Investor-Driven Governance Standards and Firm Value

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Abstract: Using a novel measure of corporate governance based on the stated preferences of a large group of institutional investors, we examine whether there are baseline corporate governance practices effective in generating value and improving performance across all firms. We find some evidence that firms that adhere more closely to these stated preferences have higher valuations. Our empirical measure of these preferences is also associated with more stringent monitoring. Taken together, our results suggest that such "minimum-fits-all" governance practices have a positive impact on firm value via more effective board oversight.

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1. Introduction

> The Investor Stewardship Group's Goal is to codify the fundamentals of good corporate governance and establish baseline expectations for U.S. corporations and their institutional shareholders. The Group brings all types of investors together and enables us to speak with one voice on these fundamental issues.
>
> –Anne Sheehan, Director of Corporate Governance at CalSTRS

What constitutes good corporate governance? Are there baseline corporate governance practices that are effective in generating value across all firms? That is, is there a "minimum-fits-all" set of governance practices? These questions have been the subject of continuing debate among academics, shareholders, regulators, managers and proxy advisory firms. One view is that corporate governance can be improved, on average, by widespread implementation of corporate governance "best practices." This view is supported by evidence that certain governance practices have faced consistent opposition from shareholders while others have received consistent support. For example, shareholders strongly oppose classified boards, poison pills and supermajority provisions (Bebchuk, Cohen and Ferrell 2009), suggesting that these governance provisions do not improve firm value. At the same time, shareholders typically support majority voting standards for director elections (Ertimur, Ferri, and Oesch 2015). If certain governance practices are beneficial, whereas others are detrimental, then the universal implementation of minimum-fits-all governance practices could improve shareholder value. This suggests that some set of governance practices are value-maximizing for all firms. A competing view is that observed governance practices reflect idiosyncratic, value-maximizing contracts between shareholders and managers (e.g., Adams, Hermalin and Weisbach 2010; Larcker, Ormazabal and Taylor 2011). If this is the case, the implementation of minimum-fits-all corporate governance practices would decrease shareholder value by forcing at least some firms away from their existing, optimal governance structures.

We contribute to this discussion by examining how a novel measure of minimum-fits-all practices relates to firm value and monitoring outcomes. Our measure of minimum-fits-all practices is based on the corporate governance framework developed for U.S. listed companies by a group of institutional investors and asset managers, the Investor Stewardship Group (ISG).[1] ISG members, who, in the aggregate, invest over $22 trillion in the U.S. equity markets, announced a set of Corporate Governance Principles on January 31, 2017. ISG presents this framework as "a set of shared behavioral expectations" intended to "create sustainable, long-term value for all shareholders" and says that the framework "reveals the depth and breadth of agreement amongst institutional investors."[2] The ISG framework meets the criteria of minimum-fits-all standards because the stated intent of the framework is to reflect a *baseline* level of governance (i.e., minimum), and the framework is intended to apply to *all* firms.

We construct a corporate governance index based on this framework and the underlying principles. Our approach has the following benefits. First, it is based on the stated preferences of institutional investors. Institutional investors play a key role in corporate governance: they can improve firm value by governance through voice (direct intervention in firm operations) or exit (selling shares); or hurt firm value by extracting private benefits (see Shleifer and Vishny 1997 and Edmans 2014 for reviews).

Second, the ISG framework allows us to observe the common corporate governance beliefs and baseline expectations of a significant block of institutional investors. This is in contrast to relying on proxy voting guidelines of a broad set of institutional investors, which vary

[1] See https://isgframework.org/ for information about the ISG. ISG signatories include BlackRock, CalPERS, CalSTRS, Goldman Sachs Asset Management, State Street Global Advisors and Vanguard, among others. In addition to the Corporate Governance Principles, ISG also developed Stewardship Principles articulating a set of fundamental stewardship responsibilities for institutional investors. The Stewardship Principles fall outside the scope of this study.

[2] https://www.businesswire.com/news/home/20170131005949/en/Leading-Investors-Launch-Historic-Initiative-Focused-U.S

in transparency, breadth and depth across institutional investors.[3] Similarly, relying on proxy voting guidelines of proxy advisory firms such as Institutional Shareholder Services (ISS) is problematic for several reasons. ISS does not propose minimum-fits-all standards per se. Further, while ISS consults with institutional investors via an annual policy survey in formulating its voting guidelines, how ISS aggregates institutional investors' views is not clear and there is likely significant variation in opinion underlying the resulting guidelines.[4] This variation often leads institutional investors' votes to deviate from ISS recommendations. For example, Iliev and Lowry (2015) find that mutual funds with stronger incentives to actively vote are significantly less likely to follow the advice of ISS. Finally, the incentives of proxy advisory firms have been called into question given concerns with lack of accountability and transparency, limited competition, and potential conflicts of interest (Choi, Fisch, and Kahan 2009; Gordon 2009).

Third, our index is comprehensive in nature. Two commonly-used governance indices, the G-Index (Gompers, Ishii and Metrick 2003) and the Entrenchment index (Bebchuk, Cohen and Ferrell 2009), include only measures of shareholder protection. Corporate governance is multi-faceted, however. Our measure captures the shareholder protection measures institutional investors deem most relevant, as well as facets such as board responsiveness, independence, and structure. Non-index approaches to capturing institutional investor preferences, such as the decision to target firms with shareholder proposals, casting votes against management proposals

[3] For example, BlackRock, an ISG signatory, lays out its proxy voting guidelines in a detailed 18-page document (https://www.blackrock.com/corporate/literature/fact-sheet/blk-responsible-investment-guidelines-us.pdf). T. Rowe Price, also an ISG signatory, provides a less granular eight-page document (https://www3.troweprice.com/usis/content/trowecorp/en/utility/policies/_jcr_content/maincontent/polices_row_1/para-mid/thiscontent/pdf_link/pdffile). Another ISG signatory, Cove Street Capital, provides its proxy voting guidelines to clients upon request.

[4] For example, in responding to the 2017–2018 ISS Global Policy Survey, 43% of the investors indicated that unequal voting rights are never appropriate for a public company in any circumstances while another 43% said unequal voting rights structures may be appropriate in limited circumstances. The resulting ISS 2018 U.S. voting guidelines recommend generally voting against proposals to create a new class of common stock but allows for exceptions. In contrast, the ISG framework asks companies to adopt a one-share, one-vote structure and for those companies that already have multiple classes of shares to phase these out as appropriate.

or withholding votes from directors are piecemeal. That is, non-index approaches address a subset of governance issues at a subset of firms (typically large, poorly performing firms).

The ISG framework is comprised of six principles that relate to (*i*) board accountability, (*ii*) voting rights, (*iii*) board responsiveness to shareholders, (*iv*) board leadership, (*v*) board practices and structure, and (v*i*) management incentives and structure. Each principle, in turn, encompasses several elements. Using various machine-readable databases and hand-collected data, we construct empirical proxies for each element (hereafter, components) for S&P 1500 firms over the 2003 – 2015 period. We aggregate these components to construct empirical proxies for each of the principles (hereafter, sub-indices). Finally, we aggregate the sub-indices to create an empirical proxy for the extent to which each firm-year observation adheres to the ISG framework (hereafter, governance index). As the framework was made public only recently (January of 2017), most of our empirical analyses precede the announcement of the ISG framework. Thus, we use the ISG framework to construct a proxy for minimum-fits-all governance practices supported by a broad group of investors; we do not investigate the consequences of ISG's promotion of the framework.

We start by examining the relation between governance index and firm value, as measured by Tobin's Q, as well as the sub-indices and firm value. To the extent that (*i*) minimum-fits-all governance standards are beneficial, and (*ii*) the ISG Corporate Governance Principles capture good governance, we expect that firms with a greater proportion of the underlying elements in place will be valued higher. We find evidence consistent with this expectation: Tobin's Q is positively associated with adherence to the governance index. We further find that firms with higher levels of the sub-indices relating to board responsiveness to shareholders and stronger management incentives have greater valuations.

If the ISG Corporate Governance Principles are effective, we should observe better monitoring at firms with a greater proportion of the underlying elements in place. To investigate whether this is the case, we examine the relation between the governance index and several proxies for monitoring: CEO "excess" compensation, the sensitivity of CEO turnover to performance, merger and acquisition activity, and stock price crash risk. With respect to compensation, we detect higher compensation at firms with higher levels of the governance index, after controlling for the economic determinants of compensation levels. We find evidence of stronger sensitivity of turnover to performance for CEOs of firms with higher levels of governance index. Taken together, these results suggest the higher compensation at firms with higher levels of the governance index is a premium provided in exchange for increased employment security risk. We further show that firms with higher levels of the governance index engage in more value-enhancing acquisitions, suggesting that these firms have more effective oversight of merger and acquisition activity. Finally, we find some evidence that certain aspects of the governance index are associated with reduced stock price crash risk. In sum, we find evidence that firms with a greater number of the ISG principles in place have higher firm value, and that this additional value is generated through effective board oversight.

Our study is subject to certain limitations. First, we examine associations and, as such, the results cannot be interpreted causally. Second, we measure firms' implementation of the framework with error; we necessarily sacrifice precision for simplicity in constructing our index. Finally, while the signatories of the ISG framework own a substantial block of the U.S. equity market, their views on what constitutes a baseline level for corporate governance may not be representative of the views of other institutional investors. Therefore, one must exercise caution in generalizing our results.

We contribute to the debate on whether "best practices" exist in governance or firms contract optimally. Overall, our results point to a positive association between minimum-fits-all governance practices and firm value. We provide some evidence that firms with greater adherence to minimum-fits-all governance standards achieve greater value through improved board monitoring. Conceptually, minimum-fits-all standards differ from one-size-fits-all standards, which posit that the same set of governance standards is optimal for all firms. Minimum-fits-all standards suggest that there is a baseline level of governance practices all firms should adopt but that the optimal set of governance practices could deviate upwards from this baseline. Thus, our results cannot be interpreted as supporting a one-size-fits-all view.

Our study also contributes to the literature on the impact of institutional investors on corporate governance (e.g., Gillan and Starks 2000; Hartzell and Starks 2003; Aggarwal, Erel, Ferreira and Matos 2011; Appel, Gormly and Keim 2016). Ownership by institutional investors has been growing steadily over time and institutions are increasingly more involved in governance-related matters.[5,6] Our study sheds light on whether the baseline governance expectations institutions promote manifest in greater shareholder value.

Finally, our study is related to research that explores the association between corporate governance and firm value. We investigate whether shareholders benefit from adherence to a minimum-fits-all set of corporate governance practices. This overlaps with prior literature on the

[5] Percentage of ownership of institutional investors in the U.S. stock markets increased from around 45% in early to mid-1990s to over 70% in 2006 (Gillan and Starks 2007). At the same time, percentage of total U.S. market capitalization held by passively managed mutual funds increased from under 2% in 1998 to over 8% in 2014 (Appel et al. 2016). As of the beginning of 2018, BlackRock, State Street Global Advisors and Vanguard, which have both actively and passively managed funds, collectively own 18% of the S&P 500 (Lazard 2018).

[6] Institutional investors' involvement takes many forms such as activism via shareholder proposals, particularly in the case of pension funds and labor union funds (Gillan and Starks 2007; Ertimur, Ferri and Stubben 2010; Ertimur, Ferri and Muslu 2011), hedge fund activism (Brav, Jiang, Partnoy and Thomas 2008; Klein and Zur 2009), one-on-one engagement with firms (Carleton, Nelson and Weisbach 1997). Recent survey evidence suggests passive investors are "increasingly committed" to using proxy voting and engagement to improve environmental, social and governance activities of their holdings (Morningstar Manager Research 2017). BlackRock Chairman and CEO Laurence Fink's annual letter to CEOs on January 16th, 2018 is another example of this increased involvement.

association between indices of shareholder rights and firm value (e.g., Gompers, Ishii and Metrick 2003; Core, Guay and Rusticus 2006; Bebchuk, Cohen and Ferrell 2009; Cremers and Ferrell 2014). The measure of corporate governance we use is broader than other commonly used indices and encompasses a number of other facets of governance. More importantly, our measure is based on the stated preferences of a large group of institutional investors seeking to establish a baseline level of beneficial governance practices.

2. Sample Selection and the Governance Index Measure

We capture the stated corporate governance preferences of institutional investors by operationalizing the Corporate Governance Principles for U.S. Listed Companies put forth by ISG (i.e., the "ISG framework"). ISG is comprised of 50 large, U.S. and international institutional investors and is led by the members' senior corporate governance practitioners. The ISG framework is comprised of six principles that relate to (*i*) board accountability, (*ii*) voting rights, (*iii*) board responsiveness to shareholders, (*iv*) board leadership, (*v*) board practices and structure, and (v*i*) management incentives and structure. Each principle consists of several elements that detail the rationale for and the expectations underlying the principle. Appendix A lists the principles and elements of the ISG framework.

We create empirical proxies for each of the elements; we refer to these proxies as components. Specifically, we construct an indicator variable to capture each element. For example, there are six elements underlying the Board Responsiveness principle. One of these elements (item 1.2) is "Requiring directors to stand for election annually helps increase their accountability to shareholders. Classified boards can reduce the accountability of companies and directors to their shareholders. With classified boards, a minority of directors stand for elections in a given year, thereby preventing shareholders from voting on all directors in a timely manner."

To operationalize this element, we create a component, *Non Classified Board*, equal to one if the board is not classified and zero otherwise. In some cases, we do not operationalize an element of the ISG framework because it is difficult to quantify or measure objectively.[7] We sum these components to create an empirical proxy for the extent to which each firm-year observation adheres to the ISG framework (hereafter, *GovIndex*). We also create an alternative version of the composite index, *GovIndexEqualWeights,* comprised of the sum of the equally-weighted sub-indices. This alternative measure ensures that each of the sub-indices receives equal weight regardless of the number of underlying components. This approach has the added benefit of reducing the dimensionality of the index. Rather than using a measure that reduces dimensionality at the proxy level, such as principal components analysis, we leverage the conceptual distinctions provided by ISG to reduce dimensionality at the construct level. We provide detailed explanations of how we measure each component in Appendix A.

This approach is, of course, a simplification of the ISG framework, and has limitations. First, simply summing the components of the index does not accurately reflect the differential effects of components on firm value, firm performance and monitoring outcomes. To allow for some variation across different components, we create sub-indices corresponding to each principle and investigate these separately. Second, the use of indicator variables to measure each component sacrifices precision within some measures for the sake of simplicity. For example, item 3.2 of the ISG framework relates to the board's responsiveness to management proposals that receive low support. We do not distinguish among different types of management proposals, i.e., director elections, say-on-pay-votes or other management proposals. Third, a benefit of using the ISG framework is that we capture a more comprehensive set of governance

[7] For example, element 6.2 states "A change in the company's long-term strategy should necessitate a re-evaluation of management incentive structures in order to determine whether they continue to incentivize management to achieve the goals of the new strategy."

characteristics than, for example, just shareholder protection measures. One consequence of this is that some elements of the ISG framework are unobservable or difficult to quantify; we are unable to capture the nuance in some elements with our empirical proxies. In addition, in six cases, we are unable to create reasonable proxies for the elements because they are overly broad, difficult to measure objectively, or difficult to quantify.[8] Thus, there is noise in our proxy for the strength of governance, but we do not have reason to believe the noise generates a systematic bias.

As our measure is quite comprehensive, we collect data from numerous sources. We require data from the ISS Directors, ISS Governance, ISS Voting Analytics, Execucomp, Compustat, CRSP, and BoardEx databases, the SEC WRDS Analytics Suite, and hand-collected data. As BoardEx coverage is robust beginning in 2003, our sample begins in the 2003 proxy season, and runs through the 2015 proxy season. This results in a primary sample of 12,709 firm-years. Variables in our regression analyses impose additional restrictions. Sample sizes for these analyses are presented in the tables.

Table 1 presents summary statistics for governance index and its components. Panel A shows the distribution of the index, each component, and the sub-indices that correspond to each ISG principle in the framework. The governance index consists of 18 components. The mean value of *GovIndex* (*GovIndexEqualWeights*) is 12 (4.171), meaning that most firms have more than half of the recommended provisions in place. The measure exhibits variation, as well. The minimum number of provisions in place is 5, and the maximum is 17. The least commonly implemented provision is proxy access, the ability of shareholders to add candidates to the proxy

[8] An example of an element we do not operationalize is item 1.1 of the ISG framework. This item states: "It is a fundamental right of shareholders to elect directors whom they believe are best suited to represent their interests and the long-term interests of the company. Directors are accountable to shareholders, and their performance is evaluated through the company's overall long-term performance, financial and otherwise."

ballot prior to the shareholder meeting. Proxy access is present in only 0.4% of firm-years in our sample. This is not surprising given that, prior to an SEC rule amendment that became effective in September 2011, proxy access bylaws were rare and shareholders did not have the ability to propose firms adopt such bylaws (Bhandri, Iliev and Kalodimos 2017). The element with which the most firms comply is shareholder proposal response; 97.4% of firms were either not targeted by shareholder proposals that received majority approval, or appear to have responded to majority-approved proposals in a timely fashion.

In our empirical analyses we estimate specifications where we focus on firms with the weakest and the strongest levels of governance. We do so to address concerns that the associations between our variables of interest and adherence to the governance index are not linear, and to provide insight into which types of firms drive any associations we observe – those with strong governance, or those with weak governance. We create indicator variables *Strongest* and *Weakest* if the firm's governance index falls in the top or bottom decile of the governance index, respectively. For *GovIndex*, *Strongest* (*Weakest*) is equal to one if the firm has an index score of 14 or greater (9 or lower), and zero otherwise. For *GovIndexEqualWeights*, *StrongestEqualWeights* (*WeakestEqualWeights*) is equal to one if the firm has an index score of 5.16 or greater (3.22 or lower), and zero otherwise.

In Panel B of Table 1 we present the means of the governance index, sub-indices and components for three time periods: 2003 to 2007, 2008 to 2011 and 2012 to 2015. The data show that firms are implementing governance measures consistent with the ISG framework over time. The aggregate level index measure (both *GovIndex* and *GovIndexEqualWeights*), the sub-indices, and most of the components are increasing during our sample period. The three cases where firms are trending away from the ISG framework provisions are: fewer boards have independent

chairpersons (*Independent Leadership*), boards are becoming less diverse (*High Diversity*); and more boards have long average tenures (*No Long Tenure*). The sensitivity of pay to performance (*Strong Incentives*) differs in each period, but does not demonstrate a monotonic trend.

In Panel C we present correlations among our index measures (*GovIndex* and *GovIndexEqualWeights*) and the sub-indices. As expected, each of the sub-indices is positively and significantly associated with the main index measure. With two exceptions, the correlations between *Equal Voting* and *Responsiveness*, and between *Equal Voting* and *Executive Incentives*, the sub-indices are significantly positively associated with one another. This suggests that the provisions in the index tend to cluster within firm.

For parsimony, we do not report correlations among the components, but they follow similar trends; of the 153 correlations (18x17/2), 73 are positive and 34 are negative. Of the negative associations ten are associated with the *High Diversity* component, nine with the *Low Busy Directors* component, and seven with the *Independent Leadership* component. The *Strong Incentives* component is not significantly correlated with other components in thirteen of seventeen cases, and is significantly negatively correlated with other components in three cases. Thus, with the exception of these measures, it appears that components within the index tend to cluster within firms.

3. Governance and Firm Value

We start our analysis with an examination of the relation between the governance index and firm value. Prior research finds that firms with greater shareholder rights have higher firm valuation (Gompers, Ishii and Metrick 2003; Bebchuk, Cohen and Ferrell 2009; Cremers and Ferrell 2014). Similar in spirit to these studies, to the extent that minimum standards fit all firms,

and the ISG Corporate Governance Principles capture good governance, we expect that firms with a greater proportion of the underlying elements in place will be valued higher.

Following Gompers, Ishii and Metrick (2003), Bebchuk, Cohen and Ferrell (2009), Cremers and Ferrell (2014), and others, we use industry-adjusted Tobin's Q as our measure of firm value. We estimate the following pooled ordinary least squares regression with standard errors clustered by firm and year:

$$\begin{aligned} IndustryAdjustedQ_{it} &= \alpha + \beta_1 GovIndex_{it}(GovIndexEqualWeights_{it}) + \beta_2 Log(Assets)_{it} \\ &+ \beta_3 CapEx_{it} + \beta_4 MissCapEx_{it} + \beta_5 Leverage_{it} + \beta_6 R\&D_{it} \\ &+ \beta_7 MissR\&D_{it} + \beta_8 PP\&E_{it} + \beta_9 MissPP\&E_{it} + \beta_{10} SP500_{it} \\ &+ IndustryEffects + YearEffects + \varepsilon_{it} \end{aligned} \quad (1)$$

The dependent variable, *IndAdjustedQ*, is the market value of assets scaled by the book value of assets adjusted for the median Tobin's Q for the firm's 48 Fama and French (1997) industry group for the fiscal year ending following the annual meeting. The market value of assets is the book value of assets plus the market value of common stock, less the sum of the book value of common stock and deferred taxes. We industry-adjust Tobin's Q to isolate the portion of firm value that can be attributed to individual firm activities, rather than industry-wide trends. The variable of interest is alternatively *GovIndex* and *GovIndexEqualWeights*, measured as of the annual meeting date and as outlined in Section 2. A positive coefficient on *GovIndex* or *GovIndexEqualWeights* ($\beta_1 > 0$) would suggest that firms with a greater proportion of the ISG elements in place are valued higher. We also estimate Equation 1 using several variations of the governance index. First, we replace *GovIndex (GovIndexEqualWeights)*with the indicator variables *Strongest* and *Weakest* (*StrongestEqualWeights* and *WeakestEqualWeights*). In this specification, the intercept captures firms with "middle" levels of governance. Second, we split *GovIndex* into the six sub-indices to explore the role of each of the ISG principles.

Similar to Cremers and Ferrell (2014), we include the log of total assets (*Log*(*Assets*)); capital expenditures scaled by average total assets (*CapEx*); debt scaled by total assets (*Leverage*); research and development expenditures scaled by average total assets (*R&D*); property, plant and equipment scaled by average total assets (*PP&E*); and an indicator variable set to one if the firm is included in the S&P 500 index, and zero otherwise (*SP*500). In cases where the values of capital expenditures, R&D expenditures, or PP&E are missing, we set the values equal to zero and include indicator variables set to one (*MissCapEx*, *MissR&D* and *MissPP&E*, respectively). We include industry and year fixed effects. We present distributions of regression variables in Table 2, and Appendix B provides detailed descriptions of all variables.

We present the results of estimating Equation 1 in Table 3. Column 1 of Panel A presents the results of the main specification, where the variable of interest is *GovIndex*. We detect a statistically significant positive association between *GovIndex* and industry adjusted Tobin's Q —β_1 = 0.014, significant at the 10% level, in column 1. Columns 2 through 4 present specifications in which we differentiate between the firms with the highest and lowest levels of the governance index. The coefficient of *Strongest* is significantly positive in columns 2 and 4, consistent with firms with the highest levels of the governance index outperforming firms with weaker governance. We do not find that the weakest levels of governance are associated with firm value, however; the coefficient on *Weakest* is not significant in either column 3 or column 4.

Panel B presents the results when we use *GovIndexEqualWeights* as the variable of interest. These results are largely consistent with those in Panel A: We document a positive and statistically significant association between *GovIndexEqualWeights* and industry adjusted Tobin's Q—β_1 = 0.038, significant at the 5% level, in column 1, and significantly positive

associations between *Strongest* and industry adjusted Tobin's Q in columns 2 and 4. We detect a significantly negative association between *Weakest* and industry adjusted Tobin's Q only when it is included in the model independently in column 3.

We next investigate the relation between each of the sub-indices and industry-adjusted Tobin's Q to assess whether the results in Panels A and B vary across the sub-indices. Table 3, Panel C presents the results; in columns 1–6 we introduce each sub-index separately and in column 7 we include all simultaneously in the estimation. The coefficients for the *ISG3_Responsiveness* and *ISG6_ExecutiveIncentive* sub-indices are positive and statistically significant, at the 5% and 10% levels, respectively. Unlike prior literature such as Gompers, Ishii and Metrick (2003) and Bebchuk, Cohen and Ferrell (2009), we do not detect an association between the sub-index reflecting shareholder rights, *ISG1_BoardAccountability*, and industry-adjusted Tobin's Q. This result is likely due to differences in the composition of the measures across studies. The coefficients for the remaining sub-indices are insignificant. In column 7, when we include all sub-indices in the estimation of Equation 1, we find both the coefficients of *ISG3_Responsiveness* and *ISG6_ExecutiveIncentives* remain positive and significant.

We estimate several additional specifications to evaluate the robustness of our results. First, we estimate the association between *GovIndex*, *GovIndexEqualWeights* or the sub-indices and Tobin's Q for a three-year time period, years *t* through *t+2*, to test whether the association between governance and firm value is persistent. We find that these associations are consistent with those in our primary analyses, though the associations are slightly weaker in some cases. Second, we re-estimate Equation 1 using industry-year adjusted controls for each of the continuous variables, omitting industry and year fixed effects. This specification is equivalent to including industry-year fixed effects, but preserves degrees of freedom in the estimation. The

associations between governance and firm value are weaker in these specifications, though consistent with the main results. Finally, in addition to the pooled ordinary least squares estimation, following Bebchuk, Cohen and Ferrell (2009), we estimate (i) annual regressions and calculate Fama-McBeth (1973) coefficients and (ii) an alternative specification where we replace industry fixed effects with firm fixed effects. The results are qualitatively similar when we use these specifications.

Taken together, the results in Table 3 suggest that firms that have a greater proportion of ISG principles in place have, on average, higher firm value. A natural follow-up question is which aspects of firm performance drive this greater value. In the context of the shareholder rights literature, earlier studies focus on the association between indices of shareholder rights and returns as well as other measures of firm performance (e.g., Gompers, Ishii and Metrick 2003; Cremers and Nair 2005). Later studies are centered around tests of the relation between indices of shareholder rights and firm value (Bebchuk, Cohen and Ferrell 2009; Cremers and Ferrell 2014). This shift is at least partially due to the difficulty of interpreting the associations between governance and returns. For example, are these results due to (*i*) investors underestimating the higher agency costs arising from lower shareholder rights, or (*ii*) managers who forecast poorer performance adopting provisions that inhibit shareholder rights, or (*iii*) a correlation between shareholder rights and some common risk factor missing from the standard asset pricing model (Gompers, Ishii and Metrick 2003)? This difficulty notwithstanding, in untabulated analyses, we supplement our tests of the relation between governance and firm value with tests of the relation between governance and firm performance, as captured by operating performance and long-run returns.

Overall, we do not find consistent evidence about the association between the governance index and firm performance. The association between the governance index and return on assets is not different from zero. Similarly, there is no indication that firms with higher values of the governance index display greater sales growth. In contrast, we find some evidence of positive associations between the governance index and return on equity, asset turnover (sales scaled by average total assets) and higher operating cash flows scaled by average total assets. Finally, we do not find evidence of significant differences in long run returns between firms in the highest and lowest levels of the governance index. Taken together, the effect of the governance principles promoted by ISG on firm performance is unclear.

4. Governance and Monitoring

We find some evidence that firms with higher levels of governance index have higher firm value, as measured by Tobin's Q. One key responsibility of the board of directors is to monitor managers to reduce agency costs. If firms with a greater proportion of ISG principles in place have higher firm values partially because of improved monitoring, we should observe better monitoring at firms with a greater proportion of the underlying elements in place. In order to investigate whether this is indeed the case, we examine the relation between the governance index and three proxies for monitoring: (i) CEO "excess" compensation, (ii) the sensitivity of CEO turnover to firm performance, and (iii) merger and acquisition activity.

4.1. Governance and CEO excess compensation

Numerous studies document that CEOs are able to extract rents in the form of residual, or excess, compensation when firms are poorly governed, and several of these studies document that this excess compensation is detrimental to firm value (e.g., Core, Holthausen and Larcker 1999; Bebchuk and Fried 2004; Faleye 2007; Coles, Daniel and Naveen 2014). In this section we

investigate whether excess CEO compensation is associated with the governance index. If boards of firms with higher levels of the governance index are better monitors, they will constrain excess CEO compensation. To examine the relation between the governance index and excess compensation, we estimate the following ordinary least squared regression with standard errors clustered by firm and year:

$$\%ResidualCompensation_{it} = \alpha + \beta_1 GovIndex_{it}(GovIndexEqualWeights_{it}) + \beta_2 FirstYear_{it} + \beta_3 TerminalYear_{it} + \varepsilon_{it} \quad (2)$$

The dependent variable, *%ResidualCompensation* is the natural logarithm of *CEO Total Compensation* less the natural logarithm of *CEO Predicted Pay*. We measure *%ResidualCompensation* as of the fiscal year end subsequent to the annual meeting. Following Core, Guay and Larcker (2008), we compute *CEOPredictedPay* as the exponent of the predicted value for each firm from annual regressions of the natural logarithm of total CEO compensation on proxies for economic determinants of CEO pay: CEO tenure, logarithm of sales, an indicator set to one if the firm is included in the S&P500 index, lagged book-to-market ratio, contemporaneous and lagged one-year stock returns, contemporaneous and lagged ROA, and indicators for the twelve Fama and French (1997) industries. We regress the residual compensation component on the governance index measures; if firms with higher values of the governance index are better able to prevent CEOs from gaining excess compensation, the association between the governance index and *%ResidualCompensation* will be negative; i.e., $\beta_1 < 0$. We estimate the same variations of Equation 2 as in prior analyses; we replace *GovIndex* with *GovIndexEqualWeights*, indicator variables *Strongest* and *Weakest*, and we split *GovIndex* into the six sub-indices to explore the role of each of the ISG principles.

%ResidualCompensation includes controls for economic determinants of compensation, but not for one-time items that typically arise in the first or last years of a CEO's tenure (e.g., special signing bonuses or severance pay). We thus include indicator variables set to one if the CEO is in her initial or terminal year, *FistYear* and *TerminalYear*, respectively, in Equation 2. We do not include industry or year fixed effects, as they are components of the estimation of residual compensation. We present distributions of regression variables in Table 2, and Appendix B provides detailed descriptions of all variables.

We present the results of estimating Equation 2 in Table 4. We do not find a significant association between *GovIndex* and residual compensation (see column 1 of Panel A), though we do detect a *positive* association between *GovIndex* and residual compensation in firms with the highest levels of governance; the coefficient on *Strongest* in columns 2 and 4 of Panel A is positive and significant at the 10% level. We do not detect significant associations between governance and residual compensation when we measure governance as *GovIndexEqualWeights*. (see column 1 of Panel B). These results are inconsistent with the idea that firms with higher values of *GovIndex* constrain excess CEO pay.[9]

In Panel C we present results of estimating Equation 2 with each of the sub-indices in place of *GovIndex*. The association between *ISG3_Responsiveness* and residual compensation is negative. This is consistent with prior literature showing that boards reduce excess compensation following shareholder opposition to compensation practices (e.g., Ertimur, Ferri and Muslu 2011). The association between the *ISG1_BoardAccountability* sub-index and residual compensation is positive. These results are consistent when we include all sub-indices in a single

[9]Chen, Hribar and Melessa (2018) demonstrate that the coefficients in regressions where the dependent variable is a residual from a first-stage regression can be biased. Our inferences are consistent when we include all controls from the first stage regression with the variables from the second stage regression and fully interact these controls with firm and year fixed effects.

specification (column 7), and the association between *ISG2_EqualVoting* and residual compensation is also significant in this specification. While not conclusive, these associations suggest that firms pay a premium to CEOs who face stronger monitoring, perhaps due to increased employment risk. We investigate these associations in the subsequent sections.

4.2. Sensitivity of CEO Turnover to Performance

One of the key responsibilities of boards is to dismiss poorly performing CEOs. Several empirical studies document that poor performance, measured as stock or accounting returns, is positively associated with CEO turnover (Warner, Watts and Wruck 1988; Parrino 1997; Jenter and Kanaan 2015; also see Adams, Hermalin and Weisbach 2010 for a broad discussion of the theoretical and empirical literature). Prior literature suggests that at firms where boards are more effective at monitoring, managers are more likely to face termination when their firms perform poorly. For example, Weisbach (1988) shows that CEO turnover is more sensitive to performance at firms with outsider-dominated boards than at firms with insider-dominated boards. Coles, Daniel and Naveen (2014) find that sensitivity of forced CEO turnover to firm performance decreases with co-option, i.e., when a greater fraction of the board is comprised of directors appointed after the CEO assumed office.

We expect forced CEO turnover to be more sensitive to performance at firms with a greater proportion of ISG principles in place to the extent that these firms have better monitoring. To examine this conjecture, following recent literature (e.g., Campbell, Gallmeyer, Johnson, Rutherford and Stanley 2011; Jenter and Kanaan 2015; Hazarika, Karpoff and Nahata 2012; Ertimur, Rawson, Rogers and Zechman 2018), we estimate the sensitivity of CEO turnover to performance using the Cox (1972) proportional hazard model. The Cox model takes into account both the timing and the occurrence of turnover (i.e., the probability of CEO experiencing forced

turnover during an interval, conditional on having survived up to the starting time of the interval). It also appropriately considers the fact that CEOs in office at the end of our study period had not yet turned over (i.e., these observations are right-censored). Specifically, to examine the relation between the governance index and sensitivity of CEO turnover to performance, we estimate the following Cox (1972) proportional hazard models with standard errors clustered by firm and year:

$$Probability(Turnover_t) = \alpha + \beta_1 ROA_{it-1} * Strongest_{it} + \beta_2 ROA_{it-1} * Middle_{it} + \beta_3 ROA_{it-1} * Weakest_{it} + \beta_6 SDIndAdjROA_{it} + \beta_7 SDIndAdjRET_{it} + \beta_8 RetirementAge_{it} + \beta_9 HighEquityOwnership_{it} + IndustryEffects + YearEffects + \varepsilon_{it} \quad (3a)$$

$$Probability(Turnover_t) = \alpha + \beta_1 Ret_{it-1} * Strongest_{it} + \beta_2 Ret_{it-1} * Middle_{it} + \beta_3 Ret_{it-1} * Weakest_{it} + \beta_4 Strongest_{it} + \beta_5 Weakest_{it} + \beta_6 SDIndAdjROA_{it} + \beta_7 SDIndAdjRET_{it} + \beta_8 RetirementAge_{it} + \beta_9 HighEquityOwnership_{it} + IndustryEffects + YearEffects + \varepsilon_{it} \quad (3b)$$

The dependent variable, *Turnover*, is equal to one if the CEO experiences forced turnover in fiscal year *t*; the fiscal year ending following the annual meeting. We adopt a process similar to that outlined in Parrino (1997), Huson, Parrino and Starks (2001), and Hazarika et al. (2012) to group CEO turnover events into voluntary and forced. Using the Execucomp database, we identify 1,1,162 potential turnover cases—situations where the CEO-firm pair changes over the period of interest. For each of these events, we perform an internet search to identify reasons for the CEO's departure. We classify departures as forced turnovers if the CEO (*i*) is fired, forced from the position, or departed due to policy differences, (*ii*) is under the age of 60 and the reason for the departure is not listed as involving death, poor health, or the acceptance of another position (i.e., a board membership within the firm or a full time executive position elsewhere or

within the firm), or (*iii*) is under the age of 60 and announcement is fewer than six months before the succession. As in Jenter and Kanaan (2015), we exclude CEOs who are explicitly identified as interim CEOs, corresponding to 45 turnover events. We classify 256 of the events as forced turnover, and the remaining 861 as voluntary. We exclude CEOs who have been in office for less than 24 months from our analysis as these may reflect interim transitions even if they are not explicitly stated as such, or boards may be less likely to terminate new CEOs in cases of poor performance. We treat voluntary turnover events as right-censored.

We measure performance alternatively as operating performance (*ROA*) in Equation 3a and stock performance (*RET*) in Equation 3b. We measure performance in the fiscal year prior to the turnover year (i.e., year t-1), and the strength of the governance index in year t, when the turnover decision is made. For ease of interpretation, we partition sample firms intro three non-overlapping mutually exhaustive groups based on the level of the governance index and estimate the sensitivity of turnover to performance separately for each group. That is, in Equation 3a β_1 captures turnover sensitivity to *ROA* for firms with the highest level of the governance index, β_3 captures turnover sensitivity to *ROA* for firms with the lowest level of the governance index and β_2 captures turnover sensitivity to *ROA* for the rest of the firms. We adopt an analogous approach for turnover sensitivity to stock returns in Equation 3b. β_1, β_2 and β_3 less than zero would indicate CEO turnover is sensitive to performance: when firms perform better (worse) the CEO is less (more) likely to turnover. $\beta_1 < \beta_3$ would indicate that turnover is more sensitive to performance at firms where a greater proportion of the ISG elements are in place, suggesting that the boards of these firms are better monitors. We estimate the similar variations of Equation 3 for *GovIndex*, *GovIndexEqualWeights*, and each of the sub-indices, splitting them into high and low groups (for

binary sub-indices) or high, medium, and low groups (for indices with more variation) to explore the role of each of the ISG principles.

We follow Bushman, Dai and Wang (2010) and control for firm risk (both idiosyncratic and industry-level) by including controls for the volatility of earnings and returns. We also control for CEO characteristics Jenter and Kanaan (2015) show to be associated with the probability of turnover: whether the CEO is of retirement age and may be subject to mandatory retirement (*RetirementAge*, an indicator variable that is equal to one if the CEO age is between 63 and 66) and whether the CEO has a large equity stake (*HighEquityOwnership*, an indicator variable that is equal to one if the CEO owns more than 5% of the outstanding shares, and zero otherwise), suggesting that the CEO may be entrenched. We include industry and year fixed effects in these models. We present distributions of regression variables in Table 2, and all variables are defined in Appendix B.

We present the results of estimating Equations 3a and 3b in Table 5. Panel A demonstrates that forced CEO turnover is sensitive to accounting performance for firms with the highest levels of *GovIndex*; β_1 is significantly negative. In contrast, β_3 is not statistically significant, suggesting that boards of firms with the lowest levels of the *GovIndex* do not effectively monitor the CEO. This difference in the sensitivity of turnover to accounting performance between firms with the strongest and weakest levels of governance is not significantly different from zero; a test of the difference between β_1 and β_3 yields a p-value of 22.6%. Shifting our attention to the results from estimating Equation 3b, we observe a similar pattern: forced CEO turnover is sensitive to performance in firms with higher levels of governance, but not at firms with lower levels of governance. Again, this difference is not significantly different from zero.

We present the results of estimating Equation 3 when we measure governance using *GovIndexEqualWeights* in Panel B of Table 5. Forced CEO turnover is sensitive to accounting performance for firms all levels of *GovIndexEqualWeights*; β_1, β_2 and β_3 are negative. Although the coefficient associated with the weakest levels of governance is less negative than the other coefficients, this difference is not significant; a test of the difference between β_1 and β_3 yields a p-value of 80.2%. In Panel B, coefficients show that forced turnover is sensitive to stock performance in firms with the strongest levels of governance (β_1=-2.213, p<.05), but not sensitive to stock performance in firms with the weakest levels of performance (β_3=0.355, p>.10). This difference in the sensitivity of turnover to stock performance between firms with the strongest and weakest levels of governance is significantly different from zero; a test of the difference between β_1 and β_3 yields a p-value of 1.5%. This is consistent with firms with stronger governance more effectively monitoring the CEO.

Panels C and D present the results for the sensitivity of forced CEO turnover to accounting and stock performance, respectively, conditional on levels of sub-indices. The inferences from Panel C are generally consistent with the results in Panel A. With the exception of *ISG6_ExecutiveIncentives*, we observe that forced turnover is sensitive to performance for firms with the highest levels of each of the sub-indices; however, the differences in sensitivities between firms with the strongest and weakest governance are not significantly different. *ISG6_ExecutiveIncentives* does not follow this pattern; firms with weaker levels of pay-performance sensitivity are more sensitive to forced turnover. Many of the sub-indices follow a consistent pattern when we measure performance using stock returns: forced turnover is sensitive to stock performance for firms with the strongest levels of *ISG2_EqualVoting*, *ISG3_Responsiveness*, *ISG4_Leadership*, and *ISG6_ExecutiveIncentives*, but not significant for

the weakest levels of those sub-indices. This difference is significant only in the case of *ISG2_EqualVoting*, however.

Overall, we find mixed evidence on the association between implementation of the governance index components and the level of monitoring. We detect higher compensation, controlling for economic determinants of compensation levels, at firms with higher levels of the governance index. We detect differences in turnover-sensitivity across different levels of the index, consistent with stronger monitoring. Taken together, our results suggest that CEOs of firms with higher levels of governance index earn higher compensation than other CEOs, but that this association may be a premium provided in exchange for increased employment risk.

4.3. Merger and acquisition activity

We next examine the associations between the governance index and measures of merger and acquisition activity. While managers are responsible for identifying and undertaking mergers and acquisitions, boards provide oversight of the process, and are ultimately responsible for ensuring that transactions maximize shareholder value. Board members provide both strategic advice and monitoring of managerial behavior, as managers have incentives to engage in acquisitions to gain personal benefits at the expense of shareholders (e.g., Jensen 1986, Morck, Shleifer and Vishny 1990). Consistent with the notion that boards are effective monitors of merger and acquisition activity, prior literature finds that strong corporate governance is positively associated with returns to merger announcements (e.g., Richardson 2006, Masulis, Wang and Xie 2007; Harford, Mansi and Maxwell 2008).

We investigate the association between adherence to ISG principles and the cumulative abnormal returns around the merger announcement in order to assess whether the merger was value-creating or value-destroying for the acquiring firm. We use a two-step Heckman (1979)

procedure to address concerns about selection, as firms that did not engage in merger activity will not have merger announcement returns.[10] We estimate the probability of merger activity using the following equation:

$$\begin{aligned} MergerActivity_{it} &= \alpha + \beta_1 GovIndex_{it}(GovIndexEqualWeights_{it}) + \beta_2 Log(MVE)_{it} \\ &+ \beta_3 SalesGrowth_{it} + \beta_4 Log(BTM)_{it} + \beta_5 Leverage_t + \beta_6 ROA_{it} \\ &+ \beta_7 RET_{it} + \beta_8 CEOOwnership_{it} + IndustryEffects + YearEffects \\ &+ \varepsilon_{it} \end{aligned} \tag{4a}$$

The dependent variable, *MergerActivity*, is an indicator variable set to one if the firm announces a merger or acquisition in year t. We control for firm size using the logged market value of equity (*Log(MVE)*), and for the investment opportunity set using sales growth (*SalesGrowth*) and logged book-to-market (*Log(BTM)*). We control for leverage (*Leverage*) and prior performance (*ROA* and *RET*) to address the ability of firms to engage in acquisitions. Finally, we control for the CEO's ownership percentage (*CEOOwnership*), as higher CEO ownership has been shown to affect merger activity (e.g., Lewellen, Loderer and Rosenfeld 1985).

We estimate the relation between the governance index and merger announcement returns, the second stage of the procedure, we estimate the following regression:

$$\begin{aligned} AnnouncementReturn_{it} &= \alpha + \beta_1 GovIndex_{it}(GovIndexEqualWeights_{it}) + \beta_2 Log(MVE)_{it} \\ &+ \beta_3 SameIndustry_{it} + \beta_4 AllCash_{it} + \beta_5 Tender_t + \beta_6 PublicTarget_{it} \\ &+ \beta_7 Completed_{it} + \beta_8 Failed_{it} + IndustryEffects + YearEffects \\ &+ \varepsilon_{it} \end{aligned} \tag{4b}$$

The dependent variable, *AnnouncementReturn*, is the Fama-French market-adjusted return around the merger announcement. To allow for information leakage, we calculate returns

[10] This procedure jointly estimates the selection model and the model of interest; we present the selection model and model of interest separately for ease of exposition.

over two event windows, -1 to +1 trading days around the announcement and the longer window of -21 to +1 trading days around the announcement. A positive coefficient on *GovIndex (GovIndexEqualWeights)* suggests that firms with more of the ISG principles in place experience more positive reactions to merger announcements, consistent with better oversight of merger activity. We estimate the same variations of Equation 4b as in prior analyses; we replace *GovIndex* with the equal weighted governance index (*GovIndexEqualWeights)*, indicator variables *Strongest* and *Weakest*, and we split *GovIndex* into the six sub-indices to explore the role of each of the ISG principles.

We include several controls that prior literature shows to be associated with announcement returns. We include a measure of firm size using the market value of equity (*Log(MVE)*). We also control for numerous deal characteristics. We control for whether the target and acquirer are in the same industry (*SameIndustry*), as mergers within the same industry likely entail less information asymmetry between the acquirer and target. We control for merger financing using an indicator variable (*AllCash*) set to one if the merger was paid for in cash, and zero otherwise. To control for the negotiating power of the target firm, we include whether the merger was a tender offer or a negotiated merger (*Tender*) and whether the target firm was public or private (*PublicTarget*). Finally we control for whether the merger is complete, has failed, or is ongoing using the indicator variables *Complete* and *Failed*. We present distributions of regression variables in Table 2, and we define all variables in Appendix B.

Table 6 displays the results from estimating the effect of *GovIndex* on merger announcement returns. Panel A presents the results when we measure adherence to ISG principles using our primary measure of adherence to ISG principles, *GovIndex.* We do not detect associations between announcement returns measured over either window and *GovIndex*.

Columns 3 through 8 present specifications in which we differentiate between the firms with the highest and lowest levels of the governance index. We do not find that the highest levels of governance are associated with announcement; the coefficient on *Strongest* is not significant in any specification. The coefficient of *Weakest* is significantly negative columns 6 and 8, suggesting that firms with the lowest levels of the governance index engaging in more value-destroying acquisition than firms with stronger governance. Panel B presents the results when we measure governance using *GovIndexEqualWeights*. We detect a significantly positive association between *GovIndexEqualWeights* and the 22-day return window ($\beta_1>0$, $p<.10$). It is not clear from this analysis whether this result is driven by firms with weak or strong governance; none of the associations between *StrongestEqualWeights* or *WeakestEqualWeights* and announcement returns is significantly different from zero. Nonetheless, the results of this estimation are consistent with those presented in Panel A; they suggest that firms with stronger governance engage in more stringent monitoring.

We next investigate the relation between each of the sub-indices and merger announcement returns to assess whether the results in Panels A and B vary across the sub-indices. We find a positive association between *ISG3_Responsiveness* and longer-window returns; the coefficient is positive and significant at the 1% level in column 6. We do not detect associations between any other sub-index and announcement returns. In sum, our evidence suggests that firms with higher levels of governance engage in more value-enhancing mergers, and a significant factor in this association is the board's responsiveness to shareholder preferences. Our inferences are consistent when we estimate Equation 4b with all sub-indices in a single model, but, for parsimony, we do not report these results.

4.4. Stock price crash risk

We next examine associations between adherence to the governance index and measures of stock price crash risk. Prior literature proposes that stock price crashes occur when managers withhold negative firm-specific information from shareholders. The bad news accumulates until the cost of hiding the bad news exceeds then benefit, at which point it suddenly becomes available to shareholders, causing a stock price crash (e.g., Jin and Myers 2006; Hutton, Marcus and Tehranian 2009). Efficient corporate governance should lead to lower incidence of managerial misbehavior, resulting in fewer incidents that result in extreme bad news events (e.g., Harford et al. 2018). Strong governance may also result managers being less likely to engage in myopic behaviors, such as hoarding bad news (e.g., Kim, Li and Xhang 2011a).

We expect that greater adherence to the governance index will result in a lower probability of stock price crashes. To examine this conjecture, we estimate the following regression with standard errors clustered by firm and year:

$$\begin{aligned} CrashRisk_{it} = \alpha + \beta_1 GovIndex_{it}(GovIndexEqualWeights_{it}) + \beta_2 DTurnover_{it-1} \\ + \beta_3 NegSkew_{it-1} + \beta_4 Sigma_{it-1} + \beta_5 RET_{it-1} + \beta_6 Log(Sales)_{it-1} \\ + \beta_7 BTM_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 ROA_{it-1} + IndustryEffects \\ + YearEffects + \varepsilon_{it} \end{aligned} \quad (5)$$

We utilize three measures of stock price crash risk (*CrashRisk*) in accordance with recent literature (e.g., Hutton, Marcus and Tehranian 2009; Kim, Li and Zhang 2011a; Kim, Li and Zhang 2011b). We construct these measures based on firm-specific weekly returns for each firm and year. We estimate the firm-specific weekly return (R_{it}) using the following market-model regression, where r_{iT} is the return on stock i in week T, and r_{mT} is the weekly return on the CRSP value-weighted index in week T.

$$r_{i,T} = \alpha_j + \beta_{1i} r_{mT-2} + \beta_{2i} r_{mT-1} + \beta_{3i} r_{mT} + \beta_{4i} r_{mT+1} + \beta_{5i} r_{mT+2} + \varepsilon_{iT} \quad (6)$$

The firm-specific weekly return (R_{iT}) is calculated as:

$$R_{iT} = ln(1 + \varepsilon_{iT}) \quad (6)$$

Our first measure of crash risk is the firm-specific probability that a firm experiences a stock price crash in any week in a fiscal year. We construct this measure following Hutton, Marcus and Tehranian (2009), Kim, Li and Zhang (2011a), and Kim, Li and Zhang (2011b). We designate a weekly crash as any week during which the stock price was 3.2 standard deviations or more below the annual mean of the firm-specific weekly return. If returns were normally distributed, this would result in stock price crashes in 0.1% of weeks. We set our indicator variable (*Crash*) equal to one if the firm experienced one or more weekly stock price crashes during the fiscal year.

Our second measure of crash risk is the negative conditional return skewness of firm-specific weekly returns (*NegSkew*), based on Chen, Hong and Stein (2001) and Kim, Li and Zhang (2011a), and Kim, Li and Zhang (2011b). We calculate *NegSkew* for each firm-year as the negative third moment of firm-specific weekly returns divided by the standard deviation of weekly returns to the third power. We use the negative value so that *NegSkew* is higher when the distribution of returns is more negatively skewed. That is, for each firm *i* in year *t* with *n* observations of weekly returns during the fiscal year:

$$NegSkew_{it} = -\left\{n * (n-1)^{\frac{3}{2}} \sum R_{iT}^{3}\right\} \Big/ \left\{(n-1)(n-2)\left(\sum R_{iT}^{2}\right)^{3/2}\right\} \quad (7)$$

Our third measure of crash risk is also based on Chen, Hong and Stein (2001) and Kim, Li and Zhang (2011a), and Kim, Li and Zhang (2011b). This measure captures the asymmetric volatility of down (below-mean) and up (above-mean) firm-specific weekly returns. We measure the down-to-up volatility as the log of the ratio of the standard deviation of the down week returns to up week returns (*DUVolatility*). For each firm-year, we separately calculate the

standard deviation of weeks during which firm-specific weekly returns were below (above) the annual mean of firm specific returns. We then calculate *DUVolatility* as the log of the ratio of the standard deviation of down weeks to up weeks. *DUVolatility* is thus larger when the volatility of negative firm-specific returns is greater than the volatility of positive firm-specific returns. That is, for each firm *i* in year *t* with n_d observations of down weeks and n_u observations of up weeks during the fiscal year:

$$DUVolatility_{it} = ln\left\{(n_d - 1)\sum_{Down} R_{iT}^2 \Big/ (n_u - 1)\sum_{Up} R_{iT}^2\right\} \quad (8)$$

If firms with higher values of the governance index are better able to prevent CEOs from hoarding bad news, leading to stock price crashes, the association between the governance index and our three measures of *CrashRisk* (*Crash*, *NegSkew*, *DUVolatility*) will be negative; i.e., $\beta_1 < 0$. We estimate the same variations of Equation 5 as in prior analyses; we replace *GovIndex* with *GovIndexEqualWeights*, indicator variables *Strongest* and *Weakest*, and we split *GovIndex* into the six sub-indices to explore the role of each of the ISG principles.

We use the same control variables as Kim, Li and Zhang (2011a), which are consistent with Chen, Hong and Stein (2001) and Hutton, Marcus and Tehranian (2009). We include the change in stock turnover (*DTurnover*) as prior literature finds that firms with greater stock turnover are more prone to crashes. We include the lagged value of *NegSkew* to capture persistence in the third moment of returns. *Sigma* is the standard deviation of prior-year stock returns, as prior literature finds that more volatile stocks are more likely to experience crashes. *RET* is the annual buy-and-hold return for the period t, as firms with higher prior period returns are more likely to experience crashes. We also control for firm size using the log of sales (*Log(Sales)*), the market-to-book ratio (*MTB*), leverage (*Leverage*) and operating performance

(*ROA*) to control for other firm characteristics that could affect stock price crash risk. We lag all control variables, consistent with prior literature. We present distributions of regression variables in Table 2, and Appendix B provides detailed descriptions of all variables.

We present the results of estimating Equation 5 in Table 7. We do not find significant associations between *GovIndex* or *GovIndexEqualWeighted* and any measure of crash risk in either Panel A or Panel B of Table 7. These results provide no evidence that firms with higher values of GovIndex constrain stock price crash risk.

In Panel C we present results of estimating Equation 5 with each of the sub-indices in place of *GovIndex*. The association between *ISG1_BoardAccountability* and crash risk, when measured as *Crash*, is negative (see column 1 in Panel C1), and the associations between *ISG3_Responsiveness* and crash risk, when measured as *NegSkew* or *DUVolatility*, are also negative (see column1 in Panels C2 and C3). These results are consistent when we include all sub-indices in a single specification, which we present in column 7 of each panel. While not conclusive, these associations suggest that certain board characteristics (i.e., accountability and responsiveness) are associated with less stock price crash risk, whereas other characteristics do not affect stock price crash risk.

5. Additional Analyses

5.1. Alternative measure of board diversity

Many of the elements of the ISG framework are abstract, and there is more than one way to measure the construct of interest. We confirm that our results are similar when we measure two of the components in slightly different fashions. First, much of the discussion around board diversity relates to whether boards include women, minorities, and younger people (e.g., Lublin 2017; Krouse 2018). As such, we construct an alternative measure of diversity that focuses on

these three characteristics, whereas our primary measure captures a wide range of characteristics (see Appendix A). We replace the *High Diversity* component with an indicator variable set to one if the board has an above-median percentage of minority, female, and young (less than 50 years old) board members. We construct the *ISG5_BoardComposition* sub-index using this alternative measure of diversity and revisit the results of our analyses. Our results do not differ when we use this alternative measure of *High Diversity*.

5.2. Incremental information content over the Entrenchment index

Numerous studies use the Entrenchment index from Bebchuk, Cohen and Ferrell (2009) to measure the strength of shareholder rights within a firm. In this section we explore whether *GovIndex* has incremental explanatory power over this widely used measure. The Entrenchment index is a subset of the G-Index (Gompers, Ishii and Metrick 2003) that includes six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachute arrangements, and supermajority approval requirements for mergers and charter amendments. The ISG Framework does not explicitly address entrenchment, but several components of the Entrenchment index overlap with our index[11].

To test whether the governance index is incrementally informative over the Entrenchment index, we re-estimate our equations including the Entrenchment index in addition to *GovIndex* and its variations. Our results are qualitatively and quantitatively similar when we include the

[11] The *ISG1_BoardAccountability* sub-index overlaps with, but differs from, the Entrenchment Index from Bebchuk, Cohen and Ferrell 2009. The Entrenchment Index summarizes the presence of 6 provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. The *ISG1_BoardAccountability* sub-index includes indicator variables for the presence of non-staggered boards (*Non Classified Board*), resignation requirements (*Resign Required*), proxy access (*Proxy Access*), high disclosure of corporate governance (*Large Proxy Statement*), and low levels of anti-takeover defenses (*Low Anti-takeover*).To calculate the number of takeover defenses we assign one point for the presence of blank check preferred stock, limited ability to call a special meeting, limited ability to act by written consent, fair price provision, poison pill provision and supermajority (2/3 or greater) provision and deduct one point for confidential voting and cumulative voting. See Figure 1. We provide additional details on our measure in Appendix A.

Entrenchment index in our specifications, suggesting that *GovIndex* captures information not included in the Entrenchment index.

6. Conclusion

In this study we examine how a novel measure of minimum-fits-all governance practices is associated with firm value and monitoring outcomes. Our measure of minimize-fits-all practices is based on the corporate governance framework developed for U.S. listed companies by a group of institutional investors and asset managers, the Investor Stewardship Group (ISG).

We conduct our analyses for a sample of S&P 1500 firms over the 2003 – 2015 period. We document that firms with higher levels of the governance index have higher values of Tobin's Q. This lends some support to the joint hypothesis that (*i*) minimum-fits-all governance standards are beneficial, and (*ii*) the ISG Corporate Governance Principles capture good governance. However, results for the relation between governance index and numerous measures firm performance, including return on assets, sales growth and returns, are mixed. We also find that CEOs of firms with higher levels of governance index earn *higher* compensation than other CEOs. This association may be a premium provided in exchange for increased employment security risk as we find evidence of stronger sensitivity of turnover to performance for CEOs of firms with higher levels of the governance index. We further show that firms with higher levels of the governance index engage in more value-enhancing acquisitions, suggesting that these firms have more effective oversight of merger and acquisition activity. Finally, we find some evidence that certain aspects of the governance index are associated with reduced stock price crash risk. In sum, we find evidence that firms with a greater number of the ISG principles in place have higher firm value, and that this additional value is generated through effective board oversight.

Our study contributes to the literature on the relation between corporate governance and firm value. Our approach is unique in that our focus is the *stated* governance preferences of a large group of institutional shareholders, and an assessment of the value of "minimum-fits-all" governance expectations. Our study is also related to the literature on the impact of institutional investors on corporate governance.

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Figure 1: Comparison of ISG1 and the Entrenchment Index Components

Component	Shareholder Rights (ISG1)	Entrenchment Index
Non classified board	X	X
Resign required	X	
Proxy access	X	
Large proxy statement	X	
Low anti-takeover		
Blank check preferred stock	X	
Limit special meeting	X	
Limit written consent	X	
Fair price provision	X	
Poison pill provision	X	X
Supermajority	X	Mergers and charter amendment requirements measured separately
Advance notice	X	
Antigreenmail	X	
Confidential voting	X	
Cumulative voting	X	
Limit bylaws		X
Golden parachutes		X

Table 1: Governance index and components
Panel A: Distributions of Governance index and components

	Minimum	Median	Mean	Maximum
GovIndex	5	12	11.602	17
GovIndexEqualWeights	1.071	4.171	4.155	5.800
ISG1_BoardAccountability	0	2	1.774	5
Non Classified Board	0	1	0.516	1
Resign Required	0	0	0.423	1
Proxy Access	0	0	0.004	1
Large Proxy Statement	0	1	0.593	1
Low Anti-takeover	0	0	0.239	1
ISG2_EqualVoting	0	1	0.931	1
Equal Voting	0	1	0.931	1
ISG3_Responsiveness	0	2	1.894	2
Shareholder Proposal Response	0	1	0.974	1
Management Proposal Response	0	1	0.920	1
ISG4_Leadership	0	1	1.383	2
Independent Leadership	0	1	0.576	1
Role Discussion	0	1	0.808	1
ISG5_BoardComposition	1	5	5.121	7
High Board Experience	0	0	0.412	1
High Diversity	0	0	0.439	1
Majority Independent	0	1	0.976	1
Independent Committees	0	1	0.874	1
Low Busy Directors	0	1	0.510	1
High Attendance	0	1	0.937	1
No Long Tenure	0	1	0.973	1
ISG6_ExecutiveIncentives	0	0	0.498	1
Strong Incentives	0	0	0.498	1

Panel B: Changes in mean of governance index over time			
	2003 through 2007	2008 through 2011	2012 through 2015
GovIndex	10.163	11.738	12.737
GovIndexEqualWeights	3.832	4.184	4.410
ISG1_BoardAccountability	0.868	1.861	2.489
Non Classified Board	0.394	0.499	0.638
Resign Required	0.032	0.485	0.708
Proxy Access	0.000	0.000	0.010
Large Proxy Statement	0.239	0.628	0.870
Low Anti-takeover	0.202	0.248	0.263
ISG2_EqualVoting	0.914	0.940	0.938
Equal Voting	0.914	0.940	0.938
ISG3_Responsiveness	1.900	1.881	1.900
Shareholder Proposal Response	0.970	0.971	0.979
Management Proposal Response	0.930	0.911	0.921
ISG4_Leadership	1.203	1.433	1.497
Independent Leadership	0.626	0.590	0.519
Role Discussion	0.577	0.843	0.978
ISG5_BoardComposition	4.766	5.142	5.411
High Board Experience	0.308	0.410	0.504
High Diversity	0.457	0.434	0.426
Majority Independent	0.942	0.990	0.993
Independent Committees	0.714	0.889	1.000
Low Busy Directors	0.461	0.501	0.562
High Attendance	0.908	0.942	0.959
No Long Tenure	0.976	0.975	0.968
ISG6_ExecutiveIncentives	0.512	0.481	0.502
Strong Incentives	0.512	0.481	0.502
Number of observations	4,022	4,077	4,610

Panel C: Correlations among sub-indices

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
(1) GovIndex	1.000						
(2) GovIndexEqualWeights	**0.803**	1.000					
	(0.000)						
(3) ISG1_BoardAccountability	**0.722**	**0.432**	1.000				
	(0.000)	**(0.000)**					
(4) ISG2_EqualVoting	**0.215**	**0.381**	**0.051**	1.000			
	(0.000)	**(0.000)**	**(0.000)**				
(5) ISG3_Responsiveness	**0.195**	**0.220**	**0.021**	**-0.023**	1.000		
	(0.000)	**(0.000)**	**(0.016)**	**(0.010)**			
(6) ISG4_ Leadership	**0.464**	**0.497**	**0.200**	**0.073**	0.007	1.000	
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	(0.421)		
(7) ISG5_BoardComposition	**0.604**	**0.282**	**0.106**	**0.084**	**0.051**	**0.058**	1.000
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	
(8) ISG6_ExecutiveIncentives	**0.243**	**0.655**	-0.008	**-0.021**	0.004	-0.007	-0.005
	(0.000)	**(0.000)**	(0.382)	**(0.019)**	(0.620)	(0.412)	(0.589)

Notes: Panel A presents the distributions of *GovIndex*, *GovIndexEqualWeights*, the five sub-indices, and the underlying components. Panel B presents the means of *GovIndex*, the five sub-indices, and the underlying components for three time periods: 2003 through 2007, 2008 through 2011, and 2012 through 2015. Panel C presents correlations among *GovIndex* or *GovIndexEqualWeights* and the five sub-indices. In Panel C, p-values are reported in parentheses, and correlations that are significant at the 10% level or less are presented in bold. Components are defined in Appendix A, and sub-indices are calculated from components as discussed in Section 2. Variables are defined in Appendix B. The sample size for this table is 12,709 firm-years.

Table 2: Distributions of regression variables

	Mean	Median	Minimum	Maximum	SD	N
GovIndex	11.60	12.00	5.00	17.00	1.97	12,709
GovIndexEqualWeights	4.15	4.17	1.07	5.80	0.75	12,709
EntrenchmentIndex	3.26	3.00	0.00	6.00	1.21	12,709
Tobin'sQ	1.76	1.42	0.41	14.21	1.06	12,709
IndAdjustedQ	0.31	0.04	-2.09	12.93	0.96	12,709
%ResidualCompensation	0.04	0.10	-16.49	3.26	0.83	12,625
ForcedTurnover	0.02	0.00	0.00	1.00	0.14	12,685
$CAR_{[-1,+1]}$	0.00	0.00	-0.39	0.52	0.05	6,637
$CAR_{[21,+1]}$	0.00	0.00	-0.54	1.35	0.09	6,637
Crash	0.22	0.00	0.00	1.00	0.41	12,698
NegSkew	0.11	0.07	-6.13	5.94	0.88	12,698
DUVolatility	0.01	0.01	-2.35	1.82	0.37	12,698
TotalAssets	25,162.38	3,791.70	62.74	2,415,689.00	124,502.36	12,709
CapEx	0.04	0.03	0.00	0.70	0.05	12,709
MissCapEx	0.01	0.00	0.00	1.00	0.07	12,709
Leverage	0.22	0.20	0.00	2.93	0.18	12,657
R&D	0.02	0.00	0.00	0.68	0.05	12,709
MissR&D	0.47	0.00	0.00	1.00	0.50	12,709
PP&E	0.24	0.15	0.00	0.97	0.24	12,709
MissPP&E	0.04	0.00	0.00	1.00	0.20	12,709
SP500	0.40	0.00	0.00	1.00	0.49	12,709
FirstYear	0.06	0.00	0.00	1.00	0.23	12,709
TerminalYear	0.11	0.00	0.00	1.00	0.31	12,709
RET	0.14	0.12	-0.97	5.75	0.40	12,709
ROA	0.05	0.04	-1.15	0.75	0.08	12,709
IndAdjROA	0.02	0.01	-1.06	1.01	0.10	12,709
SDROA	0.03	0.01	0.00	2.87	0.05	12,709
SDRET	0.31	0.25	0.02	6.84	0.24	12,709
RetirementAge	0.09	0.00	0.00	1.00	0.29	12,542
HighEquityOwnership	0.05	0.00	0.00	1.00	0.23	12,709
MVE	12,004.85	2,997.46	16.48	629,010.25	31,336.19	12,709
SameIndustry	0.63	1.00	0.00	1.00	0.48	6,637
AllCash	0.53	1.00	0.00	1.00	0.50	6,637
Tender	0.04	0.00	0.00	1.00	0.20	6,637
PublicTarget	0.34	0.00	0.00	1.00	0.47	6,637
Complete	0.81	1.00	0.00	1.00	0.39	6,637
Withdrawn	0.04	0.00	0.00	1.00	0.20	6,637

Notes: This table presents distributions of variables used in regression analyses. Variables are defined in Appendix B. The sample size for this table is 12,709 firm-years.

Table 3: Tests of the association between Tobin's Q and governance index
Panel A: *GovIndex*
Dependent variable: *IndAdjustedQ*

	(1)	(2)	(3)	(4)
GovIndex	0.014*			
	(1.77)			
Strongest		0.061*		0.060*
		(1.77)		(1.74)
Weakest			-0.040	-0.037
			(-1.58)	(-1.47)
Log(Assets)	-0.232***	-0.231***	-0.230***	-0.231***
	(-9.41)	(-9.28)	(-9.38)	(-9.32)
CapEx	5.177***	5.179***	5.192***	5.174***
	(9.06)	(9.05)	(9.11)	(9.07)
MissCapEx	-0.102*	-0.103**	-0.102*	-0.101*
	(-1.94)	(-1.98)	(-1.89)	(-1.92)
Leverage	-0.284	-0.283	-0.284	-0.283
	(-1.19)	(-1.18)	(-1.19)	(-1.18)
R&D	4.225***	4.236***	4.244***	4.228***
	(5.53)	(5.54)	(5.57)	(5.53)
MissR&D	0.001	0.000	-0.001	0.001
	(0.03)	(0.00)	(-0.02)	(0.01)
PPE	-1.005***	-1.006***	-1.002***	-1.005***
	(-5.71)	(-5.70)	(-5.70)	(-5.70)
MissPP&E	-0.123	-0.123	-0.126	-0.124
	(-1.27)	(-1.28)	(-1.31)	(-1.29)
SP500	0.721***	0.721***	0.723***	0.720***
	(10.17)	(10.23)	(10.17)	(10.20)
Constant	2.418***	2.531***	2.563***	2.560***
	(11.79)	(11.86)	(12.10)	(12.10)
Observations	12,657	12,657	12,657	12,657
Adjusted R^2	19.4%	19.4%	19.4%	19.5%

Panel B: *GovIndexEqualWeights* Dependent variable: *IndAdjustedQ*				
	(1)	(2)	(3)	(4)
GovIndexEqualWeights	0.038**			
	(2.54)			
Strongest		0.073**		0.070**
		(2.06)		(1.98)
Weakest			-0.053*	-0.049
			(-1.71)	(-1.58)
Log(Assets)	-0.232***	-0.231***	-0.230***	-0.232***
	(-9.35)	(-9.31)	(-9.40)	(-9.36)
CapEx	5.170***	5.187***	5.190***	5.181***
	(9.08)	(9.09)	(9.11)	(9.10)
MissCapEx	-0.100**	-0.102**	-0.100**	-0.099**
	(-1.98)	(-1.97)	(-1.96)	(-1.97)
Leverage	-0.284	-0.281	-0.286	-0.283
	(-1.19)	(-1.17)	(-1.19)	(-1.18)
R&D	4.246***	4.254***	4.243***	4.244***
	(5.57)	(5.58)	(5.56)	(5.56)
MissR&D	0.001	0.000	-0.000	0.001
	(0.01)	(0.00)	(-0.01)	(0.02)
PPE	-1.002***	-1.004***	-1.002***	-1.003***
	(-5.69)	(-5.69)	(-5.69)	(-5.69)
MissPP&E	-0.122	-0.125	-0.126	-0.125
	(-1.28)	(-1.31)	(-1.30)	(-1.30)
SP500	0.721***	0.722***	0.723***	0.721***
	(10.21)	(10.23)	(10.19)	(10.21)
Constant	2.413***	2.536***	2.559***	2.562***
	(12.78)	(11.74)	(12.21)	(12.08)
Observations	12,657	12,657	12,657	12,657
Adjusted R^2	19.5%	19.4%	19.4%	19.5%

Panel C: Sub-indices Dependent variable: *IndAdjustedQ*	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ISG1_BoardAccountability	0.016						0.015
	(0.97)						(0.88)
ISG2_EqualVoting		-0.019					-0.020
		(-0.26)					(-0.26)
ISG3_Responsiveness			0.078**				0.076**
			(2.46)				(2.43)
ISG4_Leadership				0.032			0.032
				(1.33)			(1.30)
ISG5_BoardComposition					-0.006		-0.007
					(-0.36)		(-0.46)
ISG6_ExecutiveIncentives						0.033*	0.033**
						(1.90)	(1.96)
Observations	12,657	12,657	12,657	12,657	12,657	12,657	12,657
Adjusted R^2	19.4%	19.4%	19.5%	19.4%	19.4%	19.4%	19.5%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: We include indicators for Fama and French (1997) 48 industries and years. We cluster standard errors by firm and year. Components are defined in Appendix A, and sub-indices are calculated from components as discussed in Section 2. Variables are defined in Appendix B. t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. We include all control variables from Panels A and B in Panel C, but suppress them for parsimony.

Table 4: Tests of the association between residual compensation and governance index
Panel A: *GovIndex*
Dependent variable: *%ResidualCompensation*

	(1)	(2)	(3)	(4)
GovIndex	0.008			
	(1.48)			
Strongest		0.037*		0.036*
		(1.71)		(1.66)
Weakest			-0.012	-0.005
			(-0.52)	(-0.22)
FirstYear	-0.083	-0.083*	-0.083	-0.083*
	(-1.64)	(-1.65)	(-1.64)	(-1.65)
TerminalYear	-0.073***	-0.073***	-0.073***	-0.073***
	(-3.00)	(-3.02)	(-3.03)	(-3.02)
Constant	-0.036	0.049***	0.057***	0.050***
	(-0.56)	(2.99)	(3.56)	(2.85)
Observations	12,625	12,625	12,625	12,625
Adjusted R^2	0.1%	0.1%	0.1%	0.1%

Panel B: *GovIndexEqualWeights* Dependent variable: *%ResidualCompensation*				
	(1)	(2)	(3)	(4)
GovIndexEqualWeights	0.018			
	(1.40)			
StrongestEqualWeights		0.011		0.008
		(0.41)		(0.28)
WeakestEqualWeights			-0.030	-0.029
			(-1.10)	(-1.09)
FirstYear	-0.083	-0.083	-0.083	-0.083
	(-1.64)	(-1.64)	(-1.63)	(-1.63)
TerminalYear	-0.073***	-0.074***	-0.073***	-0.073***
	(-3.01)	(-3.04)	(-3.02)	(-3.02)
Constant	-0.018	0.054***	0.059***	0.058***
	(-0.32)	(3.42)	(3.86)	(3.65)
Observations	12,625	12,625	12,625	12,625
Adjusted R^2	0.1%	0.1%	0.1%	0.1%

Panel C: Sub-indices Dependent variable: *%ResidualCompensation*	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ISG1_BoardAccountability	0.019*						0.019**
	(1.69)						(2.25)
ISG2_EqualVoting		0.106					0.099***
		(1.44)					(4.03)
ISG3_Responsiveness			-0.117**				-0.117***
			(-2.56)				(-3.02)
ISG4_Leadership				-0.000			-0.011
				(-0.02)			(-0.75)
ISG5_BoardComposition					0.006		0.004
					(0.45)		(0.63)
ISG6_ExecutiveIncentives						0.011	0.012
						(1.10)	(1.62)
Observations	12,625	12,625	12,625	12,625	12,625	12,625	12,625
Adjusted R^2	0.2%	0.2%	0.3%	0.1%	0.1%	0.1%	0.4%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: We cluster standard errors by firm and year. Components are defined in Appendix A, and sub-indices are calculated from components as discussed in Section 2. Variables are defined in Appendix B. t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. We include all control variables from Panels A and B in Panel C, but suppress them for parsimony.

Table 5: Tests of the association between turnover and governance index
Panel A: *GovIndex*
Dependent variable: *Turnover*

	(1)		(2)
ROAStrongest	-5.539***	*RetStrongest*	-1.212**
	(-3.02)		(-2.24)
ROAMiddle	-2.840**	*RetMiddle*	-1.114***
	(-2.18)		(-3.49)
ROAWeakest	0.134	*RetWeakest*	-0.366
	(0.03)		(-0.41)
Strongest	0.200	*Strongest*	0.127
	(0.85)		(0.54)
Weakest	-0.529	*Weakest*	-0.441
	(-1.17)		(-1.10)
SDROA	1.821	*SDROA*	2.875*
	(0.98)		(1.67)
SDRet	-0.101	*SDRet*	0.106
	(-0.26)		(0.29)
RetirementAge	-1.659***	*RetirementAge*	-1.617***
	(-2.82)		(-2.75)
HighEquityOwnership	-3.160***	*HighEquityOwnership*	-3.205***
	(-3.08)		(-3.09)
Observations	10,345	Observations	10345
Pseudo R^2	12.4%	Pseudo R^2	12.7%
Tests of strongest vs. weakest coefficients		Tests of strongest vs. weakest coefficients	
χ^2	1.47		0.66
p value	0.226		0.417

Panel B: *GovIndexEqualWeights*
Dependent variable: *Turnover*

	(1)		(2)
ROAStrongestEqualWeights	-6.272***	*RetStrongestEqualWeights*	-2.213**
	(-2.68)		(-2.44)
ROAMiddleEqualWeights	-5.423***	*RetMiddleEqualWeights*	-1.866***
	(-6.63)		(-5.52)
ROAWeakestEqualWeights	-5.447**	*RetWeakestEqualWeights*	0.355
	(-2.31)		(0.64)
StrongestEqualWeights	0.0846	*StrongestEqualWeights*	0.180
	(0.38)		(0.80)
WeakestEqualWeights	-0.393	*WeakestEqualWeights*	-0.408
	(-1.00)		(-1.02)
SDROA	1.507	*SDROA*	1.921
	(0.86)		(1.21)
SDRet	-0.294	*SDRet*	-0.0920
	(-0.71)		(-0.25)
RetirementAge	-1.621***	*RetirementAge*	-1.613***
	(-2.75)		(-2.74)
HighEquityOwnership	-3.359***	*HighEquityOwnership*	-3.358***
	(-3.21)		(-3.16)
Observations	10,353	Observations	10,353
Pseudo R^2	13.8%	Pseudo R^2	13.8%
Tests of strongest vs. weakest coefficients		Tests of strongest vs. weakest coefficients	
χ^2	0.06		5.93
p value	0.802		0.015

Panel C: Associations between turnover and sub-indices where firm performance is measured as ROA

Dependent variable: *Turnover*

	(1)	(2)	(3)	(4)	(5)	(6)
*ROA*ISG1_h*	-3.989*					
	(-1.76)					
*ROA*ISG1_m*	-3.313***					
	(-2.68)					
*ROA*ISG1_l*	-0.333					
	(-0.08)					
ISG1_h	1.077**					
	(2.22)					
ISG1_m	0.222					
	(0.54)					
*ROA*ISG2_h*		-3.399***				
		(-3.00)				
*ROA*ISG2_l*		3.581				
		(0.51)				
ISG2_h		0.758				
		(1.21)				
*ROA*ISG3_h*			-3.053***			
			(-2.58)			
*ROA*ISG3_l*			-2.075			
			(-0.63)			
ISG3_h			-0.223			
			(-0.86)			
*ROA*ISG4_h*				-3.904**		
				(-2.48)		
*ROA*ISG4_m*				-2.566*		
				(-1.75)		
*ROA*ISG4_l*				-5.409		
				(-1.05)		
ISG4_h				1.544**		
				(2.11)		
ISG4_m				1.136		
				(1.55)		
*ROA*ISG5_h*					-4.249*	
					(-1.95)	
*ROA*ISG5_m*					-3.567***	
					(-2.77)	
*ROA*ISG5_l*					-0.234	
					(-0.09)	
ISG5_h					-0.040	
					(-0.11)	
ISG5_m					-0.144	
					(-0.56)	
*ROA*ISG6_h*						-2.444
						(-1.47)
*ROA*ISG6_l*						-3.744***
						(-2.72)
ISG6_h						-0.026
						(-0.13)
Observations	10,353	10,353	10,353	10,353	10,353	10,353
Pseudo R^2	12.6%	12.3%	12.2%	12.7%	12.3%	12.2%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes
Tests of strongest vs. weakest coefficients						
χ^2	0.67	0.98	0.08	0.08	1.44	0.40
p value	0.412	0.323	0.779	0.776	0.230	0.525

Panel D: Associations between turnover and sub-indices where firm performance is measured as annual return
Dependent variable: *Turnover*

	(1)	(2)	(3)	(4)	(5)	(6)
*Ret*ISG1_h*	-0.096					
	(-0.15)					
*Ret*ISG1_m*	-1.265***					
	(-4.06)					
*Ret*ISG1_l*	-0.687					
	(-0.84)					
ISG1_h	0.807*					
	(1.85)					
ISG1_m	0.143					
	(0.43)					
*Ret*ISG2_h*		-1.250***				
		(-4.25)				
*Ret*ISG2_l*		0.284				
		(0.55)				
ISG2_h		0.673				
		(1.31)				
*Ret*ISG3_h*			-1.056***			
			(-3.60)			
*Ret*ISG3_l*			-0.693			
			(-0.95)			
ISG3_h			-0.187			
			(-0.77)			
*Ret*ISG4_h*				-1.709***		
				(-4.30)		
*Ret*ISG4_m*				-0.444		
				(-1.32)		
*Ret*ISG4_l*				-3.117		
				(-1.51)		
ISG4_h				1.759**		
				(2.07)		
ISG4_m				1.312		
				(1.54)		
*Ret*ISG5_h*					-0.478	
					(-0.78)	
*Ret*ISG5_m*					-1.157***	
					(-3.56)	
*Ret*ISG5_l*					-1.230**	
					(-2.13)	
ISG5_h					-0.298	
					(-0.81)	
ISG5_m					-0.293	
					(-1.33)	
*Ret*ISG6_h*						-1.171***
						(-3.37)
*Ret*ISG6_l*						-0.945**
						(-2.38)
ISG6_h						0.061
						(0.34)
Observations	10,345	10,345	10,345	10,345	10,345	10,345
Pseudo R^2	13.2%	12.9%	12.6%	13.5%	12.8%	12.6%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes
Tests of strongest vs. weakest coefficients						
χ^2	0.33	6.82	0.23	0.45	0.81	0.21
p value	0.564	0.009	0.635	0.500	0.367	0.646

Table 5, continued:
Notes: We include indicators for Fama and French (1997) 48 industries and years. We cluster standard errors by firm and year. Components are defined in Appendix A, and sub-indices are calculated from components as discussed in Section 2. Variables are defined in Appendix B. t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. We include all control variables from Panels A and B in Panels C and D.

Table 6: Tests of the association between merger announcement returns and governance index
Panel A: *GovIndex*
Dependent variable: *AnnouncementReturn*

	$CAR_{[-1,+1]}$ (1)	$CAR_{[-21,+1]}$ (2)	$CAR_{[-1,+1]}$ (3)	$CAR_{[-21,+1]}$ (4)	$CAR_{[-1,+1]}$ (5)	$CAR_{[-21,+1]}$ (6)	$CAR_{[-1,+1]}$ (7)	$CAR_{[-21,+1]}$ (8)
GovIndex	-0.000	0.001						
	(-0.32)	(1.64)						
Strongest			-0.000	0.004			-0.001	0.003
			(-0.28)	(1.13)			(-0.35)	(1.01)
Weakest					-0.003	-0.008**	-0.003	-0.008**
					(-1.49)	(-2.21)	(-1.50)	(-2.16)
Log(MVE)	-0.001**	-0.003**	-0.001**	-0.003*	-0.002**	-0.003**	-0.001**	-0.003**
	(-1.96)	(-1.98)	(-2.02)	(-1.88)	(-2.14)	(-1.98)	(-2.12)	(-2.03)
SameIndustry	0.005***	0.004	0.005***	0.003	0.005***	0.004	0.006***	0.004
	(4.01)	(1.35)	(4.01)	(1.32)	(4.01)	(1.38)	(4.02)	(1.33)
AllCash	0.005***	0.006**	0.005***	0.006**	0.005***	0.006**	0.005***	0.006**
	(3.94)	(2.37)	(3.93)	(2.38)	(3.91)	(2.37)	(3.92)	(2.36)
Tender	0.003	-0.005	0.003	-0.005	0.003	-0.005	0.003	-0.005
	(0.80)	(-0.75)	(0.81)	(-0.76)	(0.81)	(-0.78)	(0.81)	(-0.76)
PublicTarget	-0.007***	-0.009***	-0.007***	-0.009***	-0.007***	-0.009***	-0.007***	-0.008***
	(-4.29)	(-2.85)	(-4.29)	(-2.84)	(-4.29)	(-2.85)	(-4.29)	(-2.84)
Completed	-0.002	-0.001	-0.002	-0.000	-0.002	-0.001	-0.002	-0.001
	(-0.86)	(-0.14)	(-0.87)	(-0.11)	(-0.90)	(-0.17)	(-0.90)	(-0.16)
Failed	-0.003	-0.005	-0.003	-0.005	-0.003	-0.004	-0.003	-0.004
	(-1.05)	(-0.72)	(-1.05)	(-0.72)	(-1.03)	(-0.70)	(-1.03)	(-0.70)
Constant	0.013	0.009	0.012	0.018	0.014	0.026	0.014	0.025
	(0.84)	(0.29)	(0.80)	(0.64)	(0.95)	(0.89)	(0.96)	(0.86)
Selection model								
GovIndex	-0.007	-0.007						
	(-0.92)	(-0.92)						
Strongest			0.008	0.008			0.008	0.008
			(0.25)	(0.25)			(0.25)	(0.25)
Weakest					0.000	0.000	0.001	0.001
					(0.01)	(0.01)	(0.02)	(0.02)
LogMVE	0.237***	0.237***	0.235***	0.235***	0.235***	0.235***	0.235***	0.235***
	(28.01)	(28.01)	(28.02)	(28.02)	(28.17)	(28.17)	(27.97)	(27.97)
SalesGrowth	0.833***	0.833***	0.833***	0.833***	0.833***	0.833***	0.833***	0.833***
	(15.93)	(15.93)	(15.93)	(15.93)	(15.93)	(15.93)	(15.93)	(15.93)

Table 6, continued

LogBTM	0.127***	0.127***	0.127***	0.127***	0.127***	0.127***	0.127***	0.127***
	(6.32)	(6.32)	(6.32)	(6.32)	(6.32)	(6.32)	(6.32)	(6.32)
Leverage	0.437***	0.437***	0.437***	0.437***	0.437***	0.437***	0.437***	0.437***
	(5.48)	(5.48)	(5.48)	(5.48)	(5.48)	(5.48)	(5.48)	(5.48)
ROA	-0.621***	-0.621***	-0.619***	-0.619***	-0.619***	-0.619***	-0.619***	-0.619***
	(-3.77)	(-3.77)	(-3.75)	(-3.75)	(-3.75)	(-3.75)	(-3.75)	(-3.75)
RET	-0.097***	-0.097***	-0.097***	-0.097***	-0.097***	-0.097***	-0.097***	-0.097***
	(-2.85)	(-2.85)	(-2.84)	(-2.84)	(-2.84)	(-2.84)	(-2.84)	(-2.84)
CEOOwnership%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.07)	(0.07)	(0.17)	(0.17)	(0.15)	(0.15)	(0.17)	(0.17)
Constant	-1.528***	-1.528***	-1.583***	-1.583***	-1.583***	-1.583***	-1.584***	-1.584***
	(-4.88)	(-4.88)	(-5.14)	(-5.14)	(-5.12)	(-5.12)	(-5.13)	(-5.13)
Lambda	-0.006	-0.014	-0.006	-0.014	-0.006	-0.014	-0.006	-0.014
	(-1.22)	(-1.48)	(-1.25)	(-1.46)	(-1.28)	(-1.52)	(-1.28)	(-1.50)
Observations	14,628	14,628	14,628	14,628	14,628	14,628	14,628	14,628
R^2	2.9%	1.5%	2.8%	1.5%	2.9%	1.5%	2.9%	1.5%

Panel B: *GovIndexEqualWeights*
Dependent variable: *AnnouncementReturn*

	$CAR_{[-1,+1]}$ (1)	$CAR_{[-21,+1]}$ (2)	$CAR_{[-1,+1]}$ (3)	$CAR_{[-21,+1]}$ (4)	$CAR_{[-1,+1]}$ (5)	$CAR_{[-21,+1]}$ (6)	$CAR_{[-1,+1]}$ (7)	$CAR_{[-21,+1]}$ (8)
GovIndexEqualWeights	-0.001	0.003*						
	(-1.19)	(1.86)						
StrongestEqualWeights			-0.003	-0.001			-0.003	-0.001
			(-1.41)	(-0.31)			(-1.36)	(-0.34)
WeakestEqualWeights					0.001	-0.002	0.001	-0.002
					(0.68)	(-0.46)	(0.58)	(-0.48)
Log(MVE)	-0.001*	-0.003**	-0.001*	-0.002*	-0.001**	-0.002*	-0.001*	-0.002*
	(-1.91)	(-1.97)	(-1.91)	(-1.80)	(-1.99)	(-1.84)	(-1.87)	(-1.81)
SameIndustry	0.005***	0.004	0.006***	0.004	0.005***	0.004	0.006***	0.004
	(4.00)	(1.38)	(4.03)	(1.38)	(4.01)	(1.37)	(4.04)	(1.38)
AllCash	0.005***	0.006**	0.005***	0.006**	0.005***	0.006**	0.005***	0.006**
	(3.93)	(2.40)	(3.94)	(2.40)	(3.92)	(2.40)	(3.93)	(2.40)
Tender	0.002	-0.004	0.002	-0.005	0.003	-0.005	0.002	-0.005
	(0.79)	(-0.74)	(0.79)	(-0.78)	(0.80)	(-0.77)	(0.78)	(-0.77)
PublicTarget	-0.007***	-0.009***	-0.007***	-0.009***	-0.007***	-0.009***	-0.007***	-0.009***
	(-4.29)	(-2.85)	(-4.27)	(-2.84)	(-4.29)	(-2.85)	(-4.27)	(-2.84)
Completed	-0.002	-0.000	-0.002	-0.000	-0.002	-0.000	-0.002	-0.000
	(-0.86)	(-0.13)	(-0.87)	(-0.13)	(-0.86)	(-0.13)	(-0.87)	(-0.13)
Failed	-0.003	-0.004	-0.003	-0.005	-0.003	-0.005	-0.003	-0.005
	(-1.06)	(-0.71)	(-1.06)	(-0.72)	(-1.05)	(-0.72)	(-1.06)	(-0.72)
Constant	0.015	0.009	0.012	0.019	0.011	0.020	0.011	0.020
	(1.02)	(0.30)	(0.79)	(0.67)	(0.76)	(0.68)	(0.75)	(0.69)
Observations	14,628	14,628	14,628	14,628	14,628	14,628	14,628	14,628
R^2	2.9%	1.5%	2.9%	1.4%	2.9%	1.4%	2.9%	1.5%
Selection model included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Sub-indices
Dependent variable: *AnnouncementReturn*

	$CAR_{-1,+1}$ (1)	$CAR_{-21,+1}$ (2)	$CAR_{-1,+1}$ (3)	$CAR_{-21,+1}$ (4)	$CAR_{-1,+1}$ (5)	$CAR_{-21,+1}$ (6)	$CAR_{-1,+1}$ (7)	$CAR_{-21,+1}$ (8)	$CAR_{-1,+1}$ (9)	$CAR_{-21,+1}$ (10)	$CAR_{-1,+1}$ (11)	$CAR_{-21,+1}$ (12)
ISG1_BoardAccountability	-0.001	-0.001										
	(-0.73)	(-0.39)										
ISG2_EqualVoting			-0.002	-0.001								
			(-0.75)	(-0.31)								
ISG3_Responsiveness					0.002	0.013***						
					(0.84)	(3.38)						
ISG4_Leadership							-0.001	0.001				
							(-0.54)	(0.67)				
ISG5_BoardComposition									0.001	0.001		
									(1.10)	(1.03)		
ISG6_ExecutiveIncentives											-0.001	0.003
											(-1.23)	(1.20)
Observations	14,628	14,628	14,628	14,628	14,628	14,628	14,628	14,628	14,628	14,628	14,628	14,628
R^2	2.9%	1.5%	2.8%	1.4%	2.9%	1.6%	2.9%	1.5%	2.9%	1.5%	2.9%	1.5%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selection model included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: We use the Heckman (1979) estimation procedure to estimate the coefficients for this regression. We suppress the coefficients on dependent variables in the selection model for parsimony. Components are defined in Appendix A, and sub-indices are calculated from components as discussed in Section 2. Variables are defined in Appendix B. t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. We include all control and selection variables from Panels A and B in Panel C, but suppress them for parsimony.

Table 7: Tests of the association between stock price crash risk and governance index
Panel A: *GovIndex*

Dependent variable: *CrashRisk*

	Crash	*NegSkew*	*DUVolatility*	*Crash*	*NegSkew*	*DUVolatility*	*Crash*	*NegSkew*	*DUVolatility*	*Crash*	*NegSkew*	*DUVolatility*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GovIndex	-0.003	-0.005	-0.000									
	(-0.41)	(-0.61)	(-0.16)									
Strongest				-0.028	-0.025	-0.009				-0.029	-0.025	-0.009
				(-0.59)	(-1.42)	(-1.35)				(-0.59)	(-1.39)	(-1.35)
Weakest							-0.001	0.019	0.003	-0.003	0.017	0.003
							(-0.02)	(0.40)	(0.19)	(-0.05)	(0.37)	(0.15)
LagDTurnover	0.014	0.009	0.002	0.014	0.009	0.002	0.014	0.008	0.002	0.014	0.009	0.002
	(1.00)	(1.15)	(0.61)	(1.00)	(1.17)	(0.63)	(1.00)	(1.15)	(0.61)	(1.00)	(1.17)	(0.63)
LagNegSkew	0.040***	0.013	0.011**	0.040***	0.013	0.011**	0.040***	0.013	0.011**	0.040***	0.013	0.011**
	(2.64)	(1.27)	(2.08)	(2.66)	(1.28)	(2.09)	(2.63)	(1.27)	(2.08)	(2.66)	(1.28)	(2.10)
LagSigma	1.418	1.030	0.039	1.405	1.022	0.033	1.424	1.041	0.040	1.405	1.024	0.033
	(1.58)	(1.20)	(0.11)	(1.59)	(1.20)	(0.09)	(1.59)	(1.22)	(0.11)	(1.60)	(1.21)	(0.09)
LagRET	0.028	0.111***	0.043**	0.029	0.111***	0.043**	0.028	0.111***	0.043**	0.029	0.111***	0.043**
	(0.68)	(2.89)	(2.55)	(0.69)	(2.88)	(2.55)	(0.68)	(2.89)	(2.56)	(0.69)	(2.88)	(2.56)
LagLog(Sales)	-0.004	0.005	0.004	-0.003	0.005	0.005	-0.004	0.005	0.004	-0.003	0.005	0.005
	(-0.30)	(0.88)	(1.47)	(-0.28)	(0.87)	(1.49)	(-0.37)	(0.81)	(1.46)	(-0.29)	(0.91)	(1.51)
LagBTM	-0.132***	-0.089***	-0.040***	-0.132***	-0.089***	-0.040***	-0.131***	-0.089***	-0.040***	-0.132***	-0.089***	-0.040***
	(-3.09)	(-5.61)	(-4.88)	(-3.06)	(-5.59)	(-4.87)	(-3.08)	(-5.66)	(-4.89)	(-3.07)	(-5.59)	(-4.87)
LagLeverage	-0.002	0.059	0.048*	-0.003	0.058	0.048*	-0.002	0.059	0.048*	-0.003	0.058	0.048*
	(-0.02)	(0.91)	(1.92)	(-0.03)	(0.90)	(1.92)	(-0.03)	(0.91)	(1.91)	(-0.03)	(0.90)	(1.90)
LagROA	0.388***	0.373***	0.186***	0.389***	0.374***	0.187***	0.387***	0.372***	0.186***	0.389***	0.374***	0.187***
	(3.17)	(5.00)	(4.63)	(3.17)	(4.98)	(4.64)	(3.18)	(4.95)	(4.59)	(3.17)	(5.01)	(4.65)
Constant	-0.558**	0.094	0.006	-0.587***	0.055	0.002	-0.587***	0.040	-0.001	-0.585***	0.042	0.000
	(-2.30)	(0.65)	(0.09)	(-3.08)	(0.52)	(0.05)	(-4.34)	(0.49)	(-0.02)	(-4.24)	(0.52)	(0.00)
Observations	12,109	12,110	12,110	12,109	12,110	12,110	12,109	12,110	12,110	12,109	12,110	12,110
Pseudo R^2	2.6%			2.6%			2.6%			2.6%		
Adjusted R^2		1.1%	1.6%		1.1%	1.6%		1.1%	1.6%		1.1%	1.6%

Panel B: *GovIndexEqualWeights*												
Dependent variable: *CrashRisk*												
	Crash	*NegSkew*	*DUVolatility*	*Crash*	*NegSkew*	*DUVolatility*	*Crash*	*NegSkew*	*DUVolatility*	*Crash*	*NegSkew*	*DUVolatility*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GovIndex	-0.016	-0.012	-0.002									
	(-0.80)	(-0.68)	(-0.23)									
Strongest				-0.042	-0.004	0.005				-0.041	-0.001	0.006
				(-0.65)	(-0.18)	(0.49)				(-0.62)	(-0.05)	(0.57)
Weakest							0.018	0.046	0.016	0.015	0.046	0.017
							(0.32)	(1.08)	(0.97)	(0.27)	(1.06)	(0.98)
LagDTurnover	0.014	0.009	0.002	0.014	0.008	0.002	0.014	0.009	0.002	0.014	0.009	0.002
	(1.02)	(1.16)	(0.62)	(1.01)	(1.15)	(0.61)	(1.00)	(1.16)	(0.63)	(1.01)	(1.17)	(0.63)
LagNegSkew	0.040***	0.013	0.011**	0.040***	0.013	0.011**	0.040***	0.013	0.011**	0.040***	0.013	0.011**
	(2.67)	(1.28)	(2.09)	(2.62)	(1.26)	(2.07)	(2.65)	(1.29)	(2.11)	(2.63)	(1.29)	(2.11)
LagSigma	1.388	1.010	0.036	1.395	1.036	0.043	1.410	1.001	0.026	1.384	1.001	0.030
	(1.57)	(1.16)	(0.10)	(1.61)	(1.22)	(0.12)	(1.53)	(1.15)	(0.07)	(1.55)	(1.16)	(0.08)
LagRET	0.029	0.111***	0.043**	0.029	0.111***	0.042**	0.028	0.112***	0.043**	0.029	0.112***	0.043**
	(0.70)	(2.89)	(2.56)	(0.69)	(2.88)	(2.54)	(0.69)	(2.90)	(2.57)	(0.70)	(2.90)	(2.56)
LagLog(Sales)	-0.003	0.005	0.004	-0.003	0.005	0.004	-0.004	0.005	0.004	-0.003	0.005	0.004
	(-0.29)	(0.85)	(1.46)	(-0.26)	(0.78)	(1.41)	(-0.35)	(0.83)	(1.48)	(-0.26)	(0.85)	(1.46)
LagBTM	-0.132***	-0.089***	-0.040***	-0.131***	-0.089***	-0.040***	-0.132***	-0.089***	-0.040***	-0.132***	-0.089***	-0.040***
	(-3.09)	(-5.57)	(-4.88)	(-3.06)	(-5.61)	(-4.87)	(-3.08)	(-5.62)	(-4.89)	(-3.07)	(-5.58)	(-4.87)
LagLeverage	-0.001	0.059	0.048*	-0.003	0.058	0.048*	-0.001	0.062	0.049*	-0.002	0.062	0.050*
	(-0.01)	(0.91)	(1.91)	(-0.03)	(0.91)	(1.93)	(-0.01)	(0.94)	(1.92)	(-0.02)	(0.93)	(1.92)
LagROA	0.393***	0.376***	0.187***	0.389***	0.372***	0.186***	0.388***	0.374***	0.187***	0.390***	0.375***	0.187***
	(3.19)	(5.13)	(4.68)	(3.16)	(4.90)	(4.55)	(3.18)	(5.03)	(4.68)	(3.16)	(5.00)	(4.66)
Constant	-0.537**	0.092	0.007	-0.590***	0.053	0.002	-0.595***	0.034	-0.005	-0.596***	0.034	-0.005
	(-2.37)	(0.67)	(0.11)	(-3.05)	(0.50)	(0.04)	(-3.92)	(0.37)	(-0.14)	(-3.82)	(0.37)	(-0.14)
Observations	12,109	12,110	12,110	12,109	12,110	12,110	12,109	12,110	12,110	12,109	12,110	12,110
Pseudo R^2	2.6%			2.6%			2.6%			2.6%		
Adjusted R^2		1.1%	1.6%		1.1%	1.6%		1.1%	1.6%		1.1%	1.6%

Panel C1: Sub-indices
Dependent variable: *Crash*

	Crash (1)	*Crash* (2)	*Crash* (3)	*Crash* (4)	*Crash* (5)	*Crash* (6)	*Crash* (7)
ISG1_BoardAccountability	-0.018**						-0.018**
	(-1.98)						(-1.97)
ISG2_EqualVoting		0.054					0.051
		(0.96)					(0.91)
ISG3_Responsiveness			-0.054				-0.053
			(-1.29)				(-1.27)
ISG4_Leadership				0.004			0.003
				(0.13)			(0.11)
ISG5_BoardComposition					0.017		0.017
					(1.04)		(1.09)
ISG6_ExecutiveIncentives						-0.031	-0.031
						(-1.29)	(-1.30)
Observations	12,109	12,109	12,109	12,109	12,109	12,109	12,109
Pseudo R^2	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel C2: Sub-indices
Dependent variable: *NegSkew*

	NegSkew (1)	*NegSkew* (2)	*NegSkew* (3)	*NegSkew* (4)	*NegSkew* (5)	*NegSkew* (6)	*NegSkew* (7)
ISG1_BoardAccountability	0.000						0.002
	(0.04)						(0.16)
ISG2_EqualVoting		-0.021					-0.023
		(-0.72)					(-0.82)
ISG3_Responsiveness			-0.054**				-0.054**
			(-2.41)				(-2.43)
ISG4_Leadership				-0.003			-0.002
				(-0.20)			(-0.15)
ISG5_BoardComposition					-0.004		-0.003
					(-0.56)		(-0.44)
ISG6_ExecutiveIncentives						-0.003	-0.004
						(-0.17)	(-0.18)
Observations	12,110	12,110	12,110	12,110	12,110	12,110	12,110
Adjusted R^2	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel C3: Sub-indices
Dependent variable: *DUVolatility*

	DUVolatility (1)	*DUVolatility* (2)	*DUVolatility* (3)	*DUVolatility* (4)	*DUVolatility* (5)	*DUVolatility* (6)	*DUVolatility* (7)
ISG1_BoardAccountability	0.003						0.003
	(0.56)						(0.64)
ISG2_EqualVoting		0.006					0.004
		(0.42)					(0.34)
ISG3_Responsiveness			-0.025***				-0.026***
			(-2.62)				(-2.63)
ISG4_Leadership				0.001			0.001
				(0.20)			(0.20)
ISG5_BoardComposition					-0.001		-0.001
					(-0.61)		(-0.51)
ISG6_ExecutiveIncentives						-0.001	-0.001
						(-0.14)	(-0.13)
Observations	12,110	12,110	12,110	12,110	12,110	12,110	12,110
Adjusted R^2	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: We include indicators for Fama and French (1997) 48 industries and years. We cluster standard errors by firm and year. We use probit regression to estimate the probability of a stock price crash event (*Crash*). Components are defined in Appendix A, and sub-indices are calculated from components as discussed in Section 2. Variables are defined in Appendix B. t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. We include all control variables from Panels A and B in Panels C1, C2 and C3.

Appendix A: The ISG Framework and Corresponding GovIndex Components

Below, we reproduce the Corporate Governance Framework for U.S. Listed Companies from https://www.isgframework.org/corporate-governance-principles/.

ISG Framework	Component Name	Component Description
Principle 1: Boards are accountable to shareholders.		
1.1 It is a fundamental right of shareholders to elect directors whom they believe are best suited to represent their interests and the long-term interests of the company. Directors are accountable to shareholders, and their performance is evaluated through the company's overall long-term performance, financial and otherwise.	N/A	We do not operationalize this element of the ISG framework because it is difficult to quantify or measure objectively.
1.2 Requiring directors to stand for election annually helps increase their accountability to shareholders. Classified boards can reduce the accountability of companies and directors to their shareholders. With classified boards, a minority of directors stand for elections in a given year, thereby preventing shareholders from voting on all directors in a timely manner.	*Non Classified Board*	An indicator variable set to one if the board is not classified, and zero otherwise Source: ISS Governance database.
1.3 Individual directors who fail to receive a majority of the votes cast in an uncontested election should tender their resignation. The board should accept the resignation or provide a timely, robust, written rationale for not accepting the resignation. In the absence of an explicit explanation by the board, a director who has failed to receive a majority of shareholder votes should not be allowed to remain on the board.	*Resign Required*	An indicator variable set to one if directors who do not receive a majority vote must resign, and zero otherwise. We set this variable to one if the ISS variable indicator of a resignation requirement (resign_require) is "BYLAWS-CHARTER" or "POLICY." We also set this variable to one if the ISS resignation requirement description (major_vote_comm) includes the term "majority vot*." For the pre-2008 period during which ISS Governance database does not provide enough information, we rely on data from Ertimur, Ferri and Oesch (2014) and from Allen (2007) to identify firms with resignation requirements. We also check ISS for accuracy against the Allen report data. Sources: ISS Governance database, Ertimur, Ferri and Oesch 2014, Allen 2007.
1.4 As a means of enhancing board accountability, shareholders who own a meaningful stake in the company and have owned such stake for a sufficient period of time should have, in the form of proxy access, the ability to nominate directors to appear on the management ballot at shareholder meetings.	*Proxy Access*	An indicator variable set to one if the shareholders can nominate directors to appear on management ballots, and zero otherwise. We search all 8-Ks and proxy statements for the term "Proxy Access" and read each filing to determine whether the firm adopted a proxy access provision. Source: Hand collection.

ISG Framework	Component Name	Component Description
1.5 Anti-takeover measures adopted by companies can reduce board accountability and can prevent shareholders from realizing maximum value for their shares. If a board adopts such measures, directors should explain to shareholders why adopting these measures are in the best long-term interest of the company.	*Low Anti-takeover*	An indicator variable set to one if the firm has a below-median (over the sample period) number of takeover defenses, and zero otherwise. To calculate the number of takeover defenses we assign one point for the presence of blank check preferred stock, limited ability to call a special meeting, limited ability to act by written consent, fair price provision, poison pill provision and supermajority (2/3 or greater) provision and deduct one point for confidential voting and cumulative voting. We choose these anti-takeover provisions by reading ISG signatories' proxy voting guidelines and identifying the most commonly discussed anti-takeover provisions. Source: ISS Governance database.
1.6 In order to enhance the board's accountability to shareholders, directors should encourage companies to disclose sufficient information about their corporate governance and board practices.	*Large Proxy Statement*	An indicator variable set to one if the proxy statement file size is above the median and zero otherwise. Source: WRDS SEC Analytics Suite.
Principle 2: Shareholders should be entitled to voting rights in proportion to their economic interest.		
2.1 Companies should adopt a one-share, one-vote standard and avoid adopting share structures that create unequal voting rights among their shareholders.	*Equal Voting*	An indicator variable set to one if the firm has neither more than one class of common stock nor unequal voting rights, and zero otherwise. Source: ISS Governance database
2.2 Boards of companies that already have dual or multiple class share structures are expected to review these structures on a regular basis or as company circumstances change, and establish mechanisms to end or phase out controlling structures at the appropriate time, while minimizing costs to shareholders.	N/A	We do not operationalize this element of the ISG framework because it is difficult to quantify or measure objectively.
Principle 3: Boards should be responsive to shareholders and be proactive in order to understand their perspectives.		
3.1 Boards should respond to a shareholder proposal that receives significant shareholder support by implementing the proposed change(s) or by providing an explanation to shareholders why the actions they have taken or not taken are in the best long-term interests of the company.	*Shareholder Proposal Response*	An indicator variable set to one if (i) there is no majority approved shareholder proposal in year *t*, or (ii) a shareholder proposal received a majority vote in year *t* and was not re-proposed in the next two years, and zero otherwise Source: ISS Voting Analytics database.

ISG Framework	Component Name	Component Description
3.2 Boards should seek to understand the reasons for and respond to significant shareholder opposition to management proposals.	*Management Proposal Response*	An indicator variable set to one if (i) no management proposal lacks support (see below), (ii) a management proposal lacks support in year *t*, but receives support in the next two years. We define director elections as lacking support if at least 20% of votes are withheld. We define say on pay as lacking support if at least 30% of votes are against. We define other management proposals as lacking support if at least 50% of votes are cast against the proposal. Source: ISS Voting Analytics database.
3.3 The appropriate independent directors should be available to engage in dialogue with shareholders on matters of significance, in order to understand shareholders' views.	N/A	
3.4 Shareholders expect responsive boards to work for their benefit and in the best interest of the company. It is reasonable for shareholders to oppose the re-election of directors when they have persistently failed to respond to feedback from their shareholders.	N/A	We do not operationalize this element of the ISG framework because it is difficult to quantify or measure objectively.
Principle 4: Boards should have a strong, independent leadership structure.		
4.1 Independent leadership of the board is essential to good governance. One of the primary functions of the board is to oversee and guide management. In turn, management is responsible for managing the business. Independent leadership of the board is necessary to oversee a company's strategy, assess management's performance, ensure board and board committee effectiveness and provide a voice independent from management that is accountable directly to shareholders and other stakeholders. 4.2 There are two common structures for independent board leadership in the U.S.: 1) an independent chairperson; or 2) a lead independent director. Some investor signatories believe that independent board leadership requires an independent chairperson, while others believe a credible independent lead director also achieves this objective.	*Independent Leadership*	An indicator variable set to one if either the ISS database indicates that the chairperson of the board is an independent director, or the BoardEx database indicates the presence of a lead independent director. Sources: ISS Directors database, BoardEx database.

ISG Framework	Component Name	Component Description
4.3 The role of the independent board leader should be clearly defined and sufficiently robust to ensure effective and constructive leadership. The responsibilities of the independent board leader and the executive chairperson (if present) should be agreed upon by the board, clearly established in writing and disclosed to shareholders. Further, boards should periodically review the structure and explain how, in their view, the division of responsibilities between the two roles is intended to maintain the integrity of the oversight function of the board.	*Role Discussion*	An indicator variable set to one if the board has (i) an independent chairperson, or (ii) the chairperson is an employee, and the proxy statement includes a header for a section discussing the roles and responsibilities of the independent board leader or executive chairperson. The variable is zero otherwise. Sources: ISS Directors database (for chairperson affiliation), automated hand collection for whether the proxy statement delineates the duties of the independent board leader.
Principle 5: Boards should adopt structures and practices that enhance their effectiveness.		
5.1 Boards should be composed of directors having a mix of direct industry expertise and experience and skills relevant to the company's current and future strategy. In addition, a well-composed board should also embody and encourage diversity, including diversity of thought and background.	*High Board Experience*	An indicator variable set to one if the percent of independent board members with an employment history in the firm's two-digit SIC code is above the median (over the sample period) and zero otherwise. Source: BoardEx database.
	High Diversity	An indicator variable set to one if the board exhibits above-median board diversity in a year. Similar to McMartin et al. (2017), we measure board diversity as the trace of the board-year covariance matrix that consists of the following board characteristics: *Age*; indicator variables for *Female*, *Law Degree*, *CPA* (i.e., Certified Public Accountant), *Elite Undergraduate* (undergraduate degree from an elite institution), *Elite Graduate* (non-MBA and non-law graduate degree from an elite institution), *Elite MBA* (MBA degree from an elite institution), *CEO Experience* (prior experience as a Chief Executive Officer of a public or private company), *CFO Experience* (prior experience as a Chief Financial Officer of a public or private company), *C-Suite Experience* (prior experience as a C-Suite Officer of a public or private company), *Foreign* (nationality not American); *Trusteeships* (the number of trusteeships ever appointed to the individual during our sample period; winsorized at the 1st and 99th percentiles), *Social Clubs* (the number of social organizations in which an individual actively participates over our sample period; this measure excludes trusteeships; winsorized at the 99th percentile), *Public Company Directorships* (the number of other public companies on which the individual has served as a director; winsorized at the 99th percentile), *Private Company Directorships* (the number of private companies on which the individual has served as a director; winsorized at the 1st and 99th percentiles). Source: BoardEx database.

ISG Framework	Component Name	Component Description
5.2 A majority of directors on the board should be independent. A board with a majority of independent directors is well positioned to effectively monitor management, provide guidance and perform the oversight functions necessary to protect all shareholder interests.	*Majority Independent*	An indicator variable set to one if more than 50% of board members are independent. Source: ISS Directors database
5.3 Boards should establish committees to which they delegate certain tasks to fulfill their oversight responsibilities. At a minimum, these committees should include fully independent audit, executive compensation, and nominating and/or governance committees.	*Independent Committees*	An indicator variable set to one if all members of the audit, compensation, nominating, and governance committees are independent. Source: ISS Director database.
5.4 The responsibilities of a public company director are complex and demanding. Directors need to make the substantial time commitment required to fulfill their responsibilities and duties to the company and its shareholders. When considering the nomination of both new and continuing directors, the nominating committee should assess a candidate's ability to dedicate sufficient time to the company in the context of their relevant outside commitments.	*Low Busy Director*	An indicator variable set to one if the board has a below-median proportion of outside directors who hold seats at three or more other public companies. We use the ISS variable "outside_public_boards" for this measure. If this value is missing, we count the number of boards on which the director sits within the Directors' database. We rely on prior research (e.g., Core, Holthausen, and Larcker 1999) and set the threshold for busy directors at three outside public boards because the voting guidelines of ISG signatories exhibit substantial variation in how they define overboarding. Source: ISS Directors database.
5.5 Attending board and committee meetings is a prerequisite for a director to be engaged and able to represent and protect shareholder interests; attendance is integral to a director's oversight responsibilities. Directors should aim to attend all board meetings, including the annual meeting, and poor attendance should be explained to shareholders.	*High Attendance*	An indicator variable set to one if all board members attended at least 75% of board meetings. Source: ISS Directors database.
5.6 Boards should ensure that there is a mechanism for individual directors to receive the information they seek regarding any aspect of the business or activities undertaken or proposed by management. Directors should seek access to information from a variety of sources relevant to their role as a director (including for example, outside auditors and mid-level management) and not rely solely on information provided to them by executive management.	N/A	We do not operationalize this element of the ISG framework because it is difficult to quantify or measure objectively.

ISG Framework	Component Name	Component Description
5.7 Boards should disclose mechanisms to ensure there is appropriate board refreshment. Such mechanisms should include a regular and robust evaluation process, as well as an evaluation of policies relating to term limits and/or retirement ages	*No Long Tenure*	An indicator variable set to one if the average tenure of independent directors is less than 15 years. We rely on voting guidelines provided by ISS, The Pennsylvania State Employees Retirement Board, and Walden Asset Management to set this threshold. These organizations state that they will "scrutinize boards where the average tenure of all directors exceeds 15 years." Other ISG signatories and Glass-Lewis suggest that they do not typically support term limits, but they do not provide guidance on acceptable tenure length. Source: ISS Directors database.
Principle 6: Boards should develop management incentive structures that are aligned with the long-term strategy of the company.		
6.1 As part of their oversight responsibility, the board or its compensation committee should identify short- and long-term performance goals that underpin the company's long-term strategy. These goals should be incorporated into the management incentive plans and serve as significant drivers of incentive awards. Boards should clearly communicate these drivers to shareholders and demonstrate how they establish a clear link to the company's long-term strategy and sustainable economic value creation. All extraordinary pay decisions for the named executive officers should be explained to shareholders.	*StrongIncentives*	An indicator variable set to one if the R-squared value from a regression of CEO compensation on firm performance is above the median. We calculate the R-squared from firm-specific regressions of the log of total compensation on annual ROA and annual buy-and-hold returns. We estimate the R-squared over a five-year window, and require observations to include at least four firm-years for estimation. Sources: Execucomp database, Compustat database, CRSP database
6.2 A change in the company's long-term strategy should necessitate a re-evaluation of management incentive structures in order to determine whether they continue to incentivize management to achieve the goals of the new strategy.	N/A	We do not operationalize this element of the ISG framework because it is difficult to quantify or measure objectively.

Appendix B: Regression Variable Definitions

Variable definitions

Main variables of interest

GovIndex is the composite index measure, the sum of each of the components listed in Appendix A. Sources: See Appendix A.

GovIndexEqualWeights is an alternative version of the composite index, comprised of the sum of the equally-weighted sub-indices described in Appendix A. Sources: See Appendix A.

Dependent variables

Tobin'sQ is Tobin's Q, measured following as the market value of assets scaled by the book value of assets. The market value of assets is the book value of assets (AT) plus the market value of common stock (CSHO*PRCC_F; we use PRCC_C if PRCC_F is missing or zero), less the sum of the book value of common stock (CEQ) and deferred taxes (TXDB). We use industry-adjusted Tobin's Q (*IndAdjustedQ*) in our analyses, where industries are Fama French 48 industries, and we adjust for the median *Tobin'sQ* in each year. Source: Compustat

%ResidualCompensation is the natural logarithm of *CEO Total Compensation* less the natural logarithm of *CEO Predicted Pay*. Following Core, Guay and Larcker (2008), we compute *CEO Predicted Pay* as the exponent of the predicted value for each firm from annual regressions of the natural logarithm of total CEO compensation on proxies for economic determinants of CEO pay: CEO tenure, logarithm of sales, an indicator set to one if the firm is included in the S&P500 index, lagged book-to-market ratio, contemporaneous and lagged one-year stock returns, contemporaneous and lagged ROA, and indicators for the twelve Fama French (1973) industries. Sources: Compustat, CRSP, Execucomp

ForcedTurnover is an indicator variable set to one if the firm experienced a forced turnover in either year t+1 or year t+2. We classify turnovers as forced as described in Section 4.3. Sources: Execucomp and hand-collection

CAR-1/+1 (CAR-21/+1) is the cumulative abnormal return in the 3-day (22-day) window around the merger announcement reported in Thomson SDC Platinum. We use Fama-French Market adjusted portfolios to adjust returns. Sources: Thomson SDC Platinum and Eventus

Crash is an indicator variable set to one if a firm experiences one or more weekly stock price crashes in a firm year, where a crash is a firm-specific weekly return more than 3.2 standard deviations below the mean of firm-specific weekly returns. Firm-specific weekly returns are measured as the log of one plus the residual of the regression of firm returns in week *t* on the CRSP value-weighted index in weeks *t-2*, *t-1*, *t*, *t+1* and *t+2*.

NegSkew is the negative of the third moment of firm-specific weekly returns, where firm-specific weekly returns are measured as described above.

DUVolatility is the ratio of the standard deviation of the volatility of below-mean (down) firm-specific weekly returns to the volatility of above-mean (up) firm-specific weekly returns, where firm-specific weekly returns are measured as described above.

Control variables

Log(Assets) is the log of average book value of assets. Source: Compustat

CapEx is the value of capital expenditures (CAPX) scaled by average total assets. We set the value of missing CapEx expense to zero, and include an indicator variable set to one in these cases (*MissCapEx*). Source: Compustat

Leverage is year-end total debt (DT) scaled by the book value of assets. Source: Compustat

R&D is the value of research and development (R&D) expenditures (XRD) scaled by the book value of assets. We set the value of missing R&D expense to zero, and include an indicator variable set to one in these cases

(*MissR&D*). Source: Compustat

PP&E is the value of property plant and equipment (PPENT) scaled by the book value of assets. We set the value of missing PP&E observations to zero, and include an indicator variable set to one in these cases (*MissPP&E*). Source: Compustat

SP500 is an indicator variable set to one if the firm is included in the S&P500 index, and zero otherwise. Source: Compustat

FirstYear is an indicator variable set to one if the CEO is not associated with the same firm in the prior year as reported in Execucomp and zero otherwise. Source: Execucomp

TerminalYear is an indicator variable set to one if the CEO is not associated with the same firm in the subsequent year as reported in Execucomp and zero otherwise. Source: Execucomp

RET is the annualized buy-and-hold return calculated from monthly returns. Source: CRSP

ROA is income before extraordinary items (IB) scaled by average total assets. We use industry-adjusted *ROA* (*IndAdjROA*) in our analyses, where industries are Fama French 48 industries, and we adjust for the median industry *ROA* in each year. Source: Compustat.

SDROA is the standard deviation of *ROA* calculated over the three years t-2 through t. Source: Compustat

SDRET is the standard deviation of *RET* calculated over the three years t-2 through t. Source: CRSP

RetirementAge is an indicator variable set to one if the CEO is between the ages of 63 and 66, inclusive. Source: Execucomp

HighEquityOwnership is an indicator variable set to one if the CEO owns 5% or more of the firms' equity, as reported in the variable (SHROWN_TOT_PCT). Source: Execucomp

MergerActivity is an indicator variable set to one if the firm announced an acquisition during year t. Source: Thomson SDC Platinum

MVE is the market value of the market value of common stock (CSHO*PRCC_F; we use PRCC_C if PRCC_F is missing or zero). Source: Compustat

SalesGrowth is the difference between *Sales* in year t and *Sales* in year t-1, scaled by *Sales* in year t-1. Source: Compustat

BTM is the book-to-market ratio of equity, which is the book value of equity (CEQ+TXDB) scaled by the market value of equity (CSHO*PRCC_F; we use PRCC_C if PRCC_F is missing or zero). Source: Compustat

CEOOwnership is the percent of the firm owned by the CEO, including options. Source: Execucomp

SameIndustry is an indicator variable set to one if both the acquiring and target firms are in the same two-digit SIC code. Source: Thomson SDC Platinum

AllCash is an indicator variable set to one if the acquirer uses only cash to purchase the target firm and zero otherwise. Source: Thomson SDC Platinum

Tender is an indicator variable set to one if the acquisition is structured as a tender offer and zero otherwise. Source: Thomson SDC Platinum

PublicTarget is an indicator variable set to one if the target firm is publicly traded and zero otherwise. Source: Thomson SDC Platinum

Complete is an indicator variable set to one if the is complete. Source: Thomson SDC Platinum

Withdrawn is an indicator variable set to one if the merger offer was withdrawn. Source: Thomson SDC Platinum