

Illuminating the Corporate Governance Black Hole: Contextualizing the Link to Performance

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Abstract:

There is black hole at the center of the corporate governance galaxy. 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 a signal of the quality of its management. The idea is that better managers, on average, are 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. This signal 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 signal concerning this quality. The test compares ordinary times with 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 effect regressions, we are able to 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 would be expected to have a bigger effect in a period of greater uncertainty as to which firms had good managers. This conclusion is reaffirmed by a finding 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 more opaque as a general matter.

These results contain a larger lesson: 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, 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 can help explain 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

whose direction and intensity depend centrally on the particular context in which a firm is operating.

Table of Contents

I. The Index Studies	10
<i>A. Governance Index Construction</i>	11
<i>B. Tobin's Q as a Measure of Firm Value Creation</i>	13
<i>C. Testing the Relationship between G and E Index Ratings and Tobin's Q</i>	14
II. The Signaling Hypothesis: Theory	15
<i>A. Three Theories Explaining the Observed Relationship Between a Favorable Index Rating and Value Creation</i>	15
1. <i>Filtering for higher quality managers</i>	16
2. <i>Better incentivized and informed managers</i>	16
3. <i>Signaling management quality</i>	17
<i>B. Exploring the Signaling Hypothesis</i>	18
1. <i>The information asymmetry between the market and corporate insiders concerning management quality</i>	18
2. <i>How corporate governance can act as a credible signal to reduce information asymmetry</i>	19
3. <i>The noisiness of the signal and relative reliability of other information</i>	21
4. <i>The value of a governance structure change as a signal</i>	24
III. Testing the Signaling Hypothesis	27
<i>A. The Millennial Accounting Fraud Scandals</i>	29
1. <i>Enron</i>	30
2. <i>WorldCom</i>	33
3. <i>Health South</i>	36
4. <i>Adelphia</i>	36
5. <i>Overview: The Situation of Investors</i>	38
<i>B. Overview of the Empirical Study and Its Results</i>	40
1. <i>The nature of OLS and fixed effects tests</i>	40
2. <i>Summary of our findings</i>	42
3. <i>Implications of our findings</i>	43
<i>a. A hypothetical world without signaling</i>	43
<i>b. Allowing for the possibility of signaling</i>	46
<i>C. Data Sources and Variables Used</i>	49
<i>D. Tests and Results – Full Sample (1992-2006)</i>	52
1. <i>Fixed effects results</i>	52
2. <i>Cross-sectional OLS results</i>	54
3. <i>Summary of the full sample results</i>	55

<i>E. Tests and Results – Comparing Time Periods: The 2000-2002 Scandal Years Versus Other Years</i>	56
1. <i>Fixed effects results comparison.</i>	57
2. <i>OLS results.</i>	60
3. <i>Summary of results in accounting scandal years versus other years.</i>	61
4. <i>Robustness of the fixed-effects results to alternative definitions of normal times</i>	62
5. <i>Robustness tests: focusing on staggered boards and poison pills</i>	63
<i>F. Tests and Results – Comparing Different Types of Firms</i>	64
IV. Larger Lessons	68
<i>A. The Under Theorization of Empirical Corporate Governance Studies</i>	68
<i>B. Plausibly Explaining the First Two Links Through Which Governance Affects Tobin’s Q</i>	69
1. <i>Staggered boards, supermajority provisions, shareholder written actions, and special shareholder meetings.</i>	70
2. <i>Poison pills</i>	71
3. <i>Other scored governance attributes.</i>	72
<i>C. The Significance of the Plausible Story’s Lack of Proof</i>	73
V. Conclusion	74

Illuminating the Corporate Governance Black Hole: Contextualizing the Link to Performance

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There is black hole at the center of the corporate governance galaxy: 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 OECD have adopted corporate governance codes of best practice¹ and major institutional investors have adopted guidelines setting out how they will vote the shares in their portfolio on governance issues.² As well, corporate governance concerns were at the center of the conditions that the 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 Millennium 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

¹ See, e.g., G20/OECD Principles of Corporate Governance (2015), available at <http://www.oecd-ilibrary.org/docserver/download/2615021e.pdf>. Swiss Code of Best Practice for Corporate Governance (2014), available at http://www.ecgi.org/codes/documents/swiss_code_26sep2014_en.pdf. Codes covering particular countries also have also proliferated. These are available on the European Corporate Governance Institute web site. See Index of Codes, European Corporate Governance Institute, http://www.ecgi.org/codes/all_codes.php.

² See, e.g., California Public Employment Retirement System, "CalPERS Global Principles of Accountable Corporate Governance," (Nov. 14, 2011), <http://www.calpers-governance.org/principles/home> accessed 11/18/13; BlackRock, Global Corporate Governance & Engagement Principles (June 2014), available at <http://www.blackrock.com/corporate/en-ca/literature/fact-sheet/blk-responsible-investment-1engprinciples-global-122011.pdf>.

³ See, e.g., John M. Broder, "Asia Pacific Talks Vow Tough Action on Economic Crisis", *The New York Times*, 11/26/97, at A1; Timothy Lane et al., IMF-Supported Programs in Indonesia, Korea, and Thailand: A Preliminary Assessment, pp. 72-3 (International Monetary Fund, Occasional Paper No. 178, 1999).

⁴ Sarbanes-Oxley, for example, aims to improve auditor quality, see 15 U.S. C. §§ 201-209 (2012); promote the independence of audit committees of listed corporations, see *id.* § 78j-1; and increase corporate managers' responsibility for financial disclosures, see *id.* § 7241. Dodd-Frank implemented a host of governing reforms as well,

over the last 25 years have devoted a great deal of attention to reshaping and highlighting the governance content of Delaware corporate law.⁵

All this emphasis on corporate governance is built on the premise that “better” corporate governance structures lead to greater firm value. Here, though, is where the black hole comes into play. A nagging concern persists as to whether this foundational premise is accurate.⁶ This concern suggests two 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 that seeks 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 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

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, 1899-1907

⁵ See, e.g., Jack B. Jacobs, *Fifty Years of Corporate Law Evolution: A Delaware Judge’s Retrospective*, 5 HARV. BUS. L. REV. 141 (2015).

⁶ For example, empirical studies generally do not show that independent directors, the centerpiece of the post-1970s corporate 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 (1999).

⁷ This literature is discussed in Part I and IV *infra*. As an example of the subject’s attraction, over the years 1995 through August 29, 2013, more than a quarter of all articles published by the Journal of Financial Economics were related to corporate governance. Out of a total of 1,533 articles, 414 (27 percent) dealt with corporate 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 et al., *Corporate Governance and Equity Prices*, 118 Q.J. ECON. 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 (2009). These studies are discussed in more detail in Part I *infra*.

governance structures that receive favorable index ratings and their Tobin's Qs, a widely used measure of firm value creation.

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.⁹ For 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.¹⁰ 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.

But these criticisms raise their own problem: they advance a theory as to why the index studies *shouldn't* 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 are left in the corporate governance black hole, with no light escaping.¹¹

⁹ See, e.g., Emiliano Catan & Marcel Kahan, *The Law and Finance of Antitakeover Statutes*, 68 STAN. L. REV. 629 (2016); Michael Klausner, *Fact and Fiction in Corporate Law and Governance*, 65 STAN. L. REV. 1325 (2013); David Larcker, P. Reiss & Y Xiao, *Corporate Governance Data and Measures Revisited* (working paper 2015), available at <http://ssrn.com/abstract=2694802>.

¹⁰ John C. Coates, *Takeover Defenses in the Shadow of the Pill: A Critique of the Scientific Evidence*, 79 TEX. L. REV. 271 (2000); Emiliano Catan, *The Insignificance of Clear-Day Poison Pills* (working paper), available at <http://ssrn.com/abstract=2836223>.

¹¹ More recent studies using ever more sophisticated econometrics show that, contrary to the index skeptics, certain defensive governance attributes such as actually having a pill in place result over time in fewer takeovers. But these studies' authors stress that their results are "atheoretic": no hypotheses are offered to explain the link between these governance attributes and shareholders receiving fewer premium offers. ¹¹ Jonathan M. Karpoff, Robert Schonlau & Eric Wehrly, *Which Antitakeover Provisions Matter* (working paper March 14, 2018), available at <http://ssrn.com/abstract=3142195>.

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.¹² 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. Because the existing studies do not distinguish between different times and circumstances – 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 whose direction and intensity 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 a first 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 supported in theory and demonstrated empirically.¹³ Specifically, we test the hypothesis that corporate governance attributes can serve

¹² One exception is Bernard Black et.al., *What Matters and for Which Firms for Corporate Governance in Emerging Markets?: Evidence from Brazil (and other BRIC Countries)*, 18 J. CORP. FIN. 934 (2012), where 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.

¹³ 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 period before and after the Delaware Supreme Court's decision in *Moran v. Household International*, 500 A.2d 1346 (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 (2014). However, the Cremers and Ferrell study also presents institutional problems. The form of poison pill involved in the *Household* case was a generally ineffective flip over-

as credible signals of the quality of a firm's management and that these signals matter more in situations when the market has less other good information concerning managerial quality. If we can show that a link between governance and performance – in our study, between the market's assessment of the of the firm's capacity to create value and the quality of its governance as measured by the established indices – depends on context – in our study, the extent of information asymmetry concerning managerial quality --, we can begin our escape from the black hole. Beyond signaling, there are almost certainly additional context-dependent links between governance and firm performance that further theoretical and empirical work can reveal, but 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 R&D, which studies suggest are harder for the market to evaluate,¹⁴ with firms that do not. We report evidence supporting our management quality-based signaling hypothesis in each of these two

type pill. Only some time later was the current more effective flip in pill developed. See RONALD J. GILSON & BERNARD BLACK, THE LAW AND FINANCE OF CORPORATE ACQUISITIONS 740-51 (2d. ed. 1995); *Air Products and Chemicals, Inc. v. Airgas, Inc.*, 16 A.3d. 48 (Del. Ch. 2011).

¹⁴ See, e.g., David Aboody & Baruch Lev, *Information Asymmetry, R&D and Insider Gains*, 55 J. FIN. 2747 (2000); Bronwyn Hall & Joshua Lerner, *The Financing of R&D and Innovation* in HANDBOOK OF THE ECONOMICS OF INNOVATION (Bronwyn Hall & Nathan Rosenberg, eds., 2010), volume 1; Pierre Barbaroux, *From Market Failures to Market Opportunities: Managing Innovation Under Information Asymmetry*, 3 J. INNOVATION & ENTREPRENEURSHIP (2014) available at <https://link.springer.com/article/10.1186/2192-5372-3-5>

ways. In essence, we see that the less the market otherwise knows about a firm's managerial quality at a particular moment in time, the bigger is 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. 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 from 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 suggest not just the familiar (though neither well-framed nor well-tested) claim that one size of governance does not fit all companies,¹⁵ but also suggest that what size is right 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.

¹⁵ See, e.g., 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 a one-size-fits all governance methodology upon corporate managers).

Part II sets out our signaling hypothesis. It discusses three non-mutually-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 corporate governance structures lead to firms being better 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 having better rated governance structures in order to credibly reveal information concerning management quality, and how poor managers steer their firms toward the opposite type of structure. This third theory suggests that a firm's governance structure is 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 quality of a firm's management (one context), or where a firm's particular characteristics lead to more than average levels of such asymmetry (another context), the firm's corporate governance attributes will serve as a stronger signal of management quality. In essence, a firm's corporate governance structure acts 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 the period involving the Millennial accounting scandals Enron, WorldCom and others and the capital 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 very 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. 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 serving to filter out bad managers or to better motivate and inform 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 Q if the firm is engaging in substantial R&D activity than if it is not. 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.

Part IV explores the larger lessons of these results for the study of corporate governance. We explain how the results are an example of our central point: 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.

Part V concludes.

I. The Index Studies

Index studies, which score firms based on whether they have particular corporate governance attributes and then test to see whether better rated firms create more value for investors, play a prominent role in the empirical corporate governance literature. As already noted, index studies have shown positive results but have also been the subject of some cogent criticism – that in operation, some of the attributes that make up the index cannot in practice affect firm performance. We will save discussion of the criticism until Part IV, but it is important at the outset to explain how the index studies work and that, whatever their faults, an important reason for their creation is the endogeneity problems that so often plague event studies of individual governance attributes – 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.

A. Governance Index Construction

The two most commonly used corporate governance indices are the “G index” and the “E index,”¹⁶ on which we will focus here. Each index’s authors posit a list of corporate governance attributes that they believe affect the quality of corporate decision making. For example, the G and E indices each includes on its attribute list whether a company has a board whose members are all elected annually or has staggered board. 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. A staggered board, however, reduces the likelihood of poor managers being replaced in this way because, when

¹⁶See Gompers et al, *supra* note 8; Bebchuk et al, *supra* note 8.

combined with a 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. 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.¹⁷ 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 capital market discipline improves its governance.

The G index contains 24 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 control change and hence to reduce the capital market's ability to discipline poor performance.¹⁸

For each attribute on an index's list, a firm is assigned a score of zero if it has the positive attribute and one if it does not. A firm's score with respect to each attribute in the index is then summed to obtain its overall governance rating. The *lower* the total, the *more favorable* the rating. As this zero-one scoring indicates, neither index attempts to measure the relative importance of,

¹⁷ *Air Prods. & Chems, 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 Bebchuk, John C. Coates IV & Guhan Subramanian, *The Powerful Antitakeover Effect of Staggered Boards*, 55 STAN. L. REV. 885 (2002) (explaining the operation of a staggered board of directors and that board structure's interaction with a poison pill).

¹⁸ The six attributes are staggered boards, limits on shareholder amendments to the bylaws, supermajority requirements for shareholder approval of charter amendments, supermajority majority requirements for shareholder approval of mergers, poison pills and golden parachutes. Bebchuk, Cohen & Ferrell, *supra* note 8.

or interaction among, individual attributes. Nor does either index reflect an assessment of whether a particular attribute may matter more or less in different contexts.

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 in the form of dividends, stock buybacks and debt service, the managers obtain additional resources to work with. Managers use all 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 its managers have created with the resources that have been given to them.

Tobin's Q is 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.¹⁹ With respect to the numerator, the higher the market expects a firm's discounted future cash flows to be, 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,

¹⁹ 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 & Ross L. Watts, *The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies*, 32 J. FIN. ECON. 263 (1992). 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. Robert P. Bartlett & Frank Partnoy, *The Misuse of Tobin's Q* available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3118020. We have chosen to use the traditional measure, however, to maintain comparability with the earlier studies. We believe we take adequate account of the effect of intangibles on our results because R&D is the primary source of intangibles and we include in our regressions whether or not a firm has significant R&D as a control variable. 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.

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 management created according to the market's assessment.²⁰

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, the length of the total period typically determined simply by the number of years for which data is available. Similarly, Tobin's Q is determined for each of these firms for each of these years. 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. The G and E index

²⁰ It should be noted 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 needed 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 it 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 for a historical 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.

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.²¹ These findings are confirmed by our own results²² and repeatedly by other scholars.²³

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 is a credible signal of the quality of its managers – their capacity to create value – and that this signal is stronger in 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. Then in Part III we test this hypothesis empirically.

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

We start this discussion of the reasoning behind our hypothesis by identifying three possible (and clearly not mutually exclusive) theories as to the observed relationship between a firm's governance rating and its Tobin's Q. One 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: corporation governance structures with better ratings serve as a filter to select better quality managers. A second is that managers, regardless of their skills, are better motivated and informed when operating under a more highly rated governance structure. The first theory causes better managers to be chosen; the second makes those chosen perform better whatever their skill level. The third theory reverses the direction of causation: a firm's governance structure can be a credible

²¹ See Gompers et al, *supra* note 8; Bebchuk et al, *supra* note 8.

²² See Part III.E *infra*.

²³ Karpoff et. al, *supra* note 11, reviews this literature.

signal of the quality of its managers. We think that all three theories 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 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 higher quality managers. 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. The result is that a firm 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. Thus, they create more shareholder value, which will be reflected in a higher Tobin's Q.²⁴

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. This is because the alternative -- performing poorly -- is more likely to result in their losing their jobs.

²⁴ 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.

A highly-rated governance structure also may provide information and voice to others, for example independent directors or activist shareholders, who can improve the quality of firm decision-making through, respectively, monitoring of managements' decision-making or providing directors information that otherwise might not be available to them.²⁵ 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. 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 affects the quality of firm decision-making; it is this direct increase in decision quality that results in the higher Tobin's Q. The third possible explanation for the observed relationship between good corporate governance index scores and high Tobin's Qs is the signaling theory that is at the center of our empirical analysis. As previously described, a signaling theory involves a very different mechanism than the first two. Instead of a highly-rated governance

²⁵ See Ronald J. Gilson & Jeffrey Gordon, *The Agency Costs of Agency Capitalism: Activist Investors and the Revaluation of Governance Rights*, 113 COLUM. L. REV. 883 (2013); Ronald J. Gilson & Jeffrey Gordon, *Agency Capitalism: Further Implications of Equity Intermediation*, in RESEARCH HANDBOOK ON SHAREHOLDER POWER (J. Hill & R. Thomas eds., 2015).

structure leading to higher quality managers as in the first theory, or improving 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 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 capital market discipline and greater monitoring of other kinds. The governance structure chosen, which is observable by the market, conveys information about management quality, something that is not directly observable.

B. Exploring the Signaling Hypothesis.

Our signaling hypothesis is that a change in a firm's governance structure is a credible signal of the quality of its managers 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. Under this hypothesis, their choice of a governance structure – whether 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. 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. These other elements include external factors such as overall industry demand, the success of the firm's competitors and, importantly, simple luck. While on average good past performance indicates high quality management, it does not necessarily mean this in any particular case, especially in the short run when, as noted, good luck and good judgment can combine in proportions that are difficult for the market to observe.

2. *How corporate governance can act as a credible signal to reduce information asymmetry.* A firm's managers have a much better sense of their own quality than does the market. High quality managers would like to communicate this private information to the market. Doing so directly – saying in essence “we are high quality” -- is not very credible, however. This is because 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.

What is needed is some indirect action – a signal -- that would be costlier for a low quality manager to undertake than a high quality one. The fact that the signal is costlier for a low quality manager is what makes it credible: because of the higher cost, low quality managers are less likely to send the signal.²⁶

A firm's governance structure, we argue, constitutes just such a signal. Our theory as to why is as follows. The market knows that managers play a major role in shaping the governance

²⁶ The seminal article concerning signaling theory is Michael Spence, *Job Market Signaling*, 87 Q.J. ECON. 355 (1973). 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 Signals*, 39 J. ECON. LIT. 432, 433-36, 467-73 (2001)(providing background on signaling theory and its applications in finance).

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 capital 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 capital market discipline and other monitoring. Thus, our theory goes, a change to a more highly rated governance structure is a positive signal that the managers believe they are of good quality. This is because, in accordance with signaling theory, 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' job loss risk.

Correspondingly, a change to a lower rated structure is a negative signal. Firm managers who are doing an especially 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. In this situation, the change in governance structure sends a negative signal concerning management quality to the market. 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, the better managers are not inclined to "jam" the negative signal associated with a lower scoring governance structure.

The credible signal arising from a change to either a more or less favorably rated governance structure is information that affects the company's stock price, which in turn moves the company's Tobin's Q.

This kind of signaling theory has important antecedents in the corporate governance and finance literature concerning capital structure decisions. The logic is that an increase in debt increases the risk of bankruptcy. Bankruptcy, in turn, is costly to managers. This is because the value of their job-related human capital, which is not diversified, is reduced if the company fails and they lose their jobs. 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 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.²⁷

3. The noisiness of the signal and relative reliability of other information. Although a change in a firm's corporate governance structure can serve as a signal of managerial quality, it too is noisy information. 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. Accordingly, if one firm, simply because of its scores with respect to such non-impactful 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 rating due to differences in the attributes that do have impact, the rating would properly suggest a better capacity at value creation.

²⁷ See Bengt Holmstrom & Jean Tirole, *The Theory of the Firm*, in 1 HANDBOOK OF INDUSTRIAL ORGANIZATION 61, 78-86 (Richard L. Schmalansee & Robert Willig eds. 1987).

These sources of noise, however, do not entirely eliminate the information content of governance structures with different ratings. A firm's rating on average does say something about the quality of its management, but in a noisy way. To combat these problems of noise, scholars use large samples, where other effects tend to cancel each other out, as well as control variables. 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.²⁸ Thus our hypothesis is not that the differently scored governance structures fully result in what economists call a separating equilibrium – that they make totally 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 non-directly-observable feature such as managerial quality, the less reliable is information concerning the feature other than the signal, the greater is the value of the information contained in an even noisy signal. So, we posit that the increased information asymmetry concerning management 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 in normal times, the signal sent by a firm that changes its governance structure would have more of an effect than usual on a firm's share price and hence on its Tobin's Q. This is confirmed by our findings reported in Part III. Similarly, we would expect that this signal would be of more value with types of firms where as a

²⁸ See also Part III.E *infra*.

general matter the information asymmetry concerning the quality of management is greater, for example, firms with high R & D spending. Our findings reported in Part III support this hypothesis as well.

As is by now apparent, the power of a signal is not simply the signal's credibility in the abstract – its own signal to noise ratio.²⁹ Rather the credibility, and therefore the impact, of a governance signal depends centrally on context. This idea finds support in recent efforts to assess the value of a potential signal relating to another aspect of corporate performance. 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. The company's trustworthiness was measured by a signal: a firm's environmental, social and governance expenditures, i.e. its level of "corporate social responsibility" activity expenditures (CSR). Its bond market access was measured by secondary market bond spreads.³⁰ Over their full sample period of 2005 through 2013, the authors find no statistically significant relation between corporate bond spreads and this CSR measure. 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 trust worthiness.³¹

²⁹ 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. This is a pretty clear negative signal of management quality because why else would managers chose 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.

³⁰ Hani Amiraslani, Karl V. Lins, Henri Servaes & Ane Tamayo, *The Bond Market Benefits of Corporate Social Capital*, ECGI Finance Working Paper N. 535/2017, available at <https://ssrn.com/abstract=2978794>.

³¹ For example, Casey O'Connor & Sarah Labowitz, *Putting the "S" in ESG: Measuring Human Rights Performance for Investors* (working paper, Stern School of Business, New York University) (2017), demonstrate the difficulty in constructing a reliable rating system, focusing on the social component of ESG, assessing 12 existing measurement techniques. Given the range of factors necessary to construct a rating structure, and the fact that different investors will weight ESG different factors differently, it is not surprising that there are many ratings systems. A recent

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. The authors report that their “results are unambiguous: during the [financial-crisis-induced] crisis of trust, secondary market spreads of high CSR firms did not rise as much as the spreads of low-CSR firms.” They “conclude that corporate social capital [as measured by CSR] affects bond contracting when it matters the most: when there is a crisis of trust and bondholders seek reassurance that they will not be expropriated.” 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. Under these circumstances, information concerning the trustworthiness of a firm’s management became sufficiently more valuable than ESG scores, *despite their very considerable noisiness*, became reflected in the market in a statistically significant way.³²

This pattern matches our results with respect to the Millennium 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, but has significantly less impact in the periods before and after the crisis. This does not mean that the signal becomes

Department of Labor Study addressed to pension funds reviews the literature. Department of Labor, *Environmental, Social and Governance (ESG) Investment Tools: A Review of the Current Field* (Dec. 2017).

³² 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 Jenwittayarojje & Pornsit Jipapron, *Do Independent Directors Improve Firm Value? Evidence from the Great Recession*, 19 INT’L REV. OF 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.

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.

4. *The value of a governance structure change as a signal.* Recognizing how the value of the governance signal, though noisy, went up during the period of increased information asymmetry accompanying the Millennium accounting scandals helps elucidate one other factor in our story: we would expect that a *change* in governance structure resulting in a particular rating represents a more valuable signal concerning managerial quality than is 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. Rather, in this third theory, the value creation capacity of the firm is taken as given. The problem is that this value creation capacity is not fully understood by the market. One not-fully-understood factor affecting the firm's value creation 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 the personnel constituting management is one potential source of such quality change. But a change in quality can happen as well without such turnover. For example, the perspectives of the incumbent personal 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, Clayton Christensen's influential explanation for sharp disruptions

in the success of industry leaders highlights just this point.³³ 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 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 way.³⁴

Because managerial quality in this sense can change quite suddenly and at the same time 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 is the continuation of a governance structure that receives this same rating. Suppose that in a hypothetical Period 1 there is an index rating altering change in a firm's governance structure. The

³³ CLAYTON CHRISTENSEN, *THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL* (1997).

³⁴ Rebecca M. Henderson, *The Innovator's Dilemma as a Problem of Organizational Competence*, 23 J. PROD. INNOV. MNGMNT. 5 (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 main line 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* 290-296 (1987).

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 1. Thus, in Period 2, the information asymmetry diminishes concerning whether in fact a managerial quality change did occur during, or recently prior to, Period 1. In Period 3 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 (i.e., that it is continuing its same governance structure during the current period) 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.

III. Testing the Signaling Hypothesis

The three theories explaining 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, does not allow us to distinguish whether one, two or all three of the theories in fact are at work. Here we begin to sort this question out by showing that, at least under the right circumstances, the signaling hypothesis is consistent with powerful empirical results. The other two theories may well 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. According to our hypotheses, if we observe 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, 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 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 low quality additional managers 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. 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 2000-2002 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 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 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 greater impact on Tobin's Q than in the surrounding 12 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.³⁵

A. The Millennial Accounting Fraud Scandals

³⁵ This story can be subject to refinement, 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 pressure 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 event 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 2001-2002, 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 2000-2002 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.

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. 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 supposed to help protect society against fraud.³⁶ Warren Buffet is famously quoted as saying “[Y]ou only find out who is swimming naked when the tide goes out,”³⁷ and 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, Health South and Adelphia, were severely damaged or destroyed by senior management fraudulent behavior involving material misstatements or omissions about firm performance in the company’s financial statements. Each of these scandals warrants a brief history to show why they spread doubt across the rest of corporate America.³⁸

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

³⁶See JOHN C. COFFEE, JR., GATEKEEPERS: THE PROFESSIONS AND CORPORATE GOVERNANCE (2006); Merritt B. Fox, *Gatekeeper Failures: Why Important, What to Do*, 106 MICH. L. REV. 1089 (2010).

³⁷ Letter to the Shareholders of Berkshire Hathaway Inc. 10 (Feb. 28, 2002), <http://www.berkshirehathaway.com/letters/2001pdf.pdf> [<http://perma.cc/QUJ7-X8PG>].

³⁸ For an extensive list of companies faced with accounting scandals from 2001-2002, including Xerox, Merck, Tyco, and Bristol-Myers Squibb, see Penelope Patsuris, *The Corporate Scandal Sheet*, FORBES, <http://www.forbes.com/2002/07/25/accountingtracker.html> (last updated Aug. 26, 2002, 5:30 PM).

innovative firm for five consecutive years.³⁹ The company had been repeatedly touted as having impressive management and among the best boards of directors.⁴⁰ 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.⁴¹

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 inappropriately capitalize the SPE with its own stock.⁴² The SPE would provide Enron with a put, whereby Enron had the right to sell the asset to the SPE for a specified price.⁴³ This arrangement had an inherent problem: if the value of the asset and the value of Enron stock both fell, 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.⁴⁴ Moreover, even if the SPE did manage to perform, Enron had created an arrangement that in effect violated a fundamental accounting principle: the proceeds from the issuance of new equity should not be counted as earnings. Investors in Enron were unaware of the endogenous nature of these SPE arrangements.⁴⁵

³⁹ William W. Bratton, *Enron and the Dark Side of Shareholder Value*, 76 TULANE L. REV. 1275, 1276 (2002).

⁴⁰ See Jeffrey A. Sonnenfeld, *What Makes Great Boards Great*, HARV. BUS. REV. (Sept. 2002), available at <https://hbr.org/2002/09/what-makes-great-boards-great> (“[N]o corporation could have had more appropriate financial competencies and experience on its board [than Enron].”). Less than a year before the company declared bankruptcy, Fortune Magazine ranked Enron second in ‘quality of management’ among all U.S. corporations. See Coffee, *supra* note 36, at 18.

⁴¹ Bratton, *supra* note 39, at 1342.

⁴² Steven L. Schwarcz, *Enron and the Use and Abuse of Special Purpose Entities in Corporate Structures*, 70 U. CIN. L. REV. 1309, 1310 (2002).

⁴³ *Id.*

⁴⁴ *Id.* at 1315-16.

⁴⁵ Paul M. Healy & Krishna G. Palepu, *The Fall of Enron*, 17 J. ECON. PERSPS. 3, 11.

Enron “stretched the limits of accounting”⁴⁶ 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.⁴⁷ 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.⁴⁸ 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.⁴⁹ The partnership was ultimately dissolved in October 2001, and Enron had to reverse the earlier reported earnings.⁵⁰

Beginning in 2001, Enron’s stock began to decline for reasons unrelated to the accounting fraud, which had yet to be detected.⁵¹ The declining share price, among other things, left the SPEs with negative equity, and in October 2001 Enron was forced to announce that it had violated a variety of accounting standards.⁵² 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.⁵³ Only two months

⁴⁶ *Id.* at 9.

⁴⁷ *Id.* at 10.

⁴⁸ George J. Benston & Al L. Hartgraves, *Enron: What Happened and What We Can Learn From It*, 21 J. ACCT. & PUB. POLICY 105, 116 (2002).

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ Bratton, *supra* note 39, at 1322.

⁵² Healy & Palepu, *supra* note 45, at 11.

⁵³ *Id.*

later, Enron filed for bankruptcy with assets of \$63.4 billion, marking the largest restructuring in U.S. history.⁵⁴

Enron's failure, and the inability of its information gatekeepers — namely the auditors, rating agencies, and investment banks — to detect the financial malfeasance⁵⁵ would effectively “call[] the American market's integrity into question.”⁵⁶ Similarly, commentary at the time by prominent academics saw Enron as illustrative of more general problems. 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.”⁵⁷ Jeffrey Gordon questioned whether “[t]he real concern is that the gross overreaching at Enron is symptomatic of troubling if not egregious behavior elsewhere.”⁵⁸

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.⁵⁹ 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

⁵⁴ Benston & Hartgraves, *supra* note 48, at 106.

⁵⁵ See Coffee, *supra* note 36.

⁵⁶ Bill Mann, *Outraged Over Enron*, THE MOTLEY FOOL (Jan. 17, 2002), <http://www.fool.com/news/foth/foth020117.htm>.

⁵⁷ Healy & Palepu, *supra* note 45, at 4.

⁵⁸ Jeffrey N. Gordon, *What Enron Means for the Management and Control of the Modern Business Corporation: Some Initial Reflections*, 69 U. CHI. L. REV. 1249 (2002).

⁵⁹ 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 (Gup ed. 2007), at 113.

the time the largest merger in history.⁶⁰ By 2001 it was the nation's second largest long-distance telephone company and its largest provider of internet services.⁶¹

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.⁶² 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.⁶³ Analysts and commentators of the telecommunications industry focused heavily on the line cost expenditure-to-revenue (E/R) as an important performance indicator.⁶⁴ Over this period WorldCom consistently recorded an E/R ratio of 42%, significantly lower than its competitors, a ratio that it struggled to maintain as market conditions tightened, and ultimately did so through fraud.⁶⁵

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.⁶⁶ WorldCom manipulated its line costs by improperly releasing accruals set aside on its financial statements to pay anticipated bills in the future. These accounting accruals were intended to reflect an estimate of the costs associated with using the lines

⁶⁰ J. Randel Kuhn, Jr. & Steve G. Sutton, *Learning from WorldCom: Implications for Fraud Detection Through Continuous Assurance*, 3 J. EMERGING TECH. IN ACCT. 61, 63 (2006).

⁶¹ *Id.*

⁶² Wilmarth, *supra* note 59, at 114.

⁶³ *Id.*

⁶⁴ Kuhn & Sutton, *supra* note 60, at 63.

⁶⁵ *Id.*

⁶⁶ 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 (March 31, 2003), available at <https://www.sec.gov/Archives/edgar/data/723527/000093176303001862/dex991.htm>.

and facilities of outside vendors but for which WorldCom had not yet paid.⁶⁷ Releasing an accrual signals, in this case without a sound basis, that less is needed to pay these bills than had been previously anticipated, thereby reducing reported expenses and increasing pre-tax income.⁶⁸ By the end of 2000, WorldCom had exhausted these previously accumulated accruals.⁶⁹

Once these accruals were depleted, WorldCom shifted to other forms of accounting fraud. It capitalized, rather than expensed, \$3.8 billion of the company's cash outlays for line costs during 2001 and the first quarter of 2002.⁷⁰ Under 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.⁷¹ 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.⁷² 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%.⁷³

⁶⁷ *Id.* at 10.

⁶⁸ *Id.*

⁶⁹ *Id.* at 11.

⁷⁰ Wilmarth, *supra* note 59, at 115.

⁷¹ 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 60, at 63-64

⁷² Bob Lyke & Mark Jickling, *WebCom: The Accounting Scandal* (Congressional Research Service) 2 (2010).

⁷³ Beresford et al., *supra* note 66, at 11-12.

WorldCom met a fate similar to Enron. The company filed bankruptcy in July 2002,⁷⁴ ultimately issuing a final restatement that, in its correction of the accounting frauds, reduced its previous reported pre-tax earnings by \$10.6 billion.⁷⁵ WorldCom's CEO was sentenced to 25 years in prison.⁷⁶ 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.⁷⁷ As with Enron, the press response to the WorldCom scandal saw it as indicative of systemic failure in the quality of the financial disclosure 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."⁷⁸

3. *Health South.* Health South involved even cruder tactics to exaggerate earnings than did WorldCom. In order to maintain the appearance of growth, Health South'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. This desired figure was then forwarded to the assistant controller.⁷⁹ The controller would in turn work with a handful of finance and accounting executives, known internally as "the family," to plug the gap between desired and actual earnings.⁸⁰ These executives did so by falsifying accounting entries for cash, inventory, and

⁷⁴ Wilmarth, *supra* note 59, at 115.

⁷⁵ *Id.*

⁷⁶ Jennifer Bayot & Roben Farzad, *Ex-WorldCom Officer Sentenced to Five Years in Accounting Fraud*, N.Y. TIMES (Aug. 12, 2005), <http://www.nytimes.com/2005/08/12/business/exWorldCom-officer-sentenced-to-5-years-in-accounting-fraud.html>.

⁷⁷ Kathleen Brickley, *From Enron to WorldCom and Beyond: Life and Crime After Sarbannes-Oxley*, 81 WASH. U.L.Q. 357, 372 (2003).

⁷⁸ *WorldCom and Financial Markets: Another Scandal, Another Scare*, THE ECONOMIST (June 27, 2002), <http://www.economist.com/node/1205302>.

⁷⁹ *Id.*

⁸⁰ *Id.*

assets.⁸¹ After the fraud was revealed, bankruptcy ensued, and all five HealthSouth CFO's during the period of the fraud pled guilty to criminal indictments.⁸² As with the Enron and WorldCom scandals, Health South was said to put at issue not only the fabricated value of HealthSouth's stock, but represented as well "a fundamental attack on the core of the public market: accurate and transparent pricing information."⁸³

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. 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 subscribers across 32 states.⁸⁴ 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.⁸⁵ 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.⁸⁶

Among Adelphia's techniques were, as with WorldCom, fictitious conversions of cash outlays for operating expenses into outlays that could be capitalized. For example, Adelphia allegedly agreed with two suppliers of digital set-top boxes to overpay by \$7 million for the boxes. In return,

⁸¹ *Id.*

⁸² Carrick Mollenkamp, *An Accountant Tried in Vain to Expose HealthSouth Fraud*, WALL ST. J., <http://www.wsj.com/articles/SB105338447947754000> (last updated May 20, 2003, 12:01 AM).

⁸³ *Id.* at 131.

⁸⁴ *Id.*

⁸⁵ Barlaup et al., *Restructuring Trust in Auditing: Ethical Discernment and the Adelphi Scandal*, 24 *MANAGERIAL AUDITING* 183, 192 (2009).

⁸⁶ *Id.* at 195.

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.⁸⁷ The record suggested an overall lack of oversight of the accounting process. For example, the company’s audit committee met only once in 1999⁸⁸ and, from the last half of 2000 until April of 2002, consisted of only two members, one outside director and a member of the controlling Rigas family.⁸⁹ Finally, Adelphia’s accounting fraud was accompanied by extensive self-dealing by the Rigas family, which, 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 SEC, in part due to disagreements with its auditor, Deloitte & Touche.⁹⁰ The SEC simultaneously opened an informal inquiry to investigate the company’s accounting methods,⁹¹ and the company was forced into bankruptcy by June 2002.⁹² 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 involving Adelphia.⁹³ The *Wall Street Journal*, writing at the time, 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

⁸⁷ *Id.*

⁸⁸ *Id.* at 194.

⁸⁹ *Id.*

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *Id.* at 192.

⁹³ Peter Grant & Christine Nuzum, *Adelphia Found and One Son Are Found Guilty*, WALL ST. J., <http://www.wsj.com/articles/SB108862065449551734> (last updated July 9, 2004, 12:01 AM).

financial markets have been battered by seemingly relentless disclosures of financial shenanigans.”⁹⁴

5. *Overview: The Situation of Investors.* Consider the situation of market participants as this cascade of scandals rained down. They would have a heightened fear that some other firms, as yet untarred by scandal, would also be revealed to have engaged in 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, a very important firm characteristic to investors. But fear about the reliability of the information about each firm would have raised 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. 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 don't know who to trust. As these things come out, it just continues to build up.”⁹⁵

In this circumstance, high quality firm managers would have had an unusually strong incentive to send a signal that that credibly conveyed to the market the accuracy of their financial disclosures

⁹⁴ Jerry Markon & Robert Frank, *Adelphia Officials are Arrested, Charged with ‘Massive’ Fraud*, WALL ST. J., <http://www.wsj.com/articles/SB1027516262583067680> (last updated July 25, 2002, 12:01 AM).

⁹⁵ See David Hancock, *World-Class Scandal at WorldCom*, CBS NEWS, <http://www.cbsnews.com/news/world-class-scandal-at-worldcom/> (last updated June 26, 2002, 9:23 AM).

and hence the managers' quality—that their reported performance was the product of skill, not fraud.⁹⁶ 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 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.

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 did act as a signal of the quality of their managers. Our study employs the two broadly-used governance indices discussed above, the G index and the E index. Treating G index and E index 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 ordinary least squares (“OLS”) test and a fixed effects test. We then subdivide this large sample into two subsamples, one covering the accounting

⁹⁶ See Stewart C. Myers & Nicholas S. Majluf, *Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not*, 13 J. FIN. ECON. (1984) and Lakshmi Shayam-Sunder & Stewart C. Myers, *Testing Static Tradeoff Against Pecking Order Models of Capital Structure*, 51 J. FIN. ECON. 219 (1999).

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, the other not-tested factors that affect the firm's Tobin's Q beyond the firm's governance rating are randomly distributed.⁹⁷ 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 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 non-tested

⁹⁷ 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 reason may be that, for example, they are not easily observable or simply that they are incorrectly regarded by the author of the study as irrelevant.

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.⁹⁸

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, yields a very different result: the fixed effects test results diverge sharply from the OLS test results. The fixed

⁹⁸ Professors Bartlett and Partnoy recommend using a "first differences" approach to solving this hidden variable problem rather than our fixed effects approach. Partnoy & Bartlett, *supra* note 19. We do not believe that this is necessary. Each approach eliminates the impact of a time invariant hidden variable. The only difference is that our approach takes mean-differences rather than first-differences. The results should be very much the same and the fixed effects approach maintains comparability with the index studies that attempt to control for hidden variables.

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 as well 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.⁹⁹ 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 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 where 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

⁹⁹ See note 14 *supra*.

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 where the market understands the quality of a firm's management just as well as the managers themselves do. In other words, there would be no information asymmetry and hence no room for any 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 they will be more incentivized and informed. Relative to a firm with a poorer 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 publically available information relevant for estimating what this future cash flow will be. 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 of a governance structure with a given rating on Tobin's Qs 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 poorer 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 does not or does occur. If it does *not* occur, *neither* the OLS or 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 and 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, the difference between the two groups' average Tobin's Qs should widen because 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 did the Tobin's Q's of the firms that changed in the normal period and this difference should be reflected in the fixed effects results.¹⁰⁰ Again, if there is no strengthening of the link, we again would expect to see no difference between 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 the managers

¹⁰⁰ 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 have its effect on future cash flows. Thus, it may matter whether a firm has a particular governance structure that was just put in place or one that has had it 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.

themselves do. In other words, there is an information asymmetry and so there is at least the possibility that signaling could be at work when a firm changes its governance structure.

For reasons discussed just above, with continuing firms – the ones that according to our assumptions still send no signal – there would 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. So no difference in OLS results between the periods means there was no such strengthening of either of the first two links during the scandal period. Even with no such 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. 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 signal as to managerial quality. So if we see such a difference between the periods 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 appears to be just what we see.

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 one, at least not one of a size great enough to be statistically significant. 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.¹⁰¹ Thus, the only ways

¹⁰¹ The OLS finding includes all firms for all years in the sample under study, both the large majority that did not change their structures in a given year and the small minority that did.

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 of more poorly rate 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 the quality of management. 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.

In sum, the statistically significant greater result using fixed effects, but not one using OLS, in the comparison of the scandal period relative to the normal period suggests: (i) a governance change can act as a signal of managerial quality and did so during the 2000-2002, and (ii) whatever was the signaling impact of such a change on stock price and Tobin's Q in the normal period (and there is probably is some such impact), its impact was larger by a highly statistically significant amount during 2000-2002 period. The market in this period was unusually uncertain about the quality of management of publicly traded firms generally because of the unexpected incidence of

frauds in respected companies. As a result, receipt of a clarifying signal had an unusually large effect.¹⁰²

C. Data Sources and Variables Used

As previously described, our study employs the two well-known governance indices discussed above: the Gompers, Ishii and Metrick's G index¹⁰³ and the Bebchuk, Cohen and Ferrell's E index.¹⁰⁴ 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 ordinary least squares (OLS) regression on the cross-sectional relationship between a firm's index score and *Tobin's Q* for the same years. We then subdivide the sample into two parts – the “scandal” period of 2000-2002 and the “normal” period

¹⁰² In Part II.B.4 *supra*, we discussed how a continuation of a structure that was adopted at some point in the past and received a given index rating might itself provide some kind 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. 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-years 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 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 would actually 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.

¹⁰³ Gompers et al, *supra* note 8.

¹⁰⁴ Bebchuk et al., *supra* note 8.

consisting of our sample's surrounding years, 1992-1999 and 2003-2006. We compare, for both the fixed effect and OLS tests, the results in the scandal years with the results in the surrounding normal years.

We focus on all publicly traded companies which 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.¹⁰⁵ A firm's score can vary from a minimum of zero to a maximum of 24. 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 isolate 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.¹⁰⁶

For the above set of firms, we obtain 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.¹⁰⁷ We winsorize the values of Tobin's Q at the one-percent level and 99-percent level, so that outliers do not significantly affect our results.

¹⁰⁵ See Part I *supra*.

¹⁰⁶ We obtained data for the *Gindex* and *Eindex* from Martijn Cremers.

¹⁰⁷ See Smith & Watts, *supra* note 19.; Hyun-Han Shin and Rene M. Stulz, *Are Internal Capital Markets Efficient?*, 113 Q. J. ECON. 531 (1998); Darius Palia, *The Endogeneity of Managerial Compensation in Firm Valuation*, 14 REV. FIN. STUD. 735 (2001).

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*).¹⁰⁸ The final two variables are related to the firm's size. Specifically, 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 I. We have 26,098 observations, consisting of 3,516 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 6.17.¹⁰⁹ 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 average book leverage to asset (*Debt*) ratio of 25.5%, with median ratios of 23.5%. The average firm has a research and development expense to asset (*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 sales (*Lsales*) of 7.14, although there are many firms which are extremely large. The average size of our firms is \$4.3B, with a median value \$1.14B.

¹⁰⁸ 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 such cases. This implies that missing research and development expenses does not significantly affect the slope or sensitivity of *R&D* to Tobin's Q.

¹⁰⁹ 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.

Table I: Summary Statistics

Variable	Mean	Median	Standard deviation
<i>Tobin's Q</i>	1.004	0.675	1.063
<i>Gindex</i>	9.064	9	2.752
<i>Eindex</i>	2.297	2	1.358
<i>Debt</i>	0.255	0.235	0.265
<i>R&D</i>	0.026	0	0.079
<i>RDdum</i>	0.509	1	0.500
<i>Lsales</i>	7.143	7.048	1.526
<i>Lsales2</i>	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 effect 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 index). Hence this is the kind of test one would want to use to explore 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 et al.)¹¹⁰ that there is a relationship between better

¹¹⁰ Gompers et al., *supra* note 8.

firm governance scores and higher Tobin's Qs. As discussed, 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 II 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 one-percent 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 one-percent level. This coefficient is very similar to the Bebchuk et al (2008) 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). Table III'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.¹¹¹

¹¹¹ In examining the relationship between the control variables and firm performance, Table II also shows that firms with higher debt levels and research and development expenses are associated with higher firm value. The relationship between firm size and performance is non-monotonic, with a positive relationship that turns negative at the highest levels of firm size.

Table II: Fixed-Effects Regressions of Tobin's Q on Corporate Governance Indices

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

*** statistically significant at the 1% level, ** statistically significant at the 5% level, and * statistically significant at the 10% level, respectively.

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.¹¹² 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

¹¹² Note that a firm level fixed-effects model subsumes any impact of industry and therefore no industry controls need to be included.

only.¹¹³ These results, consistent with the OLS results of Gompers et al.,¹¹⁴ show that both *Gindex* and *Eindex* are negatively correlated to firm Tobin's Q, i.e., corporate governance structures that garner good governance ratings are associated with greater firm value creation.

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

Table III: OLS Regressions of Tobin's Q on Corporate Governance Indices

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

*** statistically significant at the 1% level, ** statistically significant at the 5% level, and * statistically significant at the 10% level, respectively.

The impact of a difference between firms in their respective *Gindex* scores on their Tobin's Qs is given in column 2 of Table III. We find a coefficient of -0.028 which yet again is statistically

¹¹³ See WILLIAM GREENE, *ECONOMETRIC ANALYSIS* (7th ed. 2005).

¹¹⁴ Gompers et al., *supra* note 8.

significant at the one-percent 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 one-percent level. Our *Gindex* results are similar to the Gompers et. al.¹¹⁵ 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.

These full sample results, taken by themselves, 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 the quality of management. 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 where 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

¹¹⁵ Gompers et al., *supra* note 8.

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 the governance effects on Tobin's Q in normal years. 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 will have a bigger long run effect on future cash flows.

For the reasons discussed earlier, we believe that 2000-2002 accounting scandal years was a period when the market perceived itself to be less informed concerning the quality of firm management than in normal times. Thus, to test our hypothesis concerning the signaling effect of changes in governance structure, we compare the fixed effects and OLS results for 2000-2002 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 (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 effect findings regarding each of the two periods. These results are given in Table IV.

The impact of 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 one-percent 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 one-percent level. Thus, we can say with a very high degree of statistical confidence that mere chance was not responsible for this observed difference between 2000-2002 and the surrounding twelve years in the impact on Tobin's Q of 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 one-percent level. When we compare the differential impact between accounting scandal and normal years in column 4, we find a negative effect of -0.1085, again statistically significant at the one-percent level

To put these numbers in perspective in terms of their economic significance, Gompers et al.'s characterize firms with a *Gindex* greater than or equal to 14 as forming a "dictatorship portfolio" and ones with a *Gindex* of less than or equal to 5 as forming a "democracy portfolio."¹¹⁶ In governance terms, the *Gindex* difference between the worst democracy firm and the best dictatorship firm is 9. Now we calculate the difference in the impact on Tobin's Q of a nine point drop (i.e., a governance improvement) in the normal period and compare it to an identical drop in the scandal period. The Tobin's Q of the median firm is 0.675. Thus we can approximate the percentage positive impact of the nine point index drop in normal period on the Tobin's Q of such a firm to be $(0.0249*9)/0.675 = 33.2\%$. In contrast, the approximate percentage positive impact on Tobin's Q of the nine point index drop in the scandal period is almost 5 times larger: $(.1062*9)/0.675 = 141.60\%$.

If instead of assuming a favorable nine-point drop in the *Gindex* rating, we examine the impact of an unfavorable increase in the *Gindex* rating, this time from the first quartile value of 7 to the third quartile value of 11, the percentage negative impact on Tobin's Q in the scandal period is still much larger, $(.1062*4)/0.675 = 62.93\%$, when compared to the normal period's negative impact on Tobin's Q of $(.0249*4)/0.675 = 14.76\%$.

¹¹⁶ Gompers et al., *supra* note 8.

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 $(.0559*2)/0.675 = 16.56\%$. 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: $(.1645*2)/0.675 = 48.75\%$.

Table IV: Fixed-Effects Regressions of Tobin's Q on Corporate Governance Provisions For the Accounting Scandal Period v. Normal Times

Variable	<i>Gindex</i>			<i>Eindex</i>		
	2000-2002 Scandal Period	Normal Period	Accounting Scandal –	2000-2002 Scandal Period	Normal Period	Scandal – Normal
<i>Gindex/Eindex</i>	-0.1061*** (-4.92)	-0.0249*** (-2.64)	-0.081*** (-3.45)	-0.1645*** (-4.95)	-0.0559*** (-3.33)	-0.1085** (-2.91)
<i>Debt</i>	0.573* (1.86)	0.293*** (5.55)		0.583* (1.88)	0.291*** (5.58)	
<i>R&D</i>	1.013 (0.56)	0.849*** (2.77)		1.065 (0.59)	0.849** (2.78)	
<i>RDdum</i>	-0.115 (-0.99)	0.079 (1.37)		0.134 (1.16)	0.079 (1.35)	
<i>Lsales</i>	0.223** (2.04)	0.131 (1.56)		0.225** (2.05)	0.129 (1.55)	
<i>Lsales2</i>	-0.026** (-2.47)	-0.009 (-1.59)		-0.026** (-2.52)	-0.009 (-1.59)	

<i>Cons</i>	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, and * statistically significant at the 10% level, respectively.

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 V show that both *Gindex* and *Eindex* rating are negatively correlated with firm performance in both 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 Q's), but there is no statistically significant difference in the strength of the relationship in between the scandal and normal periods.

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

Variable	<i>Gindex</i>			<i>Eindex</i>		
	Scandal	Normal	Scandal- Normal	Scandal	Normal	Scandal -Normal
<i>Gindex</i> or <i>Eindex</i>	-0.0309*** (-3.64)	-0.0302*** (-5.53)	-0.001 (-0.72)	-0.0862*** (-5.15)	-0.0730*** (-6.28)	-0.013 (-0.65)
<i>Debt</i>	0.367** (2.55)	0.180** (2.51)		0.383*** (2.68)	0.186*** (2.63)	
<i>R&D</i>	4.188*** (6.64)	2.338** (1.98)		4.121*** (6.53)	2.316** (1.97)	
<i>RDdum</i>	-0.312*** (-6.23)	-0.359*** (-5.80)		-0.313*** (-6.28)	-0.360*** (-5.84)	

<i>Lsales</i>	-0.220** (-2.40)	0.019 (0.26)		-0.231** (-2.55)	0.026 (0.36)	
<i>Lsales</i>	-0.010 (-1.63)	-0.001 (-0.24)		-0.011* (-1.89)	-0.002 (-0.47)	
<i>Cons</i>	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, and * statistically significant at the 10% level, respectively.

3. *Summary of results in accounting scandal years versus other years.* The results reported above provide strong support for our hypothesis that the impact of corporate governance on performance is highly sensitive to context: that changes in governance structure in particular contexts can constitute a credible signal concerning the quality of management. As our hypothesis would predict, our fixed effects tests reveal that score-improving changes in corporate governance have a highly statistically significant larger effect on Tobin's Q in the accounting scandal period 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 will 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 (i.e., 1997 to 1999), the accounting scandal period, and the three years after (i.e., 2003 to 2005) the accounting scandal period, respectively. The results of the fixed effects regressions are given in Table VII. Once again, we find that the impact of the governance variables in the accounting scandal period is statistically significantly larger than the impact of the governance variables in the three years periods prior to, or after, the scandal period.

Table VI: 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	Other	Scandal- Normal
<i>Gindex</i>	-0.1062** (-4.92)	-0.008 (-0.32)	-0.100*** (-3.52)	-0.1062** (-4.92)	-0.007 (-0.30)	-0.099*** (-3.07)
<i>Eindex</i>	-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, and * statistically significant at the 10% level, respectively. 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 24 elements going into the G index and two of the six elements going

into the E index.¹¹⁷ 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 VII 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.

Table VII: 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, and * statistically significant at the 10% level, respectively.

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

¹¹⁷ See note 17 *supra*.

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 relating to a comparison of types of *firms* that differ in terms 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,¹¹⁸ versus those that do not. Firms that spend money on research and development (R&D) are more opaque on average than those that do not because in general it is much harder to assess how worthwhile these expenditures are than are expenditures for tangible physical assets. Thus, there is on average a greater asymmetry of information between managers and the market in the case of R&D firms.

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 VIII.¹¹⁹ 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

¹¹⁸ See note 14 *supra*.

¹¹⁹ We repeat our fixed effects regressions of Table V 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 present in Table VIII only the results on the governance indices.

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 signaling hypothesis.¹²⁰ We get parallel results with regard to the impact of the *Eindex* on value creation, also reported in Table VIII.

Table VIII: Fixed-Effects Regressions of *Tobin's Q* on Corporate Governance Provisions for Firms with and without R&D

Variable	Fixed Effects					
	with R&D	No R&D	with-no R&D			
<i>Gindex</i>	-0.036** (-2.30)	-0.014** (-2.03)	-0.023 (-1.31)			
<i>Eindex</i>	-0.066** (-2.38)	-0.029** (-2.17)	-0.037 (-1.21)			

*** statistically significant at the 1% level, ** statistically significant at the 5% level, and * statistically significant at the 10% level, respectively. 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

¹²⁰ It should be noted in this connection that even if there was a difference between the R&D and non-R&D firms in terms of the actual impact of a governance change on their Tobin's Qs, it would be difficult to meet the conventional 95% standard given the power of our test. 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 .033. Thus, for there to be even a 50-50 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 .033. If the actual impact for non-R&D firms was in fact .014, the actual impact for the R&D firms would need .047, three and one-half times as great.

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. We report our fixed effects regression results in Table IX.¹²¹ 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 and do so by a statistically significant amount, as shown in the last column of Table IX. Consistent with our earlier results, our OLS results reported in Table X 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 – 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 IX. 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
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¹²¹ We repeat our fixed effects regressions of Table V 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 present in Table X only the results on the governance indices.

	Scandal	Normal	Scandal- Normal	Scandal	Normal	Scandal- Normal	
<i>Gindex</i>	-0.151*** (-3.57)	-0.031* (-1.78)	-0.119*** (-2.61)	-0.064*** (-4.07)	-0.010 (-1.35)	-0.055*** (-3.13)	-0.064** (-2.31)
<i>Eindex</i>	-0.226*** (-3.78)	-0.074** (-2.36)	-0.151** (-2.24)	-0.103*** (-3.24)	-0.027* (-1.81)	-0.076*** (-2.16)	-0.075** (-1.99)

*** statistically significant at the 1% level, ** statistically significant at the 5% level, and * statistically significant at the 10% level, respectively. Control variables are included in each regression specification but are not presented in the table.

Table X. 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 without R&D
	Scandal	Normal	Scandal- Normal	Scandal	Normal	Scandal- Normal	
<i>Gindex</i>	-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)
<i>Eindex</i>	-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, and * statistically significant at the 10% level, respectively. Control variables are included in each regression specification but are not presented in the table.

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. But also important is the developing scholarship criticizing these index studies.¹²² 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. Accordingly, they assert that many of these attributes cannot possibly have an impact on corporate performance. Their prime example is the poison pill. The pill can be adopted very quickly and easily without a shareholder vote when management is faced with an immediate takeover threat. 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 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. 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. The authors of this study, though, stress that their results are "atheoretic" : no hypotheses are offered to explain the link between these governance provisions and shareholders receiving fewer premium offers.¹²³

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

¹²² See, e.g., Emiliano Catan & Marcel Kahan, *supra* note 9; Klausner, *supra* note 9.

¹²³ See Karpoff et al, *supra* note 11.

because the impact of corporate 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 corporate governance provisions and performance, a range of linkages are possible whose direction and intensity 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 extent of impact all governance depends on the particular characteristics of both the time and the firm involved. Our empirical study of the signaling hypothesis exemplifies this story: 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. 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.¹²⁴ Still, in our view, a plausible story exists as to why, through the filtering and

¹²⁴ Klausner, *supra* note 9.

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 lower-value-creation managerial behavior because it 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 when and if

there is ever an actual takeover attempt, the firm without a pill is no less protected from capital market discipline than one with the 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 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. 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 12 to 14% in the cumulative probability that the firm will be the target of a successful takeover within 5 years after the vote.¹²⁵

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, however. For example, there is a tradeoff 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.

¹²⁵ Vicente Cuñat, Mireia Giné and Maria Guadalupe, *Price and Probability: Decomposing the Takeover Effects of Anti-Takeover Proposals* (working paper, January 27, 2015). 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 (2809 proposals in 929 different firms).

Whether or not a firm provides its managers with a golden parachute involves a similar tradeoff. 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 tradeoffs. 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 rating 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 correct point is that the relation between governance and performance is contextual: the tradeoff 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 what direction.

C. 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 significant 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 empirically demonstrated the existence of a third link, the one 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, is necessary to show 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 where 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

where 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 the inference can be drawn that whatever are the reasons, there is some benefit to a more highly rated governance structure but that 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.

V. 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. 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 be a signal concerning 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 2000-2002. This is the period of unprecedented corporate accounting scandals, such as Enron and WorldCom, involving the fall from grace of

some of America's largest and most respected companies. 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 there to be a greater asymmetry of information 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 where the market participants feel they otherwise know less than usual about managerial quality.

We compare results testing the relationship between firms' governance indices score and Tobin's Q in this 2000-2002 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 accounting scandal period (2000-2002) 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 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 and under what circumstances would 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 better utilize a firm's existing productive assets and to make better 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 actions of private actors 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 whose direction and intensity depend centrally on the particular context in which a firm is operating.

