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Corporate Governance, Accounting Outcomes, and Organizational Performance

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ABSTRACT: The empirical research examining the association between typical measures of corporate governance and various accounting and economic outcomes has not produced a consistent set of results. We believe that these mixed results are partially attributable to the difficulty in generating reliable and valid measures for the complex construct that is termed "corporate governance." Using a sample of 2,106 firms and 39 structural measures of corporate governance (e.g., board characteristics, stock ownership, institutional ownership, activist stock ownership, existence of debtholders, mix of executive compensation, and anti-takeover variables), our exploratory principal component analysis suggests that there are 14 dimensions to corporate governance. We find that these indices have a mixed association with abnormal accruals, little relation to accounting restatements, but some ability to explain future operating performance and future excess stock returns.

Keywords: *corporate governance; earnings quality; firm performance; principal component analysis; recursive partitioning.*

Data Availability: *Some of the data are available from the public sources indicated in the text. Other data are a proprietary offering from commercial providers.*

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I. INTRODUCTION

Corporate governance 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 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 et al. (1988), Byrd and Hickman (1992), Brickley et al. (1994), Yermack (1996), Core et al. (1999), Klein (2002), and Gompers et al. (2003).[2]

It is difficult to conceive of a situation where corporate governance is not relevant for understanding managerial behavior and organizational performance. However, the open research question is whether the *structural* indicators that are typically used to measure corporate governance actually capture the essence of this complex construct and exhibit acceptable levels of measurement error.[3] While prior work has examined many measures of corporate governance, the results are frequently contradictory and a consistent set of empirical results has yet to emerge regarding the importance of corporate governance for understanding accounting outcomes and organizational performance.

We suspect that part of the explanation for these mixed results is that measures used in the empirical analysis exhibit a modest level of reliability and construct validity. Most studies use either a single indicator for corporate governance, or arbitrary indices. The measurement error introduced from using a single indicator (e.g., percentage of external board members) for a complex construct (e.g., board independence) will almost certainly cause the regression coefficients to be inconsistent.[4] Similar econometric problems will be produced if a set of indicators are naively summed to form some type of governance index (e.g., the ''G-score'' used by Gompers et al. 2003). The use of multiple indicators can alleviate the measurement error associated with a single indicator. However, unless the individual indicators are measuring the same underlying governance construct, the resulting index will be difficult to interpret and contain substantial measurement error.

Prior research also tends to use a limited sample of the dimensions of corporate governance and this will generally create correlated omitted variable problems. For example,

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[1] There are also many organizations that sell governance ratings (e.g., GovernanceMetrics International, Institutional Shareholder Services, Investor Responsibility 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. One possible exception is Gompers et al. (2003), but the recent work by Cremers and Nair (2005) and Core et al. (2006) demonstrates that the Gompers et al. (2003) results are statistically fragile.

[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).

[3] We define *structural* indicators as measures of corporate governance that can be produced by external observers (e.g., board size, equity owned by the officers, etc.). Although infeasible for large sample analysis, it is also possible to develop measures of corporate governance from interviews with board members and a detailed assessment of governance practices from inside the organization (e.g., Leblanc and Gillies 2005; Hendry et al. 2006). For obvious reasons, most empirical research on corporate governance relies on structural indicators.

[4] 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 (see Bollen [1989, 159–167] for a summary discussion of this issue).

researchers using only the ''G-score'' are capturing some combination of anti-takeover provisions, but ignoring other important dimensions of governance (e.g., ownership, board structure, etc.). Unless the omitted dimensions are uncorrelated with those included in the analysis (which is a very unlikely outcome), the interpretation of the regression coefficient for the ''G-score'' will be problematic.

The purpose of this paper is to provide an exploratory inquiry into the dimensions of corporate governance and start the process of developing reliable and valid measures for this important construct.[5] This task is especially difficult because (to our knowledge) there is not a well-developed theory about the complex, multi-dimensional nature of corporate governance or a conceptual basis for selecting the relevant governance characteristics to include in an empirical study.[6] Absent clear theory, it is difficult to specify the appropriate structural models and determine whether the relevant corporate governance constructs are included in the analysis. As a result, it is important to highlight that our analysis is inherently *exploratory* and represents an initial attempt to describe the linkages between multiple measures of governance and selected outcome variables. Subsequent research will be necessary to extend and refine these measures.

Our research is designed to assess whether the somewhat standard structural measures of corporate governance are useful in understanding managerial behavior and corporate performance. If we find unexpected relations and/or statistically insignificant results after a careful attempt to develop reliable and valid measures of governance, then this raises concerns about the use of these traditional structural measures for archival governance research. However, this result does *not* necessarily imply that corporate governance has little impact on executive behavior or organizational performance. This result may simply indicate that our ability as researchers to measure and capture the construct of corporate governance is very limited with existing structural measures.

Our measurement analysis starts with a broad sample of structural indicators of corporate governance including board characteristics, anti-takeover provisions, compensation characteristics, ownership, and capital structure characteristics. Using exploratory principal component analysis (PCA), we find that 14 factors characterize the dimensionality of our 39 individual governance indicators. This observed structure enables us to identify a set of indicators for each dimension of corporate governance and compute indices that exhibit reasonable levels of reliability and construct validity for an exploratory study.

The resulting 14 corporate governance indices exhibit a mixed association with abnormal accruals and little relation to accounting restatements. However, we find that firms with a greater proportion of blockholders, a compensation mix that is weighted toward accounting performance, lead directors, smaller boards, and fewer busy directors exhibit superior future operating performance. Further, future excess stock returns are higher when compensation mix is weighted toward accounting performance, there is a lead director, and insider power is low. Thus, the typical *structural* indicators of corporate governance used in academic research and institutional rating services have only a modest ability to explain ''accounting manipulations,'' but exhibit some ability to explain future operating and stock

[5] This is an important topic for accounting because our discipline is fundamentally about measurement. While there has been considerable discussion about measuring certain constructs such as accruals (e.g., Dechow et al. 1996) and cost of capital (e.g., Easton and Monahan 2005), there has been relatively little attention devoted to the measurement of corporate governance.

[6] As discussed by Harris and Raviv (2006), there is relatively little formal theoretical work on corporate governance. Harris and Raviv (2006) and Hermalin and Weisbach (1998) provide some theoretical insights into the structure of board. However, theoretical work on the more general construct of corporate governance (to our knowledge) is unavailable.

price performance. The mixed ability of our governance measures to explain variation across a set of dependent variables makes broad generalizations difficult. Without a well-specified underlying structural model linking the many dimensions of governance to firm-level decision making and overall firm performance, it is difficult to make strong conclusions about the importance of corporate governance. Future research is needed to refine measures of corporate governance and develop structural models to enable a more sophisticated examination of the importance of corporate governance mechanisms.

The remainder of the paper is divided into five sections. Section II describes the sample selection and the governance indicators used in the study. Section III presents the PCA results and develops our 14 indices for corporate governance. Section IV presents the association between these governance indices and abnormal accruals, restatements, future operating performance, and future excess stock price returns. Section V provides a discussion of how our results are affected by using an alternative methodological approach (recursive partitioning), a single cross-section of data that coincides with Sarbanes-Oxley Act of 2002, and possible endogeneity of our governance constructs. A summary of the results and the conclusions are presented in Section VI.

II. SAMPLE SELECTION AND CORPORATE GOVERNANCE INDICATORS

Sample

Our sample was generated from the overlap between two comprehensive data sets. The first data set consists of the anti-takeover provisions for companies covered during 2002 and 2003 by TrueCourse, Inc. (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 & Poor's 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 are 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 TrueCourse and Equilar data, we have a final sample of 2,106 individual firms with complete data. This 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.[7] Finally, our sample consists of firms that are larger, more profitable, exhibit a lower book-to-market, and have more following by analysts than all other Compustat firms (see Table 1, Panel B).[8]

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

[7] Our sample only covers one year and this limits our ability to generalize the results. However, the single year of data covers a very recent time period and prior work involving large samples also is restricted to a single year (e.g., Bhagat 2004; Brown and Caylor 2006; Ashbaugh-Skaife et al. 2006). We provide further discussion concerning the impact of this research design choice in Section V.

[8] 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 to be 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.

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 Corporate Governance Information from Equilar Inc. and TrueCourse Inc. Is Available

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
51	NonDurables—Wholesale	17	0.8	1.4
52	Garden	5	0.2	0.2

(*continued on next page*)

TABLE 1 (continued)

Two-Digit SIC	Industry	Number	Percent of Sample	Compustat Composition
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 percent, 5 percent, and 1 percent, 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.) = 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 = return on average total assets for the 2002 fiscal year, using income from operations (Data #178);

(*continued on next page*)

TABLE 1 (continued)

BM = 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 computed only for firms with positive book values;
Profit Margin = ratio of operating income (Data #178) to total sales (Data #12) measured for the 2002 fiscal year;
Sales Growth = percentage change in sales (Data #12) during fiscal 2002; and
 # Analysts Following = number of analysts releasing an annual earnings forecast for the 2002 fiscal year.
Financial statement variables are winsorized to be no greater than 1 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).

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 TrueCourse.

Drawing on prior studies (e.g., Klein 1998; Bhagat and Black 2002; Core et al. 1999; Ferris et al. 2003), 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 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),[9] indicator variables equal to 1 if the chairperson of the compensation committee and audit committee is affiliated, and 0 otherwise (denoted as *CC Chair Affiliated* and *AC Chair Affiliated*, respectively), the fraction of outside directors and affiliated directors who serve on four or more other boards, and the fraction of inside directors who serve on two or more boards (denoted as *% Busy Outsiders*, *% Busy Affiliated*, and *% Busy Insiders*, respectively), fraction of outside, affiliated, and inside directors who are older than 70 (denoted as *% Old Outsiders*, *% Old Affiliated*, and *% Old Insiders,* respectively), an indicator variable equal to 1 if there is a lead director (an outside director who can call meetings of all outside directors in executive session) on the board, and 0 otherwise (denoted as *Lead Director*), an indicator variable equal to 1 if an internal executive holds the position of chairperson of the board, and 0 otherwise (denoted as *Insider Chairman*), and the fraction of affiliated and outside directors who were appointed by existing insiders (denoted as *% Affiliated Appointed* and *% Outsiders Appointed*, respectively).[10]

Consistent with prior research (e.g., Ashbaugh-Skaife et al. 2006; Bhagat 2004; 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 not a lead director (see Table 2). Most 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 inside directors, 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.

[9] 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 who were mentioned in the ''certain transactions'' section or a former executive were classified as affiliated.

[10] This variable was 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 was set equal to zero.

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
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

(*continued on next page*)

TABLE 2 (continued)

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

Board Variables:

 # AC Meetings = number of audit committee meetings (Equilar data);
 # CC Meetings = number of compensation committee meetings (Equilar data);
 # Board Meetings = number of board meetings (Equilar data);
CC Size = number of directors serving on the compensation committee (Equilar data);
AC Size = number of directors serving on the audit committee (Equilar data);
Board Size = number of directors serving on the board (Equilar data);
% Board Inside = fraction of board comprised of insider (executive) directors (Equilar data);
% AC Affiliated = 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 = fraction of the compensation committee that is comprised of affiliated (grey) directors (Equilar data);
AC Chair Affiliated = indicator variable equal to 1 if the chairperson of the audit committee is affiliated, and 0 otherwise;
CC Chair Affiliated = indicator variable equal to 1 if the chairperson of the compensation committee is affiliated, and 0 otherwise;
% Busy Outsiders = fraction of outside directors who serve on four or more other boards (Equilar data);
% Busy Affiliated = fraction of affiliated directors who serve on four or more other boards (Equilar data);
% Busy Insiders = fraction of insider directors who serve on two or more other boards (Equilar data);
% Old Outsiders = fraction of outside directors who are older than 70 (Equilar data);
% Old Affiliated = fraction of affiliated directors who are older than 70 (Equilar data);
% Old Insiders = fraction of inside directors who are older than 70 (Equilar data);
Lead Director = indicator variable equal to 1 of there is a lead director on the board, and 0 otherwise (Equilar data);
Insider Chairman = indicator variable equal to 1 if an executive holds the position of chairperson of the board, and 0 otherwise (Equilar data);
% Affiliated Appointed = fraction of affiliated directors that were appointed by existing insiders; this variable is set to 0 if there are no affiliated directors (Equilar data); and
% Outsiders Appointed = fraction of outside directors that were appointed by existing insiders; this variable is set to 0 if there are no outside directors (Equilar data).

Stock Ownership Variables:

% Outsiders Own = fraction of outstanding shares held by the average outside director (Equilar data);
% Executives Own (Excl. Top) = fraction of outstanding shares held by the average executive director but excludes the holdings of the top executive (Equilar data);
% Top Exec. Own = fraction of outstanding shares held by the top executive (Equilar data); and
% Affiliated Own = 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 = fraction of outstanding shares owned by blockholders (Spectrum data); a blockholder is defined as a shareholder who holds more than 5 percent of outstanding shares;
 # Block = number of blockholders (Spectrum data); and
% Largest = shareholding of the largest institution (Spectrum data).

Activist Variables:

 # Activists = number of activist institutions holding shares; an activist is defined as per Cremers and Nair (2005), specifically, the following 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

(*continued on next page*)

TABLE 2 (continued)

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); and

% Activists Own = fraction of outstanding shares held by activist institutions (Spectrum data).

Debt Variables:

Debt to Market = 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

Preferred to Market = 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 = fraction of total annual CEO compensation that is comprised of performance plans, stock options and restricted stock grants; and

% Accounting Mix = fraction of total annual CEO compensation that is comprised of performance plans and annual bonus.

Anti-Takeover Variables:

Staggered Board = indicator variable equal to 1 if the firm has a staggered board, and 0 otherwise (Shark Repellant data);

Supermajority = indicator variable equal to 1 if the firm has a supermajority provision for takeovers, and 0 otherwise (Shark Repellant data);

State Incorporated = indicator variable equal to 1 if the firm is incorporated in Pennsylvania, Ohio, Wisconsin or Massachusetts, and 0 otherwise (Shark Repellant data);

Unequal Voting = indicator variable equal to 1 if there are unequal voting rights across common shareholders, and 0 otherwise (Shark Repellant data); and

Poison Pill = indicator variable equal to 1 if the firm has adopted a poison pill, and 0 otherwise (Shark Repellant data).

Our board and executive ownership variables are the fraction of outstanding shares held by the average outside director (denoted as *% Outsiders Own*),[11] 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 1 percent of the outstanding equity (e.g., Hall and Liebman 1998). However, there is considerable skewness in 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 blockholders (denoted as *% Block Own*), number of blockholders (denoted as *# Block*), and shareholding of the largest institutional owner (denoted as *% Largest*).[12] The average company in our sample has two blockholders that own 16 percent of the outstanding shares (with the largest blockholder owning about nine percent of the 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

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

[12] A blockholder is defined as a shareholder who holds more than 5 percent of outstanding shares.

information contained in Cremers and Nair (2005).[13] The average company in our sample has approximately seven activists holding a total of about 2 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 market capitalization and preferred stock that is approximately 0 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 performance plans, stock options and restricted stock grants (*% Long Term Mix*).[14] Second, we measure the fraction of total annual CEO compensation that is comprised of 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 16 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*).[15] 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, 9 percent have dual classes of stock, and 51 percent have a poison pill.

III. CORPORATE GOVERNANCE INDICES

Methodology

In order to develop our corporate governance indices, we use exploratory principal component analysis (PCA) to identify the underlying dimensions or structure of corporate

[13] 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).

[14] Salary and annual bonus are valued based on 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.

[15] The TrueCourse data consists of 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 et al. [2004] who focus on dual class companies and Bebchuk and Cohen [2005] 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 sample has blank check preferred, thus there is little variance in this variable.

governance and determine which indicators are associated with each factor. 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 for our selected set of indicators (see Table 3).[16]

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 index) 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 can be more difficult. For example, the first factor has three relevant indicators that are measures of stock ownership with two of the indicators related 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.[17]

The PCA results in Table 3 produce an 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 no 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 index scores are computed using the average equal-weighted sum of the

[16] We use an *exploratory* approach to gain some initial insight into the structure of corporate governance because there is little prior theory or empirical analysis regarding the dimensions of corporate governance. However, once a consistent result emerges about these dimensions and appropriate indicators, it would be natural for researchers to adopt a *confirmatory* latent variable methodological approach.

[17] The PCA results also highlight another problematic aspect of prior research using and interpreting a single indicator. For example, assume that a researcher considers the structure of *committees* more important than the structure of the overall board for understanding earning manipulation. As a result, committee size and number of committee meetings are used in the regression analysis. Assume that the results are statistically significant in the expected direction for these variables (e.g., larger committees and fewer committee meetings are associated with higher abnormal accruals). However, it is not appropriate to conclude that *committee* structure has a more important association with earnings management than overall board structure because the PCA shows that these two indicators load on the same factor. Thus, it is problematic to distinguish between the two variables.

TABLE 3
Exploratory Principal Component Analysis (PCA)

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 Appointed			Insider Power		
% Affiliated Appointed	0.752	0.089	*% Executives Own (Excl. Top)*	0.737	0.193
% Outsiders Appointed	0.768	0.095	*% Top Exec. Own*	0.720	0.181
			% Board Inside	0.467	0.105
			Unequal Voting	0.396	0.200

(*continued on next page*)

TABLE 3 (continued)

Factor	Component Loading	Standard Error	Factor	Component Loading	Standard Error
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			Anti-Takeover II		
# AC Meetings	0.762	0.111	*Supermajority*	0.625	0.294
# CC Meetings	0.678	0.108	*State Incorporated*	0.792	0.388
# Board Meetings	0.695	0.115			
Lead Director			Busy Directors		
Lead Director	0.842	0.412	*% Busy Outsiders*	0.424	0.208
Insider Chairman	0.441	0.177	*% Busy Affiliated*	0.698	0.321
			% Busy Insiders	0.452	0.202

Factors are computed using PCA where we retain all factors with an eigenvalue greater than 1. 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).
All variables are as defined in Table 2.

standardized indicators associated with each factor (Grice and Harris 1998). The four factors mentioned above (the exceptions) either contain 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 3. 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 3. Compensation Mix is *% Accounting Mix* minus *% Long Term Mix*, divided by 2. Lead Director is *Lead Director* minus *Insider Chairman*, divided by 2 (i.e., this factor is increasing in external monitoring). 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 for each index is equal to zero.

The reliability (or the inverse of estimated measurement error) of the indices is computed using Cronbach's alpha for indicators associated with each governance construct. The mean (median) coefficient alpha is 0.532 (0.568). Although the levels of reliability are somewhat lower than the benchmarks suggested by Nunnally (1967), low levels of reliability are common in the early stages of measurement development. Moreover, our governance indices will almost certainly have higher reliability than the single indicators that are commonly used in empirical research. In addition, none of the confidence intervals for correlations among the governance indices include unity at conventional levels of statistical significance (Table 4, Panel B). This suggests that our governance indices are statistically distinct and exhibit construct validity.[18] The reliability and construct validity analyses suggest that psychometric properties of the indices are reasonable given the exploratory nature of this study. We certainly acknowledge that our indices are not perfect and it is important to refine corporate governance indices in future research.

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 suggests that firms with bigger 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 et al. 1999).

[18] While many of these correlations between factors are statistically significant at conventional levels, the absolute value for most of these 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 ($r_s = -.317$, $r_p = -0.245$).

TABLE 4
Descriptive Statistics and Correlations for the Factor Scores

Panel A: Descriptive Statistics[a]

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

(*continued on next page*)

TABLE 4 (continued)

Panel B: Correlations: Pearson (Spearman) Correlations are Presented in the Upper (Lower) Diagonal[b]

	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)	—

(*continued on next page*)

TABLE 4 (continued)

Panel C: Pearson Correlations: Governance Factors with Accounting Outcomes and Organizational Performance

	Abnormal Accruals	*|Abnormal Accruals|*	*Restatement*	*ROA*	*Alpha*
Active	.070 (.007)	−.155 (.000)	−.018 (.411)	.217 (.000)	.024 (.269)
Block	.076 (.003)	−.024 (.349)	.009 (.689)	.008 (.701)	.013 (.547)
Affiliated	−.051 (.047)	.070 (.007)	−.015 (.488)	−.059 (.007)	−.057 (.009)
Insider Appointed	.025 (.329)	.014 (.589)	−.024 (.263)	−.017 (.453)	−.019 (.377)
Compensation Mix	.069 (.007)	−.075 (.004)	.000 (.986)	.115 (.000)	.062 (.005)
Meetings	−.003 (.913)	−.027 (.305)	.105 (.000)	.018 (.417)	.007 (.745)
Anti-Takeover I	.028 (.287)	−.073 (.005)	.009 (.675)	.015 (.506)	.011 (.614)
Old Directors	.027 (.299)	−.046 (.074)	−.025 (.256)	.042 (.057)	−.012 (.581)
Debt	−.009 (.729)	−.049 (.060)	.052 (.018)	−.057 (.010)	−.101 (.000)
Insider Power	.049 (.057)	.020 (.448)	.031 (.150)	.005 (.829)	−.049 (.025)
Board Size	.027 (.290)	−.190 (.000)	.003 (.906)	.154 (.000)	.029 (.186)
Lead Director	−.041 (.112)	.001 (.981)	.011 (.620)	−.032 (.151)	.045 (.040)
Anti-Takeover II	.068 (.008)	−.098 (.000)	−.010 (.634)	.093 (.000)	−.009 (.674)
Busy	.014 (.594)	−.071 (.006)	.011 (.619)	.042 (.056)	.003 (.886)

(*continued on next page*)

TABLE 4 (continued)

Panel D: Spearman Correlations: Governance Factors with Accounting Outcomes and Organizational Performance[b]

	Abnormal Accruals	*|Abnormal Accruals|*	*Restatement*	*ROA*	*Alpha*
Active	.038 (.146)	−.159 (.000)	−.013 (.540)	.239 (.000)	−.011 (.627)
Block	.072 (.005)	−.004 (.883)	.008 (.724)	.001 (.973)	−.021 (.345)
Affiliated	−.004 (.884)	.075 (.004)	−.008 (.709)	−.065 (.003)	.036 (.102)
Insider Appointed	.039 (.132)	.030 (.248)	−.023 (.288)	−.013 (.564)	.018 (.426)
Compensation Mix	.026 (.323)	−.090 (.000)	−.010 (.631)	.117 (.000)	.133 (.000)
Meetings	−.020 (.446)	−.032 (.213)	.088 (.000)	−.061 (.006)	.003 (.902)
Anti-Takeover I	.005 (.847)	−.083 (.001)	.013 (.561)	−.005 (.803)	−.028 (.203)
Old Directors	−.011 (.683)	−.033 (.204)	.002 (.917)	.031 (.158)	.021 (.348)
Debt	−.046 (.074)	−.190 (.000)	.075 (.001)	−.186 (.000)	.104 (.000)
Insider Power	.031 (.228)	.098 (.000)	.018 (.409)	−.011 (.613)	−.050 (.024)
Board Size	−.039 (.129)	−.211 (.000)	−.010 (.654)	.099 (.000)	.064 (.004)
Lead Director	−.058 (.025)	−.023 (.365)	.014 (.528)	−.042 (.055)	.058 (.008)
Anti-Takeover II	.050 (.051)	−.093 (.000)	−.003 (.888)	.064 (.004)	.034 (.127)
Busy	−.001 (.963)	−.102 (.000)	.013 (.551)	.049 (.026)	.005 (.811)

(*continued on next page*)

TABLE 4 (continued)

[a] 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 3. Anti-Takeover I is the sum of *Staggered Board* and *Poison Pill* minus *% Affiliated Own*, divided by 3. Compensation Mix is *% Accounting Mix* minus *% Long Term Mix*, divided by 2. Lead Director is *Lead Director* minus *Insider Chairman*, divided by 2.

[b] The numbers in parentheses are the two-tailed significance levels.

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:

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

where:

TA = difference between Compustat reported operating cash flows (with extraordinary items and discontinued operations reclassified as part of operating cash flows, i.e., item 308 minus item 124) and income before extraordinary items (item 123);
$\Delta Sales$ = change in sales (item 12) for the year;
ΔREC = change in receivables reported on the statement of cash flows (item 302) for the year;
PPE = gross amount of property, plant, and equipment (item 7); and
CFO = 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 two-digit SIC group in the sample with a requirement of at least ten observations in each group. Independent variables in the accrual model are all winsorized to be no greater than 1 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 = residual from the above equation;
|*Abnormal Accruals*| = absolute value of the residual;
Restatement = indicator variable equal to 1 if the firm reports an earnings restatement related to the fiscal year (or a subsequent fiscal period) for which we have governance data, and 0 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 onward 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;
ROA (return on assets) = calculated as income before extraordinary items (Compustat data item 178) scaled by average total assets; and
Alpha = 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.

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 et al. 2006; Peng and Roell 2006). Therefore, we classify Compensation Mix as weakly increasing in ''bad'' governance.

Active, Block, Meetings, Debt, and Lead Director are classified as *increasing* in ''good'' governance. The presence of a large, and/or active blockholder 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 debtholders also offers additional monitoring benefit via external capital providers that 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.

The Pearson (r_p) and Spearman (r_s) bivariate correlations between the 14 governance factors and our set of outcome variables are reported in Table 4 (Panels C and D, respectively). Most of these correlations are small in absolute value and the Pearson and Spearman correlations are very similar. The most pronounced correlations involve ROA and Active ($r_p = 0.217$, $r_s = 0.239$) and the absolute value of abnormal accruals and Board Size ($r_p = -0.190$, $r_s = -0.211$). However, even these correlations are quite low and sign of the correlation between the absolute value of abnormal accruals and Board Size is opposite to our expectations.

IV. RESULTS

Our methodological approach is similar to the techniques used in most prior work examining the impact of corporate governance on various dependent variables. In particular, we use a multiple regression (or logistic) model of the following form:

$$\textit{Dependent Variable}_{i,t} = \alpha + \Sigma\gamma \textit{Controls}_{i,t} + \Sigma\beta \textit{Governance Factors}_{i,t} + \varepsilon_{i,t}. \quad (1)$$

One important feature in the structure of Equation (1) is that the governance factors are assumed to have no impact on the controls (and thus no *indirect* impact on the dependent variable). As a result, this structure may result in conservative estimates for the impact of governance on the dependent variable. Another approach is to only include governance factors as independent variables, or:

$$\textit{Dependent Variable}_{i,t} = \alpha + \Sigma\beta \textit{Governance Factors}_{i,t} + \varepsilon_{i,t}. \quad (2)$$

The structure in Equation (2) 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). Both sets of regression estimations are included in our analyses. We also compute the total R^2 for

the governance indices and separate incremental R^2s for governance and the controls.[19] We report the statistical significance and explanatory power for the governance factors both before and after including various control variables, thereby allowing us to assess a lower and upper bound for the explanatory power of the governance factors.

In the absence of a sophisticated theoretical model, we make the traditional assumption that higher levels of governance are associated with better accounting and economic outcomes for the firm. We expect a negative (positive) relation between governance indices that are hypothesized as ''good'' (''bad'') and abnormal accruals and restatements and a positive (negative) relation between governance indices that are hypothesized as ''good'' (''bad'') and future operating and stock price performance.

Abnormal Accruals

Accruals, Control Variables, and Prior Literature

Measures of abnormal accruals are typically used as surrogates for earnings quality (e.g., Klein 2002; Frankel et al. 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; Bartov et al. 2001). Limitations of this measure are the standard criticisms associated with any expectation model. Deficiencies in the set of independent variables (such as alternative measures of contracting or capital market pressures) and the functional form can lead to misclassification of normal accruals as abnormal and vice versa (e.g., Bernard and Skinner 1996).

We use an accrual model that builds on the modified Jones model of Dechow et al. (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 $\times$ item 199). *BM* is included as a proxy for expected growth in the firm's operations. We expect to see large 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 misspecified for firms with extreme levels of performance (Dechow et al. 1995). We therefore include current operating cash flows, *CFO* (Compustat item 308), as an additional independent variable. Our extended model is estimated as follows:

[19] 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 (2006), 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 one attempt at addressing endogeneity in Section V.

$$TA_{i,t} = \alpha + \beta_1(\Delta Sales - \Delta REC)_{i,t} + \beta_2 PPE_{i,t} + \beta_3 BM_{i,t} + \beta_4 CFO_{i,t} + \varepsilon_{i,t}. \quad (3)$$

Total Accruals (*TA*) is the difference between operating cash flows (Compustat item 308 less item 124) and income before extraordinary items (item 123) as reported on the statement of cash flows. We make an adjustment for extraordinary items and discontinued operations consistent with Hribar and Collins (2002). $\Delta Sales$ 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 1 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 ten 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 ($\Delta Sales - \Delta REC$) 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. The explanatory power of the abnormal accrual model (adjusted R^2) is, on average, 27 percent across industry groups.

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 the *absolute* value 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 nondirectional accrual measures.

Abnormal Accruals and Governance Factors

The results on the association between measures of abnormal accruals and our 14 governance factors are reported in Table 5. For our sample of 1,487 firms the mean abnormal accrual is close to zero and the mean absolute value of abnormal accruals is about 6 percent of average assets.[20] These descriptive statistics are similar to prior research (e.g., Larcker and Richardson 2004).

The results for the directional or signed abnormal accrual measure are reported in Table 5 (Panel A). For this outcome measure, we find that only Active, Block, Compensation Mix, Insider Power, and Anti-Takeover II are statistically significant at conventional levels. However, the signs for Active, and Block are opposite to our expectations. The regression model has an adjusted R^2 of 1.60 percent. When we examine the absolute value of abnormal accruals (Panel B), we find the expected result that firms with activist shareholders report lower absolute abnormal accruals. However, we continue to observe unexpected associations (Old Directors, Board Size, and Anti-Takeover II have opposite signs to our predictions). The adjusted R^2 for nondirectional accruals is 5.34 percent.

[20] The sample size used to estimate the regression is based on the total sample of observations with complete data after deleting observations where the absolute value of the studentized residual is greater than 4. This approach is used in all of our analyses to mitigate the influence of ''outliers.'' Less than 1 percent of the observations are affected by this methodological choice.

TABLE 5
Relation between Abnormal Accruals and Governance Factors

$$Abnormal\ Accruals_t = \alpha + \Sigma\beta Governance\ Factors_t + \varepsilon_t$$

Variable	Pred. Sign	Ordinary Least Squares: Governance Only Specification		Recursive Partitioning: Governance Only Specification
Panel A: Signed Abnormal Accruals				
Governance		Coef. Est.	t-statistic	
Intercept		0.009	4.57	
Active	−	0.008	2.52**	Nonlinear
Block	−	0.006	2.69***	
Affiliated	+	−0.004	1.41	
Insider Appointed	+	0.003	1.15	
Compensation Mix	+/?	0.004	1.78*	
Meetings	−	−0.001	−0.16	
Lead Director	−	−0.003	−0.90	
Anti-Takeover I	+	−0.001	−0.15	
Old Directors	+	0.003	1.04	
Debt	−	−0.002	−0.68	
Insider Power	+	0.006	1.82*	
Board Size	+	−0.001	−0.41	
Anti-Takeover II	+	0.005	1.94*	
Busy Directors	+	0.000	0.10	
Controls				
NA				
Sample Size		1,487		1,487
R^2 (Adj. R^2) Governance Factors Only		2.50% (1.60%)		1.43%
Panel B: Absolute Value Abnormal Accruals				
Governance		Coef. Est.	t-statistic	
Intercept		0.052	37.03	
Active	−	−0.008	−4.03***	
Block	−	0.000	0.10	Nonlinear
Affiliated	+	0.003	1.60	
Insider Appointed	+	0.000	−0.14	
Compensation Mix	+/?	−0.002	−1.08	
Meetings	−	0.003	1.37	
Lead Director	−	−0.003	−1.28	
Anti-Takeover I	+	0.000	0.04	
Old Directors	+	−0.005	−2.21**	
Debt	−	−0.004	−1.47	Linear (−)
Insider Power	+	−0.001	−0.61	
Board Size	+	−0.010	−4.79***	Linear (−)
Anti-Takeover II	+	−0.003	−1.64*	
Busy Directors	+	0.000	0.22	
Controls				
NA				
Sample Size		1484		1,484
R^2 (Adj. R^2) Governance Factors Only		6.24% (5.34%)		7.17%

(*continued on next page*)

TABLE 5 (continued)

*,**,*** Indicates significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests) for the regression specification.

For the recursive partitioning analysis we report only those governance factors that were significant ($p < 0.05$, two-tailed) and note whether the relation was linear or nonlinear. If linear, we also note the sign of the relation.

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:

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

where:

TA = difference between Compustat reported operating cash flows (with extraordinary items and discontinued operations reclassified as part of operating cash flows, i.e., item 308 minus item 124) and income before extraordinary items (item 123);
$\Delta Sales$ = change in sales (item 12) for the year;
ΔREC = change in receivables reported on the statement of cash flows (item 302) for the year;
PPE = gross amount of property, plant, and equipment (item 7); and
CFO = 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 two-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).

$Abnormal\ Accruals$ = residual from the above equation; and
$|Abnormal\ Accruals|$ = absolute value of the residual.

There are a variety of reasons (e.g. contractual, tax, capital market pressures) that create incentives for firms to manage earnings. It is important to note that our abnormal accrual measure is orthogonal to growth and performance. To the extent that these firm characteristics are associated with the incentives to manage earnings (e.g., need to raise external capital, desire to avoid disappointing expectations so as not to suffer from a ''torpedo'' effect [Sloan and Skinner 2002]), our abnormal accruals measure controls for these incentives. Therefore, we do not include additional controls in the models presented in Panels A and B of Table 5.

Similar to Klein (2002), Jenkins (2002), and Xie et al. (2003), the analyses in Table 5 reveal a modest association between our governance indices and abnormal accruals. The most pronounced association is for the absolute value of abnormal accruals (where 5.34 percent of the variation is explained with our governance factors). However, the majority of the governance factors that were significant (three out of four) exhibit unexpected associations.

It is conceivable that the somewhat weak and unexpected outcomes in Table 5 are the result of using an unreliable accrual measure. In order to assess this possibility, we examine seven alterative measures of the quality of the financial reporting system. The first measure is the accrual estimate produced by the performance-matched technique described in Kothari et al. (2005). The inferences from this accrual analysis are similar to those in Table 5. In particular, Active continues to be negatively associated with directional performance matched abnormal accruals, but the adjusted R^2 from this specification is only 0.2 percent.

The remaining alternative measures are conservatism, timeliness, smoothness, persistence, value relevance, and accrual quality (Verdi 2006). Each of these alternative measures

are estimated at the firm level using ten years of data leading up to and including the fiscal year for which we have our governance data. Due to the various data requirements for these measures (outlined below) we are left with 638 firms for these additional analyses.

Our measures of timeliness and conservatism follow the reverse regression methodology from Francis et al. (2004). Specifically, we run the following regression:

$$EARN_{j,t} = \alpha_{0,j} + \alpha_{1,j}NEG_{j,t} + \beta_{1,j}RET_{j,t} + \beta_{2,j}NEG_{j,t} \cdot RET_{j,t} + \eta_{j,t} \quad (4)$$

where $NEG_{j,t} = 1$ if $RET_{j,t} < 0$, and 0 otherwise. $EARN_{j,t}$ is firm j's income before extraordinary items, *NIBE* (Compustat item 18) in year t, scaled by market value of equity at the end of year $t-1$. $RET_{j,t}$ is firm j's 15-month return ending three months after the end of the fiscal year t. *Timeliness* is based on the negative of the explanatory power for Equation (4) ($-R^2_{j,t,eq(4)}$). *Conservatism* is computed as $-(\beta_{1,j} + \beta_{2,j})/\beta_{1,j}$. This index captures the extent to which bad news is incorporated into earnings compared to good news.

We measure value relevance from the following regression:

$$RET_{j,t} = \delta_{0,j} + \delta_{1,j}EARN_{j,t} + \delta_{2,j}\Delta EARN_{j,t} + \zeta j,t \quad (5)$$

where $\Delta EARN_{j,t}$ is the change in firm j's *NIBE* in year t, scaled by market value at the end of year $t-1$, and other variable are as defined above. We use the negative of the adjusted R^2 from Equation (5) to capture *Value Relevance* ($-R^2_{j,t,eq(5)}$).

Similar to Francis et al. (2004), we define *Smoothness* as the ration of firm j's standard deviation of *NIBE* divided by beginning total assets, to its standard deviation of cash flows from operations divided by its beginning total assets [$\sigma(NIBE_{j,t})/\sigma\ (CFO_{j,t})$].

Persistence is measured as the negative of the slope coefficient estimate, $\varphi_{1,t}$, from an auto-regressive model of annual split-adjusted earnings per share ($X_{j,t}$, measured as firm j's *NIBE* in year t divided by the weighted average number of outstanding shares during year t). The regression specification is as follows:

$$X_{j,t} = \varphi_{0,t} + \varphi_{1,t}X_{j,t-1} + \upsilon_{j,t}. \quad (6)$$

Finally, we compute a measure of accrual quality using the model of Dechow and Dichev (2002). *Accrual Quality* is the standard deviation of the residual from the following regression:

$$TA_{j,t} = \pi_{0,j} + \pi_{1,j}CFO_{j,t-1} + \pi_{2,j}CFO_{j,t} + \pi_{3,j}CFO_{j,t+1} + \xi_{j,t} \quad (7)$$

where *TA* is total accruals is defined earlier, and *CFO* is operating cash flows. All variables in Equation (7) are deflated by beginning total assets. We estimate Equation (7) separately for each firm and compute $\sigma(\xi_{j,t})$ as our measure of *Accrual Quality*.

The adjusted R^2 for our governance indices with these six measures are as follows: *Conservatism* (−0.84 percent), *Value Relevance* (0.24 percent), *Timeliness* (1.26 percent), *Persistence* (2.86 percent), *Smoothness* (5.19 percent), and *Accruals Quality* (22.71 percent). Despite the relatively high adjusted R^2s for several of these alternative measures it is important to examine the source of this explanatory power. There is a very mixed set of associations between our 14 governance factors and these six additional measures. In the interests of brevity, we briefly summarize these associations rather than tabulating the results.

None of the 14 governance factors are statistically significant in explaining conservatism. Affiliated is associated with lower value relevance, but Old Directors are associated with higher value relevance. Compensation Mix and Board Size are both associated with smoother net income relative to cash flows. Insider Appointed boards and Old Directors are associated with more persistent earnings and meeting frequency and Debt presence are associated with less persistent earnings. Affiliated is associated with less timely earnings, but Old Directors and Active are associated with more timely earnings. Finally, for accruals quality we found very mixed results: Active, Affiliated, Compensation Mix, and Debt exhibit expected signs, but Insider Appointed, Meetings, Anti-Takeover I, Insider Power, and Board Size exhibit unexpected signs. Consistent with the results in Table 5, there is very mixed evidence that our governance factors explain variation across numerous measures of financial reporting quality.

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 et al. 1996; Beasley [1996] with measures of board characteristics, blockholders, and CEO duality; Peng and Roell 2006; Erickson et al. [2006] for measures of executive compensation). We reexamine these findings with a sample of earnings restatements across our broad set of governance indices.[21]

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 1 if the firm reports an earnings restatement related to the fiscal year (or a subsequent fiscal period) for which we have governance data, and 0 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 onward, then the *Earnings Restatement* is set equal to 1. For other firms the indicator variable is set equal to 0 with the exception that 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, then 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.[22]

Prior research has examined the prediction and the economic consequences of earnings restatements and SEC enforcement actions (e.g., Dechow et al. 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* (calculated as net equity financing, item 108

[21] In concurrent research, Baber et al. (2006) find very little evidence of relations between various governance measures and a sample of restatements reported by the General Accounting Office.

[22] It is possible that some of our restatements are ''innocuous.'' To address this issue we identified the first mention of the earnings restatement in the media (typically this is announced via an 8-K filing in the current regulatory environment). We flag a restatement as ''severe'' if the market price drops by more than 3 percent around the announcement (three- or five-day announcement period). For this subsample of severe restatements we find very similar result to those tabulated (i.e., our 14 governance factors are not able to successfully identify restatement firms).

− item 115 − item 127, plus net debt financing, item 111 − item 114 + item 301, all deflated by beginning market value of equity), Log of market value of common equity (*Log*(*Market Cap.*)), *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 that 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 likelihood of observing a restatement (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 the dependent variable is dichotomous, we also report ''hit rates'' (or the percentage of cases that are correctly classified) 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-restating sample is much larger than the restating sample, the logistic model accurately classifies non-restatement observations, but the classification accuracy for the restatement observations is quite poor. Overall, the results in Table 6 provide little evidence that corporate governance has an impact on accounting restatements.

Future Operating Performance

Future Operating Performance, Control Variables, and Prior Literature

One way to assess the impact of governance structures on firm value is to examine an accounting based measure of future operating performance. For example, Gompers et al. (2003) find evidence that governance has a positive association with various measures of future accounting performance. Similar to prior research, we use return on assets (calculated 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., Penman 1992; Fama and French 2000). Thus, the natural candidate for expected future operating performance is current operating performance. However, to the extent that governance structures are stable over time and these factors determine the operating, investing and financing activities of the firm, the inclusion of current operating performance is likely to remove the impact of governance 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 et al. 2003; Core et al. 2006). We use the *Log* (*Market Cap.*) as our measure of firm size and the median 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.

TABLE 6
Relation between Earnings Restatements and Governance Factors

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

		Logistic Regression				Recursive Partitioning	
Variable	**Pred. Sign**	**Governance Only Specification**		**Governance and Controls Specification**		**Governance Only Specification**	**Governance and Controls Specification**
Governance		Coef. Est.	χ^2	Coef. Est.	χ^2		
Intercept		−2.867	841.28***	−3.411	30.58***		
Active	−	−0.145	1.12	−0.238	1.98		
Block	−	0.040	0.14	0.089	0.67		
Affiliated	+	−0.135	0.84	−0.154	1.07		
Insider Appointed	+	−0.136	1.23	−0.128	1.08		Linear (−)
Compensation Mix	+/?	−0.020	0.03	0.059	0.25		
Meetings	NA	NA	NA	NA	NA	NA	NA
Lead Director	−	0.080	0.30	0.087	0.36		
Anti-Takeover I	+	0.117	0.54	0.109	0.46		
Old Directors	+	−0.194	1.25	−0.191	1.23		
Debt	−	0.185	4.93**	0.171	4.04**	Linear (+)	Linear (+)
Insider Power	+	0.290	4.24**	0.277	3.75*		Nonlinear
Board Size	+	0.079	0.38	0.020	0.02	Linear (−)	
Anti-Takeover II	+	−0.072	0.30	−0.059	0.20		
Busy Directors	+	0.147	0.94	0.101	0.42		
Controls							
BM	−			−0.317	2.41		Nonlinear
Log (*Market Cap.*)	+			0.102	1.50		
External Financing	+			0.188	0.13		
Acquisitions	+			0.757	0.30		
Free Cash Flow	+			−0.584	1.29		
Sample Size		2,094		2,094		2,094	2,094
Pseudo-R^2 Governance Factors Only		1.8%				NA	

(*continued on next page*)

TABLE 6 (continued)

Variable	Pred. Sign	Logistic Regression: Governance Only Specification	Logistic Regression: Governance and Controls Specification	Recursive Partitioning: Governance Only Specification	Recursive Partitioning: Governance and Controls Specification
Incremental Pseudo-R^2 from Controls			1.1%		NA
Incremental Pseudo-R^2 from Governance Factors			2.0%		NA
Cut-Off Value		**0.10** / **0.20**	**0.30**	**0.40**	**0.50**
Hit Rates for Correctly Classifying the Occurrence of Restatements					
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					
Economic determinants		100% / 100%	100%	100%	100%
Governance only		98.1% / 99.7%	100%	100%	100%
Full		96.5% / 99.6%	100%	100%	100%

(*continued on next page*)

TABLE 6 (continued)

*,**,*** Indicates significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests) for the logistic regression specifications.
For the recursive partitioning analysis we report only those governance factors that were significant ($p < 0.05$, two-tailed) and note whether the relation was linear or nonlinear. If linear, we also note the sign of the relation.

Restatement = indicator variable equal to 1 if the firm reports an earnings restatement related to the fiscal year (or a subsequent fiscal period) for which we have governance data, and 0 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 onward 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) = book value of common equity (Compustat data item 60) divided by the market value of common equity (item 25 * item 199);
External Financing = total net external financing from debtholders 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 = 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.

Future Operating Performance and Governance Factors

The results for future operating performance analysis are presented in Table 7. 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. 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).[23]

One potential 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, 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 the model that only includes controls increases the explanatory power by 4.7 percent.[24] Given the fairly large number of statistically significant governance indices with expected signs and the moderate level of explanatory power associated with these indices, we interpret the results as indicating a statistical and substantive association between corporate governance and future operating performance.

Future Stock Returns

Future Stock Returns, Control Variables, and Prior Literature

Our final dependent variable is excess stock returns, *Alpha*. Specifically, for each firm in our sample we obtain monthly stock returns (RET) from the CRSP files from the first month of the 2003 fiscal year through to December 2004. For example, for a firm with a December 31, 2002 year end, our returns cover the January 2003 to December 2004 period. These monthly returns are regressed on the standard Fama-French monthly factor returns (MKT, SMB, HML, and UMD). The intercept from the following regression (estimated at the firm level) is our estimate of future excess returns:

$$RET_t = \alpha + \beta_{MKT}MKT_t + \beta_{SMB}SMB_t + \beta_{HML}HML_t + \beta_{UMD}UMD_t + \varepsilon_t$$

Since the dependent variable, *Alpha*, is excess returns, we do not include any additional control variables in the subsequent regression estimation. Our analysis of future abnormal

[23] The sign on Compensation Mix is somewhat ambiguous when future 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.

[24] We use different samples for the results tabulated in Table 7 for the governance only, controls only, and governance and controls specifications, due to data availability of the necessary variables. 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 percent. The incremental R^2 by including the control (governance) variables is 5.0 percent (4.9 percent).

TABLE 7
Relation between Future Operating Performance and Governance Factors

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

		Ordinary Least Squares				Recursive Partitioning	
		ROA_{t+1}		Industry Adjusted ROA_{t+1}		ROA_{t+1}	Industry Adjusted ROA_{t+1}
Variable	**Pred. Sign**	**Governance Only Specification**		**Governance and Controls Specification**		**Governance and Controls Specification**	**Governance and Controls Specification**
Governance		Coef. Est.	t-statistic	Coef. Est.	t-statistic		
Intercept		0.037	12.30***	−0.271	−15.40***		
Active	+	0.062	14.02***	0.004	0.77	Linear (+)	Linear (+)
Block	+	0.002	0.56	0.010	3.03***		
Affiliated	−	−0.004	−0.92	−0.004	−1.06		
Insider Appointed	−	−0.003	−0.85	−0.003	−0.80		
Compensation Mix	+/?	0.032	8.74***	0.025	7.63***	Linear (+)	Linear (+)
Meetings	+	−0.005	−1.04	−0.003	−0.66		
Lead Director	+	0.000	−0.09	0.003	0.76		
Anti-Takeover I	−	−0.019	−3.82***	−0.007	−1.44		
Old Directors	−	0.005	1.00	0.004	0.94		
Debt	+	−0.012	−2.96***	−0.001	−0.35	Linear (−)	Linear (−)
Insider Power	−	0.012	2.45**	0.006	1.26		
Board Size	−	0.012	2.82***	−0.008	−1.92*		
Anti-Takeover II	−	0.007	1.68*	0.007	1.93*		
Busy Directors	−	−0.005	−1.05	−0.023	−4.88***		

(*continued on next page*)

TABLE 7 (continued)

		Ordinary Least Squares			Recursive Partitioning	
		ROA_{t+1}	Industry Adjusted ROA_{t+1}		ROA_{t+1}	Industry Adjusted ROA_{t+1}
Variable	**Pred. Sign**	**Governance Only Specification**	**Governance and Controls Specification**		**Governance and Controls Specification**	**Governance and Controls Specification**
Controls						
Log (*Market Cap.*)		NA	0.400	14.72***		
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 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests) for the regression specifications.
For the recursive partitioning analysis we report only those governance factors that were significant ($p < 0.05$, two-tailed) and note whether the relation was linear or nonlinear. If linear, we also note the sign of the relation.

ROA (return on assets) = 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 two-digit SIC code with at least 5 firms).

stock returns rests on an assumption about market efficiency. If stock prices incorporate beliefs about the potential benefit of certain governance structures, then we should observe no association between our governance factors and future excess stock returns. For governance structures to be related to future excess returns it must be through either (1) inefficiency in the ability of market participants to price the associated benefits/costs or (2) systematic unexpected shocks to operating performance from these governance structures. Gompers et al. (2003) examine the relation between a set of anti-takeover provisions and excess returns for a sample of S&P 1500 firms during the 1990s and find higher future excess stock returns for ''democracy'' firms that have fewer anti-takeover provisions. Further work by Bebchuk and Cohen (2005) suggest that this relation is, in large part, due to staggered boards that are created by corporate charter. While Gompers et al. (2003) are careful to note that the association between anti-takeover provisions and stock returns is not suggestive of a trading strategy, subsequent research has challenged both the strength of this relation and the interpretation. For example, Cremers and Nair (2005) find that the impact of governance is very sensitive to the threshold cutoff used to classify firms into ''democracy'' and ''dictator'' groups. Core et al. (2006) find very little evidence to suggest that the relation is attributable to unexpected performance shocks, raising the possibility that the relation may be indicative of a market misunderstanding of the importance of governance structures. In fact, Bebchuk et al. (2006) suggest that the importance of poison pills changed significantly during the earlier part of the 1990s and this had consequences for firm valuations.

Future Stock Price Performance and Governance Factors

Table 8 reports our regression analysis for future excess stock returns. In our regression analysis we find that Insider Appointed, Compensation Mix, Lead Director, Debt, and Insider Power are significantly associated with *Alpha*. Of these, Lead Director, and Insider Power are significant in the predicted direction. The adjusted R^2 is 2.0 percent and is similar to the explanatory power of other studies that use excess stock returns as the dependent variable (e.g., Sloan 1996). Overall, we find some evidence that a subset of our corporate governance indices is associated with future excess returns.

V. EXTENSIONS AND SENSITIVITY ANALYSES

Exploratory Recursive Partitioning Analyses

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. Absent clear theory, interactions are exceedingly difficult to theoretically specify 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 (e.g., Kass 1980; Biggs et al. 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

TABLE 8
Relation between Future Stock Returns and Governance Factors

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

		Ordinary Least Squares		Recursive Partitioning
Variable	**Pred. Sign**	**Governance Only Specification**		**Governance Only Specification**
Governance		Coef. Est.	t-statistic	
Intercept		−0.002	−2.34**	
Active	+	0.001	0.07	
Block	+	0.000	0.52	Nonlinear
Affiliated	−	0.000	0.40	
Insider Appointed	−	0.002	1.91*	Linear (+)
Compensation Mix	−/?	0.004	4.25***	Linear (+)
Meetings	+	0.001	0.66	
Lead Director	+	0.004	3.24***	Linear (+)
Anti-Takeover I	−	−0.002	−1.31	
Old Directors	−	0.001	0.42	
Debt	+	−0.003	−2.82***	
Insider Power	−	−0.004	−2.90***	
Board Size	−	0.002	1.50	
Anti-Takeover II	−	0.000	0.28	
Busy Directors	−	0.001	0.37	
Controls				
NA				
Sample Size		2,066		2,066
R^2 Governance Factors Only		2.0%		2.72%

*,**,*** Indicates significance at the 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests) for the regression specifications.
For the recursive partitioning analysis we report only those governance factors that were significant ($p < 0.05$, two-tailed) and note whether the relation was linear or nonlinear. If linear, we also note the sign of the relation.
Alpha = 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 24 months of return data to generate *Alpha*.

tree-like structure that allows nonlinear and interactive associations between the dependent variable and a set of independent variables.[25]

Although recursive partitioning has a more exploratory nature than traditional econometric approaches, it is important to use multiple analysis methodologies for complex research problems in order to insure that the results are not simply due to method variance. We describe the results of the recursive partitioning analysis in detail for the directional

[25] Another advantage of recursive partitioning is that it is more straightforward to uncover whether governance constructs appear to be complements or 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 et al. (1994), Malette and Fowler (1992), Sundaramurthy et al. (1997) who find board characteristics relate to the adoption of anti-takeover devices, and Conyon and Florou (2006) who find that CEO compensation and stock holding of directors impacts investment decisions made by managers close to retirement age.

abnormal accrual variable, but for the sake of brevity, we summarize the recursive partitioning results for our other outcome variables alongside the OLS and logistic results in Tables 5–8.

The recursive partitioning results for the absolute value of abnormal accruals are presented in Figure 1 (and summarized in the last column of Table 5). Recursive partitioning analysis yields somewhat stronger explanatory power (R^2 = 7.17 percent). This is not surprising given that recursive partitioning allows nonlinear and interactive associations between the dependent variable and a set of independent variables. As illustrated in Figure 1, Board Size is an important governance factor in explaining nondirectional 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 lower levels of the diagram. In contrast to our expectations, we find that nondirectional abnormal accruals are lower for companies that have larger boards.

For companies that have small boards, we find that Block becomes important (level two of Figure 1). However, the relation between blockholders and nondirectional accruals in this subsample is nonlinear. For companies with large boards, Debt becomes important (level two of Figure 1). We find the expected inverse relation between nondirectional accruals and Debt for this subsample. Finally, for the subsample of firms with large boards and high debt, board size again becomes significant. However, similar to the level one result, board size does not exhibit the expected sign at level three.[26]

The recursive partitioning results for nondirectional accruals are only marginally consistent with the regression estimates in Table 5 (Panel B). The only factor that is consistent across the OLS and recursive partitioning results is Debt. Similar inconsistent results are also found for the directional accruals (Table 5, Panel A). The disparity in results from the two methodological approaches is further evidence that the association between our governance factors and accounting accruals is weak. An additional insight from the recursive partitioning is that the largest (smallest) nondirectional abnormal accruals are observed for firms with small boards and low ownership by blockholders (firms with large boards and high levels of debt). Although these interactions are based on purely exploratory analysis, it would be interesting to explore the nature of complements or substitutes across governance factors in future research.[27]

The recursive partitioning analysis for accounting restatements (Table 6) reveals that Debt and Board Size are the two significant governance indices in the governance only specification. 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, and Insider Power has a nonlinear association with restatements. Similar to the logistic regression results, the recursive partitioning analysis finds virtually no evidence that restatements are associated with corporate governance.

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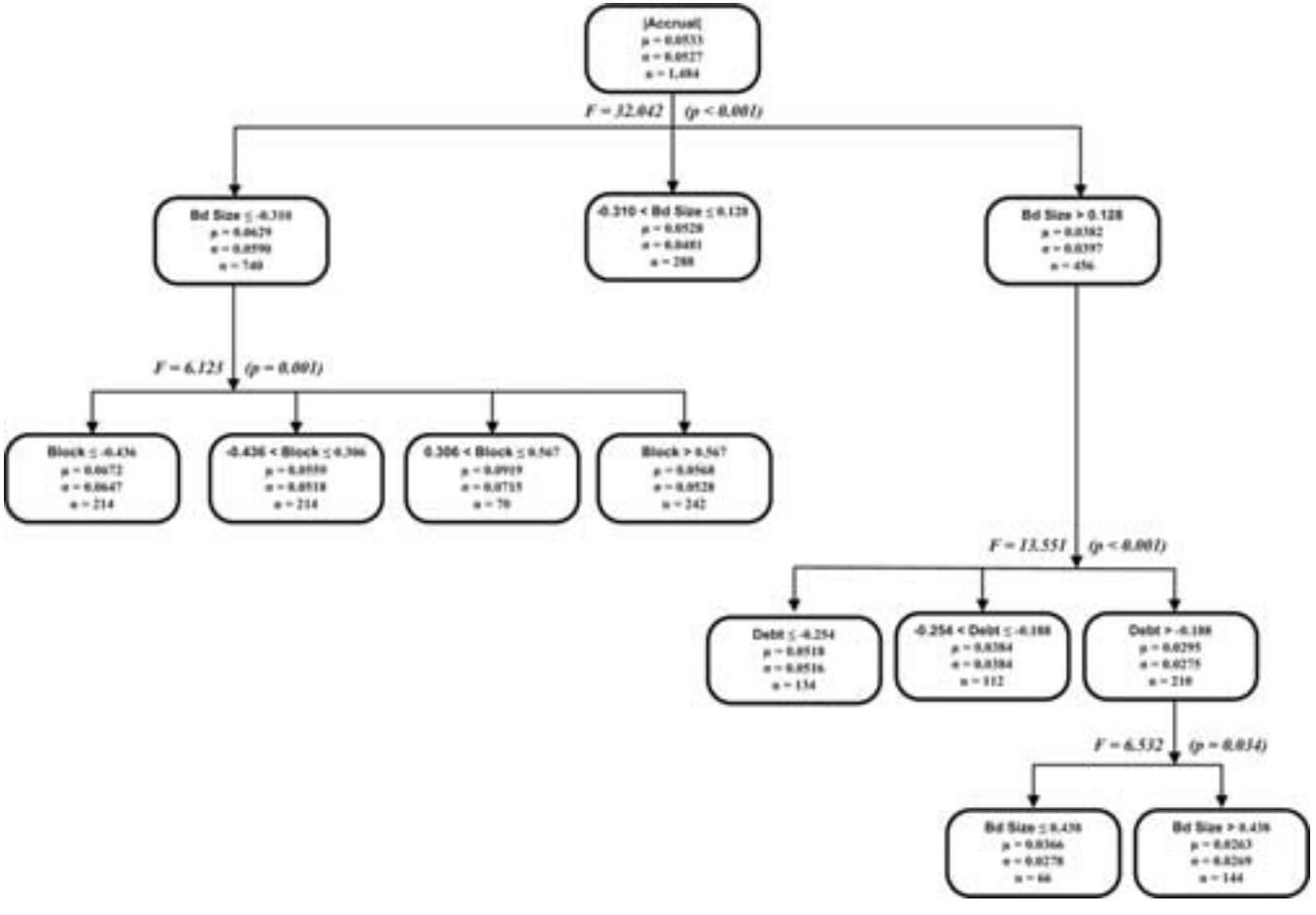
[26] It is important to highlight that regression analysis assumes that the *same* model is applicable to the entire sample of firms, whereas the recursive partitioning identifies a specific set of explanatory variables for each subsample. For example, Block (Debt) is only relevant for 740 (456) of the total sample of 1,484 firms.

[27] The R^2s from our recursive partitioning analysis for the various alternative measures of financial report quality are as follows: for conservatism (0.00 percent), timeliness (2.99 percent), smoothness (5.70 percent), persistence (4.49 percent), value relevance (0.00 percent) and accrual quality (14.20 percent). Old Directors and Anti-Takeover II are statistically significant for timeliness, but both variables have unexpected signs. Board Size and Anti-Takeover II are statistically significant for timeliness, but both variables have unexpected signs. Debt is statistically significant for persistence, but this variable has an unexpected sign. Active, Debt, Board Size, and Compensation Mix are statistically significant for accrual quality, but Board Size and Compensation Mix have unexpected signs. Finally, none of the governance indices are statistically significant for conservatism or value relevance.

FIGURE 1
Recursive Partitioning Analysis for the Absolute Value of Abnormal Accruals



The recursive partitioning analysis for future operating performance (with and without controls) is somewhat consistent with the previous regression results (Table 7). 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. While the results vary with the methodological approach, we find consistent evidence that Active and Compensation Mix have a statistical and substantive association with future operating performance.

Finally, the recursive partitioning results confirm some of the regression results for future excess returns (Table 8). The main differences are that Block is also significant (and has a nonlinear association), and Debt and Insider Power are no longer significant. Compensation Mix and Lead Director are again statistically associated with future excess stock price returns. The explanatory power from the recursive partitioning analysis is 2.7 percent.

Overall, the regression (and logistic) and recursive partitioning results are consistent for most outcome variables. This comparative evidence is important because it provides some evidence that our results are not completely confounded by method variance (i.e., whether methodologies produce substantively different results and interpretations). Nevertheless, the most appropriate methodological approach for examining the link between governance constructs and accounting outcomes and organizational performance is an unresolved econometric question.

Limited Sample Period

One potential problem with our analysis is that we use only one year of data and that time period coincides with significant regulatory reform (e.g., Sarbanes-Oxley Act and new exchange listing requirements). This observation raises some concern 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 examined 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. because we only have the necessary data from 2002 onward. Instead, we examined other data sources to look at changes in a variety of governance structures from 1990 to early 2000.

Our first analysis examines the persistence of the governance index developed by Gompers et al. (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. If we restrict our analysis to the 1,260 firms covered on the 2000, 2002, and 2004 IRRC reports, then the over-time correlation between 2000 and 2004 is 0.91 and between 2002 and 2004 is 0.97.[28] Since anti-takeover and shareholder rights provisions are very stable intertemporally, 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 subcommittees

[28] 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).

of the board. For the sample of 733 firms that had data in all years, 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 completely confounded by regulatory changes.

We also 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. The low correlation for the TCL ratings from 2002 to 2003 is caused by a change in the algorithm that TCL used 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 subcategories of governance measures or change the set of included/excluded measures from year to year.[29]

Our analysis of the stability of governance measures is consistent with the recent study by Linck et al. (2005) that examines 6,931 corporate boards over the period 1990 to 2004. In general, they find that board structure has been surprisingly stable over the last 15 years. For example, the fraction of executive directors on a board has decreased from about 37 percent in 1990 to 34 percent in 2001 and 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 et al. (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 et al. (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. 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. Furthermore, given that there is considerable cross-sectional variation in our governance measures during the period we examine, our statistical analyses are likely to have sufficient power to detect the association between measures of corporate governance and various accounting outcomes. We do, however, recognize that our sample period can be characterized by greater scrutiny from regulators and capital markets, and changing regulations and expectations from directors. If this increased monitoring has been pervasive across firms, then this will limit our ability to detect associations in the data.

[29] We also obtained data from GovernanceMetrics International for the Standard & Poor's 500 firms in 2002, 2003 and 2004. The over time rank correlation between 2003 and 2004 is 0.63 and between 2002 and 2003 is 0.64.

Concerns about Endogeneity

Our methodological approach essentially involves assessing the relation between an accounting outcome variable 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, then 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.[30]

The implication for archival corporate governance research is that it is very difficult to make causal inference from cross-sectional studies of these endogenously chosen governance characteristics and any outcome variable (e.g., Demsetz and Lehn 1985). 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 et al. (2003), this implies that observed cross-sectional differences in governance structure provide a method for assessing the accounting and economic consequences of these factors. In order to implement this approach, we assume that firm size (measured as the natural logarithm of the market value of equity) and industrial classification (measured using two-digit SIC codes) are the two primary ''exogenous'' determinants of corporate governance. Thus, the residuals produced from a regression of each governance index on firm size and industry should be a measure of how far a firm deviates from the ''optimal'' governance structure. The key assumption for this approach to be valid is that the systematic part of the regression is the appropriate governance choice for the firm. If we find similar results after adjusting for the systematic part of governance choices, then this will suggest that the results in Tables 5 to 8 are not completely confounded by econometric problems induced by endogenous regressor variables.

We estimate the statistical association of each accounting outcome variable with a variable that takes on the value of the governance factor residual if it is positive and a value of zero otherwise, and another variable that takes on the value of the governance factor residual if is negative and a value of zero otherwise. 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. We estimate four regressions (one for each accounting outcome variable) with 28 variables for the 14 governance factors.

The results (not tabulated) for the accrual analysis again exhibit the very mixed outcomes and the restatement analysis provides virtually no evidence suggesting an association

[30] 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 (2006) 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 in our setting.

between corporate governance and accounting restatements. These results are very consistent with interpretations from the results in Tables 5 and 6. The analysis of future operating performance produces results similar to those in Table 7. One interesting outcome produced by this expanded analysis is that most of the negative residuals for the governance indices are statistically significant and have the expected sign. This indicates that operating performance is *lower* for firms that have governance that is *below* the structure implied by a benchmark derived from firm size and industry. Finally, the results for future excess stock price performance are also similar to those reported in Table 8. Thus, there is evidence consistent with a statistical and substantive association between corporate governance and future operating and stock price performance, but little systematic evidence for accounting manipulations. Moreover, these results do not appear to be completely confounded by the endogeneity of the corporate governance indices.

VI. 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. However, a consistent set of results is yet to emerge from the academic literature. We suspect that these mixed results are partially the result of governance measures that have a very modest level of reliability and construct validity.

In this study, we develop a new set of indices from a comprehensive set of structural indicators of corporate governance. In order to mitigate measurement error and develop a parsimonious representation for the construct of corporate governance, we use principal component analysis and develop 14 multi-indicator indices from 39 individual governance indicators. These indices are an *initial* step in the process of developing reliable and valid indicators for the complex construct termed corporate governance. We then assess the ability of these indices to explain abnormal accruals, accounting restatements, future operating performance, and future stock returns. We find that our governance indices are related to future operating performance and excess stock returns. However, these indices have a very modest and mixed association with abnormal accruals and almost no relation with accounting restatements.

As with all somewhat exploratory studies, 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 this regulatory change caused firms to adopt greater conformity in governance mechanisms, then 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 structural measures of 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 accounting outcome measures.

Second, corporate governance choices 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, it may not be possible to capture the association between corporate governance and accounting outcomes using standard linear models. For example, a linear model cannot capture the likely complex nonlinearities and interactions among the independent variables. In order to assess the impact of method variance on our results, we also use exploratory recursive partitioning to analyze the association between corporate governance and accounting outcomes. The results are very similar for both linear model and recursive partitioning approaches, and we do not believe that our interpretations are affected by method variance.

Fourth, our empirical analysis may not adequately capture economic determinants of accounting outcomes, or even the accounting outcomes themselves. Furthermore, some of the key dimensions of the complex corporate governance construct may be missing from our analysis. Thus, our results are subject to the standard criticisms related to correlated omitted variables and measurement error. We have included virtually all variables from prior research that have been shown to be associated with each of our dependent variables, used the most contemporary measures for our outcome variables, and analyzed a very comprehensive set of governance indicators. Nevertheless, there is an unknown degree of measurement error and correlated omitted variable bias in our empirical results.

Fifth, despite a careful attempt to sample the domain of the corporate governance construct and assess the measurement properties of indices, we do *not* have perfect measures of corporate governance. Although this is a limitation, it is important to note that prior empirical work has provided almost no discussion of their selected measures (e.g., Gompers et al. 2003; Brown and Caylor 2006). Our paper is an initial attempt to develop measures of the construct that is termed corporate governance. Obviously, much measurement work remains to be done to develop reliable and valid measures that can subsequently be used by researchers.

Finally, similar to most prior work, our study primarily focuses on the number of statistically significant governance coefficients with the expected sign. While statistical significance is necessary, it is also crucial to demonstrate that the explanatory power of the predictor variables is large enough to draw substantive conclusions about corporate governance. Determining the minimum level of R^2 that must be exceeded before drawing substantive conclusions is complicated because this benchmark will vary with the complexity of the research question and the amount of prior research on a topic. However, given the strong substantive interpretations contained in most corporate governance research, it would be useful for researchers to begin a constructive debate regarding the role of explanatory power in this type of work.

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