

Governance indexes and valuation: Which causes which?

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Abstract

Two recent papers document a significant relation between valuation multiples and governance indices during the 1990s. We test whether causation runs from governance to valuation or vice versa. We find that valuation multiples during the early 1980s, a period preceding the adoption of the provisions comprising the governance indices, are highly correlated with valuation multiples during the 1990s. After controlling for valuation multiples during 1980–1985, no significant relation exists between contemporaneous valuation multiples and governance indices during the 1990s. The results are consistent with the hypothesis that firms with low valuation multiples were more likely to adopt provisions comprising the governance indices, not that the adoption of these provisions depresses valuation multiples.

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1. Introduction

Two recent papers on corporate governance document a significant relation between market-to-book ratios and indices purporting to measure the quality of a firm's governance structure. Gompers, Ishii and Metrick (2003), hereafter referred to as “GIM,” construct a firm-level governance index (“the GIM Index”) based on the prevalence of 24 governance provisions in firms surveyed by the Investor Responsibility Research Center, Inc. (“IRRC”). The authors find

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that firms with higher index values, reflecting “poor” governance, have significantly lower valuation multiples than firms with lower index values. [Bebchuk, Cohen and Ferrell \(2004\)](#), hereafter referred to as “BCF,” find similar results for a governance index (“the BCF Index”) consisting of a smaller set of provisions.

The results in the two papers show a correlation between governance indices and valuation multiples, but do not establish whether causation runs from governance to valuation or vice versa. One explanation consistent with the results is that governance provisions, which supposedly entrench managers (e.g., poison pills, staggered boards), adversely affect firm value. An alternative explanation is that causation runs in the opposite direction for at least two reasons. First, firms with low valuation multiples may be poorly managed, which makes the probability of an unsolicited bid higher than it is in better performing firms. In response to this higher likelihood of a takeover bid, managers are likely to adopt provisions that comprise the governance indices, such as poison pills. Second, firms with high valuation multiples are likely to be high growth firms. Insofar that high growth firms are less likely to become targets of unsolicited bids, these firms are less likely to adopt anti-takeover provisions. This also would result in an inverse relation between valuation multiples and the governance indices.

Both papers recognize that causality cannot be inferred from the results. GIM state that “the data do not allow strong conclusions about causality,” adding that “multiple causal explanations have starkly different policy implications and stand as a challenge for future research.” BCF state that “one important question that remains for future work concerns causation. To what extent, if any, does the correlation ... result from entrenchment producing lower value? And to what extent, if any, does this correlation simply reflect the tendency of managers of low-value firms to entrench themselves?”

This paper develops a test that attempts to distinguish between the two explanations for the observed relation between governance indices and firm value.¹ The test is prompted by the observation that the governance provisions comprising the GIM and BCF indices were either nonexistent or rarely used before 1986.

Several papers document that modern anti-takeover provisions evolved during the mid-to-late 1980s in response to a proliferation of hostile takeovers among U.S. corporations. For example, [Comment and Schwert \(1995\)](#) document that only a trivial percentage of firms had poison pills before 1986. They also document that the percentage of firms protected by state takeover laws was small before 1986, but increased substantially afterwards. [Danielson and Karpoff \(1998\)](#) document a large and broad-based increase in the use of twenty corporate governance provisions in the mid-to-late 1980s. Other studies documenting a widespread adoption of various anti-takeover provisions after the early 1980s are [Jarrell and Poulsen \(1987\)](#), [Ryngaert \(1988\)](#), and [Malatesta and Walkling \(1988\)](#).

The fact that the governance provisions comprising the GIM and BCF indices were rare in the early 1980s provides an opportunity to test whether causation runs from the governance indices to valuation or vice versa. Using a large sample of firms covered by the IRRC, we find a significant relation between market-to-book ratios during 1980–85 and the GIM and BCF indices during the 1990s. Further, after controlling for market-to-book ratios during 1980–1985, no significant relation exists between contemporaneous market-to-book ratios and governance indices during the 1990s. These results are consistent with the hypothesis that valuation multiples affect governance indices, not vice versa.

¹ The test cannot rule out the possibility that a third variable affects both valuation multiples and governance indices, thereby creating a spurious relation between the two variables.

We also examine the relation between the governance indices and both the lagged and subsequent values of market-to-book ratios. We find that the GIM and BCF indices are inversely related to lagged market-to-book ratios but not to subsequent market-to-book ratios. These results also are consistent with the hypothesis that causation runs from valuation to governance.

The paper is organized as follows. Section 2 describes the sample and data used in the analysis. Section 3 reports the empirical results. Section 4 contains concluding comments.

2. Sample and data

2.1. Sample

The sample for this analysis is drawn from the IRRC database used by GIM and BCF. We use six of the seven survey years in the IRRC database — those conducted in 1990, 1993, 1995, 1998, 2000 and 2002. Following GIM and BCF, we fill in index data for non-survey years using the latest survey year data. Each survey covers approximately 1500 firms. The union of the samples surveyed in these 6 years consists of 3154 firms. Seven hundred and eleven firms appear in all six surveys.

2.2. Data

The IRRC database is used to calculate both the GIM and BCF governance indices. The GIM index is readily available from the IRRC database as it measures the number of the 24 governance provisions adopted by a firm. The BCF index is calculated as the number of provisions identified by BCF as effective entrenchment devices adopted by a firm. BCF identify six provisions as effective entrenchment devices: staggered boards, limits on amending by-laws, limits on amending charters, supermajority requirements, poison pills, and golden parachutes.

We collected data to replicate the regression analyses in GIM and BCF, in which Tobin's q is estimated as a function of a number of variables including the contemporaneous value of the governance indices. Similar to GIM and BCF, instead of using Tobin's q as the dependent variable, we use the market-to-book ratio of assets, which is highly correlated with Tobin's q .² Following GIM and BCF, we calculate the market value of assets as the book value of assets plus the market value of common stock less the sum of the book value of common stock and balance sheet deferred taxes. These values are measured as of the end of each fiscal year. The industry-adjusted market-to-book ratio is used in all the analyses.

Following GIM, two dummy variables are included as independent variables in the regression analyses. The first dummy variable takes the value of one if the company is incorporated in Delaware and zero otherwise (DELAWARE).³ The second dummy variable takes the value of one if the firm is included in the S&P 500 Index and zero otherwise (SP500).⁴ Data on Delaware incorporation is available from the IRRC database and data on inclusion in S&P 500 is extracted from Standard and Poor's Compustat database.

We also include other independent variables used by GIM and BCF in their regression analyses. Firm age is the number of years since the firm's listing in the CRSP database (AGE).

² See, for example, Perfect and Wiles (1994), Chung and Pruitt (1994) and Lewellen and Badrinath (1997).

³ See Daines (2001).

⁴ See Morck and Yang (2001).

Firm size is measured as the book value of assets (ASSETS). Other accounting variables included as independent variables are return on assets (ROA); capital expenditure as a ratio of book value of assets (CAPEX); leverage, measured as the ratio of long-term debt plus debt due in 1 year to the book value of assets (LEV) and the ratio of research and development expenditures to total sales (R&D). All financial accounting data is taken from Compustat. Market-to-book ratios and leverage are winsorized at levels of 5% and 95% to mitigate the effect of outliers.⁵

For regressions of the GIM and BCF Index we use average managerial ownership (AVGOWN) as a control variable. This is obtained from the ExecuComp Database and is computed as the average of the ownership of the five employees with the highest pay in that year. We are unable to estimate regression models that use this variable for the years 1990 and 1991 because ExecuComp coverage is not available for these years.

2.3. Documenting the evolution of anti-takeover provisions

To confirm that anti-takeover provisions proliferated in the mid-1980s, we manually collected data from the 1990 edition of the “Corporate Takeover Defenses” manual published by IRRRC. For each of the 616 firms for which complete data are available, we collected data on the six anti-takeover provisions in the BCF index (i.e., classified boards, limits to amend charters, limits to amend by-laws, supermajority requirements, poison pills, and golden parachutes) and the year each provision was adopted. Using this data we are able to construct the BCF index and the value of each of the six provisions back to 1980⁶.

Panel A of Fig. 1 shows the percentage of firms adopting each of the six provisions during 1980 to 1990. We observe a sharp increase of provision adoption beginning in 1984. Some of the provisions such as poison pills and limits to amend charters are not even present before the mid-1980s. Panel B of Fig. 1 shows the mean and median value of BCF index for the 616 firms. The median value of the BCF index is equal to zero before 1985 and one after 1985, also indicative of the fact that these anti-takeover provisions were mainly adopted after the mid-1980s.

3. Empirical results

3.1. Replicating GIM and BCF

We first replicate the GIM and BCF results by regressing market-to-book ratios on the contemporaneous values of the GIM and BCF governance indices for each year during 1990–2003. The regression results, not reported for the sake of brevity, are consistent with those provided by GIM and BCF. Among the GIM regressions, eleven of the 14 estimated coefficients on the index are negative and significant at the 0.01 level and one is negative and significant at the 0.05 level. Similar results hold for the BCF index.

Because our subsequent tests are conditioned on the availability of Tobin’s q in the 1980s, we also replicate the GIM and BCF analyses for the sub-sample of firms surviving from 1980 through 2002. Panel A of Table 1 shows that the pattern of negative association between the GIM index and contemporaneous market-to-book ratio remains after conditioning on survival. ASSET and

⁵ The results remain the same when these variables are not winsorized or are winsorized at the 1% and 99% level.

⁶ Not all the firms in “Corporate Takeover Defenses” manual have provided the information as to the year of anti-takeover provision adoptions. We include 616 firms for which we are able to identify the exact year when they first adopted each of the six provisions.

SP500 both enter with significant coefficients. The coefficient on AGE is not significant for the sub-sample of survivors. The last two rows of Panel A report time-series means of the coefficients and the corresponding Fama and Macbeth (1973) *t*-statistics. To account for potential autocorrelation in the annual slopes we follow Fama and French (2002) and deflate all Fama–Macbeth *t*-statistics by a factor of 2.5.

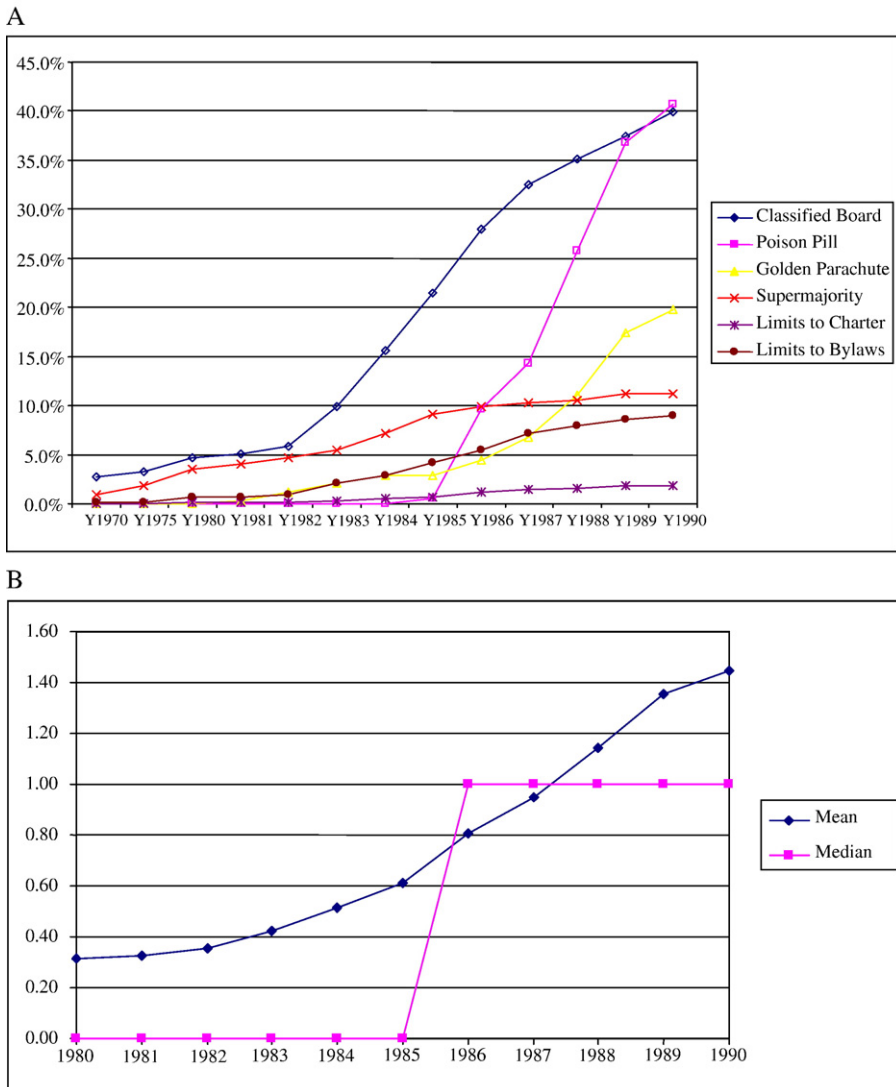


Fig. 1. Evolution of anti-takeover provision adoption. A. This figure shows the percentage of firms (of a total of 616 firms with complete data on adoption dates) that adopt each of six anti-takeover provisions through the period 1970–1990. The six provisions are classified boards, limits to amend charters, limits to amend by-laws, supermajority requirements, poison pills and golden parachutes. B. This figure shows the mean and median of the BCF index (obtained by adding a point for the existence of each of the six provisions listed above) for a sample of 616 firms with complete data on adoption dates for the provisions.

Table 1
Replication of the GIM and BCF regressions for firms surviving from 1980–2002

Panel A: GIM regressions								
Year	Intercept	GIM index	DELAWARE	ASSET	AGE	SP500	<i>N</i>	Adjusted <i>R</i> -squared (%)
1990	1.080*** (6.38)	−0.026*** (−3.19)	0.040 (0.87)	−0.138*** (−7.58)	0.051 (1.20)	0.475*** (8.45)	629	12.21
1991	1.417*** (6.24)	−0.037*** (−3.47)	−0.001 (−0.02)	−0.155*** (−6.66)	−0.004 (−0.07)	0.592*** (8.10)	631	10.99
1992	1.225*** (5.63)	−0.033*** (−3.35)	0.000 (0.01)	−0.134*** (−6.28)	−0.001 (−0.01)	0.553*** (8.17)	630	10.63
1993	0.992*** (4.89)	−0.017* (−1.92)	0.016 (0.33)	−0.109*** (−5.68)	−0.046 (−0.90)	0.496*** (7.97)	656	9.03
1994	0.962*** (5.26)	−0.013* (−1.72)	0.048 (1.12)	−0.111*** (−6.66)	−0.030 (−0.64)	0.494*** (9.10)	656	11.61
1995	0.751*** (3.63)	−0.016* (−1.82)	0.046 (0.93)	−0.101*** (−5.23)	0.017 (0.35)	0.483*** (7.70)	668	8.13
1996	0.902*** (3.92)	−0.018* (−1.89)	0.024 (0.45)	−0.101*** (−4.88)	−0.012 (−0.23)	0.525*** (7.79)	668	8.14
1997	0.896*** (3.61)	−0.017* (−1.71)	0.047 (0.84)	−0.117*** (−5.47)	0.030 (0.51)	0.692*** (9.85)	667	12.69
1998	1.149*** (4.88)	−0.022*** (−2.24)	0.034 (0.60)	−0.145*** (−6.73)	0.048 (0.97)	0.883*** (12.44)	716	18.03
1999	0.588*** (2.02)	−0.026*** (−2.20)	0.020 (0.30)	−0.088*** (−3.41)	0.038 (0.60)	0.822*** (9.55)	716	12.48
2000	0.977*** (3.91)	−0.028*** (−2.70)	0.101* (1.75)	−0.117*** (−5.24)	0.035 (0.65)	0.819*** (10.88)	722	15.21
2001	1.127*** (4.37)	−0.027*** (−2.54)	0.010 (0.17)	−0.100*** (−4.55)	−0.059 (−1.02)	0.695*** (9.17)	720	10.67
2002	0.848*** (4.05)	−0.013 (−1.46)	0.027 (0.59)	−0.096*** (−5.45)	0.006 (0.13)	0.557*** (8.97)	736	9.54
2003	1.076*** (4.02)	−0.027*** (−2.43)	−0.008 (−0.14)	−0.091*** (−4.25)	−0.072 (−1.23)	0.538*** (7.06)	691	6.65
Mean	1.00***	−0.02***	0.03	−0.11***	0.00	0.62***		
<i>T</i> -stat	(7.26)	(−4.69)	(1.56)	(−8.15)	(0.00)	(6.57)		

These are results of replication of GIM annual regressions for firms that survive from 1980 to 2002. Contemporaneous market-to-book ratio (industry-adjusted) is regressed on the GIM index. The independent variables include the value of the current year GIM index, a dummy variable equal to one if the firm is incorporated in Delaware and zero otherwise (DELAWARE), log of assets (ASSET), log of firm age (AGE), and a dummy variable equal to one if the firm is included in the S&P 500 index and zero otherwise (SP500). White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel B: BCF OLS regressions

Year	Intercept	BCF index	OTHER	ASSET	AGE	DELAWARE	ROA	CAPEX	LEV	RD	AVGOW	N	Adjusted R-squared (%)
1992	0.259*** (2.67)	−0.041 (−1.53)	−0.015*** (−2.15)	−0.018* (−1.85)	−0.021 (−0.95)	0.027 (1.04)	4.063*** (14.02)	0.048 (0.59)	−0.032 (−1.30)	0.157 (0.66)	−0.006 (−0.88)	510	39.58
1993	0.253*** (2.73)	−0.014 (−0.54)	−0.009 (−1.37)	−0.007 (−0.79)	−0.061*** (−2.85)	−0.011 (−0.45)	3.565*** (13.32)	0.129* (1.75)	−0.065*** (−2.86)	−0.011 (−1.40)	0.001 (0.11)	549	36.84
1994	0.238*** (2.75)	−0.053*** (−2.33)	−0.001 (−0.20)	−0.005 (−0.62)	−0.083*** (−4.26)	−0.011 (−0.49)	4.258*** (16.04)	0.170* (1.69)	−0.022 (−1.10)	0.006 (0.37)	−0.001 (−0.17)	554	42.14
1995	0.114 (1.10)	−0.014 (−0.50)	−0.008 (−1.06)	0.005 (0.54)	−0.044*** (−2.01)	0.011 (0.45)	2.998*** (10.84)	0.119 (1.17)	−0.064*** (−2.82)	0.022 (1.37)	0.004 (0.52)	570	24.35
1996	0.063 (0.61)	−0.034 (−1.26)	−0.008 (−1.10)	0.016* (1.65)	−0.065*** (−2.89)	−0.008 (−0.34)	4.009*** (13.97)	0.191 (1.47)	−0.060*** (−2.60)	0.144*** (3.52)	−0.006 (−0.76)	578	32.40
1997	−0.096 (−0.99)	−0.010 (−0.41)	−0.006 (−0.88)	0.023*** (2.70)	−0.029 (−1.37)	−0.010 (−0.43)	4.088*** (17.05)	−0.118 (−1.18)	−0.054*** (−2.65)	0.577*** (4.17)	0.006 (0.73)	584	39.76
1998	−0.078 (−0.76)	−0.088*** (−3.06)	0.007 (1.06)	0.031*** (3.32)	−0.028 (−1.28)	0.015 (0.59)	3.818*** (15.33)	0.103 (1.19)	−0.080*** (−3.73)	0.235* (1.85)	−0.004 (−0.49)	667	34.51
1999	−0.304*** (−2.42)	−0.068* (−1.94)	−0.005 (−0.53)	0.036*** (3.17)	0.004 (0.16)	0.028 (0.89)	3.815*** (12.00)	0.111 (0.82)	−0.051*** (−2.01)	0.177*** (3.13)	−0.010 (−0.92)	657	23.03
2000	−0.251*** (−2.19)	−0.081*** (−2.46)	0.004 (0.44)	0.045*** (4.53)	−0.010 (−0.41)	0.005 (0.17)	3.739*** (14.24)	−0.017 (−0.12)	−0.071*** (−3.08)	0.340*** (3.26)	−0.001 (−0.15)	668	30.72
2001	0.143 (1.31)	−0.106*** (−3.47)	0.008 (1.08)	0.026*** (2.80)	−0.063*** (−2.53)	−0.024 (−0.86)	2.969*** (13.06)	0.000 (0.00)	−0.090*** (−4.48)	−0.002 (−0.17)	−0.001 (−0.10)	673	28.28
2002	0.050 (0.53)	−0.122*** (−4.33)	0.013*** (2.17)	0.013* (1.71)	−0.016 (−0.77)	−0.017 (−0.74)	3.151*** (16.98)	−0.096 (−0.93)	−0.053*** (−3.20)	0.258*** (3.23)	0.005 (0.64)	713	35.30
2003	0.253 (2.21)	−0.097*** (−2.88)	−0.003 (−0.41)	−0.005 (−0.51)	−0.043* (−1.66)	−0.031 (−1.14)	2.863*** (11.75)	−0.073 (−0.52)	−0.023 (−1.19)	0.002*** (2.19)	−0.011 (−1.09)	659	20.59
Mean	0.05	−0.06**	0.00	0.01	−0.04**	0.00	3.61***	0.05	−0.06***	0.16	0.001		
T-stat	(0.94)	(−2.18)	(−0.30)	(0.94)	(−2.04)	(−0.35)	(10.16)	(1.54)	(−3.61)	(1.24)	(0.26)		

This table reports results of annual OLS regressions of industry-adjusted log (market-to-book ratio) on log (1+BCFindex) (BCF Index) for firms surviving from 1980 through 2002. Other independent variables are the same as in Panel B.1, and include other governance provisions (OTHER), log of assets (ASSET), log of firm age (AGE), a dummy variable equal to one if the firm is incorporated in Delaware and zero otherwise (DELAWARE), return on assets (ROA), the ratio of capital expenditures to assets (CAPEX), leverage (LEV), the ratio of R&D expenditure to sales (RD), and average stock ownership of insiders (AVGOWN). White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel B reports OLS regression results for the BCF index for the sub-sample of firms that survived from 1980 through 2002. The pattern of negative association between the BCF index and market-to-book ratio also remains largely unchanged.⁷ The above results for both the GIM and BCF Index hold for survival requirements of different lengths and for different beginning years.⁸

These results, similar to those reported in GIM and BCF, establish a correlation between market-to-book ratios and the governance indices, but not a causal relation between the two variables. We now turn to a test that addresses the issue of causation.

3.2. Testing the causal relation between governance indices and market-to-book ratios

To test the causal relation between governance indices and market-to-book ratios, we first examine the relation between market-to-book ratios during the early 1980s and index values in the 1990s. A significant relation between the two variables would indicate that the negative association documented by GIM and BCF is due to governance indices being related to past performance information contained in contemporaneous values of market-to-book ratios. We then test if the contemporaneous relation between market-to-book ratios and the governance indices during the 1990s holds after controlling for market-to-book ratios during 1980–1985. If this relation does not hold, then we infer that market-to-book ratios affect governance indices and not vice versa.

Before turning to the results of these tests, we first examine the serial correlation in market-to-book ratios. Table 2 presents a matrix containing correlation coefficients for pairs of industry-adjusted market-to-book ratios for each year from 1980 through 2003. The matrix reveals significant serial correlation in market-to-book ratios over the period. The correlation coefficients range from 0.22 to 0.85 and are all significant at the 0.01 level.

Perhaps most relevant for this analysis, market-to-book ratios during the early 1980s are highly correlated with market-to-book ratios during 1990–2003. For example, the 1980 market-to-book ratio has correlation coefficients of 0.32 and 0.24 with the 1990 and 2003 market-to-book ratios, respectively. The 1985 market-to-book ratio has correlation coefficients of 0.51 and 0.41 with the 1990 and 2003 market-to-book ratios, respectively. Hence, market-to-book ratios during the sample periods used by GIM and BCF are highly correlated with market-to-book ratios during 1980–1985, a period preceding the adoption of governance provisions comprising the GIM and BCF indices⁹.

⁷ We also replicate BCF analyses with the median regressions. The results are the same.

⁸ Specifically, we replicate the analyses based on sub-samples that survived different periods such as 1985–2002, 1990–2002, and so forth.

⁹ In addition to documenting serial correlations we carry out the following time series analyses of market-to-book ratios. We find that the lagged values of market-to-book ratios are significantly associated with current market-to-book ratios when different lags are included in the model simultaneously. The magnitude of the estimated coefficients decreases as the order of lag increases. Panel models with firm fixed effects using lags of up to 10 years yield similar results. The distribution of autocorrelation values derived from firm-by-firm time-series regressions tightens significantly around 0 as the number of lags is increased from one to five (because we have a maximum of 23 data points for each firm, higher order lags cannot be used in individual firm regressions). The average value of coefficient estimates (and absolute coefficient estimates) from individual firm regressions declines significantly as the order of lag increases. Finally, following Cochrane (1988) and Vuolteenaho (2000) we tabulate the variance of k -th order differences of the market-to-book ratio of our sample firms. Consistent with Vuolteenaho's (2000) results for the aggregate market-to-book ratio we find that the normalized variance of the k -th order differences in the cross-section of the market-to-book ratio declines with the order of the difference. All results are available with the corresponding author.

Table 2

Serial correlation of market-to-book ratios

	MTB 1980	MTB 1981	MTB 1982	MTB 1983	MTB 1984	MTB 1985	MTB 1990	MTB 1991	MTB 1992	MTB 1993	MTB 1994	MTB 1995	MTB 1996	MTB 1997	MTB 1998	MTB 1999	MTB 2000	MTB 2001	MTB 2002	MTB 2003
MTB80	1	0.84	0.70	0.63	0.58	0.51	0.32	0.33	0.31	0.28	0.29	0.26	0.26	0.26	0.25	0.24	0.25	0.27	0.22	0.24
MTB81	0.84	1	0.84	0.73	0.64	0.57	0.35	0.39	0.37	0.32	0.32	0.29	0.29	0.30	0.28	0.26	0.27	0.33	0.27	0.29
MTB82	0.70	0.84	1	0.85	0.73	0.66	0.37	0.43	0.41	0.38	0.38	0.34	0.32	0.33	0.33	0.34	0.32	0.38	0.35	0.39
MTB83	0.63	0.73	0.85	1	0.83	0.73	0.35	0.44	0.44	0.41	0.41	0.37	0.33	0.32	0.32	0.33	0.29	0.36	0.31	0.39
MTB84	0.58	0.64	0.73	0.83	1	0.84	0.41	0.47	0.45	0.41	0.40	0.36	0.32	0.32	0.34	0.34	0.32	0.36	0.33	0.39
MTB85	0.51	0.57	0.66	0.73	0.84	1	0.51	0.55	0.52	0.46	0.46	0.42	0.39	0.40	0.41	0.38	0.37	0.40	0.39	0.41
MTB90	0.32	0.35	0.37	0.35	0.41	0.51	1	0.81	0.69	0.55	0.54	0.48	0.43	0.37	0.34	0.36	0.39	0.37	0.33	
MTB91	0.33	0.39	0.43	0.44	0.47	0.55	0.81	1	0.85	0.68	0.62	0.55	0.46	0.40	0.38	0.36	0.37	0.44	0.38	0.38
MTB92	0.31	0.37	0.41	0.44	0.45	0.52	0.69	0.85	1	0.80	0.70	0.59	0.50	0.42	0.43	0.39	0.37	0.43	0.39	0.37
MTB93	0.28	0.32	0.38	0.41	0.41	0.46	0.55	0.68	0.80	1	0.81	0.67	0.55	0.47	0.44	0.43	0.39	0.43	0.39	0.38
MTB94	0.29	0.32	0.38	0.41	0.40	0.46	0.54	0.62	0.70	0.81	1	0.78	0.64	0.54	0.49	0.43	0.39	0.45	0.39	0.40
MTB95	0.26	0.29	0.34	0.37	0.36	0.42	0.48	0.55	0.59	0.67	0.78	1	0.81	0.65	0.55	0.48	0.44	0.46	0.38	0.40
MTB96	0.26	0.29	0.32	0.33	0.32	0.39	0.43	0.46	0.50	0.55	0.64	0.81	1	0.79	0.63	0.51	0.46	0.47	0.38	0.37
MTB97	0.26	0.30	0.33	0.32	0.32	0.40	0.37	0.40	0.42	0.47	0.54	0.65	0.79	1	0.76	0.56	0.54	0.52	0.44	0.40
MTB98	0.25	0.28	0.33	0.32	0.34	0.41	0.37	0.38	0.43	0.44	0.49	0.55	0.63	0.76	1	0.67	0.61	0.62	0.50	0.44
MTB99	0.24	0.26	0.34	0.33	0.34	0.38	0.34	0.36	0.39	0.43	0.43	0.48	0.51	0.56	0.67	1	0.66	0.64	0.47	0.54
MTB00	0.25	0.27	0.32	0.29	0.32	0.37	0.36	0.37	0.37	0.39	0.39	0.44	0.46	0.54	0.61	0.66	1	0.78	0.59	0.52
MTB01	0.27	0.33	0.38	0.36	0.36	0.40	0.39	0.44	0.43	0.43	0.45	0.46	0.47	0.52	0.62	0.64	0.78	1	0.75	0.66
MTB02	0.22	0.27	0.35	0.31	0.33	0.39	0.37	0.38	0.39	0.39	0.39	0.38	0.38	0.44	0.50	0.47	0.59	0.75	1	0.76
MTB03	0.24	0.29	0.39	0.39	0.39	0.41	0.33	0.38	0.37	0.38	0.40	0.40	0.37	0.40	0.44	0.54	0.52	0.66	0.76	1

This table reports the serial correlation of industry-adjusted market-to-book ratios (MTB) of the IRRC firms during 1980–2003. All correlation coefficients are significant at the 0.01 level.

The relevance of the serial correlation in market-to-book ratios is revealed in Fig. 2, which plots the mean industry-adjusted market-to-book ratio during 1980–2003 for two groups of firms: quartiles with the highest and lowest values of the governance indices in 1990. Panel A of Fig. 2 plots the data for the quartile of firms with the highest and lowest values of the GIM index in 1990. This is done for the full sample of IRRC firms that existed in each of the years from 1980 through 2000 and for a sample of 630 firms that existed in all years from 1980 through 2000. The

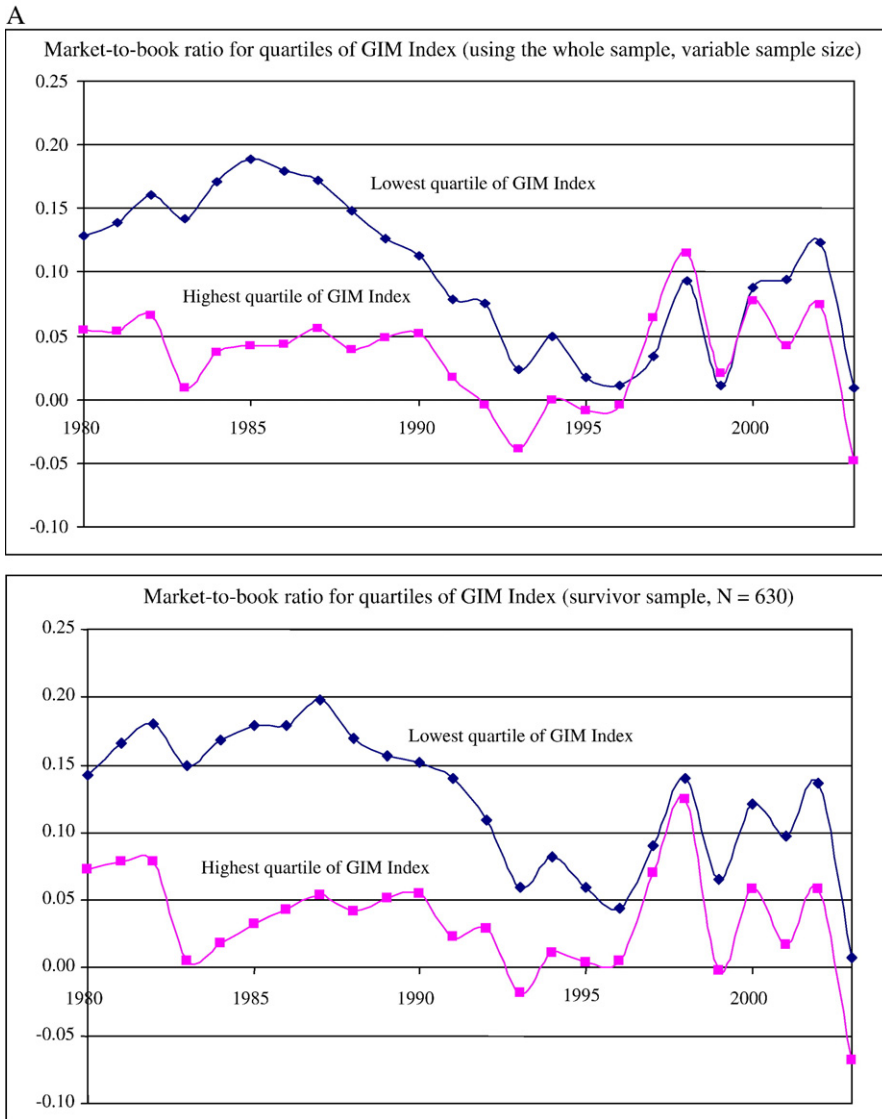


Fig. 2. Market-to-book ratio and GIM index. This figure shows the mean industry-adjusted market-to-book ratio from 1980 to 2003 for two groups of firms. The top and bottom lines are the mean market-to-book ratios for the sub-samples of firms in the lowest and highest quartiles ranked by the BCF Index in 1990, respectively. The top figure is for the whole sample. The bottom figure is for a sample of firms that survived from 1980 through 2000.

B

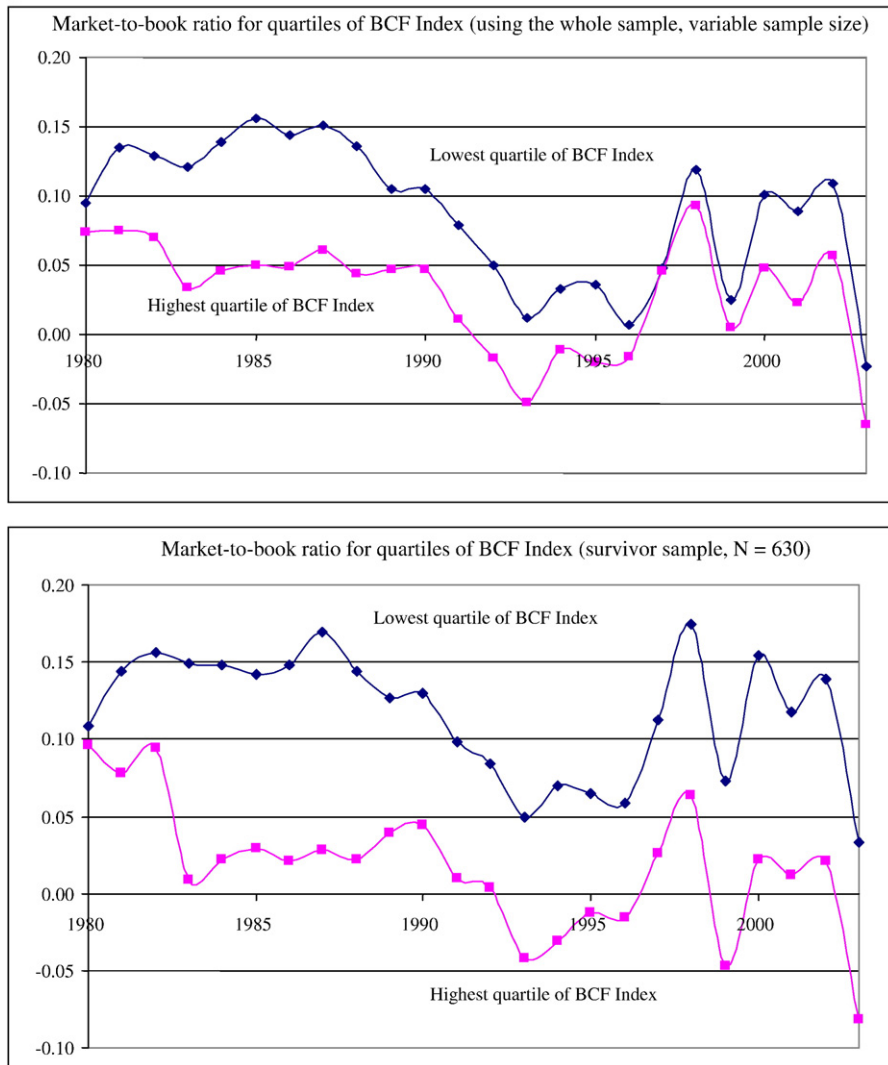


Fig. 2 (continued).

figure shows that the mean market-to-book ratio in 1990 for the quartile of firms with the lowest values of the GIM index in 1990 is substantially higher than the corresponding mean market-to-book ratio in 1990 for the quartile of firms with the highest values of the GIM index in 1990.¹⁰ This result is consistent with the regression results showing a significant negative relation between market-to-book ratios and the contemporaneous value of the GIM index.

The figure also shows that the mean market-to-book ratio of the high-GIM quartile is consistently less than the mean market-to-book ratio of the low-GIM quartile during the early

¹⁰ We also plotted the mean market-to-book ratio during 1980–2003 for firms with the highest and lowest values of the governance indices in two additional years, 1995 and 2000. These plots are similar to the ones in Fig. 2.

Table 3

Regression of governance indices during 1990–2003 on market-to-book ratios during 1980–1985

Panel A: Using the GIM index

Year	MTB80	MTB81	MTB82	MTB83	MTB84	MTB85	Avg MTB
1990	−0.058** (−1.96)	−0.072*** (−2.33)	−0.087*** (−2.83)	−0.086*** (−2.62)	−0.085*** (−2.45)	−0.081*** (−2.42)	−0.105*** (−2.62)
1991	−0.067*** (−2.21)	−0.077*** (−2.43)	−0.090*** (−2.88)	−0.086*** (−2.58)	−0.090*** (−2.59)	−0.088*** (−2.62)	−0.111*** (−2.74)
1992	−0.067*** (−2.19)	−0.078*** (−2.42)	−0.091*** (−2.86)	−0.085*** (−2.54)	−0.094*** (−2.70)	−0.093*** (−2.75)	−0.111*** (−2.73)
1993	−0.026 (−0.83)	−0.037 (−1.12)	−0.068*** (−2.15)	−0.061* (−1.89)	−0.068** (−2.03)	−0.066** (−2.09)	−0.063 (−1.54)
1994	−0.036 (−1.13)	−0.050 (−1.50)	−0.073*** (−2.29)	−0.068** (−2.07)	−0.074*** (−2.17)	−0.074*** (−2.30)	−0.074* (−1.78)
1995	−0.031 (−1.00)	−0.049 (−1.53)	−0.066*** (−5.07)	−0.062* (−1.94)	−0.065* (−1.93)	−0.070*** (−2.19)	−0.071* (−1.74)
1996	−0.026 (−0.82)	−0.045 (−1.35)	−0.065*** (−2.12)	−0.065** (−1.99)	−0.072*** (−2.11)	−0.078*** (−2.42)	−0.069* (−1.67)
1997	−0.024 (−0.70)	−0.040 (−1.15)	−0.057* (−1.77)	−0.061* (−1.80)	−0.067* (−1.88)	−0.074*** (−2.20)	−0.061 (−1.38)
1998	−0.029 (−0.87)	−0.027 (−0.80)	−0.033 (−1.11)	−0.049 (−1.46)	−0.052 (−1.49)	−0.063** (−1.97)	−0.031 (−0.72)
1999	−0.036 (−1.02)	−0.032 (−0.95)	−0.043 (−1.34)	−0.055 (−1.53)	−0.050 (−1.36)	−0.056* (−1.78)	−0.042 (−0.94)
2000	−0.021 (−0.59)	−0.011 (−0.32)	−0.026 (−0.84)	−0.040 (−1.19)	−0.034 (−1.00)	−0.036 (−1.18)	−0.032 (−0.72)
2001	−0.022 (−0.59)	−0.010 (−0.27)	−0.027 (−0.82)	−0.048 (−1.36)	−0.053 (−1.53)	−0.050 (−1.59)	−0.045 (−0.98)
2002	−0.017 (−0.53)	−0.007 (−0.22)	−0.015 (−0.53)	−0.051 (−1.55)	−0.051 (−1.57)	−0.050 (−1.57)	−0.030 (−0.74)
2003	−0.031 (−0.95)	−0.012 (−0.35)	−0.025 (−0.84)	−0.063* (−1.86)	−0.065** (−1.97)	−0.063** (−1.96)	−0.045 (−1.08)
Mean	−0.035***	−0.039***	−0.055***	−0.063***	−0.066***	−0.067***	−0.064***
<i>T</i> -stat	(−3.11)	(−2.35)	(−3.12)	(−6.48)	(−5.85)	(−6.38)	(−3.29)

This table reports results from a regression model in which log values of the GIM Index during 1990–2003 are regressed on market-to-book ratios (industry-adjusted) during 1980–1985 (MTB) and control variables as in GIM. “Avg MTB” is the average market-to-book ratio during 1980–1985. Only the estimated coefficients of market-to-book ratios are reported in this table. The estimated coefficients on other variables are not reported for the sake of brevity. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel B: Using the BCF index

Year	MTB80	MTB81	MTB82	MTB83	MTB84	MTB85	Avg MTB
1992	−0.116*** (−2.13)	−0.130*** (−2.23)	−0.146*** (−2.86)	−0.183*** (−3.46)	−0.214*** (−3.76)	−0.138*** (−2.51)	−0.177*** (−2.72)
1993	−0.111*** (−2.28)	−0.146*** (−2.77)	−0.165*** (−3.48)	−0.185*** (−3.83)	−0.214*** (−4.18)	−0.127*** (−2.57)	−0.182*** (−3.04)
1994	−0.090* (−1.77)	−0.136*** (−2.52)	−0.158*** (−3.31)	−0.181*** (−3.67)	−0.200*** (−3.85)	−0.098** (−1.98)	−0.167*** (−2.70)
1995	−0.112*** (−2.28)	−0.134*** (−2.59)	−0.174*** (−3.87)	−0.180*** (−3.82)	−0.182*** (−3.67)	−0.114*** (−2.40)	−0.161*** (−2.75)
1996	−0.124*** (−2.47)	−0.137*** (−2.60)	−0.172*** (−3.78)	−0.174*** (−3.74)	−0.190*** (−3.83)	−0.128*** (−2.68)	−0.174*** (−2.95)

Table 3 (continued)

Panel B: Using the BCF index

Year	MTB80	MTB81	MTB82	MTB83	MTB84	MTB85	Avg MTB
1997	−0.119*** (−2.26)	−0.149*** (−2.72)	−0.171*** (−3.60)	−0.182*** (−3.69)	−0.194*** (−3.66)	−0.126*** (−2.46)	−0.171*** (−2.75)
1998	−0.048 (−0.97)	−0.089* (−1.79)	−0.124*** (−2.84)	−0.165*** (−3.62)	−0.191*** (−3.97)	−0.155*** (−3.41)	−0.125*** (−2.13)
1999	−0.046 (−0.88)	−0.097* (−1.87)	−0.123*** (−2.67)	−0.160*** (−3.38)	−0.170*** (−3.44)	−0.147*** (−3.04)	−0.122** (−1.98)
2000	−0.046 (−0.91)	−0.080 (−1.56)	−0.085* (1.87)	−0.131*** (−2.78)	−0.145*** (−2.90)	−0.110*** (−2.29)	−0.106* (−1.79)
2001	−0.067 (−1.27)	−0.097* (−1.76)	−0.096** (−1.98)	−0.156*** (−3.16)	−0.168*** (−3.25)	−0.132*** (−2.68)	−0.136*** (−2.15)
2002	−0.031 (−0.71)	−0.079* (−1.72)	−0.089*** (−2.20)	−0.139*** (−3.29)	−0.149*** (−3.38)	−0.120*** (−2.84)	−0.095* (−1.81)
2003	−0.031 (−0.66)	−0.077 (−1.60)	−0.091*** (−2.11)	−0.128*** (−2.89)	−0.140*** (−3.02)	−0.109*** (−2.46)	−0.077 (−1.38)
Mean	−0.078***	−0.113***	−0.133***	−0.164***	−0.180***	−0.125***	−0.141***
T-stat	(−2.94)	(−5.48)	(−5.16)	(−7.74)	(−9.77)	(−10.59)	(−5.46)

This table reports results from a regression model in which the log values of one plus the BCF Index during 1990–2003 are regressed on market-to-book ratios (industry-adjusted) during 1980–1985 (MTB) and control variables as in BCF. “Avg MTB” is the average market-to-book ratio during 1980 to 1985. Only the estimated coefficients of BCF Index are reported in this table. The estimated coefficients on other variables, which are the same as those included in the regressions reported in Table 1, are not reported for the sake of brevity. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

1980s, the period preceding the adoption of governance provisions comprising the GIM index. In fact, the difference in the mean market-to-book ratios of the two quartiles is actually greater during 1980–1985 than it is in 1990 and thereafter. The evidence presented in Panel A of Fig. 2 is consistent with the view that firms with low market-to-book ratios were more likely to adopt governance provisions that comprise the GIM index than firms with high market-to-book ratios. The evidence is not consistent with the view that the adoption of governance provisions comprising the GIM index caused market-to-book ratios to be lower.

Panel B of Fig. 2 presents the corresponding graphs for quartiles of firms with the highest and lowest values of the BCF index in 1990. The graph shows a pattern similar to the one presented in Panel A. The quartile of firms with the highest values of the BCF index in 1990 has substantially lower market-to-book ratios in 1990 than the quartile of firms with the lowest values of the BCF index in 1990. However, firms in the high BCF index quartile also had substantially lower market-to-book ratios than firms in the low BCF index quartile during 1980–1985. This evidence also is consistent with the hypothesis that market-to-book ratios affect the governance indices and not vice versa.

Finally, the close similarity of the figures for the whole sample and the surviving sample for both the BCF and GIM indices shows that survival is not a factor driving the results.

3.3. Regressions of the GIM and BCF Indices on 1980–1985 market-to-book ratios

To test whether a significant relation exists between market-to-book ratios during 1980–1985 and the governance indices during 1990–2003, we regress governance indices during

Table 4

Annual OLS regression of market-to-book ratios on contemporaneous value of the governance indices and the average market-to-book ratio during 1980–1985

Panel A: Using the GIM index									
Year	Intercept	GIM index	DELAWARE	ASSET	AGE	SP500	AvgMTB	N	Adjusted R-squared (%)
1990	0.044 (0.34)	−0.007 (−1.29)	0.043 (1.31)	−0.028*** (−2.78)	0.070*** (2.58)	0.231*** (5.23)	0.467*** (7.83)	963	25.52
1991	0.034 (0.19)	−0.014** (−1.97)	−0.029 (−0.71)	−0.020 (−1.52)	0.053 (1.31)	0.280*** (5.20)	0.599*** (9.65)	946	25.20
1992	0.027 (0.15)	−0.014*** (−2.11)	−0.033 (−0.87)	−0.014 (−1.18)	0.041 (0.96)	0.289*** (5.80)	0.536*** (8.89)	932	25.32
1993	−0.136 (−0.82)	−0.006 (−0.89)	−0.027 (−0.73)	−0.011 (−0.92)	0.047 (1.28)	0.258*** (5.46)	0.421*** (7.79)	959	18.23
1994	−0.065 (−0.43)	−0.003 (−0.54)	0.006 (0.19)	−0.024*** (−2.30)	0.060 (1.64)	0.258*** (5.92)	0.434*** (8.96)	936	23.28
1995	−0.125 (−0.72)	−0.004 (−0.60)	0.000 (0.00)	−0.018 (−1.35)	0.062 (1.73)	0.281*** (5.63)	0.399*** (6.91)	919	15.12
1996	−0.082 (−0.41)	−0.003 (−0.43)	0.009 (0.22)	−0.018 (−1.34)	0.048 (1.12)	0.320*** (5.84)	0.414*** (7.02)	895	15.65
1997	−0.129 (−0.55)	0.002 (0.25)	0.028 (0.63)	−0.029** (−2.08)	0.087 (1.62)	0.436*** (7.38)	0.436*** (7.36)	841	18.45
1998	−0.041 (−0.20)	−0.006 (−0.74)	0.008 (0.17)	−0.045*** (−2.94)	0.131*** (2.92)	0.607*** (9.55)	0.486*** (8.36)	835	25.69
1999	−0.921 (−3.25)	−0.012 (−1.10)	−0.012 (−0.20)	0.022 (1.07)	0.190*** (3.10)	0.498*** (6.56)	0.652*** (7.70)	774	24.00
2000	−0.320 (−1.38)	−0.016 (−1.66)	0.056 (1.05)	−0.025 (−1.31)	0.166*** (3.46)	0.558*** (7.60)	0.525*** (7.65)	711	25.06
2001	−0.069 (−0.27)	−0.019* (−1.82)	−0.014 (−0.25)	−0.025 (−1.16)	0.080 (1.41)	0.483*** (6.44)	0.498*** (6.90)	667	21.23
2002	0.039 (0.18)	−0.011 (−1.30)	0.018 (0.38)	−0.052*** (−3.07)	0.117*** (2.58)	0.439*** (7.09)	0.338*** (5.18)	657	18.55
2003	0.020 (0.07)	−0.018 (−1.71)	−0.030 (−0.53)	−0.027 (−1.27)	0.041 (0.77)	0.373*** (5.04)	0.434*** (5.55)	617	16.42
Mean	−0.123	−0.009**	0.002	−0.023**	0.085***	0.379***	0.474***		
T-stat	(−0.74)	(−2.17)	(0.09)	(−2.01)	(2.66)	(4.60)	(8.53)		

This table reports results from a model in which market-to-book ratios (industry-adjusted) are regressed on, among other variables, the contemporaneous value of the GIM Index and the average market-to-book ratio during 1980–1985 (Avg MTB). Other independent variables are the same as those included in Panel A of Table 1. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel B: Using the BCF index

Year	Intercept	BCF index	MTB80–85	OTHER	ASSET	AGE	DELAWARE	ROA	CAPEX	LEV	RD	AVGOWN	N	Adjusted R-squared (%)
1992	−0.158 (−1.62)	0.003 (0.12)	0.421*** (11.07)	−0.008 (−1.36)	0.002 (0.18)	0.034 (1.36)	0.009 (0.45)	2.816*** (11.68)	0.056 (0.63)	−0.035* (−1.86)	−1.021*** (−3.53)	0.003 (0.51)	639	43.15
1993	−0.177* (−1.92)	0.012 (0.54)	0.337*** (9.56)	−0.007 (−1.32)	−0.008 (−1.03)	0.054*** (2.36)	0.001 (0.05)	2.504*** (11.50)	0.122* (1.95)	−0.049*** (−2.73)	−0.936*** (−3.31)	0.004 (0.72)	679	38.80
1994	−0.191*** (−2.21)	−0.004 (−0.18)	0.318*** (9.66)	−0.003 (−0.70)	−0.003 (−0.38)	0.033 (1.52)	0.015 (0.84)	2.732*** (11.91)	0.189** (2.00)	−0.018 (−1.05)	−0.508* (−1.82)	0.002 (0.34)	667	37.80
1995	−0.204** (−2.02)	0.017 (0.66)	0.343*** (9.04)	−0.008 (−1.41)	0.003 (0.35)	0.038 (1.60)	0.041* (1.88)	2.232*** (9.82)	0.230*** (2.45)	−0.037* (−1.94)	−1.232*** (−3.99)	−0.004 (−0.60)	664	27.53
1996	−0.339*** (−3.32)	0.010 (0.42)	0.359*** (9.74)	−0.007 (−1.19)	0.017*** (2.16)	0.027 (1.09)	0.017 (0.79)	3.192*** (13.36)	0.360*** (4.70)	−0.052*** (−2.75)	−0.485* (−1.70)	−0.009 (−1.23)	656	36.05
1997	−0.340*** (−3.09)	0.018 (0.72)	0.366*** (9.31)	−0.007 (−1.22)	0.013 (1.48)	0.060*** (2.30)	0.028 (1.24)	2.531*** (11.15)	0.087 (0.66)	−0.025 (−1.21)	−0.160 (−0.54)	−0.004 (−0.49)	622	30.39
1998	−0.534*** (−4.99)	−0.023 (−0.85)	0.398*** (9.85)	0.007 (1.08)	0.042*** (4.84)	0.043* (1.88)	0.014 (0.60)	3.023*** (13.01)	−0.008 (−0.08)	−0.032* (−1.67)	0.898*** (3.45)	−0.001 (−0.09)	644	38.09
1999	−0.829*** (−6.16)	0.001 (0.03)	0.507*** (10.30)	−0.009 (−1.13)	0.054*** (5.02)	0.083*** (2.81)	0.023 (0.77)	2.948*** (9.79)	0.186 (1.38)	−0.013 (−0.55)	0.539 (1.38)	−0.002 (−0.16)	591	32.33
2000	−0.688*** (−5.25)	−0.016 (−0.45)	0.466*** (9.76)	−0.003 (−0.37)	0.057*** (5.39)	0.070*** (2.52)	0.016 (0.57)	2.801*** (10.58)	0.160 (1.08)	−0.056*** (−2.41)	−0.105 (−0.30)	−0.009 (−0.77)	547	34.68
2001	−0.336*** (−2.64)	−0.026 (−0.81)	0.419*** (9.00)	−0.001 (−0.17)	0.042*** (4.22)	0.007 (0.26)	0.000 (0.00)	2.338*** (9.21)	0.030 (0.23)	−0.068*** (−3.24)	0.609* (1.74)	−0.014 (−1.08)	526	32.99
2002	−0.263*** (−2.38)	−0.085*** (−2.72)	0.271*** (7.11)	0.011 (1.74)	0.023*** (2.78)	0.018 (0.77)	0.007 (0.32)	2.943*** (14.35)	−0.076 (−0.63)	−0.021 (−1.21)	1.013*** (4.22)	0.007 (0.79)	543	39.19
2003	−0.160 (−1.17)	−0.044 (−1.18)	0.399*** (8.64)	−0.007 (−0.96)	0.010 (1.07)	0.003 (0.11)	−0.009 (−0.31)	2.619*** (9.34)	0.177 (1.13)	0.009 (0.44)	0.080 (0.25)	−0.014 (−1.22)	508	28.54
Mean	−0.35** (−2.21)	−0.01 (−0.52)	0.38*** (8.14)	0.00 (−0.79)	0.02 (1.29)	0.04** (2.22)	0.01 (1.42)	2.72*** (13.13)	0.13 (1.49)	−0.03** (−2.14)	−0.11 (−0.20)	0.00 (−0.66)		

This table reports results from a model in which market-to-book ratios (industry-adjusted) during 1990–2003 are regressed on, among other variables, the contemporaneous value of the BCF Index and average market-to-book ratio during 1980–1985 (MTB80–85). Other independent variables are the same as those included in Panel B of Table 1. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

1990–2003 on market-to-book ratios during 1980–1985. The results of this test are contained in Table 3.¹¹

Panel A of Table 3 presents the results for the GIM index. The panel reports the estimated coefficients on the market-to-book ratio in each year during 1980–1985 and the corresponding *t*-statistics, for various regression models in which the GIM index in each year during 1990–2003 serves as the dependent variable. The results show that the GIM indices in 1990–1992 are significantly negatively related to market-to-book ratios in each year during 1980–1985 and the average market-to-book ratios during 1980–1985 (Avg MTB). The panel shows that a significant relation also exists between later values of the GIM index and market-to-book ratios during 1980–1985. This relation holds for GIM index value as recent as 2003.

Panel B of Table 3 presents the corresponding results for the BCF index. The panel shows that market-to-book ratios during 1981–1985 are negatively related to the BCF index in years 1992 through 1997 at a significance level of 0.01. Furthermore, the market-to-book ratio in each year during 1982–1985 is negatively related to the value of the BCF index in every year from 1992–2003, and in almost every year the relation is significant at the 0.01 level. These results suggest the possibility that the negative association between governance indices and contemporary market-to-book ratios may be driven by past information contained in the contemporary market-to-book ratio.

3.4. Replicating GIM and BCF with 1980–1985 market-to-book ratios included as independent variables

We test whether the significant negative relation between market-to-book ratios and the contemporaneous value of the GIM and BCF indices during 1990–2003 holds after controlling for market-to-book ratios during the early 1980s. For this test, we replicate the results reported in Table 1 with one change — we include the average market-to-book ratio during 1980–1985 as an additional independent variable. The results from this test are contained in Table 4. Panels A and B contain the results for the GIM and BCF Indexes, respectively.

Panel A of Table 4 shows that the estimated coefficient on the average market-to-book ratio during 1980–1985 is positive and significant at the 0.01 level in every year during 1990–2003. This result complements the earlier results showing strong serial correlation in market-to-book ratios. After controlling for this variable, the significant relation between the GIM index and contemporaneous market-to-book ratio vanishes. In 11 of the 14 years, no significant relation exists between the GIM index and the contemporaneous market-to-book ratio. In only 2 years is the relation between the two variables significant at a level better than 0.05. The results are consistent with the negative relation between market-to-book ratios and the GIM index reflecting causation running from market-to-book ratios to the GIM index, not vice versa.

Panel B provides the corresponding results for the BCF index, which are similar to the results for the GIM index in Panel A.

¹¹ Alternatively, we replicate the GIM and BCF regressions with one change — instead of regressing market-to-book ratios during 1990–2003 on, among other variables, the contemporaneous values of the governance indices, we regress market-to-book ratios during 1980–1985 on the values of the governance indices during 1990–2003. The pattern of negative association between the governance index and lagged values of the market-to-book ratio remains. Results are available with the corresponding author.

Table 5

Annual OLS regression of GIM index on lagged and subsequent market-to-book ratios

Panel A: Using 3-year lead and lag market-to-book ratios					
Year	Intercept	LAGQ3	LEADQ3	N	Adjusted R-squared (%)
1990	2.029*** (26.28)	−0.138*** (−3.60)	−0.003 (−0.08)	1173	3.85
1991	1.981*** (25.51)	−0.158*** (−3.54)	0.012 (0.29)	1166	4.01
1992	1.988*** (25.00)	−0.137*** (−3.10)	0.033 (0.84)	1118	3.17
1993	2.090*** (25.88)	−0.147*** (−3.71)	0.083*** (2.28)	1199	2.38
1994	2.065*** (26.53)	−0.154*** (−4.19)	0.137*** (3.69)	1131	2.79
1995	2.045*** (26.53)	−0.121*** (−3.84)	0.070*** (2.35)	1137	2.63
1996	2.050*** (25.86)	−0.065** (−1.92)	0.001 (0.03)	1066	2.41
1997	2.053*** (24.63)	−0.065* (−1.75)	−0.009 (−0.28)	972	3.46
1998	2.122*** (27.83)	−0.096*** (−3.06)	−0.011 (−0.37)	1261	5.50
1999	2.121*** (28.15)	−0.112*** (−3.66)	0.020 (0.68)	1257	5.39
2000	2.119*** (27.86)	−0.073*** (−2.52)	0.010 (0.34)	1296	4.53
Mean	2.060***	−0.115***	0.031		
T-stat	(54.98)	(−4.33)	(0.88)		

This panel reports results of the regression of the log of the GIM index on the 3 year lagged market-to-book ratio (LAGQ3) and the 3-year lead market-to-book ratio (LEADQ3). All market-to-book ratios are industry-adjusted. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel B: Using 3-year lead and lag market-to-book ratios and control variables

Year	Intercept	ASSET	ASSET Sq	LAGQ3	LEADQ3	DUAL	AVG.OWN.	N	Adjusted R-squared (%)
1992	0.625*** (2.54)	0.375*** (6.50)	−0.022*** (−5.94)	−0.109*** (−2.40)	−0.016 (−0.36)	−0.171*** (−3.67)	−0.033*** (−4.94)	866	14.94%
1993	0.737*** (3.11)	0.383*** (6.96)	−0.023*** (−6.59)	−0.128*** (−3.13)	−0.003 (−0.07)	−0.299*** (−6.83)	−0.022*** (−3.53)	962	15.70
1994	0.796*** (3.24)	0.361*** (6.27)	−0.022*** (−6.03)	−0.150*** (−3.88)	0.042 (1.04)	−0.278*** (−6.38)	−0.024*** (−3.59)	925	14.63
1995	0.689*** (2.85)	0.380*** (6.74)	−0.023*** (−6.49)	−0.136*** (−4.19)	0.026 (0.85)	−0.224*** (−5.43)	−0.019*** (−2.92)	949	12.31
1996	0.597*** (2.49)	0.402*** (7.23)	−0.025*** (−7.21)	−0.111*** (−3.17)	−0.017 (−0.53)	−0.243*** (−5.63)	−0.018*** (−2.75)	905	13.53
1997	0.811*** (3.26)	0.345*** (6.14)	−0.021*** (−6.08)	−0.126*** (−3.27)	−0.021 (−0.62)	−0.219*** (−5.05)	−0.022*** (−2.85)	853	12.49
1998	1.010*** (4.99)	0.276*** (6.11)	−0.015*** (−5.31)	−0.091*** (−2.97)	−0.019 (−0.62)	−0.190*** (−5.66)	−0.025*** (−3.90)	1150	14.90
1999	1.125*** (5.57)	0.249*** (5.48)	−0.014*** (−4.97)	−0.116*** (−4.07)	0.017 (0.57)	−0.197*** (−5.91)	−0.031*** (−4.60)	1143	14.11

(continued on next page)

Table 5 (continued)

Panel B: Using 3-year lead and lag market-to-book ratios and control variables

Year	Intercept	ASSET	ASSET Sq	LAGQ3	LEADQ3	DUAL	AVG.OWN.	N	Adjusted R-squared (%)
2000	1.416*** (7.30)	0.175*** (4.03)	-0.009*** (-3.33)	-0.087*** (-3.27)	0.000 (0.01)	-0.191*** (-6.27)	-0.025*** (-3.98)	1151	11.80
Mean	0.867***	0.327***	-0.019***	-0.117***	0.001	-0.224***	-0.024***		
T-stat	(4.28)	(5.64)	(-4.85)	(-7.60)	(0.06)	(-6.92)	(-6.48)		

This panel reports results of the regression of the log of the GIM index on the 3 year lagged market-to-book ratio (LAGQ3), the 3-year lead market-to-book ratio (LEADQ3), log of assets, (ASSET), log of assets squared (ASSET Sq), a dual class dummy (DUAL = 1 if the firm has multiple voting classes) and the average ownership of the 5 employees with the highest compensation (AVG.OWN.). All market-to-book ratios are industry-adjusted. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

3.5. Regressions of the GIM and BCF indices on lagged and subsequent values of market-to-book ratios

We further probe the relation between governance indices and valuations by regressing the GIM and BCF indices on both lagged and subsequent market-to-book ratios on each year during 1990–2004. We use two specifications — one in which the GIM and BCF indices are regressed only on lagged and subsequent market-to-book ratios and another in which the governance indices are regressed on lagged and subsequent market-to-book ratios and other control variables. The purpose of these specifications is not to attribute causation by putting the index on the left hand side. Rather, it is to identify the temporal source of the negative association between market-to-book ratios and governance indexes.

We include various combinations of lagged and subsequent market-to-book ratios as independent variables, ranging from 1 year before and 1 year after the year in which the governance indices are measured (“-1,+1”) through 10 years before and 10 years after the governance indices are measured (“-10,+10”). The regression results are consistent across all combinations of lagged and subsequent market-to-book ratios. For the sake of brevity we report results for the combination of 3 years before and 3 years after the year when the governance indices are measured (“-3,+3”). Results for the GIM Index are in Table 5. The dependent variable is the log of the GIM Index.¹²

Panel A shows that the coefficient on the 3-year lagged market-to-book ratio is negative and significant at the 0.01 level in all 11 analysis years. The average value of the coefficient is -0.126. The coefficient on the 3-year subsequent market-to-book ratio is negative in only three of 11 years and insignificant in these years. It is positive and significant at the 0.01 level in 1993 and 1994 and at the 0.05 level in 1995. The average value of the coefficient is 0.021.

For the extended model we include the log of firm size and its squared value, a dummy variable for dual class firms that takes the value of one if the firm has multiple classes of voting stock (zero otherwise) and the percentage of the firm’s equity held by the five highest paid employees, as control variables. Size is included as a control variable because it is known to be highly correlated with the GIM Index (Gompers et al., 2003) and is often used as an explanatory variable in models of market-to-book ratios¹³. The dual class dummy and ownership variables are also included for

¹² We also run Poisson regressions in which the dependent variable is the GIM/one plus the BCF index. Results are similar to those obtained using OLS estimation.

¹³ We use a non-linear specification in order to account for the significantly large variation in size compared to the variation in the GIM Index.

Table 6

Annual OLS regression of BCF index on lagged and subsequent market-to-book ratios

Panel A: Using 3-year lead and lag market-to-book ratios					
Year	Intercept	LAGQ3	LEADQ3	N	Adjusted R-squared (%)
1990	0.895*** (6.61)	−0.108* (−1.78)	−0.032 (−0.53)	1086	3.49
1991	0.876*** (6.45)	−0.146** (−2.11)	−0.011 (−0.17)	1078	3.70
1992	0.859*** (6.33)	−0.062 (−0.89)	−0.055 (−0.90)	1034	3.71
1993	1.126*** (8.92)	−0.073 (−1.28)	−0.034 (−0.59)	1104	3.83
1994	1.113*** (9.10)	−0.084 (−1.63)	0.001 (0.02)	1038	3.34
1995	1.023*** (8.46)	−0.095* (−1.87)	−0.060 (−1.21)	1044	3.58
1996	1.029*** (8.19)	−0.077 (−1.47)	−0.083 (−1.69)	979	4.55
1997	1.021*** (7.53)	−0.063 (−1.15)	−0.126*** (−2.54)	889	6.25
1998	0.956*** (7.33)	−0.144*** (−3.14)	−0.058 (−1.27)	1122	6.04
1999	0.955*** (7.42)	−0.162*** (−3.52)	−0.034 (−0.70)	1112	5.41
2000	1.038*** (8.10)	−0.129*** (−2.69)	−0.037 (−0.77)	1142	5.37
Mean	0.990***	−0.104***	−0.048*		
T-stat	(14.58)	(−3.82)	(−1.82)		

This panel reports results of the regression of $\log(1 + \text{BCF index})$ on the 3 year lagged market-to-book ratio (LAGQ3) and the 3-year lead market-to-book ratio (LEADQ3). All market-to-book ratios are industry-adjusted. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Panel B: Using 3-year lead and lag market-to-book ratios and control variables

Year	Intercept	ASSET	ASSET Sq	LAGQ3	LEADQ3	AVG.OWN.	N	Adjusted R-squared (%)
1992	−0.984*** (−2.40)	0.564*** (5.80)	−0.038*** (−6.11)	−0.131* (−1.83)	−0.123* (−1.83)	−0.050*** (−2.72)	807	14.03
1993	−0.663* (−1.67)	0.533** (5.70)	−0.037*** (−6.13)	−0.068 (−1.10)	−0.155** (−2.36)	−0.035*** (−2.86)	895	12.04
1994	−0.650 (−1.62)	0.525*** (5.48)	−0.036*** (−5.90)	−0.086 (−1.58)	−0.127** (−2.01)	−0.041*** (−2.61)	857	11.25
1995	−1.024*** (−2.51)	0.588*** (6.04)	−0.039*** (−6.35)	−0.144*** (−2.63)	−0.101* (−1.93)	−0.042*** (−3.07)	873	12.48
1996	−0.903*** (−2.28)	0.559*** (5.91)	−0.038*** (−6.39)	−0.159*** (−2.89)	−0.101** (−2.00)	−0.050*** (−3.78)	834	13.74
1997	−0.573 (−1.36)	0.463*** (4.81)	−0.031*** (−5.21)	−0.155*** (−2.72)	−0.153*** (−3.00)	−0.060*** (−5.02)	782	14.19
1998	−0.346 (−1.12)	0.376*** (5.36)	−0.025*** (−5.53)	−0.130*** (−2.86)	−0.079* (−1.74)	−0.055*** (−4.90)	1032	12.55
1999	−0.195 (−0.62)	0.339*** (4.74)	−0.023*** (−5.07)	−0.144*** (−3.17)	−0.058 (−1.25)	−0.065*** (−4.87)	1023	12.20

(continued on next page)

Table 6 (continued)

Panel B: Using 3-year lead and lag market-to-book ratios and control variables

Year	Intercept	ASSET	ASSET Sq	LAGQ3	LEADQ3	AVG.OWN.	N	Adjusted R-squared (%)
2000	0.348 (1.14)	0.234*** (3.33)	-0.017*** (-3.86)	-0.144*** (-3.00)	-0.078 (-1.60)	-0.055*** (-5.10)	1030	11.62
Mean	-0.554	0.465***	-0.032***	-0.129***	-0.108***	-0.050***		
T-stat	(-1.52)	(4.56)	(-4.73)	(-4.92)	(-3.84)	(-6.25)		

This panel reports results of the regression of $\log(1 + \text{BCF index})$ on the 3 year lagged market-to-book ratio (LAGQ3), the 3-year lead market-to-book ratio (LEADQ3), log of assets, (ASSET), log of assets squared (ASSET Sq) and the average ownership of the 5 employees with the highest compensation (AVG.OWN.). All market-to-book ratios are industry-adjusted. White heteroscedasticity consistent *t*-statistics are in parentheses below the coefficient estimates. The last two rows report the time-series mean and Fama–Macbeth *t*-stats deflated by a factor of 2.50. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

similar reasons. Firms with dual class structures and high managerial ownership are likely to adopt fewer anti-takeover provisions than other firms because the managers of these firms already possess control.

Panel B of Table 5 reports results for the extended model for the GIM Index. Panel B shows that the coefficient on the 3-year lagged market-to-book ratio is negative and significant at the 0.01 level in all 9 analysis years (we lose 2 years due to the requirement that the firms have ExecuComp data available). The subsequent market-to-book ratio is not significant in any of the years and is positive in six of the 9 years. Consistent with univariate results reported by GIM, firm size is positive and highly significant. Also, the square of firm size is negative and highly significant. As expected, the dual class dummy and the average ownership of the top-5 paid employees are both negative and significant at the 0.01 level in all years. With the addition of the control variables the adjusted R-squared increases from the 2%–5% range to the 12%–15% range Table 6 reports corresponding results for the BCF Index. The dependent variable is the log of one plus the BCF Index. Panel A reports results for the simple model and Panel B for the extended model. Panel A shows that the coefficient on the 3-year lagged market-to-book ratio is negative in all years (average = -0.104) and significant at the 0.01, 0.05 and 0.10 levels in three, 1 and 2 years, respectively. The coefficient on the 3-year subsequent market-to-book ratio (average = -0.048) is negative and significant at the 0.01 level in 1997.

For the BCF model we use the control variables discussed above with the exception of the dual class dummy. Following BCF we exclude dual class firms from our analysis. When the control variables are included, Panel B shows that the coefficients on the 3-year lag and the 3-year subsequent market-to-book ratio become comparable in magnitude and significance. The average value of the coefficient on the lag is -0.129 and that on the lead is -0.108. The coefficient on the lagged market-to-book ratio is significant at the 0.01 level in six of the 9 years and at the 0.10 in one additional year. The coefficient on the subsequent market-to-book ratio is significant at the 0.01 level in 1 year, the 0.05 level in 3 years and the 0.10 level in 3 years. The coefficients on the control variables are similar in size and significance to those on the GIM Index.

The results of this section show that when lag and lead market-to-book ratios are used simultaneously to explain variation in governance indices it is the lagged values that show results which are consistent with those of GIM and BCF. The coefficients on the subsequent values are mixed, with some being positive and some negative and the overall significance is much lower.

The results are robust to the addition of controls. When the contemporaneous market-to-book ratio is added to the extended model it usually enters with mixed signs and low significance.

The magnitude and significance of the coefficient on the lagged value of the market-to-book ratio remains largely unchanged. Overall the evidence is consistent with a stronger association between past market-to-book ratios and present governance rather than governance leading to performance.

4. Concluding comments

This paper shows that the correlation between market-to-book ratios and the contemporaneous values of governance indices, as documented by Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004), reflects causation running from market-to-book ratios to the governance indices, not vice versa. Specifically, we find that market-to-book ratios during the early 1980s, a period preceding the adoption of the provisions comprising the governance indices, are significantly related to the subsequent value of these indices. In addition, we find that the significant relation between market-to-book ratios and the contemporaneous values of the GIM and BCF governance indices during the 1990s vanishes after controlling for market-to-book ratios during 1980–1985. Finally, when lagged and leading values of the market-to-book ratio are included simultaneously in a regression model where the governance index is the dependent variable the results documented by GIM and BCF hold true for the lagged values and not for the lead values.

The results are consistent with two explanations. First, firms with low market-to-book ratios may be poorly run and, hence, more likely to be targets of control contests. If so, these firms are more likely than other firms to adopt takeover defenses that affect the value of their governance indices. Second, firms with low market-to-book ratios are likely to have fewer growth opportunities as compared with other firms. Insofar that low growth firms are more likely to be targets of takeovers than other firms, these firms are more likely to adopt takeover defenses as well. Future research will attempt to distinguish between these two explanations.

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