores	15	0.7	0.6
54	Food Stores	9	0.4	0.6
55	Auto Dealers	13	0.6	0.3
56	Apparel – Retail	30	1.4	0.6
57	Home Equipment	15	0.7	0.5
58	Eating	20	0.9	1.4
59	Misc. Retail	45	2.1	1.7
60	Depositories	192	9.1	7.9
61	Non-depositories	14	0.7	1.5
62	Brokers	25	1.2	1.0
63	Insurance	74	3.5	2.0
64	Ins Agents	15	0.7	0.5
65	Real Estate	8	0.4	1.3
67	Trusts	107	5.1	6.9
70	Hotels	7	0.3	0.5
72	Personal Services	6	0.3	0.3
73	Business Services	284	13.5	11.0
75	Auto Repair	2	0.1	0.2
78	Movies	5	0.2	0.9
79	Amusements	16	0.8	1.1
80	Health	34	1.6	1.7
81	Legal	1	0.0	0.0
82	Educational	5	0.2	0.3
83	Social	3	0.1	0.2
87	Engineering – Retail	45	2.1	1.8
99	Nonclassifiable	5	0.2	1.0

Panel B: Comparison of sample firms with all firms on COMPUSTAT

Variable	Sample Firms	All Firms	Test of Difference
Log(Market Cap.)	6.467	6.081	11.41***
ROA	0.037	0.017	4.24***
BM	0.674	0.767	5.40***
Profit Margin	0.045	0.020	2.69***
Sales Growth	0.047	0.041	0.66
# Analysts Following	4.95	3.84	8.92***

*, **, *** indicates significance at the 10%, 5% and 1% respectively.
For our sample of 2,106 firms with available governance data we compare difference in firm characteristics to the complete sample of 4,101 firms with available data from I/B/E/S and Compustat for the following measures:
Log(Market Cap.) is the natural log of Market Cap. which is the market value of equity of the firm at the end of 2002 fiscal year (Compustat data #25 * data #199).

ROA is return on average total assets for the 2002 fiscal year, using income from operations (Data #178). *BM* is the book-to-market ratio computed at the end of fiscal 2002. It is calculated as the ratio of book value of equity (Data #60) to Market Cap. This is only computed for firms with positive book values. *Profit Margin* is the ratio of operating income (Data #178) to total sales (Data #12) measured for the 2002 fiscal year. *Sales Growth* is the percentage change in sales (Data #12) during fiscal 2002. *# Analysts Following* is the number of analysts releasing an annual earnings forecast for the 2002 fiscal year. All financial statement variables are winsorized to be no greater than one in absolute value.

Table 2

Descriptive statistics for our vector of corporate governance variables for a sample of 2,106 firms for the fiscal year ending 06/30/2002 through 05/31/2003.

Panel A: Descriptive statistics

Variable	Var. Type	Mean	Std. Dev.	Q1	Median	Q3
Board Variables						
# AC Meetings	CNT	6.33	2.59	4	6	8
# CC Meetings	CNT	3.92	2.17	2	4	5
# Board Meetings	CNT	7.31	2.98	5	7	9
CC Size	CNT	3.52	1.15	3	3	4
AC Size	CNT	3.69	0.99	3	3	4
Board Size	CNT	8.78	2.75	7	8	10
% Board Inside	C	20.03	10.36	12.5	16.67	25
% AC Affiliated	C	10.47	18.38	0	0	25
% CC Affiliated	C	15.62	24.03	0	0	33.33
AC Chair Affiliated	I	0.07	0.26	0	0	0
CC Chair Affiliated	I	0.12	0.33	0	0	0
% Busy Outsiders	C	8.56	14.30	0	0	16.67
% Busy Affiliated	C	5.21	18.46	0	0	0
% Busy Insiders	C	26.66	39.86	0	0	50
% Old Outsiders	C	9.88	16.75	0	0	16.67
% Old Affiliated	C	6.97	21.27	0	0	0
% Old Insiders	C	1.72	8.85	0	0	0
Lead Director	I	0.08	0.27	0	0	0
Insider Chairman	I	0.77	0.42	1	1	1
% Affiliated Appointed	C	41.19	46.37	0	0	100
% Outsiders Appointed	C	68.20	34.81	40	80	100
Stock Ownership Variables						
% Outsiders Own	C	0.05	0.08	0.01	0.02	0.06
% Executives Own (Excl. Top)	C	0.56	1.39	0.03	0.10	0.37
% Top Exec.Own	C	3.30	7.38	0.11	0.47	2.34
% Affiliated Own	C	0.96	2.12	0	0.02	0.81
Institutional Ownership Variables						
% Block Own	C	15.85	13.30	5.59	13.60	24.55
# Block	CNT	1.82	1.48	1	2	3
% Largest	C	9.14	5.05	5.53	8.32	11.67
Activist Variables						
# Activists	CNT	6.61	4.12	3	6	10
% Activists Own	C	1.94	1.41	0.73	1.84	2.89

Variable	Var. Type	Mean	Std. Dev.	Q1	Median	Q3
Debt Variables						
Debt to Market	C	0.89	2.16	0.02	0.25	0.84
Preferred to Market	C	0.02	0.11	0	0	0
Compensation Mix Variables						
% Long Term Mix	C	52.91	29.34	33.14	58.59	76.93
% Accounting Mix	C	15.81	16.80	1.85	11.34	23.90
Anti-Takeover Variables						
Staggered Board	I	0.63	0.48	0	1	1
Supermajority	I	0.24	0.43	0	0	0
State Incorporated	I	0.08	0.27	0	0	0
Unequal Voting	I	0.09	0.29	0	0	0
Poison Pill	I	0.51	0.50	0	1	1

Variable Type refers to the nature of the variable: I (indicator variable), C (continuous variable), and CNT (count variable).

Board Variables
 # AC Meetings is the number of audit committee meetings (Equilar data).
 # CC Meetings is the number of compensation committee meetings (Equilar data).
 # Board Meetings is the number of board meetings (Equilar data).
CC Size is the number of directors serving on the compensation committee (Equilar data).
AC Size is the number of directors serving on the audit committee (Equilar data).
Board size is the number of directors serving on the board (Equilar data).
% Board Inside is the fraction of board comprised of insider (executive) directors (Equilar data).
% AC Affiliated is the fraction of the audit committee that is comprised of affiliated (grey) directors. Any outside director who is a former executive or who is mentioned in the "certain transactions" section of the proxy statement is classified as affiliated (Equilar data).
% CC Affiliated is the fraction of the compensation committee that is comprised of affiliated (grey) directors (Equilar data).
AC Chair Affiliated is an indicator variable equal to one if the chairperson of the audit committee is affiliated and zero otherwise.
CC Chair Affiliated is an indicator variable equal to one if the chairperson of the compensation committee is affiliated and zero otherwise.
% Busy Outsiders is the fraction of outside directors who serve on 4 or more other boards (Equilar data).
% Busy Affiliated is the fraction of affiliated directors who serve on 4 or more other boards (Equilar data).
% Busy Insiders is the fraction of insider directors who serve on 2 or more other boards (Equilar data).
% Old Outsiders is the fraction of outside directors that are older than 70 (Equilar data).
% Old Affiliated is the fraction of affiliated directors that are older than 70 (Equilar data).
% Old Insiders is the fraction of inside directors that are older than 70 (Equilar data).
Lead Director is an indicator variable equal to one of there is a lead director on the board and zero otherwise (Equilar data).
Insider Chairman is an indicator variable equal to one if an executive holds the position of chairperson of the board and zero otherwise (Equilar data).
% Affiliated Appointed is the fraction of affiliated directors that were appointed by existing insiders. This variable is set to zero if there are no affiliated directors (Equilar data).
% Outsiders Appointed is the fraction of outside directors that were appointed by existing insiders. This variable is set to zero if there are no outside directors (Equilar data).

Stock Ownership Variables
% Outsiders Own is the fraction of outstanding shares held by the average outside director (Equilar data).
% Executives Own (Excl. Top) is the fraction of outstanding shares held by the average executive director but excludes the holdings of the tope executive.   (Equilar data).
% Top Exec. Own is the fraction of outstanding shares held by the top executive (Equilar data).
% Affiliated Own is the fraction of outstanding shares held by the average affiliated director (Equilar data).
All stock ownership variables include only shares of common stock held and exclude options.

Institutional Ownership Variables
% Block Own is the fraction of outstanding shares owned by block-holders (Spectrum data). A Block-holder is defined as a shareholder who holds more than 5% of outstanding shares.
 # Block is the number of block-holders (Spectrum data).
% Largest is the shareholding of the largest institution (Spectrum data).

Activist Variables
 # Activists is the number of activist institutions holding shares. An activist is defined as per Cremers and Nair (forthcoming). Specifically, the following activist public pension funds are classified as activists: institutions with the following manager numbers on Spectrum are coded as activists: California Public Employees Retirement System (12000), California State Teachers Retirement (12100 and 12120), Colorado Public Employees Retirement Association (18740), Florida State Board of Administration (38330), Illinois State Universities Retirement System (81590), Kentucky Teachers Retirement System (49050), Maryland State Retirement and Pension System (54360), Michigan State Treasury (57500), Montana Board of Investment (58650), Education Retirement Board New Mexico (63600), New York State Common Retirement Fund (63850), New York State Teachers Retirement System (63895), Ohio School Employees Retirement System (66550), Ohio School Employees Retirement System (66610), Ohio State Teachers Retirement System (66635), Texas Teachers Retirement System (82895 and 83360), Virginia Retirement System (90803), State of Wisconsin Investment Board (93405). Manager numbers are in parentheses (Spectrum data).
% Activists Own is the fraction of outstanding shares held by activist institutions (Spectrum data).

Debt Variables
Debt to Market is the ratio of book value of debt (Compustat data item 9 plus data item 34) to the market value of equity (Compustat data item 199 * data item 25).
Preferred to Market is the ratio of book value of preferred equity (Compustat data item 130) to the market value of equity (Compustat data item 199 * data item 25).

Compensation Mix Variables
% Long Term Mix is the fraction of total annual CEO compensation that is comprised of payments from performance plans, stock options and restricted stock grants.
% Accounting Mix is the fraction of total annual CEO compensation that is comprised of payments that are earned by exceeding accounting targets in performance plans and annual bonus.

Anti-Takeover Variables
Staggered Board is an indicator variable equal to one if the firm has a staggered board and zero otherwise (Shark Repellant data).
Supermajority is an indicator variable equal to one if the firm has a supermajority provision for takeovers and zero otherwise (Shark Repellant data).
State Incorporated is an indicator variable equal to one if the firm is incorporated in Pennsylvania, Ohio, Wisconsin or Massachusetts, and zero otherwise (Shark Repellant data).
Unequal Voting is an indicator variable equal to one if there are unequal voting rights across common shareholders and zero otherwise (Shark Repellant data).
Poison Pill is an indicator variable equal to one if the firm has adopted a poison pill and zero otherwise (Shark Repellant data).

Table 3
Exploratory principal component analysis (PCA).
Factors are computed using PCA where we retain all factors with an eigen-value greater than one. This table reports the loadings on individual governance variables for each of the 14 factors (reported in order of total variance explained). We retain variables where the absolute value of the loading exceeds 0.4 and the loading is significant at conventional levels (using boot-strapped standard errors).

Factor	Component Loading	Standard Error	Factor	Component Loading	Standard Error
Active			**Anti-Takeover I**		
# Activists	0.654	0.066	Poison Pill	0.665	0.139
% Activists Own	0.625	0.070	% Affiliated Own	-0.517	0.173
% Outsiders Own	-0.665	0.072	Staggered Board	0.476	0.225
Block			**Old Directors**		
% Block Own	0.985	0.003	% Old Outsiders	0.688	0.334
# Block	0.877	0.008	% Old Affiliated	0.563	0.312
% Largest	0.848	0.008	% Old Insiders	0.605	0.332
Affiliated			**Debt**		
% AC Affiliated	0.822	0.183	Debt to Market	0.778	0.296
% CC Affiliated	0.627	0.072	Preferred to Market	0.804	0.306
AC Chair Affiliated	0.824	0.242			
CC Chair Affiliated	0.536	0.089	**Insider Power**		
			% Executives Own (Excl. Top)	0.737	0.193
Insider Appointed			% Top Exec. Own	0.720	0.181
% Affiliated Appointed	0.752	0.089	% Board Inside	0.467	0.105
% Outsiders Appointed	0.768	0.095	Unequal Voting	0.396	0.200
Compensation Mix			**Board Size**		
% Long Term Mix	-0.824	0.386	CC Size	0.884	0.017
% Accounting Mix	0.896	0.465	AC Size	0.872	0.019
			Board Size	0.693	0.032
Meetings					
# AC Meetings	0.762	0.111	**Anti-Takeover II**		
# CC Meetings	0.678	0.108	Supermajority	0.625	0.294
# Board Meetings	0.695	0.115	State Incorporated	0.792	0.388
			Busy Directors		
Lead Director			% Busy Outsiders	0.424	0.208
Lead Director	0.842	0.412	% Busy Affiliated	0.698	0.321
Insider Chairman	-0.441	0.177	% Busy Insiders	0.452	0.202

All variables are as defined in Table 2.

Table 4
Descriptive Statistics and Correlations for the Factor Scores.

Panel A: Descriptive Statistics

Factor	Percent Explained	Mean	Std. Dev.	Q1	Median	Q3
Active	10.72	0	0.788	-0.559	0.002	0.729
Block	7.41	0	0.908	-0.677	-0.079	0.639
Affiliated	5.86	0	0.735	-0.467	-0.467	0.247
Insider Appointed	5.43	0	0.836	-0.706	0.013	0.856
Comp. Mix	4.85	0	0.872	-0.696	-0.162	0.481
Meetings	3.87	0	0.739	-0.547	-0.093	0.445
Lead Director	3.53	0	0.654	-0.419	-0.419	0.765
Anti-Takeover I	3.28	0	0.650	-0.625	0.041	0.714
Old Directors	3.03	0	0.814	-0.371	-0.371	0.127
Debt	2.94	0	0.658	-0.292	-0.235	-0.066
Insider Power	2.84	0	0.835	-0.425	-0.226	0.168
Board Size	2.73	0	0.667	-0.600	-0.216	0.391
Anti-Takeover II	2.61	0	0.767	-0.425	-0.425	0.749
Busy Directors	2.61	0	0.651	-0.516	-0.183	0.320

Factor scores are calculated as the average of the standardized components with the exception of Active, Anti-Takeover I, Compensation Mix and Lead Director. These factors have substitute components. These factor scores are calculated using the respective standardized components as follows to reflect the substitutability: Active is the sum of # Activists and % Activist Own minus % Outsider Own, divided by three. Anti-Takeover I is the sum of Staggered Board and Poison Pill minus % Affiliated Own, divided by three. Compensation Mix is % Accounting Mix minus % Long Term Mix, divided by two. Lead Director is Lead Director minus Insider Chairman, divided by two.

Panel B: Correlations – Pearson (Spearman) correlations are presented in the upper (lower) diagonal.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Active (1)	--	.088 (.000)	-.197 (.000)	-.067 (.002)	-.159 (.000)	.209 (.000)	.213 (.000)	-.036 (.099)	-.082 (.000)	-.183 (.000)	.301 (.000)	-.075 (.001)	.063 (.004)	.325 (.000)
Block (2)	.097 (.000)	--	-.059 (.007)	-.041 (.060)	-.037 (.088)	-.050 (.022)	.029 (.187)	-.027 (.215)	-.021 (.328)	.024 (.269)	-.155 (.000)	.047 (.030)	-.049 (.023)	.003 (.906)
Affiliated (3)	-.217 (.000)	-.076 (.000)	--	.167 (.000)	.043 (.051)	-.056 (.010)	-.245 (.000)	.093 (.000)	.141 (.000)	.088 (.000)	-.069 (.002)	.008 (.730)	-.050 (.021)	-.017 (.427)
Insider Appointed (4)	-.093 (.000)	-.039 (.074)	.248 (.000)	--	.022 (.322)	-.124 (.000)	-.086 (.000)	.119 (.000)	-.013 (.548)	.270 (.000)	-.082 (.000)	-.214 (.000)	-.033 (.129)	-.044 (.042)
Compensation Mix (5)	-.150 (.000)	-.058 (.008)	.037 (.088)	.005 (.812)	--	-.147 (.000)	-.039 (.074)	.096 (.000)	.056 (.010)	.131 (.000)	.087 (.000)	-.042 (.057)	.110 (.000)	-.098 (.000)
Meetings (6)	.241 (.000)	-.041 (.057)	-.066 (.002)	-.141 (.000)	-.138 (.000)	--	.117 (.000)	-.068 (.002)	.092 (.000)	-.198 (.000)	.222 (.000)	.086 (.000)	.027 (.222)	.071 (.001)
Anti-Takeover I (7)	.236 (.000)	.036 (.099)	-.317 (.000)	-.139 (.000)	-.016 (.453)	.126 (.000)	--	-.042 (.052)	-.097 (.000)	-.170 (.000)	.169 (.000)	-.027 (.207)	.139 (.000)	.036 (.097)
Old Directors (8)	-.016 (.457)	-.042 (.053)	.061 (.005)	.077 (.000)	.104 (.000)	-.048 (.026)	-.081 (.000)	--	.012 (.568)	.127 (.000)	.027 (.208)	-.026 (.233)	.036 (.097)	-.024 (.280)
Debt (9)	.070 (.001)	-.052 (.017)	.008 (.699)	-.022 (.309)	.219 (.000)	.165 (.000)	.047 (.030)	.077 (.000)	--	.035 (.112)	.028 (.198)	-.009 (.673)	.003 (.904)	-.007 (.761)
Insider Power (10)	-.251 (.000)	.031 (.154)	.079 (.000)	.346 (.000)	.029 (.183)	-.224 (.000)	-.158 (.000)	.094 (.000)	-.112 (.000)	--	-.256 (.000)	-.197 (.000)	-.033 (.128)	-.169 (.000)
Board Size (11)	.356 (.000)	-.129 (.000)	-.059 (.007)	-.104 (.000)	.143 (.000)	.247 (.000)	.181 (.000)	.091 (.000)	.319 (.000)	-.361 (.000)	--	.024 (.262)	.190 (.000)	.198 (.000)
Lead Director (12)	-.096. (.000)	.037 (.092)	.019 (.384)	-.223 (.000)	-.028 (.206)	.063 (.004)	-.043 (.047)	-.001 (.977)	-.023 (.293)	-.210 (.000)	.018 (.414)	--	.002 (.933)	-.012 (.580)
Anti-Takeover II (13)	.071 (.001)	-.060 (.006)	-.061 (.005)	-.030 (.174)	.156 (.000)	.024 (.277)	.132 (.000)	.036 (.094)	.138 (.000)	-.054 (.014)	.215 (.000)	-.006 (.800)	--	-.009 (.678)
Busy (14)	.372 (.000)	.039 (.076)	-.036 (.095)	-.075 (.001)	-.114 (.000)	.077 (.000)	.059 (.006)	-.021 (.339)	.081 (.000)	-.236 (.000)	.214 (.000)	-.022 (.305)	-.005 (.820)	--

Table 5
Relation Between Abnormal Accruals and Governance Factors

Abnormal Accruals$_t$ = α + ΣβGovernance Factors$_t$ + ε$_t$

Variable	Pred. Sign	Ordinary Least Squares Governance Only Specification		Recursive Partitioning Governance Only Specification
Governance				
Intercept		0.008		
Active	-	0.008	***	Linear (+)
Block	-	0.005	*	
Affiliated	+	-0.005		
Insider Appointed	+	0.007	***	Non-Linear
Compensation Mix	+/?	0.006	***	
Meetings	-	-0.001		
Lead Director	-	0.004		
Anti-Takeover I	+	-0.001		
Old Directors	+	-0.001		Non-Linear
Debt	-	-0.005		
Insider Power	+	0.008	***	
Board Size	+	0.001		Non-Linear
Anti-Takeover II	+	0.005		Linear (+)
Busy Directors	+	0.004		
Controls				
		n/a		n/a
Sample Size		1,471		1,471
R^2 (Adj. R^2) Governance Factors Only		2.8% (1.90%)		4.51%

*,**,*** Indicates significance at the 10, 5 and 1 percent level respectively (two-tailed tests) for the OLS regression specification. For the recursive partitioning analysis we report only those governance factors that were significant and note whether the relation was linear or non-linear. If linear, we also note the sign of the relation.

This regression specification does not include any control variables in addition to the governance factors as we are looking at a measure of abnormal accruals.

The accrual model is estimated using the Jones (1991) technique of decomposing total accruals into a normal (expected) and abnormal (unexpected) component. The method of decomposition is as follows:
$TA = α + β_1(ΔSales-ΔREC) + β_2PPE + β_3BM + β_4CFO + ε$
TA is the difference between operating cash flows (item 308) and income before extraordinary items (item 123) as reported on the statement of cash flows. *ΔSales* is the change in sales (item 12) for the year. *ΔREC* is the change in receivables reported on the statement of cash flows (item 302) for the year. *PPE* is the gross amount of property, plant and equipment (item 7). *CFO* is the operating cash flows (item 308). All variables used in the abnormal accrual model (except *BM*) are scaled by average total assets using assets from the start and end of the fiscal year. The regression is run for every 2 digit SIC group in the sample with a requirement of at least 10 observations in each group. Independent variables in the accrual model are all winsorized to be no greater than one in absolute value, with the exception of BM that is

winsorized at the extreme two percentiles (i.e., values less (greater) than the 2nd (98th) percentile are set equal to the value of the 2nd (98th) percentile). *Abnormal Accruals* is the residual from the above equation.

Table 6
Relation Between Earnings Restatements and Governance Factors

$$Restatement_t = \alpha + \Sigma\varphi Controls_t + \Sigma\beta Governance\ Factors_t + \varepsilon_t$$

Variable	Pred. Sign	Logistic		Recursive Partitioning	
		Governance Only Specification	Governance and Controls Specification	Governance Only Specification	Governance and Controls Specification
Governance					
Intercept		-2.867 ***	-3.411 ***		
Active	-	-0.145	-0.238		
Block	-	0.040	0.089		
Affiliated	+	-0.135	-0.154		
Insider Appointed	+	-0.136	-0.128		Linear (-)
Compensation Mix	+/?	-0.020	0.059		
Meetings	n/a	n/a	n/a	n/a	n/a
Lead Director	-	0.080	0.087		
Anti-Takeover I	+	0.117	0.109		
Old Directors	+	-0.194	-0.191		
Debt	-	0.185 **	0.171 **	Linear (+)	Linear (+)
Insider Power	+	0.290 **	0.277 *		Non-linear
Board Size	+	0.079	0.020	Linear (-)	
Anti-Takeover II	+	-0.072	-0.059		
Busy Directors	+	0.147	0.101		
Controls					
BM	-		-0.317		Non-linear
Log (Market Cap.)	+		0.102		
External Financing	+		0.188		
Acquisitions	+		0.757		
Free Cash Flow	+		-0.584		
Sample Size		2,094	2,094	2,094	2,094
R^2 Governance Factors Only		1.8%		n/a	
Incremental R^2 from Controls			1.1%		n/a
Incremental R^2 from Governance Factors			2.0%		n/a

Hit rates for correctly classifying the occurrence of Restatements					
Cut-off value	0.10	0.20	0.30	0.40	0.50
ECONOMIC DETERMINANTS	0.8%	0%	0%	0%	0%
GOVERNANCE ONLY	6.8%	0.8%	0%	0%	0%
FULL	10.2%	1.7%	0%	0%	0%

Hit rates for correctly classifying the absence of Restatements					
Cut-off value	0.10	0.20	0.30	0.40	0.50
ECONOMIC DETERMINANTS	100%	100%	100%	100%	100%
GOVERNANCE ONLY	98.1%	99.7%	100%	100%	100%
FULL	96.5%	99.6%	100%	100%	100%

*,**,*** Indicates significance at the 10, 5 and 1 percent level respectively (two-tailed tests) for the logistic regression specifications. For the recursive partitioning analysis we report only those governance factors that were significant and note whether the relation was linear or non-linear. If linear, we also note the sign of the relation.

Restatement is an indicator variable equal to one if the firm reports an earnings restatement related to the fiscal year (or a subsequent fiscal period) for which we have governance data, and zero otherwise. For example, firm XYZ has a December 31, 2002 fiscal year end. If XYZ restates its earnings for any of the fiscal periods from January 1, 2002 onwards Earnings Restatement=1. Firms that restate earnings in an earlier fiscal period are dropped from the analysis. For example, if firm XYZ had a restatement prior to January 1, 2002 we exclude that observation from our analysis. This leaves us with a sample of 2,095 firms of which 118 restate earnings. We exclude earlier restatements because we cannot be sure that the governance structures we measure have changed in response to the restatement.

Control variables include BM (book-to-market) calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), External Financing, calculated as the total net external financing from debt-holders and shareholders during the fiscal period that was restated (calculated as net equity financing, item 108 – item 115 – item 127, plus net debt financing, item 111 – item 114 + item 301, all deflated by beginning market value of equity), Log (Market Cap.), measured as the natural logarithm of market value of common equity, Free Cash Flow (measured as the difference between operating cash flows, item 308, and average capital expenditures over the 3 prior years, item 128) and Acquisitions (calculated as total cash spent on acquisitions during the fiscal period restated, item 129, deflated by beginning market value of equity). BM and Log (Market Cap.) are measured prior to the fiscal period which is restated. All control variables are winsorized at the extreme two percentiles (i.e., values less (greater) than the 2nd (98th) percentile are set equal to the value of the 2nd (98th) percentile). Note that Meetings is excluded from the set of governance factors in these regression analyses because the number of meetings is influenced by the restatement in the period it is discovered/announced.

Table 7
Relation Between Class Action Lawsuits and Governance Factors

$$\text{Lawsuit}_t = \alpha + \Sigma\varphi\text{Controls}_t + \Sigma\beta\text{Governance Factors}_t + \varepsilon_t$$

Variable	Pred. Sign	Logistic		Recursive Partitioning	
		Governance Only Specification	Governance and Controls Specification	Governance Only Specification	Governance and Controls Specification
Governance					
Intercept		-2.215 ***	-4.329 **		
Active	-	0.317 ***	0.170	Linear (+)	
Block	-	0.037	0.110		
Affiliated	+	-0.137	-0.135		
Insider Appointed	+	0.020	0.049		
Compensation Mix	+/?	-0.576 ***	-0.542 ***	Linear (-)	Linear (-)
Meetings	n/a	n/a	n/a		
Lead Director	-	-0.033	-0.027		
Anti-Takeover I	+	-0.006	-0.023		
Old Directors	+	-0.047	-0.045		
Debt	-	0.373 ***	0.210 **	Non-linear	
Insider Power	+	0.182	0.167		
Board Size	+	-0.032	-0.109		
Anti-Takeover II	+	-0.037	0.032		
Busy Directors	+	0.154	0.014		
Controls					
BM	-		0.206		Linear (-)
Negative Earnings	+		-0.275		Linear (-)
Big Auditor	+		0.496		
Size	+		0.310 ***		Linear (+)
Total Accruals	+		0.299		Non-linear
ROA	-		-2.560 ***		Non-linear
Age	-		-0.167 *		
Sample Size		1,838	1,794	1,838	1,794
R^2 Governance Factors Only		7.6%		n/a	
Incremental R^2 from Controls			4.3%		n/a
Incremental R^2 from Governance Factors			4.9%		n/a

Hit rates for correctly classifying the occurrence of Class Action Lawsuits					
Cut-off value	0.10	0.20	0.30	0.40	0.50
ECONOMIC DETERMINANTS	66.3%	22.1%	7.5%	1.0%	0%
GOVERNANCE ONLY	75.1%	13.7%	3.9%	2.4%	0%
FULL	75.4%	27.6%	11.1%	5.0%	4.0%`

Hit rates for correctly classifying the absence of Class Action Lawsuits					
Cut-off value	0.10	0.20	0.30	0.40	0.50
ECONOMIC DETERMINANTS	55.5%	93.1%	98.7%	99.8%	100%
GOVERNANCE ONLY	50.6%	94.2%	99.1%	99.5%	100%
FULL	57.8%	91.2%	98.1%	99.2%	99.7%

*,**,*** Indicates significance at the 10, 5 and 1 percent level respectively (two-tailed tests) for the logistic regression specifications. For the recursive partitioning analysis we report only those governance factors that were significant and note whether the relation was linear or non-linear. If linear, we also note the sign of the relation.

Lawsuit is an indicator variable equal to one of the firm has a class action lawsuit filed during or after the year for which we have available governance data, and zero otherwise. For example, firm XYZ has a December 31, 2002 fiscal year end. If XYZ is named in as defendant in a class action lawsuit from January 1, 2002 onwards Class Action=1. Firms that are subject to a class action filing in the period prior to the fiscal period we examine are excluded from the analysis. For example, if firm XYZ had a class action filed prior to January 1, 2002 we exclude that observation from our analysis. This leaves us with a sample of 1,764 firms of which 196 experience a class action suit. We exclude earlier suits because we cannot be sure that the governance structures we measure have changed in response to the filing.

Control variables for the class action lawsuit analysis include BM (book-to-market) calculated as the book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199), Size calculated as the log of total assets (Compustat data item 6), an indicator variable capturing whether a brand-name auditor is used (Big Auditor), total accruals measured as the change in net operating assets deflated by average total assets (Compustat data item 6), Age calculated as the log of the number of months the firm has been listed on CRSP, ROA (return on assets) calculated as income before extraordinary items (Compustat data item 178) scaled by average total assets, and an indicator variable capturing whether the firm reported a loss or not (Negative Earnings) . All control variables are measured for the fiscal year prior to the filing of the class action suit (i.e., covering the class action period) and are winsorized at the extreme two percentiles (i.e., values less (greater) than the 2nd (98th) percentile are set equal to the value of the 2nd (98th) percentile). Note that Meetings is excluded from the set of governance factors in these regression analyses because the number of meetings is influenced by the class action lawsuit in the period it is discovered/announced.

Table 8
Relation Between Future Operating Performance and Governance Factors

$$ROA_{t+1} = \alpha + \Sigma\varphi Controls_t + \Sigma\beta Governance\ Factors_t + \varepsilon_t$$

Variable	Pred. Sign	Ordinary Least Squares				Recursive Partitioning	
		ROA$_{t+1}$		Industry Adjusted ROA$_{t+1}$		ROA$_{t+1}$	Industry Adjusted ROA$_{t+1}$
		Governance Only Specification		Governance and Controls Specification		Governance and Controls Specification	Governance and Controls Specification
Governance							
Intercept		0.037	***	-0.271	***		
Active	+	0.062	***	0.004		Linear (+)	Linear (+)
Block	+	0.002		0.010	***		
Affiliated	-	-0.004		-0.004			
Insider Appointed	-	-0.003		-0.003			
Compensation Mix	+/?	0.032	***	0.025	***	Linear (+)	Linear (+)
Meetings	+	-0.005		-0.003			
Lead Director	+	0.000		0.003	*		
Anti-Takeover I	-	-0.019	***	-0.007			
Old Directors	-	0.005		0.004			
Debt	+	-0.012	***	-0.001		Linear (-)	Linear (-)
Insider Power	-	0.012	**	0.006			
Board Size	-	0.012	***	-0.008	*		
Anti-Takeover II	-	0.007	*	0.007	*		
Busy Directors	-	-0.005		-0.023	***		
Controls							
Log (Market Cap.)				0.400	***		
Sample Size		2,060		2,007		2,060	2,007
R^2 (Adj. R^2) Governance Factors Only		14.8% (14.2%)				16.18%	
Incremental R^2 from Controls				5.9%			12.27%
Incremental R^2 from Governance Factors				4.7%			6.63%

 *,**,*** Indicates significance at the 10, 5 and 1 percent level respectively (two-tailed tests) for the OLS regression specifications. For the recursive partitioning analysis we report only those governance factors that were significant and note whether the relation was linear or non-linear. If linear, we also note the sign of the relation.

ROA (return on assets) is calculated as income before extraordinary items (Compustat data item 178) scaled by average total assets.

Control variables for the operating performance regressions include Log (Market Cap.), measured as the natural logarithm of market value of common equity at the start of the fiscal period, and industry adjusted ROA (using the median ROA for each 2 digit SIC code with at least 5 firms).

Table 9
Relation Between Firm Value (1/Q) and Governance Factors

$$1/Q_t = \alpha + \Sigma\varphi Controls_t + \Sigma\beta Governance\ Factors_t + \varepsilon_t$$

Variable	Pred. Sign	Ordinary Least Squares				Recursive Partitioning	
		Governance Only Specification		Governance and Controls Specification		Governance Only Specification	Governance and Controls Specification
Governance							
Intercept		0.711		0.034			
Active	-	-0.035	***	-0.062	***	Linear (-)	
Block	-	0.041	***	0.032	***	Linear (+)	
Affiliated	+	-0.008		0.000			
Insider Appointed	+	0.012		0.017	*		
Compensation Mix	+/?	0.026	***	0.007			
Meetings	-	0.035	***	0.020	*		
Lead Director	-	0.016		0.016			
Anti-Takeover I	+	0.011		0.030	**		
Old Directors	+	0.005		-0.025	*		
Debt	-	0.064	***	-0.011		Non-Linear	Linear (+)
Insider Power	+	-0.014		-0.023	*		
Board Size	+	0.013		-0.023		Linear (-)	
Anti-Takeover II	+	0.020	**	0.014			
Busy Directors	+	-0.017		0.003		Linear (-)	Linear (-)
Controls							
Size	+			0.030	***		Linear (-)
Log(Age)	-			-0.033	***		
SP500	-			-0.120	***		
RD	-			-0.749	***		
# Segments	+			0.002			
ROA_t	-			-0.667	***		Linear (-)
ROA_{t-1}	-			0.104	*		
ROA_{t-2}	-			0.114	**		
Industry Indicators				Yes			
Sample Size		2,106		1,633		2,106	1,633
R^2 (Adj. R^2) Governance Factors Only		5.70% (5.10%)				19.37%	
Incremental R^2 from Controls				6.20%			1.61%
Incremental R^2 from Governance Factors				2.30%			1.31%

*,**,*** Indicates significance at the 10, 5 and 1 percent level respectively (two-tailed tests) for the OLS regression specifications. For the recursive partitioning analysis we report only those governance factors that were significant and note whether the relation was linear or non-linear. If linear, we also note the sign of the relation.

1/Q is calculated as the sum of book value of debt (Compustat item 9 + item 34) and the book value of equity (item 60) deflated by the sum of the book value of debt and the market value of equity (item 25 * item199). Our control variables include Size (measured as the log of total assets (item 6)), Log(Age) (is the log of the number of months that the firm has been listed on a US exchange as reported in CRSP), SP500 (an indicator variable equal to one if the firm is a member of the S&P 500 index and zero otherwise), RD (is research and development expenditure (item 46) divided by total assets (item 6)), # Segments (is the number of segments as reported on Compustat), and ROA (return on assets measured as net income (item 178) deflated by average total assets). All control variables are winsorized at the extreme two percentiles (i.e., values less (greater) than the 2nd (98th) percentile are set equal to the value of the 2nd (98th) percentile). We also include a vector of industry fixed effects (2 digit SIC) in the 1/Q regression. Note that we have measured 1/Q as the book values relative to market values (this more closely resembles a normal distribution than a Q measure of market values relative to book values), hence our predicted signs will be opposite to some prior research.

Table 10
Relation Between Future Stock Returns and Governance Factors

$$Alpha_t = \alpha + \Sigma\beta Governance\ Factors_t + \varepsilon_t$$

Variable	Pred. Sign	Ordinary Least Squares Governance Only Specification		Recursive Partitioning Governance Only Specification
Governance				
Intercept		-0.002		
Active	+	0.001		
Block	+	0.000		Non-Linear
Affiliated	-	0.000		
Insider Appointed	-	0.002	*	Linear (+)
Compensation Mix	-/?	0.004	***	Linear (+)
Meetings	+	0.001		
Lead Director	+	0.004	***	Linear (+)
Anti-Takeover I	-	-0.002		
Old Directors	-	0.001		
Debt	+	-0.003	***	
Insider Power	-	-0.004	***	
Board Size	-	0.002		
Anti-Takeover II	-	0.000		
Busy Directors	-	0.001		
Controls				
		n/a		n/a
Sample Size		2,066		2,066
R^2 (Adj. R^2) Governance Factors Only		2.6% (2.0%)		2.72%

*,**,*** Indicates significance at the 10, 5 and 1 percent level respectively (two-tailed tests) for the OLS regression specifications. For the recursive partitioning analysis we report only those governance factors that were significant and note whether the relation was linear or non-linear. If linear, we also note the sign of the relation.

This regression specification does not include any control variables in addition to the governance factors since our dependent variable is a measure of excess (risk-adjusted) stock returns.

Alpha is the intercept from a regression of monthly firm excess returns (excess over the risk free rate) on the monthly factor returns (MKT, SMB, HML and UMD). The factor returns are obtained from Ken French's website. For each firm we use up to 30 months of return data to generate Alpha.