Journal of Finance and Economics, 2016, Vol. 4, No. 6, 184-190
Available online at http://pubs.sciepub.com/jfe/4/6/3

DOI:10.12691/jfe-4-6-3

Gompers versus Bebchuck Governance Measure and Firm Value

Frederick Adjei[1,*], Mavis Adjei[2]

[1]Economics and Finance Department, Southeast Missouri State University, Cape Girardeau, USA
[2]Marketing Department, Southern Illinois University Carbondale, Carbondale, USA
*Corresponding author: fadjei@semo.edu

Abstract This study compares the two primary measures of corporate governance quality, [1], GIM index and [2] E index using tests for comparing two nonnested models. We find that the GIM index has statistically significantly more power than the E index in explaining the variability in firm value, as measured by Tobin's Q. This finding suggests that the IRRC provisions excluded from the E index may have a statistically significant incremental power in explaining the variability in firm value.

Keywords: *corporate governance, firm value*

Cite This Article: Frederick Adjei, and Mavis Adjei, "Gompers versus Bebchuck Governance Measure and Firm Value." *Journal of Finance and Economics*, vol. 4, no. 6 (2016): 182-190. doi: 10.12691/jfe-4-6-3.

1. Introduction

Extant research (see [1,2,3]), documents that corporate governance quality is correlated with firm value. Particularly, the degree of managerial entrenchment due to takeover protection is negatively correlated with firm value. There are two main measures of managerial entrenchment: the [1] corporate governance index (GIM index) and the [2] corporate governance index (E index). A considerable number of articles use the GIM index ([4,5,6]), while others use the E index ([7,8]).

With more than one measure for corporate governance quality, a non-trivial question that arises is which of these indices is a better measure? That is the question we answer in this study. Specifically, we determine which of the two governance quality measures better explains the relationship between corporate governance quality and firm value.

Using econometric tests for comparing nonnested models with the same dependent variable, we find that the GIM index has a higher power than the E index in explaining the variability in firm value, as measured by Tobin's Q. This study contributes by extending research on the relation between corporate governance and firm value. Particularly, we show that the Gompers et al. governance index explains more of the variability in firm value than can be explained by the Bebchuk et al. governance index. Additionally, this finding suggests that researchers and practitioners should consider all twenty-four IRRC provisions and not just the six provisions used in the Bebchuk et al. governance index when determining corporate governance quality.

2. Governance Measures and Firm Value

Corporate takeover protection provisions have a considerable effect on management decision making, given that the market for corporate control is considered a formidable external power for disciplining management.

With data derived from a myriad of sources including corporate charters and bylaws, annual reports, and proxy statements, the Investor Responsibility Research Center (IRRC) tracks twenty-four governance provisions that may be favorable to management. The definitions of the twenty-four corporate governance provisions published by the IRRC are summarized in the Appendix.

Extant research shows a correlation between the collective IRRC provisions and firm value. Particularly, [1] found that an index of the IRRC provisions was inversely related to firm value. In their study, Gompers et al. developed an index based on the twenty-four IRRC provisions with each provision given an equal weight. This index, also known as the GIM index, has been used by a considerable number of papers.

Alternatively, [3] developed an index based on four of the twenty-four IRRC provisions and also show that it is inversely related to firm value, as measured by Tobin's Q. However, on searching the literature we found no other studies that use the [3] index.

Finally, [2] developed an entrenchment index (the E Index) based on six IRRC provisions: charter amendments, golden parachutes, limits to shareholder bylaw amendments, poison pills, staggered boards, and supermajority requirements for mergers. Bebchuk et al. show that the negative relationship between the GIM index and firm value documented by [1] is mainly driven by the six provisions. The E index has also been used by a considerable number of papers, at least 75 according to Bebchuk, [2]. Given that very few studies employ the [3] index, we compare the GIM index and the E index.

There is no theory to suggest that all the twenty-four IRRC provisions in the GIM index drive the documented negative relationship between IRRC provisions and firm value. [2] find that some provisions may be positively correlated with Tobin's Q, the measure of firm value, and

others may not even be relevant. Particularly, Bebchuk et al. find that the eighteen IRRC provisions not included in the E index are not negatively correlated with firm value in aggregate or individually. However, a non-trivial oversight in the Bebchuk et al. study is that one or more of the excluded provisions may moderate the effect of an E index provision on firm value and hence using only six provisions may mitigate the potential explanatory power of the IRRC provisions. For example, [1] documents that the presence of a firm level Anti-greenmail provision is positively correlated with the presence of eighteen of the IRRC provisions. Furthermore, [9] finds that states with Anti-greenmail laws are likely to pass other laws to prevent takeovers.

If the E index encapsulates all the critical components of entrenchment, then there should be no significant difference in explanatory power between the E index and the GIM index. However, if the other eighteen IRRC provisions have some explanatory power in aggregate or individually, then there should be a significant difference between the E index and the GIM index in explaining the variability in firm value. Given that there are no theories to suggest which index has a higher explanatory power, we do not make an a priori selection. Hence, we state the hypothesis in the null form: there is no difference between the E index and the GIM index in explaining the variability in firm value.

3. Data

In this section we present a framework to test the previously developed hypothesis.

The sample consists of firms with data in the Investor Responsibility Research Center (IRRC) database, COMPUSTAT database, and CRSP during the period 1990 to 2006. We require that a firm have both GIM index and E index data to be included in the sample. Of the 1554 firms with the required data, we exclude 120 financial firms (sic codes 6000 to 6999) and 80 utilities (sic codes 4000 to 4999). The resulting sample is 1354 firms and 23018 firm-year observations.

We examine the two measures that capture the extent of managerial entrenchment owing to takeover protection. The first measure, the GIM index, tracks the number of anti-takeover provisions in a company's charter and in the legal code of the state of incorporation. Gompers et al. establish an inverse relationship between the number of anti-takeover provisions and the quality of corporate governance. The index data are reported about every two years (1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006) by the IRRC and the index ranges from 0 and 24. In using data for periods in which the IRRC does not report data, we assume that the governance score is the same as that in the year after the most recent reported score (see [1]). The second measure, the E index, uses the same raw data as the Gompers et al. index but tracks only six of the provisions that [2] show to have the most effect on firm value. Additionally, we use the total institutional ownership in a firm as a measure of large shareholder monitoring. Institutional ownership data are obtained from SEC EDGAR files (form 13F). All variables are winsorized at the 5% and 95% percentiles for each year to reduce the effects of outliers.

Table 1 presents the summary statistics of the main variables used in the study. The GIM index has a mean of 9.296, a median of 9.0, and ranges from 3.0 to 16. The E index mean is 2.474, a median of 2.0, and ranges from 1.0 to 6.0. These statistics indicate that for the distribution of firms across entrenchment levels, about 50% of the sample firms have an entrenchment level of GIM index 9 or more and E index 2 or more. Additionally, the mean firm's Tobin's Q is 2.965.

4. Comparing the Explanatory Powers of the GIM Index and the E Index

In this section we determine the differences, if any, between the E index and the GIM index in explaining the variability in firm value. We use econometric tests for testing two nonnested models with the same dependent variable.

Table 1. Descriptive Statistics

	Mean	Median	SD	Min.	Max.
GIM Index	9.296	9.000	2.429	3.000	16.000
E Index	2.474	2.000	1.093	1.000	6.000
Tobin's Q	2.965	2.935	1.795	0.774	4.435
Industry Adjusted Tobin's Q	-0.050	0.000	1.359	-3.651	3.661
ROA	-0.039	0.091	0.245	-0.299	0.191
Total Assets ($billions)	5.736	5.358	13.345	0.536	81.551
Total Debt / Total Assets	0.183	0.129	0.184	0.129	0.809
Capital Expenditures / Total Assets	0.028	0.020	0.040	0.010	0.118
R&D / Sales	0.031	0.014	0.035	0.004	0.077
Institutional Ownership (%)	9.735	5.470	11.680	0.010	49.910
Firm Age	16.133	12.000	13.270	1.000	73.000

The sample consists of 1354 firms with governance index data from the Investor Responsibility Research Center's (IRRC) data set over the period 1990-2006. Data on financial items and stock returns are obtained from COMPUSTAT and CRSP respectively. Institutional ownership data is obtained from SEC EDGAR files. The industry-adjusted Tobin's Q is the difference between the firm's Tobin's Q and the median industry Tobin's Q, Swhere industry is defined by the three-digit SIC code. The Gompers index and Bebchuk index data are reported about every two years (1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006) by the IRRC. Return on assets (ROA) is income before interest and taxes (EBIT) scaled by the book value of total assets. The other variables are self-explanatory.

4.1. Adjusted R-squared

The adjusted R-squared, a goodness-of-fit measure, can be used to compare the explanatory powers of nonnested models with the same dependent variable. One problem with this method, however, is that it only indicates model preference without a test for the statistical significance of the difference in explanatory powers of the independent variables. To compare the GIM index and E index using adjusted R-squared, we follow the work of [1] and [2].

We employ the definition of Tobin's Q used by [1]. Gompers et al. define Tobin's Q as the market value of total assets divided by the book value of total assets, where the market value of total assets is the book value of total assets plus the market value of common stock minus the sum of balance sheet deferred taxes and the book value of common stock. The dependent variable in our regressions is the industry-adjusted Tobin's Q, where the industry-adjusted Tobin's Q is a firm's Tobin's Q minus the firm's industry median Tobin's Q in the observation year. A firm's industry is defined by its three-digit SIC Code.

Our independent variables include a log of total assets to capture firm size, a log of firm age, return on assets, percentage of insider ownership, capital expenditures scaled by total assets, leverage, and research and development expenditures. These independent variables are also used by [2]. Additionally, we control for firm fixed effects and year fixed effects. To compare the governance measures, we employ the GIM index in one regression and the E index in another regression, with all control variables remaining the same, and compare the adjusted R-squared. We are comparing the following nonnested alternative models:

$$\begin{aligned} Q_{it} &= \alpha_0 + \alpha_1 GIM\ Index_{it} \\ &+ \alpha_2 \left[Capital\ Expenditures / Total\ Assets\right]_{it} \\ &+ \alpha_3 ROA_{it} + \alpha_4 Ln\ \left[Total\ Assets\right]_{it} \\ &+ \alpha_5 \left[Long-term\ Debt / Total\ Assets\right]_{it} \\ &+ \alpha_6 \left[R\&D\ /\ Sales\right]_{it} + \alpha_7 Ln\ \left[Firm\ Age\right]_{it} \\ &+ \alpha_8\ Insider\ Ownership_{it} \\ &+ \alpha_9\ Insider\ Ownership\ Squared_{it} \\ &+ I_i + \mu_i + \Upsilon_t + \varepsilon_i . \end{aligned} \quad (1)$$

$$\begin{aligned} Q_{it} &= \alpha_0 + \alpha_1 GIM\ Index_{it} + \beta_1 E\ Index_{it} \\ &+ \alpha_2 \left[Capital\ Expenditures\ /\ Total\ Assets\right]_{it} \\ &+ \alpha_3 ROA_{it} + \alpha_4 Ln\ \left[Total\ Assets\right]_{it} \\ &+ \alpha_5 \left[Long-term\ Debt\ /\ Total\ Assets\right]_{it} \\ &+ \alpha_6 \left[R\&D\ /\ Sales\right]_{it} + \alpha_7 Ln\ \left[Firm\ Age\right]_{it} \\ &+ \alpha_8\ Insider\ Ownership_{it} \\ &+ \alpha_9\ Insider\ Ownership\ Squared_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i . \end{aligned} \quad (2)$$

where Q_{it} is the industry-adjusted Tobin's Q of firm i in year t, I_i is the industry fixed effect for each three-digit SIC code, μ_i is the firm fixed effect, Υ_t is the year fixed effect, and ε_i is a heteroskedastic error term.

The results of the regressions are presented in Table 2. The adjusted R-squared differences suggest a preference for the GIM index over the E index. The GIM index explains more of the variability in firm value than can be explained by the E index.

Table 2. Adjusted R-squared Comparison

	GIM Index	E Index	GIM Index	E Index
Governance Index	-0.029	-0.048	-0.028	-0.048
	(0.000)	(0.000)	(0.000)	(0.000)
Capital Expenditures / Total Assets	2.112	2.188	1.690	1.775
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	3.986	4.004	4.310	4.326
	(0.000)	(0.000)	(0.000)	(0.000)
Ln(Total Assets)	-0.099	-0.103	-0.097	-0.102
	(0.000)	(0.000)	(0.000)	(0.000)
Total Debt / Total Assets	-0.178	-0.190	-0.121	-0.130
	(0.000)	(0.000)	(0.000)	(0.000)
R&D / Sales	8.934	8.997	7.993	8.025
	(0.000)	(0.000)	(0.000)	(0.000)
Ln(Firm Age)	-0.062	-0.082	-0.050	-0.070
	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Ownership	-0.019	-0.019	-0.017	-0.017
	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Ownership Squared	0.004	0.003	0.004	0.004
	(0.000)	(0.000)	(0.000)	(0.000)
Intercept	0.848	0.791	0.752	0.716
	(0.000)	(0.000)	(0.000)	(0.000)
Firm fixed effects	Yes	Yes	No	No
Year fixed effects	Yes	Yes	Yes	Yes
Number of firm-year observations	23018	23018	23018	23018
R_squared	0.4072	0.4053	0.2642	0.2621
Adjusted R_squared	0.4053	0.4035	0.2641	0.2620

This table reports the results of the comparison of the GIM index and the E index by comparing the adjusted R-squares in the following nonnested alternative models:

$Q_{it} = \alpha_0 + \alpha_1\ GIM\ Index_{it} + \alpha_2\ [Capital\ Expenditures / Total\ Assets]_{it} + \alpha_3\ ROA_{it} + \alpha_4\ Ln\ [Total\ Assets]_{it} + \alpha_5\ [Long\text{-}term\ Debt / Total\ Assets]_{it}$
$+ \alpha_6\ [R\&D / Sales]_{it} + \alpha_7\ Ln\ [Firm\ Age]_{it} + \alpha_8 Insider\ Ownership_{it} + \alpha_9\ Insider\ Ownership\ Squared_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i$ (1)

$Q_{it} = \alpha_0 + \alpha_1\ E\ Index_{it} + \alpha_2\ [Capital\ Expenditures / Total\ Assets]_{it} + \alpha_3\ ROA_{it} + \alpha_4\ Ln\ [Total\ Assets]_{it} + \alpha_5\ [Long\text{-}term\ Debt / Total\ Assets]_{it}$
$+ \alpha_6\ [R\&D / Sales]_{it} + \alpha_7\ Ln\ [Firm\ Age]_{it} + \alpha_8 Insider\ Ownership_{it} + \alpha_9\ Insider\ Ownership\ Squared_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i$ (2)

where Q_{it} is the industry-adjusted Tobin's Q of firm i in year t, , I_i is the industry fixed effect for each three-digit SIC code, μ_i is the firm fixed effect, Υ_t is the year fixed effect, and ε_i is a heteroskedastic error term. The last two columns are results of regressions without firm fixed effects.

A comparison of adjusted R-squares, although valuable, has a non-trivial limitation. This method does not test for the statistical significance of the difference in adjusted R-squares. Consequently, the significance of the difference is determined according to practical significance which can be subjective. To test for the statistical significance of the difference in explanatory powers we employ two other tests for the comparison of nonnested alternative models: the [10] test and the [11] test.

4.2. Mizon and Richard Test

Following the [10] approach, we construct a comprehensive model that contains each of our two primary models as a special case and then test the restrictions that lead to each of the models. Combining Models (1) and (2), the comprehensive model is

$$\begin{aligned} Q_{it} &= \alpha_0 + \alpha_1 GIM\ Index_{it} + \beta_1 E\ Index_{it} \\ &+ \alpha_2 \left[Capital\ Expenditures\ /\ Total\ Assets\right]_{it} \\ &+ \alpha_3 ROA_{it} + \alpha_4 Ln\ \left[Total\ Assets\right]_{it} \\ &+ \alpha_5 \left[Long-term\ Debt\ /\ Total\ Assets\right]_{it} \\ &+ \alpha_6 \left[R\&D\ /\ Sales\right]_{it} + \alpha_7 Ln\ \left[Firm\ Age\right]_{it} \\ &+ \alpha_8 Insider\ Ownership_{it} \\ &+ \alpha_9 Insider\ Ownership\ Squared_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i. \end{aligned} \quad (3)$$

Table 3. The Mizon and Richard test

	I	II
GIM Index	-0.027 (0.000)	-0.025 (0.000)
E Index	-0.007 (0.051)	-0.010 (0.001)
Capital Expenditures / Total Assets	2.112 (0.000)	1.695 (0.000)
ROA	3.987 (0.000)	4.310 (0.000)
Log(Total Assets)	-0.099 (0.000)	-0.098 (0.000)
Total Debt / Total Assets	-0.179 (0.000)	-0.121 (0.000)
R&D / Sales	8.915 (0.000)	7.965 (0.000)
Log(Firm Age)	-0.063 (0.000)	-0.051 (0.000)
Institutional Ownership	-0.019 (0.000)	-0.017 (0.000)
Institutional Ownership Squared	0.004 (0.000)	0.000 (0.000)
Intercept	0.852 (0.000)	0.759 (0.000)
Firm fixed effects	Yes	No
Year fixed effects	Yes	Yes
Number of firm-year observations	23018	23018
R_squared	0.4072	0.2643
Adjusted R_squared	0.4054	0.2642

This table presents the results of the Mizon and Richard (1986) approach. We construct a comprehensive model that contains each of our two primary models as a special case and then test the restrictions that lead to each of the models. Combining Models (1) and (2), the comprehensive model is $Q_{it} = \alpha_0 + \alpha_1\ GIM\ Index_{it} + \beta_1\ E\ Index_{it} + \alpha_2\ [Capital\ Expenditures\ /\ Total\ Assets]_{it} + \alpha_3 ROA_{it} + \alpha_4\ Ln\ [Total\ Assets]_{it} + \alpha_5\ [Long\text{-}term\ Debt\ /\ Total\ Assets]_{it} + \alpha_6\ [R\&D\ /\ Sales]_{it} + \alpha_7\ Ln\ [Firm\ Age]_{it} + \alpha_8 Insider\ Ownership_{it} + \alpha_9\ Insider\ Ownership\ Squared_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i$ (3) where Q_{it} is the industry-adjusted Tobin's Q of firm i in year t, , I_i is the industry fixed effect for each three-digit SIC code, μ_i is the firm fixed effect, Υ_t is the year fixed effect, and ε_i is a heteroskedastic error term. The second column presents results of the regression without firm fixed effects. A test for Model (1) is H_0: $\beta_1 = 0$. A significant t statistic for β_1 against a two-sided alternative is a rejection of Model (1). A test for Model (2) is H_0: $\alpha_1 = 0$. A significant t statistic for α_1 against a two-sided alternative is a rejection of Model (2).

A test for Model (1) is H_0: $\beta_1 = 0$. A significant t statistic for β_1 against a two-sided alternative is a rejection of Model (1). However, rejecting Model (1) does not mean Model (2) is the correct model. A test for Model (2) is H_0: $\alpha_1 = 0$. A significant t statistic for α_1 against a two-sided alternative is a rejection of Model (2). For a clear winner to emerge, one model has to be rejected and the other not rejected. For example, rejecting Model (2) and not rejecting Model (1) will suggest that the GIM index explains the relationship between governance and firm value better than the E index.

The results of [10] test are presented in Table 3. After controlling for firm fixed-effects and year fixed-effects, the results in Table 3 column I indicate a rejection of Model (2) at the 5% level of significance. Model (1) cannot be rejected even at the 1% level of significance. These results, consistent with our findings using adjusted R-squared, signify that the GIM index is superior to the E index in explaining firm value variability. However, we cannot reject either model if we do not control for fixed firm-effects.

4.2. Davidson-MacKinnon Test

Another method of comparing nonnested models is suggested by [11]. Davidson and MacKinnon show that if Model (1) is the true model, then the fitted values from Model (2) should be insignificant in Model (1), and vice

versa. To test Model (1), we first estimate Model (2) by ordinary least squares (OLS) to obtain the fitted values. The fitted values, treated as an independent variable, are then regressed along with all the independent variables in Model (1) as follows:

$$\begin{aligned} Q_{it} = {} & \alpha_0 + \vartheta_1 [Fitted\ Values\ of\ Q] + \alpha_1 GIM\ Index_{it} \\ & + \alpha_2 [Capital\ Expenditures\ /\ Total\ Assets]_{it} \\ & + \alpha_3 ROA_{it} + \alpha_4 Ln\ [Total\ Assets]_{it} \\ & + \alpha_5 [Long-term\ Debt\ /\ Total\ Assets]_{it} \\ & + \alpha_6 [R\&D\ /\ Sales]_{it} + \alpha_7 Ln\ [Firm\ Age]_{it} \\ & + \alpha_8 Insider\ Ownership_{it} \\ & + \alpha_9 Insider\ Ownership\ Squared_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i. \end{aligned} \quad (4)$$

The Davidson-MacKinnon test is based on the t statistic on the fitted values. A significant t statistic against a two-sided alternative is a rejection of Model (1).

Similarly, to test Model (2), we estimate Model (1) by OLS to obtain the fitted values. The fitted values are then regressed along with all the independent variables in Model (2) as follows:

$$\begin{aligned} Q_{it} = {} & \beta_0 + \vartheta_1 [Fitted\ Values\ of\ Q] + \beta_1 E\ Index_{it} \\ & + \beta_2 [Capital\ Expenditures\ /\ Total\ Assets]_{it} \\ & + \beta_3 ROA_{it} + \beta_4 Ln\ [Total\ Assets]_{it} \\ & + \beta_5 [Long-term\ Debt\ /\ Total\ Assets]_{it} \\ & + \beta_6 [R\&D\ /\ Sales]_{it} + \beta_7 Ln\ [Firm\ Age]_{it} \\ & + \beta_8 Insider\ Ownership_{it} \\ & + \beta_9 Insider\ Ownership\ Squared_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i. \end{aligned} \quad (5)$$

A significant t statistic on the fitted values against a two-sided alternative is a rejection of Model (2). Recall that for a winner to emerge, one model has to be rejected and the other not rejected.

Table 4. The Davidson-MacKinnon test

	GIM Index	E Index	GIM Index	E Index
Fitted Values of Tobin's Q	0.141	0.924	0.991	0.998
	(0.056)	(0.000)	(0.000)	(0.000)
Governance Index	-0.027	-0.007	-0.010	-0.003
	(0.000)	(0.056)	(0.000)	(0.220)
Capital Expenditures / Total Assets	-0.033	-0.001	1.309	0.208
	(0.658)	(0.995	(0.000)	(0.097)
ROA	0.025	0.004	3.368	0.517
	(0.525)	(0.920)	(0.000)	(0.025)
Log(Total Assets)	0.001	0.000	-0.075	-0.012
	(0.679)	(0.946)	(0.000)	(0.035)
Total Debt / Total Assets	0.006	0.000	-0.092	-0.015
	(0.685)	(0.980)	(0.000)	(0.395)
R&D / Sales	-0.058	-0.008	6.217	0.931
	(0.559)	(0.938)	(0.000)	(0.033)
Log(Firm Age)	0.011	0.000	-0.036	-0.007
	(0.041)	(0.929)	(0.000)	(0.275)
Institutional Ownership	0.000	0.000	-0.013	-0.002
	(0.995)	(0.984)	(0.000)	(0.083)
Institutional Ownership Squared	0.000	0.000	0.001	0.001
	(0.673)	(0.980)	(0.000)	(0.133)
Intercept	0.059	0.007	0.603	0.097
	(0.006)	(0.759)	(0.000)	(0.028)
Firm fixed effects	Yes	Yes	No	No
Year fixed effects	Yes	Yes	Yes	Yes
Number of firm-year observations	23018	23018	23018	23018
R_squared	0.4061	0.4072	0.2643	0.2643
Adjusted R_squared	0.4060	0.4071	0.2642	0.2642

This table presents the results of the Davidson-MacKinnon test. Davidson and MacKinnon show that if Model (1) is the true model, then the fitted values from Model (2) should be insignificant in Model (1), and vice versa. To test Model (1), we first estimate Model (2) by OLS to obtain the fitted values. The fitted values are then regressed along with all the independent variables in Model (1) as follows:

$Q_{it} = \alpha_0 + \theta_1$ [Fitted Values of Q] $+ \alpha_1$ GIM Index$_{it} + \alpha_2$ [Capital Expenditures / Total Assets]$_{it} + \alpha_3$ ROA$_{it} + \alpha_4$ Ln [Total Assets]$_{it} + \alpha_5$ [Long-term Debt / Total Assets]$_{it} + \alpha_6$ [R&D / Sales]$_{it} + \alpha_7$ Ln [Firm Age]$_{it} + \alpha_8$ Insider Ownership$_{it} + \alpha_9$ Insider Ownership Squared$_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i$ (4)

Similarly, to test Model (2), we first estimate Model (1) by OLS to obtain the fitted values. The fitted values are then regressed along with all the independent variables in Model (2) as follows:

$Q_{it} = \beta_0 + \theta_1$ [Fitted Values of Q] $+ \beta_1$ E Index$_{it} + \beta_2$ [Capital Expenditures / Total Assets]$_{it} + \beta_3$ ROA$_{it} + \beta_4$ Ln [Total Assets]$_{it} + \beta_5$ [Long-term Debt / Total Assets]$_{it} + \beta_6$ [R&D / Sales]$_{it} + \beta_7$ Ln [Firm Age]$_{it} + \beta_8$ Insider Ownership$_{it} + \beta_9$ Insider Ownership Squared$_{it} + I_i + \mu_i + \Upsilon_t + \varepsilon_i$ (5)

where Q_{it} is the industry-adjusted Tobin's Q of firm i in year t, , I_i is the industry fixed effect for each three-digit SIC code, μ_i is the firm fixed effect, Υ_t is the year fixed effect, and ε_i is a heteroskedastic error term. The Davidson-MacKinnon test is based on the t statistic on the fitted values. A significant t statistic against a two-sided alternative is a rejection of the Model. The last two columns present results of the regression without firm fixed effects.

The results of the Davidson-MacKinnon test are presented in Table 4. The first two columns of Table 4 present the results of Model (4) and Model (5), respectively. The p-value of 0.056 for the fitted values in Model (4) suggests that Model (1) cannot be rejected. Additionally, the p-value of 0.000 for the fitted values in Model (5) indicates that Model (2) should be rejected. Furthermore, the coefficient estimate for the E index in the second column of Table 4 is statistically insignificant even at the 5% level. These findings, consistent with our results

using adjusted R-squared and the Mizon and Richard test, indicate that the GIM index is better than the E index in explaining firm value variability. Again, on removing the control for fixed firm-effects, we cannot reject either model.

From the above discussion, it is clear that when it comes to the variability in firm value, the GIM index has a higher explanatory power than the E index. This finding gives more credence to the conjecture that some of the eighteen IRRC provisions not included in the E index might have some explanatory power. Contrary to the [2] findings that the eighteen excluded IRRC provisions have no explanatory power; we find evidence that the excluded IRRC provisions have a statistically significant incremental explanatory power.

5. Conclusion

This study compares the two primary measures of corporate governance quality, the GIM index and the E index, using a sample of 1354 firms for the period, 1990 to 2006. We find that the GIM index has a higher explanatory power than the E index in explaining the variability in firm value, as measured by Tobin's Q, suggesting that the IRRC provisions excluded from the E index may have a statistically significant incremental power in explaining the variability in firm value.

Our findings contribute to our comprehension of the relationship between corporate governance and firm value, and offer several future research avenues. These findings should eliminate the question of which corporate governance measure to use when studying the relationship between managerial entrenchment and firm value. Clearly, the GIM index should be the governance measure of choice. Additionally, our findings show that the other eighteen IRRC provisions eliminated from the E index have valuable explanatory power and are not just noise generators. Hence, all twenty-four IRRC provisions have to be included in the governance quality measure. Future research could also examine the differences in the governance measures' explanatory powers with respect to stock returns.

References

[1] Gompers, P., Ishii, J., Metrick, A., 2003. Corporate governance and equity prices. Quarterly Journal of Economics, 107-155.

[2] Bebchuk, L., Cohen, A., Ferrell, A. 2009. What matters in corporate governance, Review of Financial Studies 22, 783-827.

[3] Cremers, K., Nair, V.B., 2005. Governance mechanisms and equity prices. Journal of Finance 60, 2859-2894.

[4] Klock, M., Mansi, S., Maxwell. W., 2005. Does Corporate Governance Matter to Bondholders?, Journal of Financial and Quantitative Analysis 40, 693-719.

[5] Amit, R., Villalonga. B., 2006. How Do Family Ownership, Control, and Management Affect Firm Value?, Journal of Financial Economics 80, 385-417.

[6] Dittmar, A., Mahrt-Smith, J., 2007. Corporate governance and the value of cash holdings, Journal of Financial Economics 83, 599-634.

[7] Harford, J., Mansi, S., Maxwell, W., 2008. Corporate governance and firm cash holdings in the US. Journal of Financial Economics 87, 535-555.

[8] Bates, T., Becher, D., Lemmon. M., 2008. Board Classification and Managerial Entrenchment: Evidence from the Market for Corporate Control, Journal of Financial Economics 87, 656-77.

[9] Pinnell, Maria Carmen S., *State Takeover Laws* (Washington, DC: Investor Responsibility Research Center Inc., 2000).

[10] Mizon, G., Richard, J., 1986. The encompassing principle and its application to testing nonnested hypotheses, Econometrica 54, 657-678.

[11] Davidson, R., MacKinnon, J., 1981. Several tests of model specification in the presence of alternative hypotheses, Econometrica 49, 781-793.

Appendix: IRRC Definitions of the Twenty-Four Corporate Governance Provisions

These definitions are taked from **[1]** and [2].

E Index Provisions

Staggered board: a board in which directors are divided into separate classes with each class elected to overlapping terms.

Limitation on amending bylaws: a provision limiting shareholders' ability to amend the corporate bylaws through a majority vote.

Limitation on amending the charter: a provision limiting shareholders' ability to amend the corporate charter through a majority vote.

Supermajority to approve a merger: a requisite that stipulates that more than a majority of shareholders is needed to approve a merger.

Golden parachute: a severance accord that provides remuneration to management/board members in case of firing, demotion, or resignation after a change in control.

Poison pill: a shareholder right that is activated in case of an unauthorized change in control that usually renders the target company financially unattractive.

GIM Index Provisions

The GIM index includes the first six provisions above and the eighteen below.

Limitation on special meeting: a provision limiting shareholders' capacity to act by calling a special meeting.

Limitation on written consent: a provision limiting shareholders' capacity to act via written consent.

Elimination of cumulative voting: a provision eliminating shareholders' capacity to apportion their votes in an election.

Secret ballot: a system of voting that guarantees that management does not see individual proxy cards.

Director indemnification: a charter or bylaw provision protecting the firm's officers and directors against some legal expenses and judgments resulting from their conduct.

Director indemnification contract: an agreement with individual officers and directors promising protection against some legal expenses and judgments resulting from their conduct.

Limited director liability: a provision that restricts the personal liability of a firm's directors.

Compensation plan: a plan that hastens benefits in case of a change in control.

Severance agreement: an agreement which guarantees management some income protection in case they lose their positions.

Unequal voting rights: a provision dictating conditional changes in voting power.

Blank check preferred stock: when authorized, this stock gives the board power in establishing the stock's dividend, voting, and other rights when issued.

Fair price requirements: a requisite that a bidder pays shareholders a "fair price," usually the highest price that is paid by a bidder before a tender offer is made.

Cash-out law: a provision that allows shareholders to sell their shares to a controlling shareholder, typically at the highest price just paid by the controlling shareholder.

Director duties: a provision that allows the board to consider the interests of non-shareholder in assessing a possible change in control.

Business combination law: a law that limits the capacity of an acquirer to carry out certain transactions with the acquired firm post-acquisition.

Antigreenmail provision: a provision that averts an entity from buying a block of stock in a firm and selling it back to the firm at an above-market price.

Pension parachute: provisions that restrict the capacity of an acquirer from using extra money in a pension plan to pay for the acquisition.

Silver parachute: a severance agreement that offers benefits to a large number of company employees in the event of demotion, firing, or resignation after a change in control.