THE CORE CORPORATE GOVERNANCE PUZZLE: CONTEXTUALIZING THE LINK TO PERFORMANCE

MERRITT B. FOX,[*] RONALD J. GILSON[**] & DARIUS PALIA[***]

ABSTRACT

There is a puzzle at the core of corporate governance theory. Prior scholarship reports a strong relationship between firms best at creating shareholder value and those rated highly by the established corporate governance indices. Little work explores why, however. We hypothesize that the link between governance and performance depends centrally on context. We illustrate the importance of context by exploring circumstances when a firm's governance structure can operate as a signal of the quality of its management. The idea is that better managers are on average more likely to choose a highly rated governance structure than are bad managers because a structure garnering a high rating increases the risk of job loss more for bad managers than for good ones. Conversely, the choice of a poorly rated governance structure signals negative information about managerial quality because good managers would not wish to make a false negative signal. Signals of managerial quality can take on particular significance under certain circumstances.

This Article tests empirically the hypothesis that a particular context—the existence of an especially high information asymmetry between a firm's insiders and the market concerning the quality of its management—is a situation in which a change in the firm's governance structure will become a stronger signal concerning its management's quality. The test compares ordinary times with the years 2000-2002, a period of unprecedented corporate accounting scandals that led to greater than usual uncertainty as to which firms had the better managers.

We show that an index-score-altering change in governance structure during these accounting scandal years is associated with a much larger change in a measure of firm value creation—Tobin's Q—than a comparable governance change in the years before or after the accounting scandal period. By running both OLS and fixed effects regressions, we show that the market's perception of the effectiveness of a highly rated governance structure at better incentivizing managers, or at filtering out bad ones, was not significantly different in the scandal years than in the years before or after. Thus, "signaling"—the third possible causal link between good scores and higher Tobin's Q—must have been at work. The reasoning is that the clarifying signal arising from a governance change should have a bigger effect in a period of greater uncertainty as to which firms had good managers. This conclusion is further confirmed by empirical evidence that the impact of a governance change on Tobin's Q during the scandal years was especially elevated for firms engaging in substantial amounts of R&D. Such firms have been shown by other studies to be generally more opaque.

These results also teach a larger lesson: the impact of governance is in important respects contextual, depending on the particular circumstances of the time and the particular characteristics of the firms involved. This point, largely missed to date, helps illuminate the current debate concerning the corporate governance index studies. It suggests that that there is an empirically verified theory that provides one explanation for the index studies' strong results linking governance structure with firm value creation but that, rather than a single link between the specified corporate governance provisions and performance, a range of linkages are possible the direction and intensity of which depend centrally on the particular context in which a firm is operating.

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INTRODUCTION

There is a critical puzzle at the core of corporate governance theory: Is corporate performance really linked to a firm's governance structure? Promoting "good" corporate governance has become a global industry. Large international organizations, such as the Organisation for Economic Co-operation and Development ("OECD"), have adopted corporate governance codes of best practice,[1] and major institutional investors have adopted guidelines setting out how they will vote the shares in their portfolios on governance issues.[2] As well, corporate governance concerns were at the center of the conditions that the International Monetary Fund ("IMF") imposed on financial assistance to countries after the East Asian financial crisis.[3] In the United States, both the Sarbanes-Oxley legislation following the Millennial accounting scandals and the Dodd-Frank legislation following the "Great Recession" sought, among other things, to improve the corporate governance practices of the companies the statutes cover.[4] In turn, Delaware courts over the last twenty-five years have devoted a great deal of attention to reshaping and highlighting the governance content of Delaware corporate law.[5]

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[1] *See generally, e.g.*, OECD, G20/OECD PRINCIPLES OF CORPORATE GOVERNANCE (2015); *see also* ECONOMIESUISSE, SWISS CODE OF BEST PRACTICE FOR CORPORATE GOVERNANCE (2014). Codes covering particular countries have also proliferated. These are available on the European Corporate Governance Institute's website. *See Codes*, EUROPEAN CORP. GOVERNANCE INST., https://ecgi.global/content/codes [https://perma.cc/NMY3-5U9A] (last visited Sept. 21, 2019).

[2] *See generally, e.g.*, BLACKROCK, GLOBAL CORPORATE GOVERNANCE & ENGAGEMENT PRINCIPLES (2014) (setting out BlackRock's approach to engaging with companies through proxy voting and board communication); CAL. PUB. EMPS.' RET. SYS., GLOBAL PRINCIPLES OF ACCOUNTABLE CORPORATE GOVERNANCE (2011) (providing framework by which CalPERS executes its proxy voting).

[3] *See* Timothy Lane et al., INT'L MONETARY FUND, POLICY DEV. & REVIEW DEP'T, IMF-SUPPORTED PROGRAMS IN INDONESIA, KOREA, AND THAILAND: A PRELIMINARY ASSESSMENT 72-73 (1999); John M. Broder, *Asia Pacific Talks Vow Tough Action on Economic Crisis*, N.Y. TIMES, Nov. 26, 1998, at A1 (outlining Asia Pacific economic summit reforms).

[4] Sarbanes-Oxley, for example, aims to improve auditor quality, *see* 15 U.S.C. §§ 7231-7234 (2012) (regulating auditor independence); promote the independence of listed corporations' audit committees, *see id.* § 78j-1 (adding requirements for formation and maintenance of audit committees); and increase corporate managers' responsibility for financial disclosures, *see id.* § 7241 (detailing requirements for quarterly reports). Dodd-Frank implemented a host of governing reforms as well, focusing in particular on executive compensation structures. *See* Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, §§ 951-957, 124 Stat. 1376, 1899-907 (2010) (codified as amended in scattered sections of 12 U.S.C. and 15 U.S.C.) (imposing requirements regarding executive compensation, including shareholder vote).

[5] *See, e.g.*, Jack B. Jacobs, *Fifty Years of Corporate Law Evolution: A Delaware Judge's Retrospective*, 5 HARV. BUS. L. REV. 141, 141-44 (2015) (analyzing expansion of officers' fiduciary duties and evolution of corresponding Delaware courts' standards of review).

This emphasis on governance is built on the premise that "better" corporate governance structures lead to greater firm value. Here, though, is where the core puzzle comes into play. A nagging concern persists as to whether this foundational premise is accurate.[6] This concern suggests three central questions: Is there in fact a relationship between the firm's governance structure and its capacity to create value, and if so, when and why?

A large academic literature in law and finance has arisen seeking to test empirically the link between certain corporate governance attributes and firm value.[7] One genre in particular—the index study—suggests a positive relationship between a firm's performance and the quality of its corporate governance. The index lists a set of what the author believes to be favorable governance attributes and assesses the quality of a firm's governance by counting how many of these attributes a firm displays.[8] These studies show a statistically and economically significant positive relationship between firms with governance structures that receive favorable index ratings and their Tobin's Qs, a widely used measure of firm value creation.[9]

Other scholars, though, have challenged these index studies, arguing that there is no sensible story to explain how many of the governance attributes that determine a company's index rating could in fact affect firm value.[10] For

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[6] For example, empirical studies generally do not show that independent directors, the centerpiece of the post-1970s governance reforms, are associated with higher firm value. *See, e.g.*, Sanjai Baghat & Bernard Black, *The Uncertain Relationship Between Board Composition and Firm Performance*, 54 BUS. LAW. 921, 922 (1999) ("However, studies of overall firm performance have found no convincing evidence that firms with majority-independent boards perform better than firms without such boards.").

[7] This literature is discussed in Parts I and IV *infra*. As an example of the subject's attraction, from 1995 through August 29, 2013, more than a quarter of all articles published by the Journal of Financial Economics were related to governance. Out of a total of 1533 articles, 414 (27%) dealt with governance (authors' calculation).

[8] The two most prominent indices are the G index and the E index. The G index was originally designed for use in the study reported in Paul Gompers, Joy Ishii & Andrew Metrick, *Corporate Governance and Equity Prices*, 118 Q.J. ECON. 107, 107 (2003). The E index was originally designed for use in the study reported in Lucian Bebchuk, Alma Cohen & Allen Ferrell, *What Matters in Corporate Governance*, 22 REV. FIN. STUD. 783, 785 (2009). These studies are discussed in more detail in Part I, *infra*.

[9] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 785 (finding that unfavorable entrenching governance provisions correlate with lower firm valuation); Gompers, Ishii & Metrick, *supra* note 8, at 144 ("We find that corporate governance is strongly correlated with stock returns during the 1990s.").

[10] *See, e.g.*, Emiliano M. Catan & Marcel Kahan, *The Law and Finance of Antitakeover Statutes*, 68 STAN. L. REV. 629, 668-69 (2016) (arguing that variables used in index studies often have little actual impact); Michael Klausner, *Fact and Fiction in Corporate Law and Governance*, 65 STAN. L. REV. 1325, 1364 (2013) (arguing that G Index includes many elements that have no significant impact on entrenchment); David F. Larcker, Peter C. Reiss & Youfei Xiao, *Corporate Governance Data and Measures Revisited* 6 (Rock Ctr. of Corp. Governance, Working Paper Series No. 211, 2015), http://ssrn.com/abstract=2694802

example, not currently having a poison pill takeover defense in place is scored in the index studies as a positive attribute. However, a firm's board, without shareholder approval, can quickly adopt a pill if its management feels the need in the face of an actual immediate takeover threat. Hence, the critics argue, the absence of a pill prior to such an immediate threat should have no consequence for firm value.[11] In effect, any company not having a pill already in place has a "shadow" pill that can be activated at any moment and achieve exactly the same effects.[12]

But these criticisms raise their own problem: they advance a theory as to why the index studies *should not* yield empirical results but no theory as to why they nevertheless *appear to do so*. Given the absence of careful theory on either side, we come face to face with the core corporate governance puzzle: What is the link between governance and performance?[13]

Our central thesis is that corporate governance is more complicated, and its effects more contingent, than the governance theories used to construct the indices on which the governance index studies are based. This point is largely missed by the debate to date.[14] The existing index studies, for example, only measure the average impact of a set of attributes on firm value across a large number of corporations over a considerable period of time.[15] Because the existing studies do not distinguish between different times and circumstances—

[https://perma.cc/J966-LTL2] (arguing that "systematic measurement issues in the coding of IRRC profiles" have caused inaccurate findings based on G and E indices).

[11] *See, e.g.*, Emiliano M. Catan, *The Insignificance of Clear-Day Poison Pills*, 48 J. LEGAL STUD. (forthcoming 2019) (manuscript at 2-5), http://ssrn.com/abstract=2836223 [https://perma.cc/2GAP-7QNL] (arguing that adopting poison pill absent an actual bid does not cause drop in firm value); John C. Coates, IV, *Takeover Defenses in the Shadow of the Pill: A Critique of the Scientific Evidence*, 79 TEX. L. REV. 271, 271 (2000) (arguing that poison pill studies do not support the common belief that pills reduce firm value).

[12] *See* Coates, *supra* note 11, at 286.

[13] More recent studies using ever more sophisticated econometrics show that, contrary to the index skeptics, certain defensive governance attributes, such as having a pill in place on an ongoing basis, result in fewer takeovers over time. But these studies' authors stress that their results are "atheoretic": they offer no hypotheses to explain the link between these governance attributes and shareholders' receipt of fewer premium offers. *See* Jonathan M. Karpoff, Robert J. Schonlau & Eric W. Wehrly, Which Antitakeover Provisions Matter 1 (Apr. 18, 2019) (unpublished manuscript), http://ssrn.com/abstract=3142195 [https://perma.cc/Q3ZJ-69DN].

[14] One exception is Bernard S. Black, Antonio Gledson de Carvalho & Érica Gorga, *What Matters and for Which Firms for Corporate Governance in Emerging Markets?: Evidence from Brazil (and Other BRIK Countries)*, 18 J. CORP. FIN. 934, 946-49 (2012), in which the authors argue that the impact of governance elements is context specific and so can be expected to have different results in different countries. This is a particularized version of the more general critique that tests of the impact of governance elements too often lack an institutional grounding for the tested hypotheses.

[15] *See* Gompers, Ishii & Metrick, *supra* note 8, at 108 (describing this approach as a "long-run event study").

i.e., differences in context—they observe only an average. Most firms, though, are not average. That a more complicated story may be at work should not be surprising to careful observers of the corporate world. They would find it highly likely that, rather than a single link between the specified corporate governance provisions and performance, a range of linkages are possible the direction and intensity of which depend centrally on the particular context in which a firm is operating. From this perspective, the impact of governance on firm performance is second order *except* when circumstances make it important.

This Article is an early contribution to a different approach to corporate governance research: a more focused inquiry into the particular circumstances in which the observed empirical link between governance and performance can be both demonstrated empirically and supported in theory.[16] Specifically, we test the hypothesis that governance attributes in some circumstances can serve as credible signals of the quality of a firm's management and that these signals matter more in situations when the market lacks good information concerning managerial quality. If we can show that a link between governance and performance depends on context—in our study, the extent of information asymmetry concerning managerial quality—then we can begin to better understand the relationship between governance and firm performance. Beyond signaling, there are almost certainly additional context-dependent links between governance and firm performance that further theoretical and empirical work can reveal. This study is a first step in showing the way.

We examine our context-dependent signaling hypothesis in two ways: comparing *time periods* that differ in terms of the reliability of other information concerning managerial quality, and comparing *types of firms* that differ in terms of the reliability of other such information. With regard to comparing time periods, we take advantage of a natural experiment that arose when uncertainty concerning management quality was widely reported to have spiked: the 2000-2002 period, when a series of high-profile accounting scandals, such as Enron and WorldCom, shook the financial world. With regard to types of firms, we compare firms engaging in substantial research and development ("R&D"),

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[16] Professors Martijn Cremers and Allen Ferrell in a fashion precede us in this endeavor by identifying a temporal factor affecting the relationship between a good index score and firm value. They demonstrate a difference between the periods before and after the Delaware Supreme Court's decision in *Moran v. Household International, Inc.*, 500 A.2d 1346, 1357 (Del. 1985), in which the Delaware Supreme Court found the adoption of a poison pill as a defense against a hostile takeover attempt to be a valid exercise of board authority. Martijn Cremers & Allen Ferrell, *Thirty Years of Shareholder Rights and Firm Value*, 69 J. FIN. 1167, 1168-71 (2014) (utilizing G Index factors while taking into account "shock to the importance of shareholder rights" caused by *Moran*). However, the Cremers and Ferrell study also presents institutional problems. The form of poison pill involved in the *Moran* case was the generally ineffective flip-over pill. Only some time later was the current, more effective flip-in pill developed. *See* RONALD J. GILSON & BERNARD S. BLACK, THE LAW AND FINANCE OF CORPORATE ACQUISITIONS 740-48 (2d ed. 1995) (discussing early adoption of flip-in pills). *See generally* Air Prods. & Chems., Inc. v. Airgas, Inc., 16 A.3d 48 (Del. Ch. 2011).

which studies suggest are harder for the market to evaluate,[17] with firms that do not. We report evidence supporting our management quality-based signaling hypothesis in each of these two ways. In essence, we see that the greater the market's uncertainty concerning a firm's managerial quality at a particular moment in time, the bigger the impact of a governance change on the market's valuation of the firm.

This empirical demonstration of our signaling hypothesis is significant. To start, the result is important in itself; it is useful to better understand the reasons for the observed relationship between corporate governance and measures of firm value, and our empirical results support an explanation not previously identified in the literature. Moreover, reducing information asymmetry between the market and corporate insiders makes share prices more accurate, which enhances the efficiency of our overall economy.[18] In evaluating what assistance government regulations can provide in this regard, it is valuable to identify as well what market-based forces are at work. Even more important, however, is the contribution to the law and finance literature concerning corporate governance provided by our demonstration that the impact of governance is in important respects contextual, depending on the particular circumstances of the measurement period and the particular characteristics of the firms involved. Our results not only suggest the familiar (though often neither well-framed nor well-tested) claim that one size of governance does not fit all companies[19] but also that the "right" size for a particular company can differ over time.

Our analysis proceeds as follows: Part I describes the corporate governance index studies reporting empirical evidence that firms with better-rated governance structures have better economic performance. We describe how these indices are created and how the typical gauge of the firm's success at creating value, Tobin's Q, is measured.

Part II sets out our signaling hypothesis. It discusses three nonmutually exclusive theories for explaining the observed relationship between more highly rated governance structures and measures of firm value. The first two theories focus on how better-rated governance structures lead to firms being better

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[17] *See, e.g.*, Bronwyn H. Hall & Josh Lerner, *The Financing of R&D and Innovation*, *in* 1 HANDBOOK OF THE ECONOMICS OF INNOVATION 610, 623-24 (Bronwyn H. Hall & Nathan Rosenberg eds., 2010) (stating that R&D is difficult to value and fund); David Aboody & Baruch Lev, *Information Asymmetry, R&D, and Insider Gains*, 55 J. FIN. 2747, 2765 (2000) (demonstrating that unique nature of R&D causes large information asymmetry between managers and investors); Pierre Barbaroux, *From Market Failures to Market Opportunities: Managing Innovation Under Asymmetric Innovation*, J. INNOVATION & ENTREPRENEURSHIP, Jan. 2014, at 1, 12 (stating that information asymmetries related to R&D both cause market failures and provide opportunities for innovation).

[18] *See* Barbaroux, *supra* note 17, at 3 (explaining mainstream belief that information asymmetries cause market inefficiencies).

[19] *See* Martin Lipton & Paul K. Rowe, *The Inconvenient Truth About Corporate Governance: Some Thoughts on Vice-Chancellor Strine's Essay*, 33 J. CORP. L. 64, 68 (2007) (arguing against imposing one-size-fits-all governance requirements).

managed: first, by filtering out bad managers; and second, by better motivating and informing managers regardless of their ability level. The third theory, in contrast, looks at a causal link running the other way: how better firm managers steer their firms toward better-rated governance structures in order to credibly reveal information concerning management quality and how poor managers reveal information about their quality by selecting a lower-rated structure. This third theory suggests that a firm's governance structure can be a signal concerning a firm's managerial quality, a characteristic that is difficult for the market to observe directly. Specifically, we posit that in periods of greater information asymmetry concerning the firm's management quality (one context) or where a firm's particular characteristics lead to above average levels of such asymmetry (a second context), the firm's governance attributes will serve as a stronger signal—positive or negative—of management quality. In essence, changes in a firm's corporate governance structure can in particular contexts act as a signal of its managerial quality, and the less that is otherwise known about the quality of its management, the bigger the signal's impact.

Part III reports our empirical tests of this signaling hypothesis. It first describes the time-period-based variation in context: a comparison between normal times and the period involving the Millennial accounting scandals, including Enron, WorldCom, and others, as well as the market's reaction to them. We then then set out our two central empirical findings. The first is that a change in a company's governance index score during the period of the accounting scandals resulted in a much larger change in Tobin's Q—the measure of firm value—than did score changes in the years both preceding and following the accounting scandal period.[20] We take advantage of differences between ordinary least squares ("OLS") and fixed effects regression methodologies to show that it is the signaling link between a firm's governance rating and its Tobin's Q that is responsible for this much bigger change in Q during the scandal period, rather than the two alternative explanations: corporate governance filtering out bad managers or better motivating and informing existing managers of any quality. Put differently, as another kind of information concerning management quality—accounting reports—came to be viewed during the scandal period as less reliable than at other times, the signal that we study—a firm's change in a governance structure—took on greater importance and hence had greater impact on the firm's market valuation.

Our second central finding is that a change in a company's governance index score has on average a bigger impact on the firm's Tobin's Q if the firm is engaging in substantial R&D activity than if it is not.[21] Substantial R&D independently adds to information asymmetry concerning a firm's management quality and hence again heightens the importance of governance structure as a credible managerial quality signal.

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[20] *See infra* Section III.B.

[21] *See infra* Section III.B.

Part IV explores the larger lessons of these results for the study of corporate governance. We explain how the results support our core hypotheses: that the relationship between corporate governance and performance is in important respects contextual, with the strength of this relationship depending on the time period involved and the particular characteristics of the firm. This central point helps both to illuminate the index study debate and to enrich our understanding of corporate governance more generally.

I.   THE INDEX STUDIES

Index studies, which score firms based on their particular governance attributes and then test whether better-rated firms create more value for investors, play a prominent role in the empirical governance literature.[22] As already noted, index studies have shown a positive link between a firm's governance and its capacity to create value, but they have also been the subject of some cogent criticism—that in actual operation, some of the attributes that make up the index cannot affect firm performance.[23] While we save discussion of the criticism until Part IV, it is helpful at the outset to explain how the index studies work and an important reason for their creation. Event studies of the adoption or removal of individual governance attributes are plagued by an endogeneity problem—the difficulty in determining whether the change in a firm's value that accompanies the change in any particular attribute is due to the attribute change itself or is due instead simply to whatever contextual factor prompted the attribute's change.[24]

A.   *Governance Index Construction*

The two most commonly used corporate governance indices are the "G" and "E" indices,[25] on which we will focus here. Each index's authors posit a list of governance attributes that they believe affect the quality of corporate decision-making. For example, the G and E indices each include on their attribute list whether a company has a board whose members are all elected annually or has a staggered board.[26] The apparent reasoning for including this attribute starts with the observation that a poorly run firm can be an attractive takeover target because an acquirer can make the firm more valuable simply by substituting better management.[27] A staggered board, however, reduces the likelihood of poor managers being replaced in this way because, when combined with a

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[22] *See supra* text accompanying notes 7-8.

[23] *See supra* note 9 and accompanying text.

[24] *See* Catan & Kahan, *supra* note 10, at 668-69 (arguing that index studies commonly misinterpret whether selected governance attributes actually change firm value).

[25] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 785 (creating E index); Gompers, Ishii & Metrick, *supra* note 8, at 107 (creating G index).

[26] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 791; Gompers, Ishii & Metrick, *supra* note 8, at 146-47.

[27] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 791.

poison pill, the presence of a staggered board requires a hostile bidder to run two successful annual proxy contests before it can take control of the firm.[28] This is a highly unattractive prospect to a prospective bidder, indeed one that the Chancellor of Delaware a few years back believed had never been attempted.[29] Thus, if a poorly run firm has a staggered board, its incumbent managers have less incentive to improve, and there is less chance of a takeover by a hostile bidder who will install better managers. In essence, including the absence of a staggered board on the list of positive attributes reflects an index author's belief that exposing a company's management to market discipline improves its governance.

The G index contains twenty-four corporate governance attributes. The E index is composed of only six of the G index's attributes, each of which is said to relate to the company's ability to protect itself from a hostile change in control and hence to reduce the market's ability to discipline poor performance.[30]

For each attribute on an index's list, a firm is assigned a score of zero if it has the positive attribute and a score of one if it does not.[31] A firm's score with respect to each attribute in the index is then summed to obtain its overall governance rating.[32] The *lower* the total, the *more favorable* the rating. As this zero-one scoring indicates, neither index attempts to measure the relative importance of or interaction among individual attributes.[33] Nor, as is important to us here, does either index reflect an assessment of whether a particular attribute may matter more or less in different contexts.

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[28] *See* Gompers, Ishii & Metrick, *supra* note 8, at 146-47.

[29] *Air Products and Chemicals, Inc. v. Airgas, Inc.*, 16 A.3d 48, 114-15 (Del. Ch. 2011) illustrates the barriers presented by the combination of a staggered board and a poison pill. In *Air Products*, Chancellor Chandler remarked that the record reflected that no hostile bidder had ever continued its offer for two successive proxy fights. *See* Lucian Arye Bebchuk, John C. Coates, IV & Guhan Subramanian, *The Powerful Antitakeover Effect of Staggered Boards: Further Findings and a Reply to Symposium Participants*, 55 STAN. L. REV. 885, 888-901 (2002) (explaining interaction of staggered board and poison pill).

[30] The six attributes are: staggered boards, limits on shareholder amendments to the bylaws, supermajority requirements for shareholder approval of charter amendments, supermajority requirements for shareholder approval of mergers, poison pills, and golden parachutes. *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 796.

[31] *See id.* at 796 ("[T]he level of the 'entrenchment index' for any given firm is calculated by giving one point for each of the six components of the index that the firm has."); Gompers, Ishii & Metrick, *supra* note 8, at 114 ("[F]or every firm we add one point for every provision that restricts shareholder rights.").

[32] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 796; Gompers, Ishii & Metrick, *supra* note 8, at 114.

[33] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 796; Gompers, Ishii & Metrick, *supra* note 8, at 114.

B. *Tobin's Q as a Measure of Firm Value Creation*

Investors give managers initial resources to work with in the form of equity and debt. To the extent that the firm generates cash flow in excess of what is returned to investors through dividends, stock buybacks, and debt service, the managers obtain additional resources to work with. Managers use these resources to make real investments. A company's expected future cash flow depends on the quality of the real investment choices that the managers make and how well they utilize the real investments that they have chosen. The greater these future expected cash flows (discounted to present value), the more value the company's managers have created with the resources that have been given to them.

Tobin's Q is commonly used as a measure of how well managers have done in this regard. Simplifying slightly, Tobin's Q is the ratio of the firm's stock market capitalization to the book value of its assets.[34] With respect to the numerator, the higher the market's expectation of a firm's discounted future cash flows, the greater its stock market valuation. With respect to the denominator, the historical cost of acquiring the firm's real assets reflects what investors provided the firm in the form of equity, debt, and retained cash flow, and is the starting point for the calculation of the firm's book value. Thus, the ratio of the two is a measure of a firm's managers' capacity to create value from the resources given to them: the higher the ratio, the more value the market credits management for having created.[35]

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[34] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 800. More precisely, to account for resources obtained by debt and retained earnings financing, the typically used formula for Q is the market value of a firm's equity minus the book value of the equity plus the market value of the firm's debt, all divided by the book value of its assets. *See* Clifford W. Smith, Jr. & Ross L. Watts, *The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies*, 32 J. FIN. ECON. 263, 265-69 (1992) (explaining endogenous and exogenous variables requiring a specific empirical method). We follow that practice here. Some commentators have recently criticized the widespread use of Tobin's Q measured in this fashion, advocating instead the use of "Total Q," which takes account of intangible assets not picked up by the traditional measure of Q. *See, e.g.*, Robert P. Bartlett & Frank Partnoy, The Misuse of Tobin's Q 6-7 (Feb. 4, 2018) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3118020 [https://perma.cc/CT66-QKQQ]. We have chosen to use the traditional measure, however, to maintain comparability with the earlier studies. We control for the concern over the exclusion of intangibles by using the firm's R&D as a control variable. Because R&D is the primary source of intangibles, the concern over the impact of intangibles on using Q as a measure of performance is thus dealt with. In doing so, we confirm the findings of the index studies that there is a highly statistically significant association between firm index ratings and their Tobin's Qs.

[35] We note that maximizing Tobin's Q is not equivalent to maximizing value creation, i.e., maximizing the value of the expected cash flow from the firm's real investment projects over the cost of implementing these projects. Ex ante, a value-maximizing firm must identify value-creating real investment projects and then should implement every real investment project proposal that is expected to add more to the value of the firm than the cost of assets

C.   *Testing the Relationship Between G and E Index Ratings and Tobin's Q*

The claimed link between the G and E indices' measure of governance quality and corporate performance has been empirically tested in the following manner. First, the index scores of a large number of U.S. firms are calculated over a significant number of years, with the length of the total period typically being determined simply by the number of years for which data is available.[36] Similarly, Tobin's Q is determined for each of these firms for each of these years.[37] This creates a few thousand firm-year observations. Econometric techniques are then used to determine whether, based on these observations, firms with better governance scores on average created more value with the resources given them by investors than firms with worse scores.[38] The G and E index studies each show a strong, statistically significant relationship between a favorable governance index score and a firm's value creation as measured by Tobin's Q.[39] These findings are confirmed by our own results[40] and repeatedly by other scholars.[41]

II.   THE SIGNALING HYPOTHESIS: THEORY

Our signaling hypothesis is that a change in a firm's governance structure as measured by the G and E indices can be a credible signal of the quality of its managers—their capacity to create value—and that this signal is stronger in

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needed to implement it. If, however, a firm with an already high Tobin's Q took as its goal the maximization of Tobin's Q, it would not proceed with a proposed project where the ratio of the value the project adds to the firm over the cost of the assets to implement it is lower than the firm's current Q even where this proposed project's ratio is positive, i.e., where the addition to value exceeds the cost of the needed resources. Tobin's Q is still, however, a reasonable way of looking at a period of time to see which firms on average did better at creating value and which did worse. It is widely used in this fashion because it is hard to create a test that identifies both the capacity of management to identify the greatest value-creating projects and the willingness to go just to the margin, i.e., to implement all of the expected value-increasing projects and none of the expected value-decreasing projects. Growth in share price is not a reliable measure, for example, because the initial price already incorporates the market's then-current assessment of management's capacity to find value-creating projects and willingness to implement them just up to the margin. Where the question under study is the effect of a particular corporate governance provision on firm generation of value, something amenable to testing by an event study, endogeneity issues often arise. In other words, did the adoption of the provision result in a change in value, or did some other circumstance that affects value induce the adoption of the provision?

[36] *See, e.g.*, Bebchuk, Cohen & Ferrell, *supra* note 8, at 796.

[37] *See id.* at 800.

[38] *See id.* at 801-03.

[39] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 823 (finding that E index score is negatively correlated to Tobin's Q rating); Gompers, Ishii & Metrick, *supra* note 8, at 144 (finding that G index is negatively correlated to Tobin's Q rating).

[40] *See infra* Section III.E.

[41] Karpoff, Schonlau & Wehrly, *supra* note 13, at 1-16, reviews this literature.

situations where there is greater information asymmetry between insiders and the market concerning management quality. In this Part, we explore the reasoning behind our hypothesis. We then test this hypothesis empirically in Part III.

A.   *Three Theories Explaining the Observed Relationship Between a Favorable Index Rating and Value Creation*

Three possible (and clearly not mutually exclusive) theories predict the observed relationship between a firm's governance rating and its Tobin's Q. The first theory is that a governance structure with a better rating leads over time to a firm having higher-quality managers than if it had a structure with an inferior rating: governance structures with better ratings serve as a filter to select better-quality managers. The second theory is that managers, regardless of their skills, are better motivated and informed when operating under a more highly rated governance structure. Under the first theory, a better-rated structure causes better managers to be chosen; under the second, it makes those chosen perform better whatever their skill level. The third theory, and the focus of this Article, reverses the direction of causation: a firm's governance structure can be a credible signal of the quality of its managers.

All three theories plausibly help explain the relationship between governance ratings and Tobin's Q, but, for reasons discussed below, the signal's impact will be particularly strong when a rating-altering change in structure, whether positive or negative, occurs in a context involving greater information asymmetry concerning management quality. This third theory gains empirical support from our empirical findings reported in Part III.

1.   Filtering for Management Quality

The first explanation is that over time a highly rated governance structure does a better job at filtering out bad managers through monitoring and discipline than does a poorly rated structure.[42] The result is that, over time, a firm with a better governance structure chooses better managers, who create more value because they make better decisions concerning both new investment projects and how to utilize the firm's existing productive capacity.[43] Thus, they create more shareholder value, which will be reflected in a higher Tobin's Q.[44]

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[42] *See* Gompers, Ishii & Metrick, *supra* note 8, at 131 (proposing the inverse explanation—that low-rated governance structures cause inefficient operation and difficulty replacing bad managers).

[43] *See id.*

[44] From this perspective, the six entrenchment attributes that compose the E index are a last line of defense. Really good governance acts internally through devices such as a requirement that a majority of the board be independent, resulting in bad managers being weeded out before outsiders can observe the opportunity for improvement. These six entrenchment attributes, which facilitate capital market policing of management, serve as a subsequent backstop if the other devices fail.

2.   Better Incentivized and Informed Managers

A second explanation for the governance structure-performance link is that a highly rated governance structure may provide greater incentives for a firm's CEO and other managers to make the right decisions. That is, whatever the quality of a firm's managers, a highly rated governance structure causes these managers to make better decisions. For example, a governance structure that makes a firm more open to hostile takeovers provides managers greater incentive to perform well (and vice versa). This is because the alternative—performing poorly—is more likely to result in their losing their jobs.

A highly rated governance structure also may provide information and voice to others; for example, to independent directors or activist shareholders, who can improve the quality of firm decision-making through, respectively, monitoring of management's decision-making or providing directors information that otherwise might not be available to them.[45] To illustrate, the recent phenomenon of activist investors providing companies with a detailed alternative strategic plan, often set out in a (very) large PowerPoint deck, may give boards, managers, and the market information that they otherwise would not have because of the cost of undertaking a detailed strategic review.[46] Fewer structural barriers to a tender offer or proxy contest, which translate into a better governance rating under the G and E indices, provide an incentive for activists to make the effort. Operating decisions based on better information and the imposition of discipline on the decision-making process should result in better decisions that lead to greater shareholder value by more and less talented managers alike.

3.   Signaling Management Quality

Each of the first two explanations—more effectively filtering out bad managers; and better motivating, monitoring, and informing managers of all ability levels—directly affect the quality of firm decision-making; it is this direct increase in decision quality that results in the higher Tobin's Q. In turn, worse governance protects bad managers and results in worse performance.

The third possible explanation for the observed relationship between good corporate governance index scores and higher Tobin's Qs is the signaling theory that is at the center of our empirical analysis.[47] As previously described, a

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[45] *See* Ronald J. Gilson & Jeffrey N. Gordon, *Agency Capitalism: Further Implications of Equity Intermediation*, *in* RESEARCH HANDBOOK ON SHAREHOLDER POWER 42-43 (Jennifer G. Hill & Randall S. Thomas eds., 2015) [hereinafter Gilson & Gordon, *Equity Intermediation*] (presenting activist investors as key providers of information and proposals for strategic changes); Ronald J. Gilson & Jeffrey N. Gordon, *The Agency Costs of Agency Capitalism: Activist Investors and the Revaluation of Governance Rights*, 113 COLUM. L. REV. 863, 872 (2013).

[46] *See* Gilson & Gordon, *Equity Intermediation*, *supra* note 45, at 42 (stating that the more thorough and compelling activist investor proposals are, the more seriously they are taken).

[47] *See infra* Part III (testing signaling theory).

signaling theory involves a very different mechanism than the first two.[48] Instead of a higher-rated governance structure leading to higher-quality managers as in the first theory or influencing the performance of managers of all ability levels as in the second theory, the direction of causation in the third theory is reversed. Under this theory, high-quality managers choose a highly rated governance structure for their firm—one that does not protect them—because doing so shows that they have less to fear than do the low-quality managers from the structure's lower level of protection from market discipline and greater monitoring of other kinds. In turn, the change to a lower-rated governance structure provides negative information about managers' quality. The governance structure chosen, which is observable by the market, thus conveys information about management quality, something that is not directly observable.

B.   *Exploring the Signaling Hypothesis*

This Article's signaling hypothesis is that a change in a firm's governance structure can be a credible signal of managerial quality and that this signal is stronger in periods when there is a greater asymmetry of information concerning management quality between the firm's insiders and the market. This hypothesis rests on the fact that managers play a major role in shaping the governance structures to which they are subject because changes in these structures usually come at their initiative.[49] Under this hypothesis, their choice of a governance structure—whether it is one that is better-rated or more poorly rated—provides the market with credible information about a value-relevant but not fully observable firm characteristic: management quality.

1.   The Information Asymmetry Between the Market and Corporate Insiders Concerning Management Quality

To see the value of a credible signal concerning management quality, consider what other characteristics are available to help the market assess management quality. Managers' education and experience are observable, but they are noisy predictors of future performance.[50] Past firm performance is also observable, but it too is a noisy measure of management quality because a cacophony of other elements combine with management quality to affect firm performance in any given year.[51] These other elements include external factors, such as overall industry demand, the success of a firm's competitors, and, importantly, simple luck. While, on average, good past performance indicates high-quality management, it does not necessarily do so in any particular case, especially in

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[48]   *See supra* Introduction (introducing signaling theory).

[49]   *See* Gompers, Ishii & Metrick, *supra* note 8, at 107.

[50]   Michael Spence, *Job Market Signaling*, 87 Q.J. Econ. 355, 356-58 (1973) (developing signaling concept).

[51]   *See id.* at 356-60.

the short run when, as noted, good luck and good judgment can combine in proportions that are difficult for the market to observe.[52]

2.   How Corporate Governance Can Act as a Credible Signal to Reduce Information Asymmetry

A firm's managers have, in the first instance, a much better sense of their own quality than does the market. The question is: How does a change in governance structure signal this information to the market? The analysis differs depending on whether the change is to a better- or worse-rated structure.

High-quality managers would like to communicate to the market that they are high quality. Doing so directly—say, by announcing "we are high quality"—is not very credible, however.[53] Talk is cheap, and therefore, it is just as easy for low-quality managers to say the same thing. Managers (like the rest of us) often do not disclaim responsibility for good performance or accept it for bad performance.

For high-quality managers, the signal that is needed is some indirect evidence of managerial quality—a signal that would be costlier for a low-quality manager to undertake than a high-quality one. The fact that this positive signal is costlier for low-quality managers is what makes it credible: because of the higher cost, low-quality managers are less likely to send the signal.[54]

A firm's governance structure, we argue, can constitute just such a signal. Our hypothesis as to why is as follows: The market knows that managers play a major role in shaping the governance structure to which they are subject. It also knows that when a bad manager is subject to a governance structure that exposes her to greater market discipline and other monitoring, she faces a greater risk of losing her job than does a good manager subject to the same governance structure. Therefore, it would be costlier for a bad manager to choose such a structure than for a good manager to do so. The G and E indices assign better governance ratings to governance structures that result in greater market discipline and other monitoring.[55] Thus, a change to a more highly rated governance structure is a

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[52] *Id.*

[53] *See generally* Bengt R. Holmstrom & Jean Tirole, *The Theory of the Firm*, *in* 1 HANDBOOK OF INDUSTRIAL ORGANIZATION 82 (Richard L. Schmalensee & Robert D. Willig eds., 1989) (stating that managers cannot effectively communicate project value by simply stating their view).

[54] The seminal article concerning signaling theory is Spence, *supra* note 50, at 355 (analyzing signaling theory in context of job markets). It was first applied in the context of dealing with adverse selection in capital markets in Stephen A. Ross, *Disclosure Regulation in Financial Markets: Implications of Modern Finance Theory and Signaling Theory*, *in* ISSUES IN FINANCIAL REGULATION 177 (Franklin R. Edwards ed., 1979). *See also* John G. Riley, *Silver Signals: Twenty-Five Years of Screening and Signaling*, 39 J. ECON. LITERATURE 432, 433-36, 467-73 (2001) (providing background on signaling theory and its applications in finance).

[55] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 788-95; Gompers, Ishii & Metrick, *supra* note 8, at 114-19.

positive signal that the managers believe they are of good quality. It would be costlier for bad managers to make such a change: it would increase the bad managers' risk of job loss more than the same change would increase the good managers' risk of job loss.

The signaling analysis is different, and easier, when the signal is a negative one: a change to a lower-rated governance structure. Firm managers who are doing a poor job are also likely to know more about how poorly they are doing than does the market. Fearing, for example, that potential acquirers or activist hedge funds will soon figure out what a poor job they are doing, managers make changes in their governance structures that provide more protection against a potential takeover—an action that worsens their index ratings.[56] In this situation, the change in governance structure sends to the market a facially credible, negative signal concerning management quality. Firms with better managers will be less inclined to make such a change because they are in less need of the protection. In other words, better managers are not inclined to "jam" the negative signal associated with a lower-scoring governance structure.[57] Again, a negative signal is inherently credible because good managers have no reason to falsely present themselves as poor managers. The credible signal arising from a change to either a more or a less favorably rated governance structure is information that affects the company's stock price, which in turn moves the company's Tobin's Q.[58]

This kind of signaling theory has important antecedents in the corporate governance and finance literature concerning how capital structure decisions can serve as signals.[59] The logic underlying a positive signal through a capital structure decision is that an increase in debt increases the risk of bankruptcy.[60] Bankruptcy, in turn, is costly to managers: the value of their job-related human capital, which is not diversified, is reduced if the company fails and they lose their jobs.[61] For any given level of debt, bankruptcy is less likely for good managers than bad managers, so when managers increase the amount of debt in

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[56] *See* Gompers, Ishii & Metrick, *supra* note 8, at 108-10 (noting that managers often impose defensive governance measures when they fear hostile takeover bids or other governance challenges).

[57] *See* Riley, *supra* note 54, at 457 (discussing "signal jamming," whereby an uninformed party is aware of an informed party's signal equilibrium strategy).

[58] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 785 (finding that unfavorable entrenching governance provisions correlate with lower firm valuation); Gompers, Ishii & Metrick, *supra* note 8, at 107 (finding that defensive corporate governance provisions correlate strongly with stock price).

[59] *See, e.g.*, Holmstrom & Tirole, *supra* note 53, at 78-86 (discussing managers' incentives and signals gleaned from their actions in context of capital structure decisions).

[60] *See id.*

[61] *Id.* at 94-95.

their company's capital structure, they credibly signal their own quality. The signal would be too costly to bad managers for it to be in their interest to fake.[62]

3.   The Noisiness of the Signal and Relative Reliability of Other Information

Although a change in a firm's governance structure can serve as a negative or positive signal of managerial quality, the signal is noisy information.[63] In part, this is because many other factors also play a role in determining a particular firm's governance structure. Moreover, as the index study critics argue, some attributes scored in the indices may in fact have no impact on firm performance.[64] Accordingly, if one firm, simply because of its scores with respect to such unimpactful attributes, has a better rating than another firm, this would not mean that the first firm is any better at value creation. Of course, if the first firm had a better (worse) rating due to differences in the attributes that do have impact, the rating would properly suggest a greater (lesser) capacity at value creation.[65]

These sources of noise, however, do not entirely eliminate the information content of governance structures that earn different ratings. A firm's rating on average does say something about the quality of its management, but it does so in a noisy way.[66] To combat these noise problems, scholars use large samples, in which other effects tend to cancel each other out, as well as control variables.[67] As discussed in Part I, repeated tests show there is a relation between a firm's index rating and measures of its value creation—a relationship confirmed by our own findings.[68] Thus our hypothesis is not that the differently scored governance structures result in what economists call a separating equilibrium—i.e., that they make entirely observable the differences in quality between competing management teams. Rather, we require only that they provide the market credible, but otherwise unavailable, information even if the signal is noisy.

For a feature that is not directly observable, such as managerial quality, the less reliable the information concerning the feature apart from the signal, the greater the value of the information contained in an even very noisy signal. So, we posit that the increased information asymmetry concerning management

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[62] *See id.* at 78-86 (examining broad array of signals communicated to shareholders when managers adjust capital structure).

[63] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 799 (arguing that governance indices contain significant amounts of "noise").

[64] *See, e.g.*, Coates, *supra* note 11, at 283-86 (contending that adoption of poison pill has no effect on firm value).

[65] *See* Klausner, *supra* note 10, at 1363 ("[E]ach noncausal element in the index introduces a hook for spurious correlation or correlation with no potential causation.").

[66] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 799.

[67] *See* Gompers, Ishii & Metrick, *supra* note 8, at 110-14 (justifying noise produced by large data set used in study).

[68] *See infra* Section III.E.

quality associated with the Millennial accounting scandals made the signal associated with a firm's governance structure, though still noisy, more valuable. In other words, these scandals lowered the market's confidence in *all* companies' financial statements, and so when this other information is viewed as less reliable than it would be in normal times, the signal sent by a firm that changes its governance structure would have a higher effect on a firm's share price and hence on its Tobin's Q.[69] This is confirmed by our findings reported in Part III.[70] Similarly, we would expect that this signal would be of more value with types of firms in which, as a general matter, the information asymmetry concerning the quality of management is greater—for example, firms with high R&D spending. The findings reported in Part III support this hypothesis as well.

As is by now apparent, the power of a signal is not simply a function of the signal's credibility in the abstract—its own signal-to-noise ratio.[71] Rather, the credibility, and therefore the impact, of a governance signal depends centrally on context—the level of noise absent the signal. This idea finds support in recent efforts to assess the value of a potential but very noisy signal relating to a different aspect of corporate performance. Professors Amiraslani, Lins, Servaes, and Tamayo sought to test the link between a company's trustworthiness—a form of management quality—and its access to the bond market.[72] Because a company's trustworthiness is not directly observable, it was measured by a signal: a firm's environmental, social, and governance expenditures, i.e., its level of "corporate social responsibility" ("CSR") activity expenditures.[73] Socially responsible companies, the authors hypothesized, are more trustworthy—less likely to take advantage of lenders when circumstances like the financial crisis made doing so possible. Its bond market access was measured by secondary market bond spreads.[74] Over their full sample period of the years 2005-2013, the authors found no statistically significant relation between

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[69] *See infra* Section III.A (discussing Millennial accounting scandals).

[70] *See infra* Part III.

[71] It should be noted, however, that some of the governance structure changes are in fact not all that noisy. For example, the most common action that changed a company's index score during the scandal period was the adoption of a "clear day" poison pill—one that is not a response to an immediate threat of a hostile tender offer or other control change. *See infra* Section III.E.5. This is a clear negative signal of management quality because managers lack reasonable incentives to adopt a pill in the absence of a threat of a hostile offer or an activist investor initiating a proxy fight. High-quality managers would have no incentive to "jam" the signal—to pretend that they have the negatively signaled characteristic—because a high-quality manager would not take a governance action that suggests that she is less talented than can otherwise be observed.

[72] Hani Amiraslani et al., *The Bond Market Benefits of Corporate Social Capital* 6 (European Corp. Governance Inst., Finance Working Paper No. 535/2017, 2018), https://ssrn.com/abstract=2978794 [https://perma.cc/J7FW-QJJG].

[73] *See id.* at 4.

[74] *Id.* at 11.

corporate bond spreads and this CSR measure.[75] This is hardly surprising; the literature is clear that the various CSR measures in use are, to put it kindly, very noisy signals as to managerial trustworthiness.[76]

The results are strikingly different, however, for the August 2008 through March 2009 sub-period within the full sample period—the months constituting the height of the financial crisis.[77] The authors report that their "results are unambiguous: during the [financial-crisis-induced] crisis of trust, secondary market credit spreads of high CSR firms did not rise as much as the spreads of low-CSR firms."[78] They "conclude that corporate social capital [as measured by CSR] affects bond contracting and pricing when it matters most: when there is a crisis of trust and bondholders seek reassurance that they will not be expropriated."[79] In other words, there was a great increase in interest concerning companies' trustworthiness because the crisis created an opportunity for untrustworthy firms to disadvantage their lenders.[80] Under these circumstances, information concerning the trustworthiness of a firm's management became sufficiently more valuable such that CSR scores, *despite their very considerable noisiness*, became reflected in the market in a statistically significant way.[81]

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[75] *See id.* at 13-15.

[76] For example, CASEY O'CONNOR & SARAH LABOWITZ, N.Y.U. STERN CTR. OF BUS. & HUMAN RIGHTS, PUTTING THE "S" IN ESG: MEASURING HUMAN RIGHTS PERFORMANCE FOR INVESTORS 16-25 (2017), demonstrates the difficulty in constructing a reliable rating system, focusing on the social component of the environment, social, and governance factors and assessing twelve existing measurement techniques. Given the range of factors necessary to construct a rating structure and the fact that different investors will weigh different environment, social, and governance factors differently, it is not surprising that there are many ratings systems. A recent study prepared for the U.S. Department of Labor and addressed to pension funds reviews the literature. *See* OGECHUKWU EZEOKOLI ET AL., SUMMIT CONSULTING, LLC, ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) INVESTMENT TOOLS: A REVIEW OF THE CURRENT FIELD 35-38 (2017).

[77] *See* Amiraslani et al., *supra* note 72, at 16-20 (analyzing CSR and credit spreads during financial crisis).

[78] *Id.* at 6.

[79] *Id.*

[80] *See id.*

[81] Two recent papers show a similar contextual relationship between governance and performance using an empirical design similar to ours. Karl V. Lins, Henri Servaes & Ane Tamayo, *Social Capital, Trust and Firm Performance During the Financial Crisis*, 72 J FIN. 1785 (2017), and Mattawut Jenwittayaroje & Pornsit Jiraporn, *Do Independent Directors Improve Firm Value? Evidence from the Great Recession*, 19 INT'L REV. FIN. 207 (2019), examined whether two different governance characteristics—the presence of independent directors and a firm's social capital—affected the firm's performance. Both found that these governance characteristics had a positive and statistically significant impact on firm performance during the financial crisis, when stress reduced the value of existing information, but had no impact outside the crisis period. *See* Lins, Servaes & Tamayo, *supra*, at 1788; *see also* Jenwittayaroje & Jiraporn, *supra*, at 211.

This pattern matches our results with respect to the Millennial accounting crisis: corporate governance changes operate as a powerful signal of management quality in just those circumstances, when uncertainty over management quality is highest, and so the value relevance of additional information conveyed by governance changes outweighs its noise. It has significantly less impact, however, in the periods before and after the crisis.[82] This does not mean that the signal becomes less noisy; rather, we posit that the value of the signal goes up because the increased information asymmetry with regard to managerial quality makes a governance structure change more valuable as a signal despite its noise.[83]

4.   The Value of a Governance Structure Change as a Signal

Recognizing how the impact of the governance signal, though noisy, went up during the period of increased information asymmetry accompanying the Millennial accounting scandals helps elucidate one other factor in our account: we would expect that a *change* in governance structure resulting in a particular rating represents a more valuable signal concerning managerial quality than does a *continuation* of a structure with that same rating from prior periods. In contrast to the other two theories linking index scores with Tobin's Q—filtering and incentives/informedness—the signaling theory does not concern how the governance structure affects the value-creation capacity of the firm.[84] Rather, in this third theory, the value-creation capacity of the firm is taken as given.[85] The problem is that this value-creation capacity is not fully understood by the market.[86] One important but not fully understood factor affecting the firm's value-creation capacity is the quality of the firm's management. The firm's governance structure provides information concerning this factor.

The quality of a firm's management can change from time to time, sometimes substantially. Turnover in management personnel is one potential source of such quality change. But a change in quality can happen as well without a personnel change. For example, the perspectives of the incumbent personnel can become outmoded, and this can sometimes happen quite rapidly in a dynamic economy in which the management skills necessary to success can be subject to sudden dramatic shifts. Most notably, Professor Clayton Christensen's influential explanation for sharp disruptions in the success of industry leaders highlights just this point.[87] In its current popular sense, the term "disruption" reflects the capacity of a new idea, most familiarly deployed by a new company, to fundamentally alter the structure of a product market to the advantage of the

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[82] *See infra* Section III.E.

[83] *See infra* Section III.E.

[84] *See supra* Sections II.B.1 to .2.

[85] *See supra* Section II.B.3.

[86] *See supra* Section II.B.3.

[87] Clayton M. Christensen, The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail 207-10 (1997).

newcomer over the incumbent leaders in that market. Managers whose skills fit well the prior competitive environment do not fit the new one; effective management quality drops without either a change in managerial personnel or a change in their current skills. Indeed, where a new competency is required, existing management's tried-and-true experience actually may be a disadvantage; they must first unlearn the old ways of thinking and doing things before they can learn the new ways.[88]

Because managerial quality—management "fit" may be a better term here—can in this sense change quite suddenly, and because, at the same time, it is not directly observable, there will at any point in time be a high level of information asymmetry as to whether such a quality change has occurred recently, and if so, the extent of the change. Over time, this asymmetry is reduced as performance results accumulate and become more reliable indicators of whether, at that earlier point, there in fact had been a change in quality.

Against this background, it is apparent why a governance structure change resulting in a given new rating represents a more valuable signal concerning the current quality of management than does the continuation of a governance structure that receives this same rating. Suppose that in a hypothetical Period One there is an index-rating-altering change in a firm's governance structure. The high level of information asymmetry concerning whether or not there has been a recent change in the firm's management quality gives value to the signal coming from the governance structure change. Still, this is a noisy signal. In other words, on average, it suggests something about a change in managerial quality, but, in any individual case, there well may not have been such a change in quality. Over time, more information arrives as to whether this signal correctly indicated a change in managerial quality during or recently prior to Period One. Thus, in Period Two, the information asymmetry diminishes concerning whether in fact a managerial quality change did occur during, or recently prior to, Period One. In Period Three it diminishes further, and so on. Generalizing, a firm that is continuing its same governance structure during the current period is one that adopted this structure in some prior period, quite possibly many periods back. This means that the fact that a firm adopted a particular governance structure at some point in the past and did not change during the current period (i.e., that it is continuing its already-established governance structure) has less value in revealing to the market the quality of the firm's management today than would a current-period change to this same structure.

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[88] Rebecca Henderson, *The Innovator's Dilemma as a Problem of Organizational Competence*, 23 J. PRODUCT INNOVATION MGMT. 5, 6-10 (2006), provides a useful survey of alternative mechanisms that may give rise to a reduction in management quality without a change in the persons constituting management or in their existing skills. For a description of the difficulty that the mainline electronics firms had in recognizing the potential of semiconductors, which subsequently became the heart of the whole information technology revolution, see MERRITT B. FOX, FINANCE AND INDUSTRIAL PERFORMANCE IN A DYNAMIC ECONOMY: THEORY, PRACTICE AND POLICY 290-97 (1987).

III.   TESTING THE SIGNALING HYPOTHESIS

The three theories addressing the observed relationship between firms with more highly rated governance structures and Tobin's Q are not by their terms mutually exclusive. The existing studies that show this relationship, however, do not allow us to distinguish whether one, two, or all three of the theories in fact are at work.[89] Here we begin to sort out this question by showing that, at least under the right circumstances, the signaling hypothesis is consistent with powerful empirical results. The other two theories may also help explain the relationship—indeed we think that this is likely—but our findings fairly definitively show that at least the third theory is at work.

Our starting point is a time period when the market was unusually uncertain about the quality of the managements of individual U.S. firms, and so new information concerning management quality was especially value relevant.[90] According to our hypotheses, if we observe that firms that changed their governance index ratings during such a period experienced larger changes in Tobin's Q than did firms that made similar changes in other years, then signaling was likely to have been at work. The idea is straightforward: if an action has a bigger effect on stock prices, and hence Tobin's Q, in periods when the market is otherwise less informed, the action must be something that provides information to the market. As documented below, the three-year period of 2000-2002 was otherwise less informed. During this period, the United States was rocked by a series of corporate accounting scandals affecting large respected firms. These scandals called into question the reliability of the earnings reports of all the nation's public companies and hence of the market's assessments of management quality of all these firms. The market reasonably wondered whether there were more shoes still to drop that would reveal as additional managers to be low quality who were previously thought to be capable.

We report two key findings with respect to this period. First, the impact on the Tobin's Qs of firms that *changed* their structures in 2000-2002 was *substantially greater* than for firms that changed their structures in the twelve years surrounding this period.[91] Second, the overall relation between firm index ratings and Tobin's Q, measured across all firms (which includes the vast majority that did not change their governance structures), is *not* significantly different during the 2000-2002 period than in the other twelve years. This second finding suggests that the market did not think that a governance structure with a higher rating was any more effective at *creating* extra value during the scandal period than in normal times, or at least it was not sufficiently more effective to generate a statistically significant difference. In other words, the second finding shows there is no significant evidence that either of the first two theories explaining the positive relation between good governance ratings and Tobin's

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[89]   *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 823.

[90]   *See infra* Section III.A.

[91]   *See infra* Section III.E.

Q—filtering out bad managers or better incentivizing and informing managers generally—was working differently in the 2000-2002 period than in other years.

This leaves the third explanation—signaling—to explain why governance changes in the 2000-2002 period had a markedly greater impact on Tobin's Q than in the surrounding twelve years. If signaling does in part explain the relationship between governance ratings and firm value, one would expect to see a bigger effect when there is more doubt about the subject of the signal—managerial quality. This is exactly what we see.[92]

A. *The Millennial Accounting Fraud Scandals*

The 2000-2002 period was special in U.S. corporate history because of the unprecedented cascade of accounting frauds that were revealed. In the years immediately preceding these revelations, there appears to have been a buildup, unknown to the market, of undisclosed frauds.[93] One possible reason for this buildup was a proliferation of short-time-horizon, share-price-based executive compensation packages, which created greater incentives for manipulating the numbers as well as for genuinely better performance. Another was an apparent decline over the preceding years in the effectiveness of the various gatekeepers, such as accountants, rating agencies, investment banks, and lawyers, who are

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[92] This story can be refined, but the basic message remains unchanged. During the 2000-2002 period, the economy experienced three other significant events beyond the wave of accounting scandals: the dot-com bust as reflected in the March 2001 NASDAQ market crash; the beginning of a recession in March 2001; and the September 11, 2001, World Trade Center terrorist attacks. These kinds of event-driven pressures on a firm's business environment raise questions about existing strategies and generally disrupt business as usual. By increasing the choices confronting a company, such events should make the quality of management more important. *See* Edward G. Fox, Merritt B. Fox & Ronald J. Gilson, *Economic Crisis and the Integration of Law and Finance: The Impact of Volatility Spikes*, 116 COLUM. L. REV. 325, 344 (2016). If, as we would expect, management quality became more important to the market in the 2001-2002 period, we would expect an accentuation of the effects of good ratings on Tobin's Q that are at the heart of the first two theories. Our second finding—that the overall relation between firm index ratings and Tobin's Q, measured across all firms, is not significantly different during the 2000-2002 period than in the other twelve years—means that we do not have empirical support for that expectation. This could mean that our tests lack the power to detect the accentuation that we would expect, rather than that it did not occur. The important point is that tests with similar power are behind our first finding of a large increase in the impact on Tobin's Q from firms that changed structure when comparing the 2000-2002 period to the other twelve years. So these other events in the economy and their effects on the workings of the first two theories cannot explain much of our first finding, which leaves the third theory—signaling—as the likely explanation.

[93] *See* JOHN C. COFFEE, JR., GATEKEEPERS: THE PROFESSIONS AND CORPORATE GOVERNANCE 15-16 (2006) (reviewing hundreds of U.S. corporations that restated financial statements and were sued by Securities and Exchange Commission in 2001 and 2002).

supposed to help protect capital markets against fraud.[94] Warren Buffett is famously quoted as saying, "[Y]ou only find out who is swimming naked when the tide goes out"[95]; the recession that hit the country shortly after the beginning of the new millennium seems to have made observable a buildup of accounting fraud. Some of the most prominent and, at the time, respected corporations in the country, including Enron, WorldCom, HealthSouth, and Adelphia, were severely damaged or destroyed by senior management's fraudulent behavior involving material misstatements or omissions about firm performance in the company's financial statements.[96] Each of these scandals warrants a brief history to show why they spread doubt across the rest of corporate America.[97]

1.   Enron

Enron was the poster child for the phenomenon. In August 2000, Enron's stock peaked at nearly ninety dollars per share, and the company had been listed as America's most innovative firm for five consecutive years.[98] The company had been repeatedly touted as having impressive management and among the best boards of directors.[99] In a year's time, following the revelation of massive fraud, Enron would enter Chapter 11 bankruptcy as the largest bankruptcy filing in American history.[100]

Perhaps most famously, Enron sponsored hundreds of special purpose entities ("SPEs") that it claimed insured it against the downside risks associated with many of the assets it acquired. In the typical transaction, Enron would

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[94] *See* Merritt B. Fox, *Gatekeeper Failures: Why Important, What to Do*, 106 MICH. L. REV. 1089, 1091-93 (2010) (expanding on Professor Coffee's conception of gatekeeper failure by connecting such failures to broader defects in governance).

[95] Letter from Warren Buffett, Chairman, Berkshire Hathaway Inc., to the Shareholders of Berkshire Hathaway Inc. 10 (Feb. 28, 2002), http://www.berkshirehathaway.com/letters /2001pdf.pdf [http://perma.cc/QUJ7-X8PG].

[96] *See* COFFEE, *supra* note 93, at 15 (recounting a "stunningly complete breakdown in all systems of internal control and external monitoring" among prominent U.S. corporations).

[97] For an extensive list of companies faced with accounting scandals from 2001-2002, including Bristol-Myers Squibb, Merck, Tyco, and Xerox, see Penelope Patsuris, *The Corporate Scandal Sheet*, FORBES (Aug. 26, 2002, 5:30 PM), http://www.forbes.com /2002/07/25/accountingtracker.html [https://perma.cc/4QH4-9EFB].

[98] William W. Bratton, *Enron and the Dark Side of Shareholder Value*, 76 TUL. L. REV. 1275, 1276 (2002) ("Enron flew high. When its stock price peaked at close to ninety dollars in August 2000, it was America's seventh largest firm by market capitalization.").

[99] *See* Jeffrey A. Sonnenfeld, *What Makes Great Boards Great*, HARV. BUS. REV., Sept. 2002, at 106, 108 ("[N]o corporation could have had more appropriate financial competencies and experience on its board [than Enron]."). Less than a year before Enron declared bankruptcy, Fortune Magazine ranked the company second in "quality of management" among all U.S. corporations. *See* COFFEE, *supra* note 93, at 18 (outlining Enron's six-year stretch of winning "every conceivable award").

[100] Bratton, *supra* note 98, at 1276.

inappropriately capitalize the SPE with its own stock.[101] The SPE would provide Enron with a put, whereby Enron had the right to sell the asset to the SPE for a specified price.[102] This arrangement had an inherent problem: if the value of the asset and the value of Enron stock both fell, then the SPE would not have sufficient assets to make the purchase at the exact moment when the protection of the put against downside risk would be most important.[103] Moreover, even if the SPE did manage to perform, Enron had created an arrangement that in effect violated a fundamental accounting principle: that proceeds from the issuance of new equity should not be counted as earnings.[104] Investors in Enron were unaware of the endogenous nature of these SPE arrangements.[105]

Enron "stretched the limits of accounting"[106] in other ways as well. Enron valued certain of its varied assets on a "mark-to-market" basis in a way that allowed the company to recognize as current income what was really just forecasted future income on a long-term contract.[107] In July 2000, for example, Enron entered into a twenty-year partnership with Blockbuster Inc. to develop a company that would provide films to customers through Enron's fiber-optic cables.[108] Enron assigned a $124.8 million value to the partnership based on its projection of future revenues and, based on these long-run expected profits, reported an additional $53 million in current earnings in the last quarter of 2000 and $58 million in the first quarter of 2001. In contrast, Blockbuster recorded no profits from the deal for those quarters.[109] The partnership was ultimately dissolved in October 2001, and Enron had to reverse the earlier reported earnings.[110]

Beginning in 2001, Enron's stock began to decline for reasons unrelated to the accounting fraud, which had yet to be detected.[111] The declining share price, among other things, left the SPEs with negative equity, and in October 2001

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[101] *See* Steven L. Schwarcz, *Enron and the Use and Abuse of Special Purpose Entities in Corporate Structures*, 70 U. CIN. L. REV. 1309, 1310 (2002) (explaining Enron's method of relying on rising stock prices to avoid paying guarantees on SPE value).

[102] *Id.*

[103] *See id.* at 1315-16.

[104] *See* Paul M. Healy & Krishna G. Palepu, *The Fall of Enron*, 17 J. ECON. PERSP., Spring 2003, at 3, 10-11 (listing ways in which Enron shirked accounting rules and principles).

[105] *See id.* at 11 (stating that, while investors were aware of SPEs' existence, they were not aware that SPEs were guaranteed entirely with Enron stock).

[106] *Id.* at 9 (stating that Enron reported as current earnings contracts extending decades into future).

[107] *Id.*

[108] *Id.* at 10 (explaining large "Project Braveheart" deal between Enron and Blockbuster); *see also* George J. Benston & Al L. Hartgraves, *Enron: What Happened and What We Can Learn From It*, 21 J. ACCT. & PUB. POL'Y 105, 116 (2002).

[109] Benston & Hartgraves, *supra* note 108, at 116 (highlighting disingenuity of Enron's accounting practices).

[110] *Id.*

[111] Bratton, *supra* note 98, at 1322.

Enron was forced to announce that it had violated a variety of accounting standards.[112] As a result of these accounting revisions, the company restated its financial statements for years 1997 to 2000, reducing total earnings by $613 million, increasing liabilities by $628 million, and removing $1.2 billion of shareholder equity.[113] Only two months later, Enron filed for bankruptcy with assets of $63.4 billion, marking the largest restructuring in U.S. history.[114]

Enron's failure and the inability of its information gatekeepers—namely the auditors, rating agencies, and investment banks—to detect the financial malfeasance[115] would effectively "call[] the entire American market's integrity into question."[116] Similarly, commentary at the time by prominent academics saw Enron as illustrative of more general problems. Professors Healy and Palepu noted that "the problems of governance and incentives that emerged at Enron can also surface at many other firms and may potentially affect the entire capital market."[117] Professor Jeffrey Gordon questioned whether "[t]he real concern is that the gross overreaching at Enron is symptomatic of troubling if not egregious behavior elsewhere."[118]

2.   WorldCom

WorldCom's accounting fraud was less sophisticated than Enron's but had similar consequences. WorldCom's CEO and CFO (Bernard Ebbers and Scott Sullivan, respectively) were widely regarded as "one of the best executive pairings in American business."[119] Between 1985 and 2001, WorldCom acquired more than seventy companies for over $100 billion. This included its 1998 merger with MCI Communications in a transaction valued at $37 billion, at the time the largest merger in history.[120] By 2001 it was the nation's second

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[112] Healy & Palepu, *supra* note 104, at 11.

[113] *Id.*

[114] Benston & Hartgraves, *supra* note 108, at 106.

[115] *See* COFFEE, *supra* note 93, at 15-16 (arguing that gatekeepers' inability to detect wrongdoing was often caused by willful ignorance of "sentries upon whom investors relied").

[116] Bill Mann, *Outraged Over Enron*, MOTLEY FOOL (Jan. 17, 2002), http://www.fool.com /news/foth/foth020117.htm [https://perma.cc/H3N5-LM23].

[117] Healy & Palepu, *supra* note 104, at 4.

[118] Jeffrey N. Gordon, *What Enron Means for the Management and Control of the Modern Business Corporation: Some Initial Reflections*, 69 U. CHI. L. REV. 1233, 1249 (2002).

[119] Arthur E. Wilmarth, Jr., *Conflicts of Interest and Corporate Governance Failures at Universal Banks During the Stock Market Boom of the 1990s: The Cases of Enron and WorldCom*, *in* CORPORATE GOVERNANCE IN BANKING: A GLOBAL PERSPECTIVE 113 (Benton E. Gup ed., 2007).

[120] *See* J. Randel Kuhn, Jr. & Steve G. Sutton, *Learning from WorldCom: Implications for Fraud Detection Through Continuous Assurance*, J. EMERGING TECHS. ACCT., Dec. 2006, at 61, 63 (stating that merged entity was so large that it controlled over half of world's emails).

largest long-distance telephone company and its largest provider of internet services.[121]

WorldCom maintained its capacity to provide long distance phone service in part by entering into long-term leases to use the lines of other telecom firms.[122] These leases would often require WorldCom to make fixed monthly payments regardless of utilization. By 2000, these line costs were WorldCom's largest expense item and represented nearly half of its operating costs.[123] Analysts and commentators of the telecommunications industry focused heavily on the line cost expenditure-to-revenue ("E/R") ratio as an important performance indicator.[124] Over this period, WorldCom consistently recorded an E/R ratio of 42%—significantly lower than its competitors'—that it struggled to maintain as market conditions tightened, and ultimately did so through fraud.[125]

WorldCom's accounting fraud took two principal forms—an understatement of its line costs and an exaggeration of its revenues—with the objectives of anchoring the E/R ratio at 42% and reporting double-digit revenue growth.[126] WorldCom manipulated its line costs by improperly releasing accruals set aside on its financial statements to pay anticipated bills in the future.[127] These accounting accruals "were supposed to reflect estimates of the costs associated with the use of lines and other facilities of outside vendors, [but] for which WorldCom had not yet paid."[128] Releasing an accrual suggested, in this case without a sound basis, that less was needed to pay these bills than had been previously anticipated, thereby reducing reported expenses and increasing pre-tax income.[129] By the end of 2000, WorldCom had exhausted these previously accumulated accruals.[130]

Once these accruals were depleted, WorldCom shifted to other forms of accounting fraud.[131] It capitalized, rather than expensed, $3.8 billion of the company's cash outlays for line costs during 2001 and the first quarter of

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[121] *See id.*

[122] Wilmarth, *supra* note 119, at 114 (explaining WorldCom's ability to scale its operation to such a massive size).

[123] *Id.*

[124] Kuhn & Sutton, *supra* note 120, at 63.

[125] *See id.* (stating that "management manipulated financial information to increase the appearance of revenue growth, cost reduction, and overall profit" in order to retain favorable E/R ratio).

[126] DENNIS R. BERESFORD, NICHOLAS DEB. KATZENBACH & C.B. ROGERS, JR., REPORT OF INVESTIGATION BY THE SPECIAL INVESTIGATIVE COMMITTEE OF THE BOARD OF DIRECTORS OF WORLDCOM, INC. 9 (2003) ("WorldCom's improper accounting took two principal forms: reduction of reported line costs, WorldCom's largest category of expenses; and exaggeration of reported revenues.").

[127] *Id.* at 10.

[128] *Id.*

[129] *Id.*

[130] *Id.* at 11.

[131] *See id.*

2002.[132] Under generally accepted accounting principles ("GAAP"), operating expenses must be deducted from gross revenues to calculate earnings, whereas cash outlays characterized as capital are not so deducted. The theory behind this difference in treatment is that unlike operating expenses, the outlays properly characterized as capital acquire longer-lasting assets that will be available to generate revenues in future periods. Thus, these outlays will instead be deducted from revenues over time as depreciation or amortization.[133] Since these line cost outlays were in fact expenses needed to provide the services that generated current revenues and acquired nothing useful for generating future revenues, WorldCom, by capitalizing these outlays, was again able to inflate net income.[134] Had WorldCom not inappropriately capitalized its line costs, it would have reported a pre-tax loss in three of the five years in which the scheme went on and would have had E/R ratios consistently exceeding 50%.[135]

WorldCom met a fate similar to Enron's. The company filed bankruptcy in July 2002,[136] ultimately issuing a final restatement that—in its correction of the accounting frauds—reduced its previous reported pre-tax earnings by $10.6 billion.[137] WorldCom's CEO was sentenced to five years in prison.[138] Its CFO also received a prison sentence, and its Director of General Accounting and several of his employees pled guilty to conspiracy and securities fraud charges.[139] As with Enron, the press response to the WorldCom scandal saw it as indicative of systemic failure in the quality of the financial disclosures provided by U.S. public corporations. In the words of *The Economist* at the time, "WorldCom may also mark the point when investors, particularly foreigners, finally lose all confidence in American accounting . . . ."[140]

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[132] Wilmarth, *supra* note 119, at 115.

[133] The outlays for capital assets are ultimately counted against revenue, but this is done in future periods in the form of deductions for depreciation that are spread over the useful life of the asset. Kuhn & Sutton, *supra* note 120, at 63-64.

[134] *See* BOB LYKE & MARK JICKLING, CONG. RESEARCH SERV., RS21253, WORLDCOM: THE ACCOUNTING SCANDAL 2-3 (2002) ("[C]apitalizing line costs would have enabled the company to spread its current expenses into the future.").

[135] BERESFORD, KATZENBACH & ROGERS, *supra* note 126, at 11-12.

[136] Wilmarth, *supra* note 119, at 115.

[137] *Id.*

[138] Jennifer Bayot & Roben Farzad, *WorldCom Executive Sentenced*, N.Y. TIMES, Aug. 12, 2005, at C1.

[139] Kathleen Brickley, *From Enron to WorldCom and Beyond: Life and Crime After Sarbanes-Oxley*, 81 WASH. U. L.Q. 357, 372 (2003).

[140] *WorldCom and Financial Markets: Another Scandal, Another Scare*, ECONOMIST, June 29, 2002, at 67, 67.

3.   HealthSouth

HealthSouth involved even cruder tactics to exaggerate earnings than did WorldCom.[141] In order to maintain the appearance of growth, HealthSouth's CEO and a group of executives would, near the end of each reporting quarter, pick a desired earnings-per-share figure in light of existing analyst expectations.[142] This desired figure was then forwarded to the assistant controller.[143] The controller would in turn work with a handful of finance and accounting executives, known internally as "the family," to plug the gap between the desired figure and actual earnings.[144] These executives did so by falsifying accounting entries for cash, inventory, and assets.[145] After the fraud was revealed, bankruptcy ensued and all five HealthSouth CFOs during the period of the fraud pled guilty to criminal indictments.[146] As with the Enron and WorldCom scandals, the HealthSouth scandal was said not only to put at issue the fabricated value of HealthSouth's stock, but also to represent "a fundamental attack on the core of the public market: accurate and transparent pricing information."[147]

4.   Adelphia

The scandal at Adelphia included the added twist that part of the accounting fraud covered up significant self-dealing between Adelphia and the family that controlled it.[148] Adelphia Communications, a publicly traded but family-controlled cable company, had by 2002 become the sixth largest U.S. cable company, with annual revenues of $2.9 billion and over five and a half million

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[141] *See* Carrick Mollenkamp, *Missed Signal: An Accountant Tried in Vain to Expose HealthSouth Fraud*, Wall Street J., May 20, 2003, at A1 (describing how employees falsified invoices to cover up larger accounting fraud).

[142] *See* Kenneth N. Gilpin, *S.E.C. Accuses HealthSouth and Chief of Accounting Fraud*, N.Y. Times (Mar. 19, 2003), https://www.nytimes.com/2003/03/19/books/sec-accuses-healthsouth-and-chief-of-accounting-fraud.html (describing how CEO required HealthSouth to "meet the quarterly earnings estimates of Wall Street analysts").

[143] *See* Complaint for Injunctive and Other Relief at 17, SEC v. HealthSouth Corp., 261 F. Supp. 2d 1298 (N.D. Ala. 2003) (No. 03-cv-00615), 2003 WL 22002425, at *17 ("If HRC's actual results fell short of expectations, Scrushy would tell HRC's management to 'fix it' . . . .").

[144] *See* Gilpin, *supra* note 142 ("[S]enior in-house accounting executives responsible for fixing earnings shortfalls referred to meetings at which these changes were made as 'family meetings' and referred to themselves as 'family members.'").

[145] Mollenkamp, *supra* note 141 (describing how senior accounting executives falsified assets on balance sheets and falsified invoices to cover up falsified assets).

[146] *Id.*

[147] Ken Randall & Hunter Hill, *Corporate Governance and the HealthSouth Derivative Litigation*, 71 Ala. Law. 129, 131 (2010).

[148] *See* Kristine Barlaup, Hanne Iren Drønen & Iris Stuart, *Restructuring Trust in Auditing: Ethical Discernment and the Adelphia Scandal*, 24 Managerial Auditing 183, 193 (2009) (describing how Rigas family used company as "personal 'piggy bank'").

subscribers across thirty-two states.[149] As it turned out, however, Adelphia had been manipulating its financial reports since the company went public in 1986, according to the testimony of a former vice president of finance, James R. Brown, who pled guilty to securities fraud and bank fraud.[150] Brown stated that he and other Adelphia officers regularly fabricated statistics on the number of subscribers, cash flow, cable-system upgrades, and other closely followed metrics.[151]

Among Adelphia's techniques were, as with WorldCom, fictitious conversions of cash outlays for operating expenses into outlays that could be capitalized.[152] For example, Adelphia allegedly agreed with two suppliers of digital set-top boxes to overpay by $7 million for the boxes. In return, the suppliers agreed to provide Adelphia with an equal amount in "marketing support." The additional outlay for the boxes was capitalized and thus did not count against earnings. The sleight of hand saved Adelphia $7 million in marketing expenses, boosting its reported earnings by that amount.[153] The record suggested an overall lack of oversight of the accounting process. For example, the company's audit committee met only once in 1999[154] and, from the last half of 2000 until April 2002, consisted of only two members: one outside director and a member of the controlling Rigas family.[155] Finally, Adelphia's accounting fraud was accompanied by extensive self-dealing by the Rigas family that, of course, was not disclosed in the company's financial statements.

In April 2002, Adelphia delayed the filing of its annual 10-K report with the Securities and Exchange Commission ("SEC"), in part due to disagreements with its auditor, Deloitte & Touche.[156] The SEC simultaneously opened an informal inquiry to investigate the company's accounting methods,[157] and the company was forced into bankruptcy by June 2002.[158] John Rigas was convicted of fraud and conspiracy for stealing more than $100 million in company funds and hiding more than $2 billion in debt incurred by the family through entities

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[149] *Id.* at 192.

[150] *Id.* at 195.

[151] *Id.*

[152] Jerry Markon & Robert Frank, *Five Adelphia Officials Arrested on Fraud Charges— Three in the Rigas Family, Two Other Executives Held, Accused of Massive Looting*, WALL STREET J., July 25, 2002, at A3 (explaining how CEO instructed employees to create fictitious transactions to boost revenue).

[153] *See id.*

[154] Barlaup, Drønen & Stuart, *supra* note 148, at 194.

[155] *Id.*

[156] *Id.*

[157] *Id.* at 193.

[158] *Id.* at 192.

involving Adelphia.[159] The *Wall Street Journal* noted that the charges brought by the federal government in the immediate aftermath of the fraud represented the latest effort "to crack down on corporate malfeasance as public confidence and the financial markets have been battered by seemingly relentless disclosures of financial shenanigans."[160]

5. Overview: The Situation of Investors

Consider market participants' situation as this cascade of scandals rained down. They would have feared that other firms, as yet untarred by scandal, would reveal fraudulent accounting practices. This fear would call into question the accuracy of public information concerning the performance of all the still-untarred companies in the market, resulting in a serious problem. Market participants would have recognized there was a distribution of managerial quality among firms, an important firm characteristic to investors. But fear about the reliability of the information about each firm would raise questions about whether their previous assessments of management quality were correct, particularly because the scandals described above took place at some of the country's most respected companies. Press accounts from this period reported that investors were coming to harbor suspicion that financial statements more generally were subject to fraud risk but were uncertain as to who were the bad actors.[161] A statement by Brett Truman, an accounting professor from the University of California-Berkeley's Haas School of Business, captures the concern: "This is why the market keeps going down every day - investors do not know who to trust. . . . As these things come out, it just continues to build up."[162]

In this circumstance, high-quality firm managers would have had an unusually strong incentive to send a signal that credibly conveyed to the market the accuracy of their financial disclosures and hence the managers' quality—i.e., that their reported performance was the product of skill, not fraud.[163] In a period when the market was surprised by a pattern of fraud in respected exchange-listed companies, equity holders could be uncertain of their ability to distinguish between companies with honest managements and those that would resort to

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[159] Peter Grant & Christine Nuzum, *Adelphia Founder and One Son Are Found Guilty—Jury Remains Deadlocked on Second Son, Acquits Former Assistant Treasurer*, WALL STREET J., July 9, 2004, at A1.

[160] Markon & Frank, *supra* note 152.

[161] *See, e.g.*, *WorldCom and Financial Markets: Another Scandal, Another Scare*, *supra* note 140, at 67.

[162] *See* David Hancock, *World-Class Scandal at WorldCom*, CBS NEWS (June 26, 2002, 9:23 AM), http://www.cbsnews.com/news/world-class-scandal-at-worldcom/ [https://perma.cc/HP82-B85Y].

[163] *See* Stewart C. Myers & Nicholas S. Majluf, *Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have*, 13 J. FIN. ECON. 187, 188 (1984); Lakshmi Shayam-Sunder & Stewart C. Myers, *Testing Static Tradeoff Against Pecking Order Models of Capital Structure*, 51 J. FIN. ECON. 219, 225 (1999) (discussing how information asymmetry between management and investors drives investment decisions).

fraud. Accordingly, the market would discount every company for the chance that it was a "hidden" bad company—in signaling terms, a pooling equilibrium. This discounting would create a strong incentive for honest, capable managers to find ways to signal their high quality. Managers who succeeded in freeing themselves from suspicion by the use of such a signal would separate themselves from the lemons-like market pooling and so see their companies' share prices rise. This would both reduce the cost of equity finance and provide the variety of other benefits that managers enjoy from higher share prices. Conversely, firms that took action that sent a negative sign of management quality would stand out starkly; as discussed earlier, negative signals are inherently credible since high-quality managers would have no incentive to jam the signal.[164]

B.   *Overview of the Empirical Study and Its Results*

The findings that we report below strongly suggest that during the 2000-2002 period, changes in firm governance structures acted as a signal of the quality of their managers. Our study employs the two broadly used governance indices discussed above, the G and E indices. Treating G and E ratings, respectively, as the independent variable, we use a linear regression analysis to see what on average happens to a firm's Tobin's Q, the dependent variable, when there is a difference in the rating. For a large sample of firms for the years 1992-2006, we run two kinds of econometric tests described below: an OLS test and a fixed effects test. We then subdivide this large sample into two subsamples—one covering the accounting scandal years 2000-2002 and the other covering the surrounding twelve years (1992-1999 and 2003-2006)—and run the two kinds of tests on each of the subsamples. We compare the results for each of the tests in the three years of the governance scandal (2000-2002), with the results for each of the tests for all the other years in our longer period.

1.   The Nature of OLS and Fixed Effects Tests

It is useful at the outset to briefly describe the nature of these two econometric tests because the signaling analysis is driven in significant part by the differences between them. In the OLS test, the sample being tested consists of the pairing of the index rating and the Tobin's Q for each firm in the sample for each year that it is in the sample. The assumption is that across this sample, all other untested factors that affect the firm's Tobin's Q beyond the firm's governance rating are randomly distributed.[165] This means that, for any given firm in any given year, these other factors are assumed to be as likely to boost Q above as to diminish

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[164] *See supra* Section II.B.2.

[165] To act as a control, the regressions include, as other independent variables, several additional factors that might affect Tobin's Q. The factors being referred to in the text, however, are not ones included this way in the regression. The assumption that the omission of these factors does not bias the results will be correct in many cases. Where it is not, however, the reason for the omission may be, for example, that the factor is not easily observable or simply that it is incorrectly regarded by the author of the study as irrelevant.

Q below what the impact of the rating on Q would have been if the rating were the sole factor at work. With this large sample, these boosts and diminishments will largely cancel each other out, thereby revealing just the impact of the governance rating.

In a fixed effects test, the sample being tested consists of the pairing of the index rating and the Tobin's Q for each firm only in the year or years, if any, when the firm *changed* its governance structure in a way that altered its rating. This approach is typically used to guard against an omitted-variable problem that can arise with an OLS test. That is, the fixed effects regression seeks to control for the possibility that, contrary to the OLS assumptions, there are one or more untested factors affecting Q that are not randomly distributed and that correlate with the firm's governance rating.

If there are one or more such factors, an OLS result that appears to show a relation between a good governance rating and Tobin's Q could be partially, or possibly entirely, due instead to the untested factor or factors. However, as long as the untested factor or factors are time invariant in their influence on Tobin's Q—i.e., have a fixed effect—this omitted-variable problem is avoided by running a regression that, out of all the observations of all the firms in all the sample years, considers only those relating to the firms that in any given year changed their governance structures in a rating-altering way. This is because the other factor or factors will have the same impact on Tobin's Q before and after the governance change, and so the test isolates the effect on Tobin's Q of just the governance change.[166]

2.   Summary of Our Findings

Consistent with the earlier studies, our cross-sectional OLS test for the entire fifteen-year sample period finds a highly significant positive relationship, both statistically and economically, between firms with good governance ratings and their Tobin's Qs. Also consistent with previous studies, our fixed effects test for the entire fifteen-year period similarly shows a highly significant positive relationship, both statistically and economically, between a score-improving governance change and Tobin's Q.

Comparing the 2000-2002 period with the other years in the sample, however, reveals a new and previously unrecognized result: the fixed effects test results

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[166] Professors Bartlett and Partnoy recommend using a "first differences" approach to solving this hidden-variable problem rather than our fixed effects approach. Bartlett & Partnoy, *supra* note 34, at 1. Both approaches eliminate the impact of time-invariant hidden variables. The only difference is that our approach takes mean-differences rather than first-differences. We have chosen to present the results of using the fixed effects approach in part because it maintains comparability with those index studies that attempt to control for such hidden variables. Also, although the first-differences approach narrows the timing gap between the before- and after-observations of Q relative to the moment of the governance change, it also has less statistical power because it does not allow for as many observations. In any event, we have also run first-differences regressions, and our results are essentially the same.

diverge sharply from the OLS test results. The fixed effects tests reveal that a changed governance rating in the scandal years is associated with a much larger change in Tobin's Q than a comparably sized rating change occurring in other years. This difference between 2000-2002 and the other years is highly significant both statistically and economically. In contrast, the OLS tests show no significant difference between the 2000-2002 period and the other years in terms of the relationship between a firm's governance score and its Tobin's Q.

In addition to investigating the role of differences in information asymmetry across time periods, we investigate them across different types of firms—another test of our hypothesis that the effect of governance depends on context. Firms that engage in significant R&D typically have greater information asymmetry associated with them than other firms.[167] We divide our full fifteen-year sample between R&D and non-R&D firms. Relative to the normal period, the increase in a governance change's impact on Tobin's Q during the scandal period was greater by a statistically significant amount for R&D firms than it was for non-R&D firms.

3.   Implications of Our Findings

This difference between the fixed effects comparison (scandal period versus normal period) and the OLS comparison strongly suggests that signaling was at work during the scandal period. To see why, we first need to imagine a world in which signaling is not possible and consider what, in that world, we would expect our OLS and fixed effects results to look like in both the normal and scandal periods. Then we will allow for the possibility of signaling and consider what our actual OLS and fixed effects results for the normal and the scandal periods can tell us about whether signaling was in fact at work, at least during the scandal period.

a.   *A Hypothetical World Without Signaling*

Imagine a world in which the market understands the quality of a firm's management just as well as do the managers themselves. In other words, there would be no information asymmetry and hence no room for signaling. In this world, we would have only the theories relating to the first two links—filtering and incentives/informedness—to explain the relationship between firm governance structures and their Tobin's Qs. Under these first two theories, a firm with better governance structures will on average have better managers, and managers will be more incentivized and informed.[168] Relative to a firm with a worse governance structure, these managers will on average make decisions that generate greater cash flow in the future. A firm's share price represents the market's assessment of its future cash flows discounted to present value, and in an efficient market this price quickly and fully reflects all publicly available

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[167] *See supra* note 17 and accompanying text (summarizing research showing that firms engaging in major R&D are hard for market to evaluate).

[168] *See supra* Section II.A (summarizing the two theories).

information relevant for estimating future cash flow. A firm's corporate governance structure is publicly known, and this is so whether the structure was recently changed or has been in place for some time. Either way, the impact of a governance structure with a given index rating on a firm's future expected cash flows will, in an efficient market, be reflected in the firm's share price and hence in its Tobin's Q. So, at any point in time, the average impact on Tobin's Q of a governance structure with a given rating will be the same whether the structure has been in place for a long time or was adopted only recently. In each case, the question relates to how the structure will affect *future* cash flows. Put another way, the difference in the average impact on Tobin's Q of two differently rated governance structures will be the same whether we are talking about two different firms, one of which has had the worse-rated structure for some time and the other of which has had the better-rated one for some time, or about a single firm that has just switched from the same more poorly rated structure to the same better-rated one.

For this hypothetical world without signaling, now consider what comparisons between the scandal-period and the normal-period OLS and fixed effects results would look like and what they would imply. During the scandal period, if there is an increase in the market's perception of (i) the value of high-quality management, (ii) the effectiveness of a better-rated governance structure with a filtering process leading to higher-quality management, and/or (iii) the effectiveness of a better-rated structure in providing the incentives and information to promote better management decisions, the impact of a firm's governance structure on its Tobin's Q through the first two links would be strengthened.

This possible scandal-period strengthening either occurs or it does not. If it does *not* occur, *neither* the OLS results nor the fixed effects results should show a difference between the scandal period and the normal period. If this scandal-period strengthening *does* occur, we would expect to see a difference between the scandal period and the normal period for *both* the OLS results and the fixed effects results.

To see the reason why, first consider the OLS results. These are primarily driven by a comparison of the Tobin's Qs of different firms with differently rated governance structures that they have had for some time—what we might call "continuing" firms. If there is a strengthening of impact through the first two links when we compare two sets of continuing firms—ones with governance structures having a given poor index rating and ones with governance structures having a more favorable index rating—then the difference between the two groups' average Tobin's Qs should widen because the strengthened link means that the difference in structure should lead to a larger difference in expected future cash flows of all the firms in the sample. This widening should be reflected in the OLS results. If there were no strengthening of the link, we would expect to see no difference in the OLS results between the scandal period and the normal years.

Now consider the fixed effects results, which are driven solely by a comparison between normal and scandal periods of the Tobin's Qs of firms that change their governance structures—what we might call "change" firms. Take a set of firms that, during a year in the normal period, change from having governance structures with a poor index rating to governance structures having a better index rating, and compare that to a set of firms that make the same change during a year in the scandal period. If there is a strengthening through the first two links during the scandal period, the Tobin's Qs of the firms that changed during the scandal period should on average increase by more than the Tobin's Qs of the firms that changed in the normal period, and this difference should be reflected in the fixed effects results.[169] Again, if there is no strengthening of the link, we again would expect to see no difference between the fixed effects results for the scandal periods and the normal periods.

b.   *Allowing for the Possibility of Signaling*

Now adopt the more realistic assumption that the market does not understand the quality of a firm's management as well as do the managers themselves. In other words, there is an information asymmetry, and so there is at least the possibility that signaling could operate when a firm changes its governance structure.

For the reasons just discussed, continuing firms—the ones that, according to our assumptions, still send no signal—would show no difference between the OLS results in the scandal period versus those in the normal period unless one or both of the first two links between governance and Tobin's Q were strengthened during the scandal period. No difference in OLS results between the periods, therefore, means there was no such strengthening of either of the first two links during the scandal period. Even absent strengthening in the first and second links, however, there could still be a difference between the scandal and normal periods in the fixed effects results. Again, these results relate only to firms in years in which they make their rating-altering changes in governance structures, which according to our hypothesis could be a positive or negative signal of managerial quality. So if we see such a difference between the periods

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[169] This assertion needs a small qualification, but not one that undermines our interpretation of our results. To the extent that the share price reaction to a change in governance structure reflects the anticipation of a change in filtering—the basis of our first theory concerning the link between governance and Tobin's Q—this may take time to affect future cash flows. Thus, it may matter whether a firm has a particular governance structure that was just put in place or one that it has had for longer. Consider a structure that includes an attribute that tends to enhance filtering and hence is an attribute that boosts the rating a firm receives. For a firm that has had this attribute longer, its discounted future cash flows do not include the periods when the filtering is still doing its work, i.e., filtering's improvement in future cash flows will have been fully realized. Thus, the impact of this attribute on Tobin's Q for a firm that has had it for some time will be larger than for a firm that just adopted it. The same would be true in the opposite direction with respect to firms with an attribute that would tend to decrease filtering.

in the fixed effects results but not in the OLS results, it can only be due to a strengthening of the signal sent by a change in the scandal period relative to one sent in the normal period. This is just what our results show.

Our OLS results show that, relative to the normal period, during the scandal period there was no widening of the difference in average Tobin's Q scores between firms with a poorly rated governance structure and firms with more favorably rated ones, at least not one of a size great enough to be statistically significant.[170] The OLS results relate predominantly to firms that did not change their governance structure during the scandal years—the continuing firms—and hence firms that were not sending a signal of the kind we are discussing here.[171] Thus, the only ways these firms' governance structures could impact their Tobin's Qs is through the first and second links. The fact that our OLS results show no statistically significant widening of impact on Tobin's Q from having a better-rated structure versus a more poorly rated one suggests that these two governance links were not strengthened during the scandal period.

Our fixed effects results show that, relative to the normal period, there was, in the scandal period, on average a very statistically significant greater change in Tobin's Q for firms that changed from a structure with one rating to a structure with a different rating. Viewed in isolation, these fixed effects findings could be caused by (i) a scandal-period strengthening of the impact of firm governance structure on their Tobin's Q through the first and second links, and/or (ii) a scandal-period increase in the value of the governance structure's signal concerning management quality. When we take into account the OLS findings, however, we can rule out the first cause. If, as indicated by the OLS result, a given governance structure's impact on Tobin's Q through the first and second links is not strengthened during the scandal period for firms that continue with that structure, there is no reason to think that it would be strengthened for firms that have just changed to this structure.[172]

In sum, the fixed effects results show that the impact of a ratings change on Tobin's Q was greater by a statistically significant amount in the scandal period versus the normal period, whereas the OLS results do not. This suggests that: (i) a governance change can act as a signal of managerial quality and did so during the 2000-2002 period, and (ii) whatever was the signaling impact of such a change on stock price and Tobin's Q in the normal period (and there probably was some impact), its impact was larger by a highly statistically significant amount during the 2000-2002 period. The market in this period was unusually uncertain about the management quality of publicly traded firms generally

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[170] *See infra* Section III.D.2.

[171] The OLS finding includes all firms for all years in the sample under study, both the large majority that did not change their governance structures in a given year and the small minority that did.

[172] *See infra* Section III.D.2 (summarizing cross-sectional OLS results).

because of the unexpected incidence of fraud in respected companies.[173] As a result, receipt of a clarifying signal had an unusually large effect.[174]

C. *Data Sources and Variables Used*

As previously described, our study employs the two well-known governance indices discussed above: Bebchuk, Cohen, and Ferrell's E index[175] and Gompers, Ishii, and Metrick's G index.[176] For each of these indices, we run a firm-level fixed effects regression on the relationship between the change in a firm's index rating and the change in the firm's Tobin's Q for the years 1992-2006. We also run, for each index, an OLS regression on the cross-sectional relationship between a firm's index score and Tobin's Q for the same years. We

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[173] *See supra* Sections III.A.1 to .3 (recounting accounting scandals at Enron, HealthSouth, and Adelphia in early 2000s).

[174] In Section II.B.4, *supra*, we discussed how a continuation of a governance structure that was adopted at some point in the past and received a given index rating might itself provide a form of message concerning today's managerial quality. The discussion makes clear, however, that a change in the current period to a governance structure with this same rating constitutes a more valuable signal concerning managerial quality. In other words, the signaling significance of having adopted a particular structure erodes over time. Firm governance ratings are relatively stable over time, and so for most of the firms in the OLS sample, they have not changed their governance structures in many years. *See supra* note 171. Thus, the value of the signals coming from their continued structures has been eroded considerably. It is true that, relative to normal times, even this considerably eroded residual signal would presumably have become more valuable in the scandal period, given the increased information asymmetry concerning managerial quality. But the scandal period's magnification of this eroded residual signal should have much less absolute impact on Tobin's Q than the similar magnification of the signal sent by a change in governance structure. This conclusion tends to be confirmed by the fact that our OLS results, which relate primarily to firms that simply continued their governance structures, show no statistically significant increase in the impact of differences in index scores on Tobin's Q during the scandal period versus the normal period. Whatever the value of the signal coming from the continuation of a given governance structure, it was sufficiently small that, even when magnified during the scandal period, it did not add to the total impact of differences in firm index ratings on their Tobin's Qs by a statistically significant amount. It should also be noted that if there was any signaling effect from the continuation of a given governance structure, this would not undermine our larger conclusion that the increase, if any, in the impact on Tobin's Q through the filtering and incentives/informedness links during the scandal period was not large enough to be statistically significant. This conclusion is based on simple arithmetic. Our OLS results show that for firms that did not change structure, the increase, if any, in the total impact on Tobin's Q through all three links was not large enough to be statistically significant. If there were some signaling effect from simply continuing a governance structure, this effect actually would have been magnified in the scandal period. So any increase in the impact from the filtering and incentives/informedness links could not by itself be large enough to be statistically significant.

[175] Bebchuk, Cohen & Ferrell, *supra* note 8, at 785.

[176] Gompers, Ishii & Metrick, *supra* note 8, at 108.

then subdivide the sample into two parts—the "scandal" period of 2000-2002 and the "normal" period consisting of our sample's surrounding years, 1992-1999 and 2003-2006. We compare, for both the fixed effects and OLS tests, the results in the scandal years with the results in the surrounding normal years.

We focus on all publicly traded companies that have a G index score. For ease of reference, we give our variable names in italics. As noted earlier, the G index quantifies governance attributes with regard to a variety of matters, including a number of factors relating to the capacity of incumbent management to resist hostile takeovers.[177] A firm's score can vary from a minimum of zero to a maximum of twenty-four.[178] A lower score is interpreted as reflecting a better corporate governance structure. The E index consists of six of the G index items, which are interpreted as most related to the capacity of management to protect the company from capital market discipline: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, supermajority requirements for mergers, and limits to charter amendments.[179]

For the above set of firms, we obtained financial data from Standard and Poor's Annual Compustat database. Consistent with the previous literature, firm value creation is proxied by Tobin's Q. Following that literature, we calculate Tobin's Q as the market value of a firm's equity minus book value of equity plus the market value of a firm's debt divided by the book value of its assets.[180] We winsorize the values of Tobin's Q at the 1% level and 99% level so that outliers do not significantly affect our results.

We control for four firm-specific variables that prior literature suggests might independently affect measures of firm value creation independent of the effect of its governance structure. The first variable is the firm's ratio of debt to total assets ("*Debt*"), which is calculated as the ratio of short-term debt plus long-term debt to total assets. The second is the firm's ratio of research and development expenses to total assets ("*R&D*").[181] The final two variables are

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[177] *See supra* Part I.

[178] *See* Gompers, Ishii & Metrick, *supra* note 8, at 115 (showing that "G has a possible range from 1 to 24").

[179] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 784-85 (describing construction of index using items listed above). We obtained data for the *Gindex* and *Eindex* from Martijn Cremers.

[180] *See* Darius Palia, *The Endogeneity of Managerial Compensation in Firm Valuation: A Solution*, 14 REV. FIN. STUD. 735, 742 (2001) (describing method for calculating Tobin's Q); Hyun-Han Shin & René M. Stulz, *Are Internal Capital Markets Efficient?*, 113 Q.J. ECON. 531, 534 (1998) (defining Tobin's Q as "value of equity plus the book value of total assets minus the book value of equity"); Smith & Watts, *supra* note 34, at 266.

[181] *See supra* note 17 and accompanying text (summarizing studies accounting for R&D as a factor). In many cases the firm has missing data for research and development expenses. Rather than discard these observations, we set a dummy variable ("*RDdum*") to unity for missing data and equal to zero when not missing. Additionally, R&D is set to zero in these cases. This implies that missing research and development expenses does not significantly affect the slope or sensitivity of R&D to Tobin's Q.

related to the firm's size.[182] We include the natural logarithm of total sales ("*Lsales*"), and for any nonmonotonic effect we also include its square ("*Lsales2*").

We present the summary descriptive statistics of these variables in Table 1. We have 26,098 observations, consisting of 3516 unique firms for the years 1992-2006. We find the average Tobin's Q to be 1.004, which is higher than the median value of 0.675. There is substantial variation, which, assuming Tobin's Q to have a normal distribution, can vary between –0.122 and 6.17.[183] The average *Gindex* is 9.06 with a similar median value. The *Eindex* has an average value of 2.3 and a median value of 2, which is not surprising given that the maximum value is 6. Our sample firms have an average *Debt* ratio of 25.5%, with median ratios of 23.5%. The average firm has an *R&D* ratio of 2.6%, with the median firm having no significant research and development expenses. On average, our sample firms have a natural logarithm of *Lsales* of 7.14, although there are many firms that are extremely large. The average size of our firms is $4.3 billion, with a median value of $1.14 billion.

Table 1. Summary Statistics.

Variable	Mean	Median	Standard Deviation
Tobin's Q	1.004	0.675	1.063
Gindex	9.064	9.000	2.752
Eindex	2.297	2.000	1.358
Debt	0.255	0.235	0.265
R&D	0.026	0.000	0.079
RDdum	0.509	1.000	0.500
Lsales	7.143	7.048	1.526
Lsales2	53.35	49.67	22.09

D.   *Tests and Results—Full Sample (1992-2006)*

1.   Fixed Effects Results

We first estimate a firm-level fixed effects regression of Tobin's Q on the two governance indices for the full sample period. It is the nature of fixed effects tests that they measure the effect on the dependent variable (in our case, Tobin's Q) of a *change* in the independent variable (in our case, the governance

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[182] *See* Gompers, Ishii & Metrick, *supra* note 8, at 119 (listing firm size as a variable for G index).

[183] In the lower tail of the distribution we find negative values, as the market value of equity is less than the difference between the book values of equity and debt. *See supra* text accompanying note 180 (defining Tobin's Q as difference between equity and book value of equity).

index).[184] Therefore, this is the appropriate test for exploring whether a change in an independent variable is a signal of some kind. The fixed effects technique also serves as a check on the conclusion from our cross-sectional OLS tests reported below (and those of Gompers, Ishii, and Metrick)[185] that there is a relationship between better firm governance scores and higher Tobin's Qs. As discussed earlier, using the fixed effects technique tests whether this OLS conclusion is a false positive arising from a hidden variable that correlates with both Tobin's Q and the governance scores but that is invariant over time. Our finding of a fixed effects relationship between Tobin's Q and the governance indices allows us to reject this alternative explanation of the OLS results.

Table 2 presents our fixed effects results for both the *Gindex* and the *Eindex*. All standard errors are adjusted for clustering at the firm level, and the fixed effects are jointly statistically significant but not presented. The robust t-statistics are presented in parentheses.

The impact of a change in the *Gindex* on Tobin's Q is given in column 2. We find a coefficient of –0.0259, which is statistically significant at the 1% level. In other words, this result is highly statistically significant, meaning that we can reject with at least 99% confidence that this finding was simply the result of chance. The impact of a change in the *Eindex* is given in column 3. We find a coefficient of –0.0384 on the *Eindex*, which is similarly statistically significant at the 1% level. This coefficient is very similar to the Bebchuk, Cohen, and Ferrell coefficient of –0.028 in their fixed effects regressions, although the respective sample periods differ slightly (ours is 1992-2006, and theirs is 1990-2003).[186] Table 2's results are consistent with those of the previous literature. This suggests that there is nothing unique about our sample that is generating our subsequent results.[187]

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[184] *See, e.g.*, Bartlett & Partnoy, *supra* note 34, at 39 (describing use of fixed effects regressions to measure effect on firm value of changes firms made in governance).

[185] Gompers, Ishii & Metrick, *supra* note 8, at 129 (describing cross-sectional differences in their results).

[186] *See* Bebchuk, Cohen & Ferrell, *supra* note 8, at 802.

[187] In examining the relationship between the control variables and firm performance, Table 2 also shows that firms with higher debt levels and R&D expenses are associated with higher firm value. The relationship between firm size and performance is nonmonotonic, with a positive relationship that turns negative at the highest levels of firm size.

Table 2. Fixed Effects Regressions of Tobin's Q on Corporate Governance Indices.

Variable	G index	E index
Governance Indices	-0.0259*	-0.0384*
	(-3.05)	(-2.65)
Debt	0.322*	0.318*
	(4.92)	(4.93)
R&D	0.596**	0.597**
	(2.15)	(2.15)
RDdum	0.051	0.050
	(0.99)	(0.98)
Lsales	0.108***	0.103***
	(1.87)	(1.80)
Lsales2	-0.010**	-0.009**
	(-2.23)	(-2.19)
Constant	0.821*	0.691*
	(3.40)	(2.97)
R^2	0.024	0.026

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

2.   Cross-Sectional OLS Results

In this section, we provide cross-sectional OLS results with 10 Fama-French industry controls and year dummies (not reported) and with standard errors clustered at the firm level.[188] For each variable, we calculate the average across the years by firm. By doing so, we abstract away from any time variation and focus on the cross-sectional variation only.[189] These results, consistent with the OLS results of Gompers, Ishii, and Metrick,[190] show that both the *Gindex* and *Eindex* are negatively correlated to a firm's Tobin's Q, i.e., corporate governance structures that garner good governance ratings are associated with greater firm value creation.

Table 3 presents these OLS results for both the *Gindex* and the *Eindex*. The robust t-statistics are presented in parentheses.

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[188] Note that a firm level fixed effects model subsumes any impact of industry; therefore, no industry controls need to be included.

[189] *See generally* WILLIAM H. GREENE, ECONOMETRIC ANALYSIS (7th ed. 2005) (discussing methods of using least squares estimators).

[190] Gompers, Ishii & Metrick, *supra* note 8, at 127.

Table 3. OLS Regessions of Tobin's Q on Corporate Governance Indices.

Variable	G index	E index
Governance Indices	-0.028* (-5.13)	-0.079* (-6.72)
Debt	0.202* (2.65)	0.212* (2.83)
R&D	2.485** (2.20)	2.452** (2.18)
RDdum	-0.340* (-5.70)	-0.341* (-5.74)
Lsales	0.038 (0.52)	0.051 (0.69)
Lsales2	-0.002 (-0.49)	-0.004 (-0.80)
Constant	1.274* (3.76)	1.197* (3.58)
R^2	0.109	0.113

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

The impact of a difference between firms in their respective *Gindex* scores on their Tobin's Qs is given in column 2 of Table 3. We find a coefficient of –0.028, which yet again is statistically significant at the 1% level. The impact of a change in the *Eindex* is given in column 3. We find a coefficient of –0.079 on the *Eindex*, which is also statistically significant at the 1% level. Our *Gindex* results are similar to the Gompers, Ishii, and Metrick[191] coefficient of –0.043 in their OLS regressions. Again, while our sample periods differ slightly, the similarity in results suggests that there is nothing unusual about our sample that is generating our subsequent results.

3.   Summary of the Full Sample Results

Our full sample OLS results suggest that governance structures associated with good ratings, by filtering out bad managers and/or providing more effective managerial incentives, are consistent with better corporate decision-making and hence, over time, higher cash flows available for shareholders. Our full sample fixed effects results affirm that consistency. They indicate that the OLS results do not represent a false positive caused by some hidden, time-invariant variable that correlates with both firm Tobin's Q scores and firm governance scores.

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[191] *Id.* (summarizing negative G index coefficient results).

Taken by themselves, these full sample results do not, however, tell us whether a firm's decision to *change* its structure in a score-altering way constitutes a signal to the market concerning management quality. Assuming, as our OLS results suggest, that governance structures with better scores do in fact lead to higher cash flows to shareholders, we would see the fixed effects results that we have obtained even if the market were already fully informed about the quality of a firm's management prior to the change, i.e., a situation in which there would be no need to signal management quality. This is because when a firm changes its structure in a rating-improving way, the anticipation of the resultant better decision-making and increased future cash flows would, in an efficient market, lead to an immediate increase in share price. Thus, even without any signaling, our data suggests that the change in a firm's structure would still lead to a change in its Tobin's Q.

E.   *Tests and Results—Comparing Time Periods: The 2000-2002 Scandal Years Versus Other Years*

In reality, of course, the market is never fully informed about the quality of a firm's management. Suppose that in particular years the market believes it is more poorly informed about firm management quality than in normal years. Further suppose, however, that the market's perception of the long-run effect of a good governance structure on future cash flows (through better filtering out of bad managers and/or better incentives for all managers) does not change much from one year to the next. Under these assumptions, as discussed earlier, we would expect that if a score-altering change in governance structure serves as a signal concerning the quality of management, the signal would take on more value in years when the market perceives itself to be otherwise less informed about managerial quality.

As outlined before, our hypothesis is, therefore, that if changes in governance structure constitute a signal concerning the quality of management, a fixed effects test will reveal that they have a bigger effect on Tobin's Q in years when the market perceives itself to be less informed concerning management quality relative to how well-informed it perceives itself in normal years.[192] OLS tests that do not show a larger effect of governance on Tobin's Q in the less-informed years than in normal years would suggest that such fixed effects results for the less-informed years are not the result of the market believing in such years that a change in governance structure would have a bigger long-run effect on future cash flows.

For the reasons discussed earlier, we believe that the 2000-2002 accounting scandal years comprised a period when the market perceived itself to be less informed concerning the quality of firm management than in normal times.[193] Thus, to test our hypothesis concerning the signaling effect of changes in

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[192]   *See supra* Section III.D.3 (laying out this hypothesis based on data).

[193]   *See supra* text accompanying note 162 (discussing overall state of distrust by market in management).

governance structure, we compare the fixed effects and OLS results for the 2000-2002 period with their respective results for the other years in our sample.

1. Fixed Effects Results Comparison

The first step in the comparison test is to split our full sample into two periods: the 2000-2002 accounting scandal years and the twelve years surrounding the accounting scandals (1992-1999 and 2003-2006). We then analyze each of these periods, using the same firm-level fixed effects regression specifications used for the full sample. Finally, we consider the differences between these fixed effects findings regarding each of the two periods. These results are given in Table 4.

The impact of a change in the *Gindex* on firm performance in the accounting scandal period is shown in column 2. We find a coefficient of –0.1061, which is more than four times as large as the normal-times coefficient of –0.0249 given in column 3. Both coefficients are statistically significant at the 1% level. When we compare the differential impact between scandal and normal years in column 4, we find a negative effect of –0.081, which is also statistically significant at the 1% level. Thus, we can say with a very high degree of statistical confidence that mere chance was not responsible for this observed difference between 2000 and 2002 and the surrounding twelve years in the impact on Tobin's Q from a firm changing its governance structure.

We then examine a similar relationship for the *Eindex*. Column 5 addresses the accounting scandal period. We find a coefficient of –0.1645, which is about three times the normal year's coefficient of –0.0559 given in column 6. Both coefficients are again statistically significant at the 1% level. When we compare the differential impact between accounting scandal and normal years in column 7, we find a negative effect of –0.1085, again statistically significant at the 1% level.

These numbers can be usefully put in perspective in terms of their economic significance. The Tobin's Q of the median firm is 0.675. Thus we can approximate the percentage positive impact on the Tobin's Q of such a firm made by a governance change yielding a one-point index rating drop in the normal periods to be $(0.0249)/0.675 = 3.69\%$. In contrast, the approximate percentage positive impact on Tobin's Q of the nine-point index drop in the scandal period is almost five times larger: $(0.1062)/0.675 = 15.73\%$.[194]

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[194] This increase during the scandal period in the impact on Tobin's Q from a change in one index-scored governance attribute may at first impression seem surprisingly large. It becomes quite plausible, however, once it is appreciated that what we are seeing is the market's reaction to the signal concerning managerial quality during a period of sharply increased information asymmetry, not a change in the market's reaction to the impact of this governance change itself on the underlying value of the firm. In this regard, our results are comparable in some ways to the finding by Professors Karpoff, Lee, and Martin, that when a firm has penalties imposed on it in an SEC enforcement action for financial misrepresentation, the adverse impact on share price from the damage to the reputation of the firm's managers is almost eight times the adverse impact on share price from the resulting legal penalties.

Next, we examine the economic significance of the *Eindex* by analyzing the impact on Tobin's Q of a favorable movement from the third quartile of the *Eindex* (equal to three) to the first quartile (equal to one), a change of two. We calculate the difference in the impact on Tobin's Q of this two-point decrease in normal times and compare it to making the drop in accounting scandal times. We can approximate the percentage positive impact on Tobin's Q of the two point drop in normal times as (0.0559*2)/0.675 = 16.56%. Once again, the approximate percentage positive impact on Tobin's Q of the two point drop in the scandal period is more than three times larger: (0.1645*2)/0.675 = 48.75%.

Table 4. Fixed Effects Regressions of Tobin's Q on Corporate Governance Provisions for the Accounting Scandal Period v. Normal Times.

Variable	G index			E index		
	2000-2002 Scandal Period	Normal Period	Scandal – Normal	2000-2002 Scandal Period	Normal Period	Scandal – Normal
Gindex/ Eindex	-0.1061* (-4.92)	-0.0249* (-2.64)	-0.081* (-3.45)	-0.1645* (-4.95)	-0.0559* (-3.33)	-0.1085** (-2.91)
Debt	0.573*** (1.86)	0.293* (5.55)		0.583*** (1.88)	0.291* (5.58)	
R&D	1.013 (0.56)	0.849* (2.77)		1.065 (0.59)	0.849** (2.78)	
RDdum	-0.115 (-0.99)	0.079 (1.37)		0.134 (1.16)	0.079 (1.35)	
Lsales	0.223** (2.04)	0.131 (1.56)		0.225** (2.05)	0.129 (1.55)	
Lsales2	-0.026** (-2.47)	-0.009 (-1.59)		-0.026** (-2.52)	-0.009 (-1.59)	
Cons	1.515* (2.97)	0.639** (1.97)		0.939*** (1.94)	0.551*** (1.72)	
R^2	0.003	0.011		0.005	0.013	

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

Jonathan Karpoff, D. Scott Lee & Gerald S. Martin, *The Cost to Firms of Cooking the Books*, 43 J. FIN. & QUANTITATIVE ANALYSIS 581, 581 (2008).

2.   OLS Results

In this Section, we provide cross-sectional OLS results comparing the 2000-2002 accounting scandal period with the years in our sample that surround it. Again, we calculate for each variable the average across the years by firm, thereby abstracting away from any time variation, and focus on the cross-sectional variation only. The results in Table 5 show that both the *Gindex* rating and the *Eindex* rating are negatively correlated with firm performance both in the 2000-2002 accounting scandal years and in the normal years in our sample (i.e., better-rated governance structures are associated with higher Tobin's Qs), but there is no statistically significant difference in the strength of the relationship in between the scandal and normal periods.

Table 5. Cross-Sectional OLS Regressions of Tobin's Q on Corporate Governance Provisions for the Accounting Scandal Period v. Normal Times.

Variable	G index			E index		
	Scandal	Normal	Scandal − Normal	Scandal	Normal	Scandal − Normal
Gindex or Eindex	-0.0309* (-3.64)	-0.0302* (-5.53)	-0.001 (-0.72)	-0.0862* (-5.15)	-0.0730* (-6.28)	-0.013 (-0.65)
Debt	0.367** (2.55)	0.180** (2.51)		0.383* (2.68)	0.186* (2.63)	
R&D	4.188* (6.64)	2.338** (1.98)		4.121* (6.53)	2.316** (1.97)	
RDdum	-0.312* (-6.23)	-0.359* (-5.80)		-0.313* (-6.28)	-0.360* (-5.84)	
Lsales	-0.220** (-2.40)	0.019 (0.26)		-0.231** (-2.55)	0.026 (0.36)	
Lsales2	-0.010 (-1.63)	-0.001 (-0.24)		-0.011*** (-1.89)	-0.002 (-0.47)	
Cons	0.166 (0.48)	1.281* (3.83)		0.086 (0.25)	0.178* (3.57)	
R^2	0.096	0.090		0.101	0.093	

*Statistically significant at the 1% level.

**Statistically significant at the 5% level.

***Statistically significant at the 10% level.

3.   Summary of Results in Accounting Scandal Years Versus Other Years

The results reported above provide strong support for our thesis that the impact of corporate governance on performance is highly sensitive to context: in this case, specifically, that changes in governance structure in particular contexts can constitute a credible signal concerning the quality of management. As our signaling hypothesis predicts, our fixed effects tests reveal that score changes in corporate governance have a highly statistically significant larger effect on Tobin's Q in the accounting scandal period of 2000-2002—years when the market appeared to perceive itself as less informed concerning management quality—than during the normal twelve-year surrounding period. Our OLS tests reveal no statistically different effect of governance structure differences across firms on Tobin's Q in 2000-2002 than in other years. These latter results suggest that our fixed effects results do not arise because, in the accounting scandal years, the market believed the long-run effect of governance changes on future cash flows would be greater because of their filtering or incentive/informedness effects.

4.   Robustness of the Fixed Effects Results to Alternative Definitions of Normal Times

In the above sections we included a large time period of twelve years as our proxy for normal times. Accordingly, as a robustness test, we examine the three years prior to the accounting scandal period (i.e., 1997 to 1999), and the three years after the accounting scandal period (i.e., 2003 to 2005), respectively. The results of the fixed effects regressions are given in Table 6. Once again, we find that the impact of the governance variables in the accounting scandal period is statistically significant larger than the impact of the governance variables in the three-year periods prior to and after the scandal period.

Table 6. Fixed Effects Regressions of Tobin's Q on Corporate Governance Provisions for Firms in the Accounting Scandal Period v. Different Definitions of Normal Times.

Variable	Normal Times: 1997-1999			Normal Times: 2003-2005		
	Scandal	Normal	Scandal – Normal	Scandal	Normal	Scandal – Normal
Gindex	-0.1062** (-4.92)	-0.008 (-0.32)	-0.100* (-3.52)	-0.1062** (-4.92)	-0.007 (-0.30)	-0.099* (-3.07)
Eindex	-0.1645* (-4.95)	-0.029 (-1.07)	-0.135** (-3.14)	-0.1645* (-4.95)	-0.033 (-0.89)	-0.131* (-2.63)

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

Control variables are included in each regression specification but are not presented in the table.

5.   Robustness Tests: Focusing on Staggered Boards and Poison Pills

Many commentators believe that the most important governance-structure determinants of a poorly managed firm's susceptibility to takeover are the presence or absence of the combination of a poison pill and a staggered board, two of the twenty-four elements going into the G index and two of the six elements going into the E index.[195] We examine the change in Tobin's Q associated with changes in these two elements during the accounting scandal years of 2000-2002 versus the effect of a change during the other years in our sample. The results in Table 7 show that, in each case, the effect was greater in the 2000-2002 period by an amount that was statistically significant at the 1% level. In other words, we once again find a larger impact from changes in governance structures in a period of greater uncertainty as to management quality. These findings reinforce our conclusion that certain governance structure changes can serve as a signal of management quality.

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[195] *See supra* note 29 (noting potency of poison pill and staggered board in deterring takeover).

Table 7. Changes in Tobin's Q when Firm Initiated a Poison Pill or Staggered Board for the Scandal Period v. Normal Times.

		Scandal	Normal	Scandal – Normal
Initiated poison pill	Mean (t-statistic) Number	-0.240* (-3.32) 210	-0.200* (-4.38) 247	-0.039* -(5.37)
Initiated staggered board	Mean (t-statistic) Number	-0.117 (-1.22) 49	-0.053 (-0.88) 71	-0.063* (-4.95)

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

Table 7 reveals something else tending to support our signaling hypothesis: firms initiated poison pills and staggered boards (governance changes that lead to worse ratings) with much greater frequency during the scandal period than during the normal period. For poison pills, there were seventy initiations per year during the three-year scandal period versus approximately twenty-one initiations per year during the twelve-year normal period. For staggered boards, the comparable comparisons are approximately sixteen per year during the scandal period versus about six per year in the normal period. Given that the frequency of takeovers was especially low during the 2000-2002 scandal period, the initiation of one of these changes would send to the market a particularly strong negative signal of low management quality: it would suggest an unusually high level of concern by the managers of the initiating firms that they would subsequently be found to be inadequate and vulnerable to replacement through a takeover. And there would be particularly little reason for high-quality managers to initiate such changes and jam the negative signal being sent by the low-quality managers.[196]

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[196] However, Catan, *supra* note 11, at 5, also presents evidence that can be interpreted as inconsistent with our signaling hypothesis. Professor Catan reports that, based on public disclosure of accounting statements, a drop in performance by companies adopting clear-day poison pills occurs in the accounting periods closely preceding pill adoption. That drop in performance could be interpreted as disclosing what we argue is addressed in the signal sent by pill adoption. For present purposes, however, we note that Professor Catan's analysis does not—because it is beyond the scope of his project—address the very large increase in the effect of pill adoption during the scandal period compared to adoption during the non-scandal years that he (and we) consider. The signaling hypothesis here is not that pill adoption signals prior poor firm performance, a result rejected by Cremers & Ferrell, *supra* note 16, at 1190. Rather, it is that, in the scandal period, when the uncertainty concerning management quality is very high, pill adoption provides new and significant (albeit noisy) information about the

F.   *Tests and Results—Comparing Different Types of Firms*

The results above relate to comparing *time periods* that differ in terms of the reliability of other information concerning managerial quality. They show that changes in a firm's governance structures in the accounting scandal years had a larger effect on its Tobin's Q than changes made in normal years. These results support the proposition that in identifiable contexts, changes in governance structure can have a signaling effect concerning managerial quality: if governance changes are signals of managerial quality, we would expect a bigger impact on firm value in situations where the market is less informed concerning such quality.

Additional support for this proposition comes from our results comparing types of *firms* that differ in the reliability of other information concerning managerial quality. Our comparison involves firms engaging in substantial R&D, which other studies suggest is harder for the market to evaluate,[197] versus those that do not. Firms that spend money on R&D are more opaque on average than those that do not because it is generally much harder to assess how worthwhile these expenditures are than to assess expenditures for tangible physical assets.[198] Thus, there is on average a greater asymmetry of information between managers and the market in the case of R&D firms.[199]

We test this hypothesis multiple ways. First, we split our sample for the full fifteen years into firms with R&D expenditures and those with no such expenditures. We report our fixed effects regression results in Table 8.[200] The impact of the *Gindex* on firm value creation for firms with R&D is shown in column 2. We find a coefficient of –0.036, which is more than twice as large as the non-R&D firms' coefficient of –0.014 given in column 3. Both coefficients are statistically significant at the 95% level. When we compare the differential impact between R&D and non-R&D firms in column 4, we find a negative effect of –0.023. This difference is not statistically significant in conventional terms, since we can only rule out with about 80% confidence that the difference is not due to chance. Still, it is at least modest additional evidence in support of our

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quality of management not revealed by prior reported accounting performance, including, of course, its possible dishonesty.

[197] *See supra* note 17 and accompanying text (observing information asymmetry between managers of R&D-heavy firms and market).

[198] *See* Aboody & Lev, *supra* note 17, at 2748 (explaining why R&D expenditures are more opaque than other capital and financial inputs).

[199] *See id.* (listing three factors leading R&D expenditures to create more information asymmetry than traditional capital and financial outputs).

[200] We repeat our fixed effects regressions of Table 4 with the same control variables, just substituting a comparison of R&D versus non-R&D firms for a comparison of scandal versus normal years. For ease of exposition, Table 8 presents only the results on the governance indices.

signaling hypothesis.[201] We get parallel results with regard to the impact of the *Eindex* on value creation, also reported in Table 8.

Table 8. Fixed Effects Regressions of Tobin's Q on Corporate Governance Provisions for Firms with and without R&D in the Scandal v. Normal Times.

Variable	Fixed Effects		
	With R&D	No R&D	With R&D – No R&D
Gindex	-0.036**	-0.014**	-0.023
	(-2.30)	(-2.03)	(-1.31)
Eindex	-0.066**	-0.029**	-0.037
	(-2.38)	(-2.17)	(-1.21)

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

Control variables are included in each regression specification but are not presented in the table.

Additional, and stronger, evidence supporting our hypothesis comes from our tests splitting our sample into firms with R&D expenditures and those with no such expenditures and then, for each group, comparing the impact on Tobin's Q of a score-altering governance change in the scandal years versus normal years. If our signaling hypothesis is correct, then we would expect that when R&D firms, which are less well understood by the market, change their governance structures, the impact of the change on their Tobin's Q in the accounting scandal years would be even greater than for other firms that changed their governance structures in those years.

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[201] Our failure to find a difference between R&D and non-R&D firms at the 95% confidence level could well be because our test does not have the power to detect the difference rather than that there is no difference. The standard error for our measurement of the difference between R&D and non-R&D firms is 0.017. The observed difference in a governance change's impact on the Tobin's Qs of the two kinds of firms to meet the 95% confidence standard would thus need to be at least 0.033. Thus, for there to be even a fifty-fifty likelihood that a test in this situation would yield an observed change in Tobin's Q this great, the actual difference would need to be 0.033. So, if the actual impact for non-R&D firms was in fact 0.014, then the actual impact for the R&D firms would need to be 0.047, three and one-half times as great.

We report our fixed effects regression results in Table 9.[202] As our earlier results would suggest, both kinds of firms that change their governance structures have a greater change in Tobin's Q in the scandal years versus normal years. But the R&D firms—those for whom there is a greater information asymmetry between managers and the market—have the larger of the increases by a statistically significant amount, as shown in the last column of Table 9. Consistent with our earlier results, our OLS results, reported in Table 10, show that for firms that do not engage in a governance change, neither type of firm— R&D or non-R&D—shows a statistically significant difference in terms of the impact of governance scores on Tobin's Q between the scandal years and the normal years. In sum, in the circumstances involving the greatest information asymmetry between the market and insiders—i.e., R&D firms in the scandal period—we see the largest impact on the relationship between a change in a firm's governance score and its Tobin's Q, just as our signaling hypothesis would predict, and it is largest by a statistically significant amount.

Table 9. Fixed Effects Regressions of Tobin's Q on Corporate Governance Provisions for Firms with and without R&D in the Scandal v. Normal Times.

Variable	With R&D			Without R&D			Difference with and without R&D
	Scandal	Normal	Scandal – Normal	Scandal	Normal	Scandal – Normal	
Gindex	-0.151*	-0.031***	-0.119*	-0.064*	-0.010	-0.055*	-0.064**
	(-3.57)	(-1.78)	(-2.61)	(-4.07)	(-1.35)	(-3.13)	(-2.31)
Eindex	-0.226*	-0.074**	-0.151**	-0.103*	-0.027*	-0.076*	-0.075**
	(-3.78)	(-2.36)	(-2.24)	(-3.24)	(-1.81)	(-2.16)	(-1.99)

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

Control variables are included in each regression specification but are not presented in the table.

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[202] We repeat our fixed effects regressions of Table 5 with the same control variables, just substituting a comparison of R&D versus non-R&D firms for a comparison of scandal versus normal years. For ease of exposition, Table 9 presents only the results on the governance indices.

Table 10. OLS Regressions of Tobin's Q on Corporate Governance Provisions for Firms with and without R&D in the Scandal v. Normal Times.

Variable	With R&D			Without R&D			Difference with and with-out R&D
	Scandal	Normal	Scandal – Normal	Scandal	Normal	Scandal – Normal	
Gindex	-0.041* (-2.83)	-0.035* (-3.91)	-0.006 (-0.34)	-0.024* (-2.50)	-0.024* (-3.51)	-0.000 (-0.05)	-0.005 (-0.25)
Eindex	-0.123* (-4.14)	-0.091* (-4.98)	-0.033 (-0.93)	-0.064* (-3.24)	-0.052* (-3.66)	-0.012 (-0.53)	-0.020 (-0.48)

*Statistically significant at the 1% level.
**Statistically significant at the 5% level.
***Statistically significant at the 10% level.

Control variables are included in each regression specification but are not presented in the table.

G.   *Choice of Methodology*

As described above, our methodology has been to examine the relationship between a firm's index governance ratings and its Tobin's Q. The hypothesis we test relates to the impact of governance changes on the market's assessments of firm value. Only the numerator of Tobin's Q relates to the market assessment of a firm's value, with the denominator relating to its book value. Given this, one might ask whether it would be better instead to explore our hypothesis by undertaking event studies on the impact on firm value of changes in each of the various governance attributes that are scored in the G and E indices. Doing so, it might be argued, would avoid any of the noise introduced by changes in book value that are a component of calculating a firm's Q.

Notwithstanding the concerns driving such a question, we have chosen our Q-based methodological approach for a number of reasons. First, and most importantly, the index studies have been subject to trenchant critiques based on the argument that theory suggests they should not get any results. A primary goal of this Article is to help explain why they nevertheless can. The index studies examine the relationship between a firm's governance rating and its Q, and so any effort to explain their results requires a comparable approach. Second, doing an event study introduces its own kinds of noise. This is in part because, for many of the governance changes under study here, it would be hard to specify

with any precision when the market became aware of the change. Also, the scandal period was characterized by substantial discontinuities in the volatility of individual firm share prices, which make event studies harder to undertake and interpret. Third, we have no reason to believe that any noise introduced by a change in the book values of the firms under study would introduce bias that would drive our results. Assuming there is no such bias, the added noise should work against our finding statistically significant results. The fact that we nevertheless do find such results tends, if anything, to strengthen the support that they provide for our hypothesis.

This said, our effort here is at the vanguard of what we hope will develop into a deep vein of studies seeking to better understand the contextual nature of the impact of corporate governance. If other scholars wish to extend our work by examining through event studies the signaling aspect of corporate governance changes, we would welcome their efforts.

IV. LARGER LESSONS

In this Part, we discuss the larger lessons of our findings and how they illuminate current debates in corporate governance.

A.   *The Under-Theorization of Empirical Corporate Governance Studies*

A rich literature has developed in recent years concerning the connection between corporate governance and corporate performance. The G and E index studies play an important role in this literature, helping to give it an empirical foundation.[203] But also important is the developing scholarship criticizing these index studies.[204] As noted briefly earlier, these critics argue that a correct understanding of the institutional context is inconsistent with any plausible causal connection between many of the governance attributes scored by the indices and corporate value creation.[205] Accordingly, they assert that many of these attributes cannot possibly have an impact on corporate performance.[206] Their prime example is the poison pill.[207] The pill can be adopted very quickly and easily without a shareholder vote when management is faced with an immediate takeover threat.[208] So, the critics argue, while a firm's index rating will be affected by whether or not it has a pill, the presence or absence of a pill

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[203] *See supra* note 8 (summarizing key studies laying out G and E index methodologies).

[204] *See, e.g.*, sources cited *supra* note 10 and accompanying text (summarizing scholarship arguing that index studies cannot adequately explain how governance changes impact firm value).

[205] *See, e.g.*, Klausner, *supra* note 10, at 1349-50 (arguing that evidence shows no causal link between many takeover defenses and reduced share value).

[206] *See, e.g.*, *id.* at 1365-67.

[207] *See* Coates, *supra* note 11, at 271 (discussing relationship between poison pill and firm value).

[208] *See id.* at 287 ("For large, sophisticated targets, pill adoption can occur in a single business day . . . .").

at any point prior to an immediate takeover threat cannot be of consequence. Because a pill can be quickly adopted, in effect all firms have a "shadow" pill regardless of whether one has yet been formally adopted.[209] Despite the seeming logic of this argument, a recent empirical study, using ever more sophisticated econometrics, reports that certain defensive tactics such as having a pill in place do in fact result in fewer future takeovers.[210] The authors of this study, though, stress that their results are "atheoretic": they offer no hypotheses to explain the link between these governance provisions and shareholders' receipt of fewer premium offers.[211]

In essence, these various empirical corporate governance results have gotten ahead of the capacity of existing theory to explain them. In our view, the reason for this theoretical shortfall is because the impact of governance on performance is more contextual than is generally understood. The G and E index studies, for example, only measure the average impact of a set of attributes on firm value across a large number of corporations over a considerable period of time. Because these studies do not distinguish between different times and circumstances, they observe only an average, and most firms are not average. As noted in the Introduction, careful observers of the corporate world would find it highly likely that, rather than a single link between the specified governance provisions and performance, a range of linkages are possible, the direction and intensity of which depend centrally on the particular context in which a firm is operating. From this perspective, the impact of governance on firm performance is second order except when circumstances make it important. Thus, the impact of governance depends on the particular characteristics of both the time and the firm involved. Our empirical study of the signaling hypothesis exemplifies this hypothesis: the strength of the signaling link between governance and performance was much greater in the scandal period than in the normal period and more for R&D firms than for non-R&D firms.

B.   *Plausibly Explaining the First Two Links Through Which Governance Affects Tobin's Q*

We agree with many aspects of the argument put forth by the critics of the G and E index studies. Professor Michael Klausner, for example, makes a very important point: with a better understanding of the institutional realities, the indices could have been constructed with considerably more subtlety so as to frame a better hypothesis between governance characteristics and firm performance.[212] Still, in our view, a plausible story exists as to why, through the

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[209] *See id.* at 288.

[210] *See* Karpoff, Schonlau & Wehrly, *supra* note 13, at 1 ("[O]ur main inferences and contribution to the literature are based on data-driven, atheoretic tests that examine the relation between firms' uses of specific provisions and their takeover likelihoods.").

[211] *Id.*

[212] Klausner, *supra* note 10, at 1362-63 (critiquing failure of empirical literature to deal with institutional facts).

filtering and incentives/informedness links, firms with differently rated governance indices will on average differ in terms of value creation as measured by Tobin's Q.

1.   Staggered Boards, Supermajority Provisions, Shareholder Written
       Actions, and Special Shareholder Meetings

The presence of a staggered board is scored unfavorably by both indices. As Klausner himself relates, there are good reasons, both theoretically and empirically, to believe that a staggered board will lead to managerial behavior that creates less value because a staggered board provides managers protection from capital market discipline. Also, while it is true that certain other governance attributes scored unfavorably by one or both of the indices become largely irrelevant in the presence of a staggered board—supermajority provisions, limitations on shareholder action by written consent, and prohibitions on special shareholder meetings—they may well still be of consequence for the approximately 40% of firms that do not have a staggered board. Moreover, as for the firms that do have staggered boards and thus are unfavorably scored for that attribute, many do not have these other negatively scored attributes: 80% do not have supermajority provisions, a majority do not limit shareholder action by written consent, and a majority do not prohibit special meetings—perhaps in each case for the very reason that they are irrelevant. In sum, we believe that there are reasons to believe that, on average across all firms and time periods, firms that score more favorably with respect to these various governance attributes would create more value. At the same time, we share with Klausner the belief that a recognition of interactions among the various attributes might well allow a much more precise prediction of the value creation capacity of individual firms and a more theoretically compelling explanation of why.

2.   Poison Pills

As noted above, another key criticism of the index studies concerns the poison pill. Recall the argument that because a pill can be put in place quickly and easily if and when there is ever an actual takeover attempt, the firm without a pill is no less protected from capital market discipline than one with a pill and so should not be scored more favorably by the indices. Reality may not be so simple. For example, the absence of a poison pill may be value-relevant for a firm that had a pill in the past that management subsequently removed, perhaps to improve its governance image to institutional investors. To thereafter reinstate the pill at the time of a hostile takeover or proxy fight would tarnish management and hurt its chances in the fight against the potential hostile acquirer. There is empirical evidence consistent with this conjecture. Professors Vicente Cuñat, Mireia Giné, and Maria Guadalupe report that approval of a precatory shareholder proposal to remove an antitakeover proposal listed in the G index results in an increase of

10-12% in the cumulative probability that the firm will be the target of a successful takeover within five years after the vote.[213]

3.   Other Scored Governance Attributes

There are a number of items in the G index that concern governance attributes unrelated to entrenching incumbent management. These attributes can, at least in theory, affect performance by other means. For example, there is a trade-off between attracting the best officers and directors, which may be aided by governance attributes such as indemnification and protection from exposure to money damage suits for fiduciary duty violations, and the deterrent effect of facing such damage actions without such indemnification or liability exposure protection. Such indemnification and liability protection are each scored as indicating poor governance by the G index.

Whether or not a firm provides its managers with a golden parachute involves a similar trade-off. On the one hand, because a parachute provides incumbent managers with a handsome payment if there is a takeover, it lessens their resistance to one. This increases the likelihood that if the firm is being poorly run, its assets will be transferred to more capable hands. On the other hand, the parachute lessens the sting of a takeover if one takes place and so weakens the incentive to do a good job in order to avoid a takeover. Both the G and E indices score the absence of a golden parachute favorably.

It is unclear whether these G and E index scorings identify the right spot in terms of each of these trade-offs. In other words, it is unclear with respect to each of these three attributes whether the index authors made the correct choice in terms of whether it is better to have the relevant provision at issue or not, i.e., the choice that, on average across all firms and time periods, results in firms with the more favorable ratings creating more value. They may be making the right choice, however, in which case their scoring of these attributes helps explain the G and E index study results. In any event, consistent with our larger thesis, the critical point is that the relation between governance and performance is contextual: the trade-off for any given firm at any given point in time self-evidently might vary considerably from what on average is best. These questions are left unanswered because of the absence of studies that take a more nuanced approach concerning under which circumstances these governance attributes in fact matter and in which direction.

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[213] Vicente Cuñat, Mireia Giné & Maria Guadalupe, *Price and Probability: Decomposing the Takeover Effects of Anti-Takeover Provisions* 22 (Ctr. for Econ. Pol'y Research, Discussion Paper No. 12059, 2017), https://cepr.org/active/publications/discussion_papers /dp.php?dpno=12059# [https://perma.cc/6S2A-8CUU]. The sample was composed of all shareholder-sponsored proposals to remove an antitakeover provision voted on in annual meetings of S&P 1500 firms between 1994 and 2013 (2820 proposals in 931 different firms). *Id.* at 3-4.

B.   *The Significance of the Plausible Story's Lack of Proof*

We have just presented a story as to why firms with differently rated governance structures will on average differ in terms of value creation as measured by Tobin's Q. This story is plausible. But in substantial parts it is unproven and in some parts even quite speculative. What is the significance of this lack of proof?

The first point to make is that the index study critics are putting forth a theory as to why the index studies should not get their empirical results but no theory as to why they nevertheless do. Our plausible story *is* a theory as to why they do. So, we would say to the critics, it takes a theory to beat a theory. More importantly, though, our story recognizes the more contingent and contextual nature of the relationship between governance and value creation and in so doing provides the first sketch of a guide for future empirical research.

The second point goes to our signaling hypothesis. Whatever the validity of our story here about how governance structure ratings affect Tobin's Q through the first two links—filtering and incentives/informedness—we have demonstrated empirically the existence of a third link involving signaling. The index critics might respond that if we are unable to show why the filtering and incentives/informedness links work, our empirical results relating to signaling lack a theory as well. Proof of our story, they might suggest, requires showing that it would be more costly for low-quality managers to adopt a rating improving governance change than for high-quality managers to do so. Without this higher cost for low-quality managers, such a governance change would not be a credible signal of managerial quality. Proving our story is difficult because the effectiveness of particular defensive techniques is also contextual: the circumstances of a particular company may cause a technique that may not be generally effective to be protective in particular circumstances.

In a situation in which context matters, however, it is sufficient to note what our empirical results demonstrate: score-altering governance changes have larger impacts on Tobin's Q in situations in which information asymmetry concerning managerial quality is greater. Given this finding, if it were not costly to the managers of at least some firms to improve their governance score, every firm would have an incentive to do so, with the result that all companies—those with good managers and those with bad managers—would change their governance in the same direction during the sample period. We observe that this is not the case. Hence one can infer that whatever the reasons, there is some benefit to a more highly rated governance structure, but obtaining this benefit is more costly for low-quality managers than for high-quality ones. The alternative inference is that managers make changes in governance structure randomly. We are aware of nothing in the literature that makes this claim or offers evidence consistent with it.

CONCLUSION

Prior scholarship reports a relationship between firms with good corporate governance index ratings and those best at creating shareholder value, results

that our study confirms.[214] However, little work explores why we observe this relationship. We hypothesize that, in the right context, a rating-altering change of corporate governance structure can signal the quality of a firm's management. This is because a change in governance structure that makes a firm's management more vulnerable to a hostile takeover or that gives independent directors or activist shareholders more voice imposes greater costs on poor-quality managers than on good-quality ones. A positive signal concerning the quality of management would lead to a positive reevaluation by the market of a firm's future cash flows and hence an increase in the firm's Tobin's Q, with a negative signal having the opposite effect.

We test this hypothesis by focusing on the years 2000-2002—a period of unprecedented corporate accounting scandals involving the fall from grace of some of America's largest and most respected companies, including Enron and Worldcom. Commentators at the time reported concern about where the "next shoe would drop," and, more generally, expressed reduced confidence in the accounting behind all firms' reports of past performances. The market thus perceived a greater information asymmetry between it and corporate insiders concerning the quality of firm management. The signal of management quality arising from a change in governance structure, even though always noisy, would take on added value in this environment, in which the market participants felt they otherwise knew less than usual about managerial quality.

We compare results testing the relationship between firms' governance indices scores and Tobin's Qs in this 2000-2002 accounting scandal period with results from the same tests in the years surrounding the accounting scandal period (1992-1999 and 2003-2006). The comparison involves both the results from fixed effects tests of the impact of an index-rating-altering governance structure change on Tobin's Q in any given year, and the results of cross-sectional OLS tests on the relationship in any given year between firm governance ratings and firm Tobin's Qs. The comparison of the fixed effects tests reveals that a changed governance index score in the accounting scandal years is associated with a much larger change in Tobin's Q than a comparably sized rating change occurring in the surrounding years. This difference is highly significant both statistically and economically.

In contrast, the comparison of the OLS results, which are dominated by firms that did *not* change, shows no significant difference in terms of the relationship between a firm's governance index rating and its Tobin's Q during the 2000-2002 accounting scandal period relative to the surrounding years. The difference between the fixed effects comparison and the OLS comparison strongly suggests that signaling was at work. The fact that the OLS finding for 2000-2002 is not significantly different from the OLS finding for these other years suggests that there was no significant difference between the scandal period and normal period in terms of the filtering and incentive/informedness effects of a good corporate governance structure. This is because the OLS results relate to

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[214] *See supra* note 10 (discussing this relationship).

observations, a large majority of which involve firms that did *not* change their governance structure. So, the fact that that there was a significantly greater impact on Tobin's Q during the scandal period relative to the normal period for firms that *did* change suggests that it must have been the third link between governance structure and performance—signaling—that became stronger in the scandal period, a period with heightened information asymmetry.

We strongly suspect that the signaling feature of a change in governance structure is not confined to 2000-2002. The market also did not know everything about management in 1996-1999 and 2003-2006. Likely, what we are seeing in 2000-2002 is simply a larger-than-usual signaling effect because, in this period, the market was abnormally uncertain about the quality of management based on the other information available, and so the value-relevance of the signal, even if still noisy, was greater. This conclusion, relating to differences in information asymmetry across time periods, is bolstered by our study relating to differences in information asymmetry across different types of firms. Thus, in response to the question we posed at the outset—*why* the observed relationship between governance ratings and Tobin's Q exists and under what circumstances does governance structure particularly matter—we believe that signaling can play a substantial role at least in certain contexts.

The idea that governance structure choices can serve a signaling function is an important conclusion in and of itself. Reducing asymmetry of information between the market and corporate insiders significantly enhances the efficiency of the economy. It allows improved monitoring of managers so that they are under more pressure to utilize well a firm's existing productive assets and to make good decisions concerning investments in new projects.

The more accurate share prices that result from reduced asymmetries also help the efficiency with which capital is allocated by external capital markets and make trading markets more liquid. A variety of regulations are designed, at least in part, to reduce these asymmetries, including our mandatory issuer disclosure regime and the antifraud rules concerning trading on private information. In designing public policy, it is important to appreciate as well the role that the private actors' actions can play in reducing these asymmetries. Our results give new insight in this regard. They also suggest how sharply asymmetries about management quality can grow if regulatory and gatekeeper failures allow a substantial number of accounting frauds to develop.

Even more important is the larger lesson of our results and their contribution to the law and finance literature concerning corporate governance. These results are strong evidence that the impact of governance is in important respects contextual, depending on the particular circumstances of the time involved, and the particular characteristics of the firms involved. This point, consistent with the familiar but unsupported claim that one size of governance does not fit all, helps illuminate the current debate concerning the corporate governance index studies. It suggests that there is theory that can help explain the index studies' strong empirical results linking governance structure with firm value creation but that, rather than a single link between the specified corporate governance

provisions and performance, a range of linkages are possible the direction and intensity of which depend centrally on the particular context in which a firm is operating.