Do Staggered Boards Affect Firm Value?

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Abstract

We attempt to resolve conflicting empirical results in studies on the wealth effects of staggered boards by addressing issues of endogeneity, omitted variable bias and functional form. In a sample of up to 2,961 firms from 1990 to 2013 we find that additional variables provide significant explanatory power for the (negative) wealth effects of staggered firms found in prior studies, and their inclusion makes the effect of a staggered board on firm value insignificant. When we control for endogeneity by the instrumental variable method, we find again that the staggered board has no significant effect on firm value. Our results suggest caution about legal solutions which advocate wholesale adoption or repeal of the staggered board and instead evidence an individualized firm approach, and provide some measure of skepticism for law-related corporate governance proposals generally.

I. Introduction

Does the presence of a staggered board affect firm value? A common belief is that a staggered board insulates a company from a hostile takeover by making it significantly more difficult to acquire the company.[1] A board can adopt a shareholder rights plan, commonly known as a poison pill, requiring a hostile acquirer to remove a majority of a

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[1] *See* Lucian Arye Bebchuk, John C. Coates IV & Guhan Subramanian, *The Powerful Antitakeover Force of Staggered Boards: Theory, Evidence, and Policy*, 54 STAN. L. REV. 887, 925–39 (2002) (finding that in a sample of hostile bids from 1996-2000, a target with an effectively implemented staggered board was twice as likely to remain independent when subjected to a hostile bid).

target's directors in order to have the new directors remove the poison pill and allow the hostile bid to proceed.[2] But a staggered board requires that a hostile bidder run successive proxy contests over a multi-year period to replace a majority of the board. The time and cost of such an uncertain endeavor can function to deter a hostile bidder.[3]

The theoretical impediments created by a staggered board have been confirmed by prior empirical research. Research has found that a staggered board is associated with lower firm value, attributed in part to the diminished likelihood of a takeover.[4] A staggered board insulates management from the discipline of the market for corporate control that would otherwise pressure managers to perform better or eliminate low-quality managers.[5] It also facilitates managerial entrenchment and diminishes board accountability, which exacerbates the agency problem due to conflicts of interests between stockholders and managers, hurting firm performance.[6] These predictions on the negative effect of a staggered board on firm value have been supported in a number of studies which find diminished firm performance and reduced executive turnover in firms with staggered boards.[7]

Recent research, however, has questioned the findings that a staggered board harms firm value and presents evidence to the contrary.[8] These studies claim that a staggered board ensures stability and continuity within the board and enables firm management to

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[2] *See* Steven M. Davidoff, *Airgas and the Value of Strategic Decision-Making*, 2012 COLUM. BUS. L. REV. 502, 508-509 (outlining the common board strategy of adopting a poison pill to inhibit a hostile takeover from succeeding, requiring a hostile bidder to run a proxy contest).

[3] Tom Bates, Becher & Lemmon, *Board classification and managerial entrenchment: Evidence from the market for corporate control*, 87(3) J. FIN. ECON. 656 (2008) (finding that a staggered board reduces the likelihood of receiving a takeover bid, though the economic effect is marginal).

[4] *See* Lucian Bebchuk & Alma Cohen, *The Costs of Entrenched Boards*, 78(2) J. FIN. ECON. 409 (2005); Lucian Bebchuk, Alma Cohen & Alan Ferrell, *What matters in corporate governance?*, 22(2) REV. FIN. STUD. 783 (2009); James M. Mahoney & Joseph T. Mahoney, *An Empirical Investigation of the Effect of Corporate Charter Antitakeover Amendments on Stockholder Wealth*, 14 STRAT. MANAG. J. 17 (1993).

[5] *See* Henry G. Manne, *Mergers and the Market for the Corporate Control*, 75 J. OF POL. ECON. 110 (1965) (theorizing that the unconstrained takeover market acts as a disciplining force on management).

[6] *See generally* Lucian A. Bebchuk, *The Myth That Insulating Boards Serves Long-Term Value*, 113 COLUM. L. REV. 1637, 1638 (2013). *See also* Andrei Shleifer & Robert W. Vishny, *A Survey of Corporate Governance*, 52 J. FIN. 2 (1997) (outlining the fundamental issues in corporate governance and the desire to address the separation of ownership from control it addresses).

[7] Olubunmi Faleye, *Classified boards, firm value, and managerial entrenchment*, 83 J. FIN. ECON. 501 (2007) (finding that a staggered board reduces the probability of forced CEO turnover, reduces the sensitivity of CEO turnover to firm performance, and reduces pay–performance sensitivity in managerial compensation); Ronald Masulis, Cong Wang & Fei Xie, *Corporate Governance and Acquirer Returns*, 62 J. FIN. 1851 (2007) (finding that bidder firms with a staggered board carry out worse acquisitions and their stock price declines more at the acquisition announcement).

[8] We discuss these results *infra* Part II.

pursue long-term strategic plans.[9] Absent a staggered board such long-term plans could be frustrated by a hostile offer. A staggered board can also strengthen managers' bargaining power against hostile bidders, thus enabling the extraction of better terms for the target firm, and could also benefit stockholders by enabling the target firm to better evaluate competing bids.[10] Consistent with this contrasting theory, the adoption (removal) of a staggered board is found to increase (reduce) value.

In this paper we employ different ways of estimating the effect of a staggered board on firm value, aiming to provide clarity and a forward research path in the staggered board debate as well as to address various legal proposals for the appropriate use of the staggered board. We begin in Part II by highlighting empirical issues with prior studies. Most importantly, there is a selection problem in any analysis of a staggered board and firm value which arguably has not been fully accounted for in prior studies. The implementation of a staggered board defense is voluntarily made by a firm.[11] It is not imposed on the firm exogenously but it is rather endogenous, being affected by firm characteristics and by the views and objectives of the firm's decision makers.[12] This raises a problem of selection which we believe prior studies of staggered boards have not fully addressed.[13] To put this issue another way, is it that the staggered board affects firm value, or is it the other way around, that the adoption of the staggered board is affected by firm value and other performance measures? This is indeed a major empirical issue that has been acknowledged

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[9] David F. Larcker, Gaizka Ormazabal & Daniel J. Taylor, *The Market Reaction to Corporate Governance Regulation*, 101 J. FIN. ECON. 431 (2011); Martijn J. Cremers, Lubomir P. Litov & Simone M. Sepe, *Staggered Boards and Long-Term Firm Value, Revisited*, J. FIN. ECON. (forthcoming) (electronic copy available at http://ssrn.com/abstract=2364165); Martijn J. Cremers & Alan Ferrell, *Thirty years of shareholder rights and firm valuation*, 69(3) J. OF FIN.1167 (2014).

[10] Richard H. Koppes, Lyle G. Ganske & Charles T. Haag, *Corporate Governance Out of Focus: The Debate Over Classified Boards*, 54 BUS. LAW. (1999) (arguing that staggered boards are an effective mechanism which enhances corporate governance); Martin Lipton & Theodore Mirvis, *Harvard's Shareholder Rights Project is Wrong*, Harvard Law School Forum on Corporate Governance and Financial Regulation (July 7, 2016), https://corpgov.law.harvard.edu/2012/03/23/harvards-shareholder-rights-project-is-wrong/ (stating that "it is our experience that the absence of a staggered board makes it significantly harder for a public company to fend off an inadequate, opportunistic takeover bid, and is harmful to companies that focus on long-term value creation."). *See also* Leo E. Strine, Jr., *Can We Do Better by Ordinary Investors?: A Pragmatic Reaction to the Dueling Ideological Mythologists of Corporate Law*, 114 COLUM. L. REV. 449, 450-51 (2014).

[11] More specifically, a staggered board requires that it be approved by the firm's board and then approved by the firm's shareholders if placed in the certificate of incorporation. A staggered board can also be placed in the firm's bylaws without shareholder approval, but this is known as an ineffective staggered board since shareholders can unilaterally remove the staggered board by amending the bylaws. *See generally* Bebchuk, Coates & Subramanian, *supra* note 1, at 894.

[12] An exception is the legislation of staggered board in the state of Massachusetts. *See infra* text accompanying note 45.

[13] *See infra* at Part II.B.

by Bebchuk and Cohen and most recently by Cohen and Wang.[14] Firms with low value may be worried and decide to adopt a staggered board in the hope of stalling an underpriced takeover offer.[15] In such a scenario the staggered board is not the cause of a change in firm valuation but a symptom.

A second issue with prior empirical studies is whether a staggered board affects firm value or whether firm value measurements are a symptom of other firms' characteristics that affect value and are correlated with staggered board.[16] To illustrate, a person that is sick with an infection also has high temperature, which is the symptom but not the cause of the sickness. In this context, it could be that inefficient management (board) and weak corporate governance negatively affects firm value and leads to adoption of a staggered board. Thus, the "villain" is not the staggered board but bad management. It could be argued, then, that the staggered board makes it harder to remove the current inefficient management and thus perpetuates the effect of weak corporate governance on value. Absent a staggered board, the argument goes, the firm could be taken over more easily and the inefficient management would be removed. This could indeed be the case in some firms; but for other firms, a staggered board could be beneficial. As with the selection issue, prior studies have failed to fully grapple with this issue, including the issue of omitted variable bias.[17] More specifically, it may be, as we indeed show, that with the addition of proper variables the effects of the staggered board become insignificant.

In Part III of our study we conduct our own empirical analysis attempting to correct for these prior issues. Using data compiled by Institutional Shareholder Services ("ISS"), formerly called RiskMetrics and before IRRC ("Investor Responsibility Research Center")

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[14] *See* Bebchuk & Cohen, *supra* note 4, at 410-411; Alma Cohen & Charles C.Y. Wang, *How Do Staggered Boards Affect Shareholder Value? Evidence from a Natural Experiment*, 110(3) J. FIN. ECON. 627 (2013) (asserting that prior studies of staggered board had observed negative correlation between a staggered board and firm value but that "[s]uch correlation, however, might not imply causation but could reflect the greater propensity of low-value firms to maintain such provisions.")

[15] *See generally* Bates et al., *supra* note 3 (examining empirically the reasons for adoption of staggered boards).

[16] Martijn Cremers & Simone Sepe, *The Shareholder Value of Empowered Boards*, 68 STAN. L. REV. 67, 105 (2016) (asserting that prior staggered board studies "are intrinsically limited in their ability to address endogeneity concerns—that is, the ever-present risk that correlation might be mistaken for causation.")

[17] *See infra* at Part II.

database, we examine the effect of a staggered board on up to 2,961 firms over a time span of 23 years for a total of up to 27,016 firm years.[18]

We begin our analysis by modeling the effect of the existence of a staggered board over time on firm value, employing the explanatory variables used in prior studies. Our initial results are consistent with prior studies, including the most prominent of these by Bebchuk and Cohen, which have found a staggered board to be negatively correlated with firm value. This highlights the importance of the ground-breaking Bebchuk and Cohen study which ended in 2002 and which we extend until 2013 with a similar result.[19] However, we find that the models used in Bebchuk and Cohen are sensitive to the variables included. We rerun our tests with additional variables which are related to firm value finding that in a number of estimations the presence of a staggered board has no significance and in other instances it has conflicting signs for firm value. The results highlight evidence that prior studies may have an "omitted variable" problem, namely that the results of prior studies may have inappropriately attributed a lower firm value to the presence of the staggered board instead of attributing it to other value-related variables that are correlated with the presence of absence of a staggered board.

We further test for an omitted variable problem by using a prominent measure of internal corporate governance known as the entrenchment index or E-Index.[20] The E-Index is an index of six measures of corporate governance, including the staggered board, which has been found to influence firm value.[21] We create a variable in our models which we call EInet which uses the E-Index and excludes the staggered board. When we add EInet to our models we find no significant results for staggered board and negative significant effects on the other components of the E-Index. Because the incidence of staggered board

[18] In some of our models we use a dataset of 1,959 firms over a time span of 21 years for a total of 15,921 firm years. Consistent with the findings of Larcker, Reiss and Xiao we find that there are significant coding errors in this database. *See* David F. Larcker, Peter C. Reiss & Youfei Xiao, *Corporate Governance Data and Measures Revisited* (Rock Center for Corporate Governance at Stanford University, Working Paper No. 211, 2015), http://dx.doi.org/10.2139/ssrn.2694802 (finding that "the IRRC coding and one commercial source of corporate governance data disagree significantly for several important governance indicators. Our own review of source documents uncovered measurement errors in the IRRC summaries, especially for golden parachutes and supermajority voting provisions."). We discuss this *infra* at Part III.A.

[19] Bebchuk & Cohen, *supra* note 4, at 410.

[20] This index was first proposed in Lucian Bebchuk, Alma Cohen & Alan Ferrell, *What matters in corporate governance?*, 22(2) REV FIN. STUD. 783 (2009).

[21] These six measures are staggered boards, limits to shareholder bylaw amendments, limits to amend the corporate charter, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendment. *Id.* at 783.

across firms is positively correlated with the magnitude of EInet, it could be that the previously documented negative value effect of staggered board picks up the negative value effect of EInet, with which it is positively correlated. This provides further evidence that the value effect of a staggered board is a symptom of other factors. These findings differ from Bebchuk and Cohen which include in their estimation model a related governance index, the G-Index and find that for their shorter estimation period, it does not detract from the negative effect of staggered board on firm value.[22] Our estimation model also employs a functional form that fits the data better than models used in earlier studies.[23]

We finish the main part of our empirical analysis by attempting to control for the selection and endogeneity issues associated with prior studies. Our strategy is to use the established econometric technique of instrumental variables to determine the attributes of a staggered board. We utilize a number of identification measures (also known as instrumental variables) including California, Massachusetts, New York and Pennsylvania incorporation as well as other measures to test for robustness including the three year stock return and measures identified by Karpoff, Schonlau, and Wehrly.[24]

In the first stage of our instrumental variables analysis we estimate the determinants of the staggered board. In addition to the effects of five instrumental variables, we find that the probability of having a staggered board is significantly affected by firm size, age, and a dummy variable for whether the firm is included in the S&P 500 index. The coefficients of these three variables are negative, suggesting that larger, more mature and more established firms are less likely to have a staggered board. Importantly, we observe that past performance, as measured by return on assets ("ROA"), sales growth, and profit margin, is an important determinant of whether a firm has staggered board. More profitable firms are less likely to have staggered board. Firms with higher research and development ("R&D") spending, higher leverage, and higher asset liquidity are also less likely to have a staggered board. These findings are consistent with the theory that the staggered board

[22] Bebchuk & Cohen, *supra* note 4, at 427 (Table 3). The G-Index is a count of 24 governance-related provisions proposed by Paul Gompers, Joy Ishii & Andrew Metrick. *See* Paul Gompers, Joy Ishii & Andrew Metrick, *Corporate Governance and Equity Prices*, 118(1) Q. J. ECON. 107 (2003).
[23] Earlier studies estimated a linear model, but we find that a nonlinear (logarithmic) model fits the data better. In this model, the effect of a staggered board on firm value is weaker than in the linear model.
[24] *See* Jonathan M. Karpoff, Robert J. Schonlau & Eric W. Wehrly, *Do Takeover Defense Indices Measure Takeover Deterrence?* REV. FIN. STUD. (forthcoming).

is endogenously determined based on the individual characteristics of the firm, and that more poorly performing firms adopt staggered boards.

When we conduct the second stage of our identification process and estimate the models using the predicted values of staggered board from our first-stage estimation we find that the coefficient of staggered board is insignificant in our models, meaning that it has no effect on firm value. This is contrary to the results of prior studies which through different identification procedures have found conflicting indicators of value for the staggered board.[25]

We conclude our analysis by examining possible explanations for the finding that a staggered board affects firm value. More specifically, if as prior studies find, the staggered board affects firm value there should be some channel through which this happens. In other estimations that we do we find that the staggered board has no significant effect on ROA, a common measure of corporate performance that affects value.

We thus find that when we controls for endogeneity and omitted variables, there is no evidence that a staggered board affects firm value. This suggests that the prior observed effects of the staggered board are related to the intrinsic value of the firm rather than the existence (or not) of the staggered board.

We conclude in Part IV by examining the policy implications of our findings.

Our analysis about the inconsistent effect of staggered boards means no definitive conclusion can be made at this time as to their positive or negative wealth effects. In terms of wholesale policy efforts to adopt or repeal staggered boards, our results suggest caution. We find evidence to support the proposition that a staggered board may have no meaningful effect on firm value, and its effect on performance may be idiosyncratic to a firm. They may be affected by firm characteristics that account for its decision on adoption, retention and removal of the staggered board provision which are unobserved to researchers or cannot be quantified for the purpose of research. More generally, our results provide evidence for measured skepticism of corporate governance studies and their implications for the structure of the board of directors generally. Attempting to tease out the effects of individual corporate governance measures may be significantly affected by the choice of variables and models. We conclude by analyzing various legal proposals related to the

[25] For a discussion of these studies, see *infra* Part II.A.

staggered board, and find that our results suggest caution about each of them. Instead, it appears a firm-specific approach should be adopted for the staggered board and that prior contractarian or agency-cost analyses to the defense may not fully encompass explanations for its presence or absence.

II. Background

A. Prior Research

The first set of studies exploring the wealth effects of staggered boards analyzed stock price movements around the time of the staggered board adoption/rejection. These studies examined the excess returns on company stock surrounding the time of adoption or rejection of a staggered board by companies, attempting to measure the wealth effects of the staggered board through stock price reactions. The results in these studies were mixed. Jarrell and Paulson found that the effect of the staggered board was statistically weak and abnormal returns around staggered board announcements were insignificant.[26] In contrast, however, a later study by Guo, Kruse, and Nohel finds that the de-staggering of corporate boards significantly increases stock prices by approximately one percent in a matched sample of 188 companies.[27]

These studies only examined value in the immediate aftermath of a staggered board adoption and deletion but they did not examine the long term effect since under the market efficiency hypothesis, current prices reflect future value. A second set of studies examine the effect of a staggered board adoption or rejection on a longer time series. The most prominent and important study in this group is by Bebchuk and Cohen. The authors find that a staggered board decreases firm value as measured by Tobins' Q, the ratio of the firm's market value to its book value of assets. The authors also find evidence that a staggered board placed in the corporate charter is determinative of value rather than one

[26] George A Jarrell & Annette B. Poulsen, *Shark Repellents and Stock Prices: The Effects of Antitakeover Amendments Since 1980*, J. FIN. ECON. 127, []-144 (1987). *See also* James M. Mahoney, *An Empirical Investigation of the Effect of Corporate Charter Antitakeover Amendments on Stockholder Wealth*, STRAT. MGM'T J. 17 (1993) (event study of 409 firms from 1974-1988 finding a strong negative shareholder wealth effect around staggered board adoptions).

[27] Rejin Guo, Timothy A. Kruse & Tom Nohel, *Undoing the Powerful Anti-Takeover Force of Staggered Boards*, 14 J. CORP. FIN. 274 (2008).

placed in the bylaws. In the latter case, the authors find that there is no lower value effect, a circumstance likely attributable to the fact that shareholders can unilaterally amend a by-law to remove a staggered board.[28]

A staggered board is said to be value decreasing because it reduces the likelihood of takeovers. Indeed, Bates, Becher, and Lemmon find that firms with a staggered board are less likely to receive an acquisition offer.[29] Field and Karpoff find that antitakeover provisions including a staggered board in initial public offering ("IPO") firms reduce the likelihood of subsequent takeover.[30] This is value reducing for firm stockholders because they accordingly forgo a potential acquisition premium. However, Daines and Klausner find that the great majority of firms going public have an array of antitakeover provisions that include a staggered board.[31] If a staggered board deprives stockholders of future takeover premia and if in general it reduces firm value, it means that the firm's owners bear this cost because they receive lower value for their shares in a market sale. If a firm's owners do include the staggered board provision in the corporate charter of their firm before going public, then if they are wealth maximizers they possibly foresee a benefit in this provision, or at least they do not consider it to be harmful.

Finally, an influential study by Bebchuk, Coates and Subramanian found that in a sample of 92 firms, firms with a staggered board were less likely to be taken over (by half) and that the premiums paid in such takeovers did not compensate shareholders for the fewer number of takeovers.[32]

A staggered board is also said to be value decreasing because it insulates management from the discipline of the market for corporate control that would otherwise pressure managers to perform better or eliminate low-quality managers. A staggered board facilitates managerial entrenchment and diminishes board accountability, which exacerbates the agency problem due to conflicts of interests between stockholders and

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[28] Bebchuk & Cohen, *supra* note 4, at 429 (table 5). *See also* Faleye, *supra* note 7, at 507 (finding a similar value decreasing effect on Tobin's Qs among firms with staggered boards).
[29] Bates et al., *supra* note 3, at 671.
[30] Laura Casares Field & Jonathan M. Karpoff, *Takeover Defenses of IPO Firms*, 57 J. FIN. 1857, 1881 (2002).
[31] Robert Daines & Michael Klausner, *Do IPO Charters Maximize Firm Value? Antitakeover Protection in Ipos*, J. LAW ECON & ORG. (2001).
[32] Bebchuk, Coates & Subramanian, *supra* note 1, at 891. *See also* John Pound, *The effects of anti-takeover amendments on takeover activity: Some direct evidence*, 30(2) J. LAW & ECON. 353 (1987) (finding in a matched sample of 100 firms that the staggered board reduces the likelihood of a takeover without an increase in deal premium).

managers, hurting firm performance.[33] Faleye finds that a staggered board reduces the probability of forced CEO turnover, reduces the sensitivity of CEO turnover to firm performance, and reduces pay–performance sensitivity in managerial compensation.[34] Masulis, Wang, and Xie find that bidder firms with a staggered board carry out worse acquisitions and their stock price declines more at the acquisition announcement.[35]

Proponents of staggered boards claim that they are beneficial to firms.[36] A staggered board ensures stability and continuity within the board and enables the firm's management to pursue long-term strategic plans, which take time to materialize. Absent a staggered board, such long-term plans could be frustrated by a hostile acquirer.[37] A staggered board can also strengthen managers' bargaining power against hostile acquirers, thus enabling the extraction of better terms for the target firm, and could also benefit stockholders by enabling the target firm to better evaluate competing bids.[38] A staggered board could also encourage director independence: Because of their three-year term, staggered board directors who disagree with management cannot be removed in the annual elections through a simple failure to renominate them for their position.[39]

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[33] *See generally* Bebchuk, *supra* note 6. David Scharfstein, *The Disciplinary Role of Takeovers*, 55 REV. ECON. STUD.185 (1988) (modelling when a takeover presents a genuine disciplinary threat).

[34] Faleye, *supra* note 7, at 528.

[35] Ronald W. Masulis, Cong Wang & Fei Xie, *Corporate Governance and Acquirer Returns*, 62 J. FIN.1851, 1868-1869 (2007). However, Rose finds that the negative relation between firm value and a staggered board exists only for firms with concentrated ownership. Morgan Rose, *Heterogeneous impacts of staggered boards by ownership concentration*, 15 J. CORP. FIN. 113 (2009). *See also* Robert Daines & Michael Klausner, *Do IPO Charters Maximize Firm Value? Antitakeover Protection in Ipos*, J. LAW ECON & ORG. (2001) (analyzing 310 firms at IPO stage and presence or absence of a staggered board does not appear correlated with value maximizing principles).

[36] Richard H. Koppes, Lyle G. Ganske & Charles T. Haag, *Corporate Governance Out of Focus: The Debate over Classified Boards*, 54 BUS. LAW. 1023 (1998).

[37] The ability and duty of a board to defend a corporation against a harmful takeover bid has long been recognized in Delaware law. *See Unocal v. Mesa Petroleum Co*., 493 A.2d 946 (Del. 1985) (stating that "the board's power to act derives from its fundamental duty and obligation to protect the corporate enterprise, which includes stockholders, from harm reasonably perceived, irrespective of its source. Thus, we are satisfied that in the broad context of corporate governance, including issues of fundamental corporate change, a board of directors is not a passive instrumentality.")

[38] Bebchuk, Coates, and Subramanian and Bates, Becher, and Lemmon find that the presence of a staggered board did not significantly increase a target firm's takeover premium. Bebchuk, Coates & Subramanian, *supra* note 1, at 935 (finding no statistical difference in takeover premiums between targets with and without staggered boards); Bates et al., *supra* note 3, at [] (finding that "[w]hile board classification alters the dynamics of takeover bidding, the expected gains to target shareholders are equivalent in bids for targets with and without classified boards."). However, Davidoff cites cases where the staggered board protection enabled the target to extract a higher premium. *See* Davidoff, *supra* note 2, at 510, n. 32 (citing Willamette's fourteen-month resistance to a hostile offer by Weyerhaeuser Airtran's hostile offer for Midwest Air Group as transactions where a staggered board appeared to allow a target to bargain for a higher premium).

[39] For a discussion of the value of director independence in corporate governance, see Renee B. Adams, Benjamin E. Hermalin & Michael S. Weisbach, *The Role of Boards of Directors in Corporate Governance: A Conceptual Framework and Survey*, 48(1) J. ECON. LIT. 58 (2010).

These arguments have been put forth most vigorously on a theoretical basis by Marty Lipton, the inventor of the poison pill.[40] But they also explain the results of recent studies which have found that the adoption of a staggered board increases value.[41] In particular, Cremers, Litov and Sepe attempt to distinguish their findings from Bebchuk and Cohen by using firm fixed effects in their regressions. Their strategy is to examine the effects of staggering and destaggering over time on firm values while holding the firms' unobserved characteristics constant through time. They conduct their study over the period 1978-2015 among 3,076 firms, finding that staggering the board increases Tobins' Q while destaggering it decreases this value measurement.[42] A similar result is also obtained in the study of Cremers and Ferrell.[43] Ge, Tanlu, and Zhang estimate the consequences of de-staggering the board in a sample of 384 firms, employing a method that accounts for the reasons for doing so.[44] They find that de-staggering does not improve firm performance. Larcker, Ormazabal, and Taylor examine a sample of 3,451 companies during the period from 2007 through 2009 examining excess returns in light of proposed legislation affecting staggered boards. They find that firms with staggered boards experience negative excess returns when legislation is proposed which would prevent the usage of staggered boards.[45]

In sum, the evidence on the value of staggered boards is mixed. Earlier studies examining the long term effects of the staggered board have generally found that the staggered board has a wealth decreasing effect. However, more recent studies have found that the staggered board may have wealth increasing effects over time. The differences between the studies is attributable to the different estimation methods that they employ, partly intended to address the issues of endogeneity and simultaneity, issues that we address in the remainder of this section.

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[40] *See* Martin Lipton, *Pills, Polls, and Professors Redux*, 69 U. CHI. LAW REV. 1037, 1039 (2002) (arguing that the purpose of takeover defenses is to "preserve the ability of the board of directors of a target of a hostile takeover bid to control the target's destiny and, on a properly informed basis, to conclude that the corporation remain independent.")

[41] Larcker, Ormazabal & Taylor, *supra* note 9, at 433; Cremers, Litov & Sepe, *supra* note 9, at 2; Cremers & Ferrell, *supra* note 9, at 19.

[42] Cremers, Litov & Sepe, *supra* note 9. *See also* Cremers and Sepe, *supra* note 16.

[43] Cremers & Ferrell, *supra* note 9.

[44] Weili Ge, Lloyd Tanlu & Jenny Li Zhang, *Board Destaggering: Corporate Governance Out of Focus?*, (Mar. 29, 2016) (working paper) (electronic copy available at https://ssrn.com/abstract=2312565).

[45] Larcker, Ormazabal & Taylor, *supra* note 9. *See also* Daines & Klausner, *supra* note 35, at 91.

B. The Issue of Endogeneity and the Staggered Board

As Cohen and Wang point out, evidence on the negative value effect of staggered boards should be interpreted with care because it is subject to *endogeneity*.[46] Adopting a staggered board (or retaining one) could be the result of poor firm performance rather than its cause. In addition, firm value could rise following board de-staggering because activist shareholders, who often press managers to do so, target firms that can benefit from de-staggering; but this result will not hold if de-staggering were applied to *all* firms. This endogeneity problem raises the need for an analysis using an *exogenous* event associated with staggered boards. An example of such an event is the legislation of staggered boards by the state of Massachusetts in 1990. The state of Massachusetts in response to a hostile bid by BTR, an English firm, against Norton, a Massachusetts company, passed a statute requiring that all public companies in Massachusetts have a staggered board.[47] Boards could opt out, but were permitted to opt back in at any time if they did so. Maryland has passed a similar statute, though it has received much less attention.[48]

Indeed, Bebchuk and Cohen acknowledged their own concerns about this problem: "Do staggered boards bring about a lower firm value? Or, is the correlation produced by the selection of staggered boards by firms with lower firm values—either because boards of low-value firms feel more vulnerable to a takeover or because low-quality management tends to both produce low value and seek antitakeover protection?"[49] And, Cohen and Wang who analyze the effect of staggered board on firm value point out that the negative relation between a staggered board and firm value "might not imply causation but could reflect the greater propensity of low-value firms to maintain such provisions."[50]

Bebchuk and Cohen attempted to address this concern in their seminal 2005 study. They state:

> Such questions of interpretation often arise, and have proven difficult to resolve, in studies of the correlation between Tobin's Q and various corporate structures. We also are unable to establish conclusively the direction of causation. However, we explore this question using the fact that charter-based staggered boards cannot

[46] Cohen & Wang, *supra* note 14, at 1.
[47] Mick Swartz, *The Massachusetts Classified Board Law*, 22 J. ECON. FIN. 29 (1998).
[48] We discuss the Maryland statute further at *infra* note 133 and accompanying text.
[49] Bebchuk & Cohen, *supra* note 4, at 426.
[50] Cohen & Wang, *supra* note 14, at 627.

be adopted by incumbents without a vote of shareholder approval, which was generally difficult to obtain during the 1990s.[51]

Bebchuk and Cohen thus attempted to address the endogeneity issue by estimating the firms' Tobin's Q as a function of the firms' staggered board as of 1990, when the ISS database began to document the phenomenon. They suggest that in firms with staggered boards in 1990, shareholders had no power to remove it, while "shareholders were generally unwilling to permit existing firms to adopt charter-based staggered boards during the 1990s".[52] In this estimation of firms' Tobin's Q as a function of staggered board provisions in 1990 they find again that the effect of staggered board on Tobin's Q is negative and significant.

However, since the Bebchuk-Cohen study, which ends in 2002, there have been many firms – 350 in ISS, 291 of which end up in our sample – whose staggered board has been removed. Also, between 1990 and 2013, there have been 101 firms who adopted staggered boards, 69 of which appear in our largest multivariate specification. This provides us the ability to address the selection problem by studying the determinants of the choice of firms having or removing staggered board and incorporate this factor into our empirical analysis.

Swartz, who studies the value consequences of the Massachusetts legislation mandating staggered boards, finds that the law had no significant effect on the stock values of firms which had no staggered board, neither on the introduction day nor on the passage day of the law. Examining the differential value effect of the law on firms with and without a classified board amendment, he found that there was no significant difference in the value effect of the law between the two groups. There was, however, a difference in price reaction between firms with and without already existent antitakeover amendments in their corporate charters.[53] The value of those firms without takeover amendments declined by 16 percent.[54] In a recent study of this event by Robert Daines, Shelley Xin Li, and Charles Wang,[55] the authors find that the imposition of a staggered board on firms led to an increase

[51] Bebchuk & Cohen, *supra* note 4, at 426.
[52] Bebchuk & Cohen, *supra* note 4, at 426.
[53] Swartz, *supra* note 47, at 31. For these purposes Swartz defines antitakeover amendments as provisions in a firm's corporate charter designed to limit takeovers other than a staggered board.
[54] *Id.*
[55] Robert Daines, Shelley Xin Li & Charlie Wang, *Can Staggered Boards Improve Value? Evidence from the Massachusetts Natural* Experiment (Sept. 2016) (working paper) (electronic copy available at

in Tobin's Q for younger, innovative firms and evidence that this is attributable to increased R&D and capital expenditure. The authors note that their findings cover a dataset different than that of Swartz which included more mature firms.

Smith proposes another way to overcome the endogeneity problem by employing an estimation method that uses the phenomenon of "over-voting" as an instrument.[56] The author finds that shareholder value increases around the passage of antitakeover provisions, including a staggered board, consistent with the findings of Cremers, Litov and Sepe.[57]

Recent studies have cast doubt on earlier findings that a staggered board is harmful to firm value by attempting to address this endogeneity issue. The most recent and prominent of these, Cremers, Litov and Sepe address the endogeneity issue by adopting a two-pronged strategy. First, they adopt a matched sample approach pairing a "firm with a changing board structure in a given year is matched to a firm with the same ex-ante board structure and similar observable characteristics that relate to board structure."[58] Second, they exploit the exogenous event of Massachusetts's adoption of a mandatory staggered board law also doing a matched sample between Massachusetts companies and similar control firms outside Massachusetts. They find that there is a positive (negative) relation between the adoption (deletion) of a staggered board and firm value.[59] These results naturally depend on the quality of the match between firms that are subject to the change in staggered board and those that serve as control firms.

Finally, a recent study by Cohen and Wang attempts to exploit two decisions by a Delaware court which allowed (then disallowed) companies to circumvent the staggered board.[60] Because the change in the legality of the staggered board was judicially imposed, these rulings are, like the Massachusetts legislation, considered exogenous events and so do not have the issue of endogeneity when a firm itself adopts a staggered board. Cohen and Wang examine the cross-section of stock returns around the announcements of the court ruling, distinguishing between firms that were potentially affected by these rulings and firms that were not. They find evidence that "is consistent

https://ssrn.com/abstract=2836463).

[56] Erin Smith, *Do shareholders want less governance?* (Jan. 8, 2013) (working paper) (on file with author).

[57] *See* Cremers, Litov & Sepe, *supra* note 9.

[58] *See* Cremers, Litov & Sepe, *supra* note 9, at 3.

[59] Cremers, Litov, & Sepe, *supra* note 9, at 4.

[60] Cohen & Wang, *supra* note 14.

with the hypothesis that the value of the affected companies was increased by the initial ruling weakening the antitakeover force of staggered boards and was decreased by the ruling's subsequent reversal."[61]

These findings are disputed by Amihud and Stoyanov which find that these results are driven by the inclusion in the sample of low-value and penny stocks that are mostly traded over-the-counter.[62] For other "normal" firms, the staggered board-related ruling had no effect on value. Amihud and Stoyanov also find that Cohen and Wang's results are not robust to changing the definition of the industry fixed effects. Cremers, Litov, and Sepe find that the results of Cohen and Wang are "not robust to either enlarging the sample by adding more data through hand collection or to using different industry fixed effects."[63]

The end result is that while attempts have been made to address the endogeneity issue associated with the staggered board, it is not clear whether a convincing approach has been put forth to date which either confirms or denies the wealth effects of a staggered board.

C. The Issue of Omitted Variables and the Staggered Board

The other important question concerning the wealth effects of a staggered board is whether it is the staggered board that affects firm value or whether the decline in value is a symptom of other firms' characteristics that affect value.

This is referred to in empirical analysis as an "omitted variable" problem.[64] The problem of omitted variables can never be fully resolved because one may not know the effects of unknown variables on the dependent variable, which in the case of our analysis

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[61] Cohen & Wang, *supra* note 14, at 3.

[62] *See* Yakov Amihud & Stoyan Stoyanov, *Do Staggered Boards Harm Shareholders?*, J. FIN. ECON (forthcoming Apr. 2016), https://ssrn.com/abstract=2686902. The assertions by Amihud and Stoyanov were disputed by Cohen and Wang in a second piece. *See* Alma Cohen & Charles C.Y. Wang, *Staggered Boards and Shareholder Value: A Reply to Amihud and Stoyanov* 15–16 (Harvard Business School, Working Paper No. 16-097, 2016).

[63] *See* Cremers, Litov & Sepe, *supra* note 9, at 25-26.

[64] Formally this can be written as follows: Suppose that the true model is one in which the dependent variable Y is affected by two explanatory variables X1 and X2, Y = a0 + a1*X1 + a2*X2. If we estimate a model Y = a0 + a1*X1, omitting X2, then the estimated coefficient a1 will be biased if X1 and X2 are correlated and if a2 is non-zero, i.e., if X2 has a direct effect on Y. It could even be that a1 = 0, i.e., X1 has no effect on Y. But if, for example X2 is positively correlated with X1 and its own effect on Y is negative – a2 < 0 – then the estimated value of a1 in a regression Y = a0 + a1*X1 will be negative. Then, the effect of the omitted variable X2 is attributed to X1.

is firm value as measured by Tobin's Q. All we can hope for is that the included variables reflect the best set of variables to estimate the determinants of the dependent variable.

Illustrative of this issue, the estimation model of Bebchuk and Cohen does not include variables that have significant effect on Tobin's Q.[65] Bates, Becher and Lemmon address this deficit and conclude it is questionable whether the value effect of a staggered board that is associated with the ease of takeover can produce the large effect on value that is documented by Cohen and Bebchuk.[66] They find that the effects on target firm value of hostile bids are similar for firms with and without classified boards.[67] In addition, Bates, Becher and Lemmon find that a bidder's stock price reaction upon the time of bid announcement is lower by 2.7% if the target firm has staggered board. Bates, Becher and Lemmon interpret these findings as follows:

> These results are not consistent with the notion that classification, on average, facilitates self-dealing by incumbent managers at the expense of target shareholders. Instead, the findings indicate that, consistent with the shareholder interest hypothesis, bidders fare worse when negotiating takeover bids with targets with a classified board structure.[68]

However, Bates, Becher and Lemmon find that a staggered board reduces significantly the likelihood of receiving a takeover bid. Bates, Becher and Lemmon calculate that "eliminating the deterrence effect associated with board classification increases the implied value of firms by only 1.1%."[69] This estimate seems far smaller than the effect of a staggered board on firm value estimated by Bebchuk and Cohen. Bebchuk and Cohen find that the negative effect of staggered board on the firm's Tobin's Q is in the range of 16%-17% and in Table 3, which uses staggered board provisions as of 1990, the negative effect of staggered board on Tobin's Q is nearly 7%.[70] The Tobin's Q figures in Bebchuk and Cohen's analysis are adjusted for the industry median.[71] It is hard to translate this to the effects on value, ceteris paribus, since there are no reported means and medians of the firms' market to book values. But assuming for simplicity that

[65] Bebchuk & Cohen, *supra* note 4, at 418-425.
[66] Bates et al., *supra* note 3, at 657.
[67] *Id.* at 669.
[68] *Id.*
[69] *Id.* at 674.
[70] Bebchuk & Cohen, *supra* note 4, at 423-426.
[71] *Id.*

the median Tobin's Q for the economy is 1, it means that the negative effect of staggered board on firm value as estimated by Bebchuk and Cohen is between 6 and 16 times greater than that estimated by Bates, Becher and Lemmon.

One conclusion from this analysis is that the large negative effect of staggered board on firm value, documented by Bebchuk and Cohen, can hardly be accounted for by the fact that a staggered board impedes the replacement of inefficient management. This effect can rather be attributed to other firm's characteristics which affect firm value and are correlated with the presence or absence of a staggered board.

D. Our Approach

In this paper, we address the problems of omitted variables and the endogeneity of the estimated effect of staggered board on firm value. To address the omitted variable problem, we expand the analysis to include firm characteristics and performance measures as well as industry variables that have not been included in earlier empirical estimates of the effect of staggered board on firm value. We estimate multiple regressions in which the effects of the added variables are estimated together with that of a staggered board. These estimations present the relation between a staggered board and Tobin's Q after controlling for the interaction of a staggered board and Tobin's Q with the other variables.

The issue of endogeneity is more difficult. To address this issue we adopt an instrumental variables approach as an identification procedure. Our identification procedure attempts to isolate the effects of a particular variable by using a third variable – an instrumental variable – which influences the variable which we consider to be endogenous, such as staggered board, without affecting the dependent variable, which in this case is Tobin's Q. This allows us to isolate the effect of a staggered board on value. We use four states of incorporation as identifiers, more specifically incorporation in California, Massachusetts, New York, and Pennsylvania. We find that these state variables do not influence firm value but do influence the incidence of a firm having a staggered board. This is due to the differing legal regimes in each of these states. We also use past three-year return as an instrumental variable. In robustness tests, we add two instrumental variables proposed by Karpoff, Schonlau, and Wehrly which make use

of peer firms' characteristics. We also examine another way by which staggered board could affect corporate performance by testing whether a staggered board affects a firm's ROA.

In conducting our analysis, it is important to note that there is strong evidence that the incidence of a staggered board provision is not random across firms. Across industries, there is a large variation in the likelihood of a firm having a staggered board provision. We find that the fraction of firm-years with a staggered board in an industry ranges between 6% and 87%. The difference in the incidence of staggered board among firms across industries is highly significant; the likelihood that these differences are due to chance is less than 0.001. If staggered board adoption and retention or de-staggering by firms were random, there would be no systematic differences between industries in the likelihood of firms in the industry having staggered board. Below, we present a detailed model of the determinants of a firm having staggered board. But the non-randomness of a staggered board across industries shows the need for considering the causes for firms having a staggered board before analyzing the effect of staggered board on firm value, something we assess in our identification procedures.

III. Empirical Findings

A. Dataset

Our dataset is the same one used by Bebchuk and Cohen expanded to include later years. We use the data compiled by the Investor Responsibility Research Center (IRRC) during the period 1995 to 2006. The IRRC data were available for 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006. After 2005, the database changed its name to RiskMetrics first and then ISS and in 2007 began publishing annual data. In the period 1990-2006, we follow Gompers, Ishii, and Metrick, Bebchuk, Cohen, and Ferrell and others and assume that a firms' governance provisions as reported in a given IRRC volume remained in place during the period following the publication of the volume until the publication of the subsequent volume.[72]

[72] Gompers et al., *supra* note 22; Bebchuk, Cohen and Ferrell, *supra* note 4.

The dataset we utilize includes between 1,939 and 2,961 firms over a time span of between 21 and 23 years for a total of between 15,921 and 27,016 firm years, depending on the model employed.[73] As observed by Larcker, Reiss and Xiao we too find coding errors in the ISS database.[74] We correct by hand any errors we find regarding the staggered board status of firms. Our corrections constitute approximately 0.5% of staggered board observations.[75] Our analysis is conducted with the corrected dataset. In unreported results also run each analysis on the uncorrected dataset and find no significant difference in our results. For stock prices we use the Center for Research in Security Prices ("CRSP") database, for accounting information we use the COMPUSTAT database and for acquisition data we use Thomson SDC. For institutional holdings we use the Thomson 13F database and for insider holdings we use S&P's ExecuComp database.

We exclude from our dataset Real Estate Investment Trusts and firms with dual-class shares.[76] In addition, we trim the sample in each year by deleting firms that have the highest and lowest 1% of the distribution of lagged size (market capitalization). Micro-size firms are non-consequential and very large firms are less likely to become takeover targets. We delete an entire industry if all firms in that industry either have a staggered board or do not have a staggered board.[77] We also code all firms incorporated in the state of Massachusetts as having a staggered board given that this state adopted a staggered board statute in 1990 and even in firms that opted out of the requirement, management can re-adopt it at will meaning every Massachusetts company has a latent staggered board.[78]

B. Empirical analysis

[73] We begin with a larger dataset. The remaining data are after we employ some filters which are detailed in the text.
[74] Larcker, Reiss & Xiao, *supra* note 18, at 1.
[75] Since we do not recreate the entire database by hand, we cannot be certain that our corrections are comprehensive. More specifically our strategy to double-check the IRCC database is to recode by hand any company who has switched the staggered board at least three times (e.g., adopting a staggered board, dropping it, and adopting it again or the other way around).
[76] This is consistent with Bebchuk and Cohen. Bebchuk & Cohen, *supra* note 4.
[77] This is done because we use industry fixed effects in our models so these observations do not contribute towards the identification of the coefficient of *SBdum*.
[78] *See* MASS. GEN. LAWS Chapter 156D, § 8.06 (1990).

In this section we test the effect of a staggered board on firm value by estimating regressions of firm annual Tobin's Q, defined as the ratio of the firm's market value to its book value, on a dummy variable SBdum and control variables. SBdum equals one in a firm-year if the firm had a staggered board provision in the previous year, and zero otherwise. A negative coefficient of SBdum that is statistically significant implies that a staggered board reduces firm value. This is the result that is obtained by Bebchuk and Cohen in a regression model that controls for firm characteristics and industry fixed effects.[79]

We proceed as follows. First, we estimate the model proposed by Bebchuk and Cohen using the ordinary least squares (OLS) method as they do. Then, we add to Bebchuk and Cohen's model more than ten variables that explain firm value. These are firm characteristics and industry characteristics pertaining to each firm. We then estimate the effect of SBdum on Q in the presence of these additional variables to assess the omitted variable problem.[80] The dependent variable in most of our analysis is logQ (the natural logarithm of Q) rather than Q, which is the dependent variable in Bebchuk and Cohen's analysis.[81] We show that the regression model fits the data much better with logQ as the dependent variable compared to Q. This means that the effect of the explanatory variables on Q is non-linear. Other researchers use logQ when studying the effects of some variables on firm value. For example, Griliches and more recently Sanders and Block show that the effect on the firm's value of its intangible capital, measured by its R&D expenditures, patents and trademarks, is explained in a model where the dependent variable is logQ.[82] The distribution of Q shows a strong positive skewness, i.e., it is highly asymmetric with a large right "tail" of high positive values

[79] Bebchuk & Cohen, *supra* note 4, at 427.

[80] Adding explanatory variables to the model is important because the documented effect of SBdum could be a result of the "omitted variable problem." Suppose we omit a variable X that has negative effect on Q and that is positively correlated with SBdum, and suppose further than SBdum itself is uncorrelated with Q. Then, including in the model SBdum but not X will make SBdum pick up the negative effect of X on Q. The regression coefficient of SBdum will be negative and we then mistakenly conclude that a staggered board has a negative effect on firm value. Yet, if we include in the model both X and SBdum, the negative effect of X on Q is directly estimated rather than it being shown indirectly through SBdum, and the estimated effect of SBdum itself becomes insignificant. We observe below for a number of our control variables that they have conflicting-sign relation with Q and with SBdum and thus, omitting these variables from the model results in mistakenly attributing to SBdum a negative effect on Q.

[81] *Id.*

[82] Zvi Griliches, *Market value, R&D, and patents*, 7 ECON. LET. 183 (1981); Phillip Sandner & Joern Block, *The market value of R&D, patents, and trademarks*, 40 RES. POL. 969 (2011).

while on the left it is naturally bounded by zero. The logarithmic transformation makes logQ have a smaller positive skew and smaller deviation from the normal distribution than that of Q. Of course, we never know the exact functional specification of the model. But our estimations show that using logQ provides a better fit than when using Q.

We focus on the effect on Q of the explanatory variable SBdum. The control variables, all lagged one year, are as follows. We first include the following variables that are employed in Bebchuk and Cohen's study.[83] logTA is the logarithm of the firm's total assets; logAge is the logarithm of the firm's age;[84] DE is a dummy variable that equals one if the firm is incorporated in Delaware (zero otherwise); ROA is return on assets, defined as earnings before interest, taxes, depreciation and amortization divided by lagged total assets; CAPEX is capital expenditures relative to assets; RND is the ratio of development R&D expenditures to sales; InH is insider holdings, the share of the company's stock held by the top five executives as reported in S&P's ExecuComp database. We add the following variables that are not employed in Bebchuk and Cohen's study: RNDmiss is a dummy variable that equals one if the firm does not report R&D; InstH is institutional holdings, the share of the company's stock held by institutional investors; TAg is the one-year growth rate of total assets;[85] SALESg is the one-year growth rate of sales;[86] Leverage is the ratio of total debt (long term and short term) to the firm's total assets; SPdum equals one if the firm is in the Standard and Poor's 500 index; PM is the profit margin, the ratio of the difference between sales and cost of goods sold to total sales; Illiq is the Amihud illiquidity measure, defined as the average daily ratio of absolute stock return to dollar volume over the year;[87] LIQ is asset liquidity, defined as current assets minus the difference between current liabilities and debt in current liabilities, all divided by total assets; HHI is the Herfindahl-Hirschman index of market concentration for the industry, using sales; NDeals is the number of acquisitions in the firm's industry in a given year ; Ndeals0 is a dummy variable that equals one if NDeals = 0; the variables HHI and NDeals are based on four-digit SIC codes. We also add EInet,

[83] Bebchuk & Cohen, *supra* note 78, at 427.
[84] Defined as the number of years the company is included in CRSP.
[85] Defined as total assets divided by lagged total assets.
[86] Defined as sales divided by lagged sales.
[87] *See* Yakov Amihud, *Illiquidity and stock returns: cross-section and time-series effects*, 5 J. FIN. MARKETS 31 (2002).

which as noted supra is Bebchuk, Cohen and Ferrell's entrenchment index of six governance-related provisions excluding staggered board (hence its value ranges from 0 to 5).[88] All models include industry fixed effects, which control for differences in firms' market value (relative to book value) between industries. Thus, the effects of the explanatory variables on firm value is effectively done within industry. This procedure is the convention in all such studies, including that of Bebchuk and Cohen.

i. Examining the Determinants of Firm Value and the effect of a Staggered Board

Table A.1 in the appendix presents the statistics of the series that we use for the observations in our sample. Because some variables have missing data for some firm-years, there is a different number of observations for each variable. We observe that among the firm-years in the sample, the mean SBdum is 0.592 which means that about 60 percent of the firm-years have a staggered board.

In Table 1 we turn to estimation of the determinants of the firms' Tobin's Q. The first set of estimations is pooled ordinary least squares ("OLS") regressions.[89]

[INSERT TABLE 1 (NOTE – TABLES ARE AT END OF ARTICLE RIGHT NOW AND WILL BE MOVED HERE FOR PUBLICATION]

Table 1 presents the results for the OLS estimations of a number of models. The table presents the coefficients of the variables and their t-statistics which enable us to test whether the coefficient is significantly different from zero. We indicate by *, ** or *** whether the coefficient is significant at the level of 10%, 5% or 1%.

[88] All explanatory variables are lagged one year relative to the year of Q, i.e., the regression model is predictive. All ratios are winsorized at the 1% and 99% level to avoid outlying values.

[89] All estimated models include year and industry fixed effects, using two-digit SIC code or Fama and French's 49 industries classification. Bebchuk and Cohen comment that the results are qualitatively similar under both classifications, and our finding is usually similar. The tests of statistical significance employ standard errors that are clustered by firms. This is because the same firms appear multiple times in the regression and then the unexplained residuals for each firm over some years may not be independent. For example, if a firm has an unobserved characteristic that makes its value deviate from that which is predicted by the model, the residual values for the firm over the years will not be independent. The clustering procedure accounts for this and consequently affects the statistical significance of the results. The estimated standard errors that we use are also robust to heteroskedasticity (i.e., to being non-constant across observations) and serial correlation using the robust Huber-White sandwich estimator.

Columns (1)-(2) include only the variables used by Bebchuk and Cohen.[90] Columns (3)-(4) include additional variables which theoretically may affect firm value.[91] We denote by M1 the models presented in columns (1) and (2) and by M2 the models presented in columns (3) and (4). M2 includes more variables than M1 and has less firm-years (11 percent less observations in column (3) compared to column (1)) and 24 percent less observations in column (4) versus (2)).

We begin with Panel A where the dependent variable is logQ and the industry fixed effects employ the two-digit SIC code. The results across the four columns (1)-(4) are that staggered board has a negative effect on firm value, as suggested by Bebchuk and Cohen.[92] The effect of SBdum is statistically significant in columns (1) and (2) which employ Bebchuk and Cohen's specification.[93]

However, in columns (3) and (4), which include additional explanatory variables, the coefficients of SBdum are less negative and are not statistically significant. The coefficients of SBdum in columns (3) and (4) are, respectively, -0.014 with t = -1.31 and 0.013 with t = -1.14. The significance levels of these coefficients in testing whether the coefficients are different from zero, denoted by p, are p = 19% and p = 25%, respectively, which is much higher than the standard benchmark of p = 5%.[94] This means that even in the absence of a negative linear relationship between SBdum and logQ, there is a probability of 25% of finding this relationship in the data. Another way to illustrate this is that under these findings if we state that a staggered board affects firm value, there is a chance of 25% that this statement is wrong. Formally, since this probability is higher than the 5% benchmark, we conclude that there is no significant negative linear relationship between the variables. Notably, the estimated coefficient – and thus the economic significance – of SBdum is much less negative in the expanded models

[90] Column 1 excludes the variable stockholding by insiders and institutions (InH) since the inclusion of this variable greatly reduces the number of firm-years with available data. Because data on InH began only in 1992 whereas the sample begins in 1990, including InH moves the starting year of our sample from 1991 to 1993 since we lag all explanatory variables by one year.

[91] Column (4) includes stockholding by both insiders (InH) and institutions (InstH) which reduces the sample size compared to column (3).

[92] Bebchuk & Cohen, *supra* note 4, at 427.

[93] *Id.*

[94] p represents the probability of type I error.

(columns (3) and (4)) compared to those in Bebchuk and Cohen's models, columns (1) and (2).[95]

The estimated coefficients of the variables that we add to the model are mostly significant implying that they should not be absent from the estimation model. We show later that some of these additional variables are also significantly related to SBdum. The inclusion of the additional variables increases the explanatory power of the model as evidenced from the rise in R^2 from 0.408 in column (1) to 0.433 in column (3).[96]

In columns (5)-(8) we add to the model the variable EInet.[97] Bebchuk and Cohen also use in their estimations a related governance index, that of Gompers, Ishii, and Metrick.[98] We find that the coefficient of EInet is negative and highly significant while the coefficient of SBdum is insignificant. For example, in column (8), the coefficient of EInet is -0.023 with t = 4.16, highly significant, while the coefficient of SBdum is -0.003 with t = 0.24, insignificantly different from zero.

One reason that the value effect of a staggered board is insignificant when EInet is included in the model is the positive correlation of 0.23 between these variables which is highly significant ($p < 0.001$) in the sample that includes all variables (those that appear in columns (4) and (8)). When EInet is excluded (columns (1)-(4)), its effect is partially assumed by SBdum but when EInet is included (columns (5)-(8)), its effect on logQ is estimated directly while that of SBdum is considerably weakened to the extent of becoming indistinguishable from zero.

The significant negative effect of EInet on Q is puzzling given that the components of EInet hardly have an effect on the likelihood of a firm being acquired. The components of EInet are the poison pill, golden parachute, supermajority vote requirement for mergers, limits to amend bylaws and limits to amend the charter.[99] It is hard to claim that golden parachute is potent in stopping hostile acquisitions. In addition, Larcker, Reiss, and Xiao show that the ISS reporting of golden parachute and

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[95] Bebchuck & Cohen, *supra* note 4, at 427.
[96] An F-test for the significance of the 10 additional variables in Column (3) gives a value of 51.2 with a p-value < 0.001, meaning that these added variables are jointly significant.
[97] EInet is calculated as the count of governance-related provisions in the E-Index excluding the staggered board provision. *See supra* text accompanying notes 20-23.
[98] *See* Gompers, Joy & Metrick, *supra* note 22.
[99] *See* Bebchuk, Cohen & Ferrell, *supra* note 4.

supermajority provision reflects considerable measurement errors.[100] EInet includes a poison pill variable, yet potentially every company has a poison pill since it can be adopted by the board of directors at any time. Thus, the effect of a poison pill should be already incorporated in the firm's value whether or not the firm has explicitly adopted a poison pill.[101] The other provisions in EInet are also not considered to be potent in stopping hostile takeover bids or significant determinators of firm value.

Indeed, Cremers and Ferrell find that except for the poison pill, whose effect is negative and marginally significant, the provisions included in EInet have no significant effect on firm value when estimated in a model with firm fixed effects which control for unobserved or omitted firm characteristics. In this estimation, Cremers and Ferrell find that the effect of a staggered board is positive and significant.[102] We find that the effect of a staggered board is insignificant.

Bebchuk, Cohen and Ferrell point out that the documented negative relation between the entrenchment index and firm value "does not establish that entrenching provisions … cause lower firm value."[103] It could be that the reasons for the negative effect of EInet on firm value is that EInet indicates the existence of an agency problem, which is not directly observed. But this problem is reflected in both a higher propensity of some managers to adopt (or keep) the provisions in EInet and in lower firm value. This leads to an estimated negative relation between Tobin's Q and EInet even if the provisions in EInet are not potent deterrents of hostile takeover bids.[104] Similarly, the staggered board provision may be an indication for the existence of a value-reducing agency problem in the firm rather than a cause for the value reduction, and when a better measure of agency problems – EInet – is included in the model, the effect of staggered board becomes insignificant.

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[100] Larcker, Reiss & Xiao, *supra* note 18.

[101] *See* John C. Coates IV, *Takeover Defenses in the Shadow of the Pill: A Critique of the Scientific Evidence*, 79 TEX L. REV. 271, 317 (2000); Marcel Kahan & Edward B. Rock, *How I Learned to Stop Worrying and Love the Pill: Adaptive Responses to Takeover Law*, 69 U. CHI. LAW REV. 871 (2002). *See also* Emiliano Catan, *The Insignificance of Clear-Day Poison Pills* (New York University School of Law, Working Paper No. 16-33, 2016), https://ssrn.com/abstract=2836223.

[102] Cremers & Ferrell, *supra* note 9.

[103] Bebchuk, Cohen & Ferrell, *supra* note 4, at 785.

[104] If the measures in EInet are not potent, why do some managers adopt or keep them? In this instance managers may be making this adoption because they believe these provisions help or at least will not hurt.

We further test whether the value effect of a staggered board depends on the magnitude of EInet. If a high value of EInet indicates a more severe agency problem in the firm, a staggered board provision would have a more negative value effect if it enables the problem to persist. We test this hypothesis by adding to the model the interaction term SBdum*EInet. The coefficient of this variable should be negative if a staggered board exacerbates the value loss due to EInet. We find that in this regressions, the coefficients of both SBdum and SBdum*EInet are insignificant. For example, in Model (3), the coefficient of SBdum and that of SBdum*EInet is insignificant. In these regressions, the coefficient of EInet remains negative and highly significant. We conclude that the effect of staggered board on firm value is insignificant even in conjunction with EInet.

In the following panels we do robustness tests using models of different specifications.[105]

We replicate the analysis using industry fixed effects that employ the Fama-French industrial classification which is based on 49 industries, each being an aggregation of some four-digit SIC code industries.[106] Bebchuk and Cohen report that Fama-French and two-digit SIC code industry classification produce similar results.[107] Our results with this industrial classification are similar to those obtained in Panel A, though the effect of SBdum here is weaker (less significant) than in Panel A. The coefficient on SBdum becomes insignificant even in a model that is similar to that in column (1). For brevity, we do not report these results in a table.

In Panel B we present models that are like those in Panel A but with Tobin's Q instead of logQ as the dependent variable.[108] As discussed above, the logarithmic transformation of Tobin's Q reduces the positive skewness (extreme positive values) in the data. For example, for the sample of firms used in estimating our model in column 3, the skewness of logQ and Tobin's Q are, respectively, 1.04 and 3.29. The median of logQ is 0.40 with values ranging between -0.57 and 2.47 while the median of Tobin's Q

[105] To save space, we present only the coefficients of SBdum, EInet (where applicable) and the regression R^2 which estimates the extent to which the dependent variable is explained by the model.
[106] The industrial classification is obtained from Kenneth French's data library and can be found at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[107] Bebchuk & Cohen, *supra* note 4, at 420.
[108] Bebchuk and Cohen use Q, not logQ. *See* Bebchuk & Cohen, *supra* note 4, at 426.

is 1.49 with values ranging between 0.56 and 11.85. Here, the upper levels of Tobin's Q are quite far from the median, much more so than in the case of logQ.[109]

Importantly, the fit of the model with Tobin's Q as the dependent variable is inferior to that of the model with logQ as the dependent variable. R^2, which measures the explanatory power of the model, rises from 0.333 in column (1) of Panel B, where Tobin's Q is the dependent variable, to 0.408 in column (1) of Panel A, where logQ is the dependent variable, i.e., a rise of about 23% in the explanatory power of the model. For our model M2, R^2 rises from 0.400 when using Tobin's Q to 0.477 when using logQ (column (4) in Panel B and Panel A, respectively), again a rise of about 20% in the explanatory power of the model. In summary, a model with logQ instead of Tobin's Q as dependent variable explains the data better.

There are two major differences between the results in panel B, with Q as dependent variable, versus A with logQ as dependent variable. First, the coefficients of SBdum are more negative and more statistically significant in Panel B than they are in Panel A. In the first four models without EInet (columns (1) to (4)), the effect of SBdum on Tobin's Q is negative and statistically significant throughout, consistent with the results of Bebchuk and Cohen.[110] It is a tribute to Bebchuk and Cohen's analysis that the significant effect of staggered board on firm value is retained even in models that are broader than theirs both in the number of years covered and in the number of explanatory variables used. Still, in columns (7) and (8) in Panel B that include EInet, the effect of SBdum becomes insignificant. Again, it seems that the negative association between firm value and the provisions in EInet is dominant, and the previously-documented negative effect of a staggered board on firm value is due to the fact that SBdum is positively correlated with EInet.

In conclusion, we observe that the negative effect of staggered board on firm value is not robust to model specification. Specifically, its effect becomes statistically insignificant when we account for the omitted variable problem we have previously highlighted.

[109] We winsorize the top and bottom 1% of the values of Q as we do with all ratios but still we obtain higher skewness for Q than for logQ.
[110] Bebchuk & Cohen, *supra* note 4, at 426.

ii. Accounting for Causality: The Instrumental Variables (IV) method

We now turn to the main empirical analysis of our paper which attempts to account for the causality behind the firm having a staggered board provision. We account for this issue by using the commonly known instrumental variable estimation method (the "IV method").

The IV method uses a two-step procedure. In the first step, the determinants of a firm having a staggered board are estimated from a regression of SBdum on two sets of variables. The first set of variables are those used in the OLS model that estimates their effects on Tobin's Q. The second is a set of instrumental variables. The second step of the procedure is a regression of the firms' Tobin's Q values on the fitted values of SBdum (rather than on its "raw" values) together with the other variables that affect value.

The key to any IV method is the validity of the instrumental variables. In our case, a good instrumental variable should (1) affect the firm's likelihood of having a staggered board thereby meeting the relevance criterion but (2) not affect directly a firm's value as measured by Tobin's Q other than through the staggered board itself. This is called an exclusion restriction. The instrumental variables that we use in our model are dummy variables for four states of incorporation: Massachusetts (MA), New York (NY), California (CA) and Pennsylvania (PA).[111] The reasons for the selection of these four states as instrumental variables are as follows. Massachusetts firms are all coded as having a staggered board because of the 1990 statute which imposes a staggered board on all firms in the state.[112] Even if a firm opts out of the staggered board provision, it can be reinstituted by the board without a need for shareholder approval, meaning that every firm has a latent staggered board.[113] Because the staggered board in all of these cases

[111] For firms incorporated in these states, the values of the dummy variable for the respective state equals one and it is zero otherwise. The firm-years for which either of these four instrumental variables equals one constitute about 10% of the sample.
[112] *See supra* text accompanying note 78.
[113] *Id.*

was imposed by the Massachusetts legislature it effects the adoption of a staggered board while not affecting the firms' value directly.

We theorize that California and New York corporations are less likely to adopt a staggered board since there are relatively uncertain takeover standards in these states due to the dearth of precedent caselaw as well as lesser oversight compared to that provided by Delaware courts.[114] This would provide other avenues for takeover defenses and make staggered board adoption less likely. We also theorize that Pennsylvania firms should be more inclined to adopt a staggered board because of the hospitable atmosphere to takeover defenses in this state, whose antitakeover statutes enacted by legislatures are considered to be among the strongest in the country.[115]

We find that these four dummy variables have a very significant effect on the likelihood of a firm having a staggered board provision. In addition, prior studies have found that companies in these states receive fewer takeover bids necessitating fewer protections.[116] Prior studies have also found that while a Delaware incorporation positively affects firm value, this effect is not present in other states.[117] We therefore theorize that while each of these instrumental variables affect staggered board adoptions, they do not affect firm value other than (possibly) through the staggered board, making these good instrumental variables, something we confirm in our analysis.[118]

Our fifth instrumental variable, Ret3Y, is the average annual stock return over the preceding three years. We theorize that this variable will have a negative effect on the likelihood of the firm having a staggered board. If the firm had a negative realization of its performance, its management may feel that it is vulnerable to acquisition "on the cheap" by a hostile raider.[119] Management may then want to implement a strategic plan

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[114] *See generally* Matthew D. Cain, Stephen B. McKeon, and Steven Davidoff Solomon, *Do Takeover Laws Matter? Evidence from Five Decades of Hostile Takeovers*, J. FIN. ECON. (forthcoming) (detailing various takeover laws and their application to New York and California companies).

[115] *Id.* (noting that Pennsylvania has enacted more anti-takeover laws than any other state). *See also* William G. Lawlor, Peter D. Cripps and Ian A. Hartman, *Doing Public M&A Deals in Pennsylvania: Minesweeper Required*, 38 REV. SEC. & COMM. REG. 15 (2005) ("Today, virtually all states have [anti-takeover] laws, but only a few, including Massachusetts, Ohio, Virginia and Wisconsin, rival Pennsylvania in terms of breadth and complexity (and to some cynics, opacity) of their statutes.")

[116] Robert Daines, *Does Delaware Law Improve Firm Value*, 62 J. FIN. ECON. 525, 541 (2001).

[117] *Id.* at 527 (finding evidence that Delaware law improves firm value as measured by Tobins Q).

[118] Also, the firms that choose to incorporate in these states are of different characteristics than those which opt to incorporate in states with stronger antitakeover atmosphere. *See id.* at 546.

[119] Catan has similar findings in the context of poison pills, that they are adopted subsequent to stock price drops. *See* Catan, *supra* note 100. We do not take a stand here on whether a staggered board is a potent

intended to improve its performance but because outside stockholders may not be fully informed on the benefits of this plan, the effect of this plan will not be reflected in the stock price. Or, it could be that the management is biased in believing that their plan will succeed (otherwise they would not have implemented it) and thus they will attempt to have shareholders adopt or retain a staggered board provision hoping that it would buy the firm time to improve its value. On the other hand, managers in firms whose price fairly represents their value or in overvalued firms will not have such a concern and will not mind if their firm is acquired. Such managers may seek to remove or not want to adopt a staggered board provision. While Ret3Y may influence staggered board adoptions or repeals, it may not directly affect current firm value as reflected by Tobin's Q given that the model includes other performance variables which affect Q and since the variable Ret3Y is measured with a gap of one year before the current year. Since a change in the stock price is merely an indicator of the market's assessment of past value, not a cause of its level in the following period.

We test and find that our five instrumental variables have no significant effects on logQ, after controlling for the effects of all the other variables included in the models. Yet, as we discuss below, their effects on whether a firm has staggered board (on the variable SBdum) is highly significant. These are the characteristics that are required of instrumental variables.

[INSERT TABLE 2]

The estimation results on the determinants of a staggered board are presented in Table 2, using models M1 and M2 (see Table 1) with SBdum as the dependent variable. The estimation is done by OLS and the industry fixed effects are based on two-digit SIC classification.[120] Importantly, the joint contribution of the five instrumental variables – PA, MA, NY, CA and Ret3Y – to the explanation of whether a firm has staggered board is highly significant. This result is obtained by applying the Wald test to the contribution of the five instrumental variables to the reduction in the sum of squared errors. Consistent with our predictions, the state dummy variables PA and MA have positive and significant coefficients while CA and NY have negative and generally significant

deterrent to hostile acquisitions; it suffices that some managers think so and adopt a staggered board or retain a staggered board as means of protection against a hostile acquisition.

[120] The results are qualitatively similar when using the 49 Fama-French industries.

coefficients (NY is insignificant in column (3)) meaning that in the case of PA and MA firms they are more likely to have a staggered board and in the case of CA and NY firms they are less likely to have a staggered board. As expected, the likelihood of a firm having a staggered board is negatively related to the firm's past stock price performance, measured by its lagged three-year stock return Ret3Y.

In addition to the five instrumental variables, size, age, and the dummy variable for whether the firm is included in the S&P 500 index have a significant negative coefficient suggesting that larger, more mature and more established firms are less likely to have a staggered board. Importantly, we observe that past performance, as measured by ROA, sales growth, and the profit margin, is an important determinant of whether a firm has staggered board. More profitable firms are less likely to adopt and retain a staggered board. Firms with higher R&D spending, higher leverage, and higher asset liquidity ("LIQ") are also less likely to have a staggered board. Also, firms with higher institutional ownership and with higher stock illiquidity are less likely to have a staggered board. Finally and perhaps surprisingly, more takeover activity in a firm's industry is negatively related to the likelihood of a firm having a staggered board. This finding remains for further study.

Some variables that affect logQ in Table 1 also affect SBdum in this model, but with conflicting signs. This may explain why the negative and significant effect of SBdum on logQ in columns (1) and (2) in Table 1, Panel A, become insignificant in columns (3) and (4) when we add control variables to the model. The omission of these variables from the model of Bebchuk and Cohen (columns (1) and (2) in Table 1) biases the effect of SBdum on logQ. To illustrate, consider the variable LIQ, the firm's asset liquidity. It positively affects logQ (columns (3) and (4) in Table 1) and is negatively related to SBdum (columns (3) and (4) in Table 2). If LIQ is omitted from the determinants of logQ, its negative association with SBdum and its positive relation to logQ will be expressed as a negative effect of SBdum on logQ. Yet, when including LIQ in the model in Table 1, its positive effect on logQ is estimated directly and not through SBdum, and thus the negative effect of SBdum becomes weaker and insignificant. The same analysis applies to RND which has strong positive effect on logQ and strong negative effect on SBdum. Other variables have conflicting effects on logQ and SBdum

– Salesg, SPdum, PM and Ndeals0 – and thus their omission from the models in Table 1 would bias the coefficient of SBdum there, showing it to have a negative effect on Q.

Having found the determinants of a staggered board in the first step of our identification procedure, we use the estimations from the first step of the IV method to estimate the effect of staggered board on firm value. That is, we replace SBdum in the models by its instrumented value, i.e., the predicted value from the first stage. The results are presented in Table 3.

[INSERT TABLE 3]

Columns (1)-(4) in Table 3 present estimates of models M1 and M2 that have been employed in columns (1)-(4) in Table 1, where here we use the instrumented SBdum. In Panel A, the dependent variable is logQ and the industry fixed effects are based on the two-digit SIC classification.[121]

The important result here is that in all four columns of Table 3, Panel A, the coefficient of the instrumented SBdum is positive rather than negative and it is insignificantly different from zero.[122] The results are qualitatively similar when using Tobin's Q instead of logQ as dependent variable (Panel B) and when using industry fixed effects based on Fama-French 49 industries (results are available upon request). For this industry specification, the coefficients of SBdum are slightly more positive than they are when using the SIC two-digit classification, but they are quite insignificantly different from zero.[123]

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[121] To save space we report only the coefficient of the instrumented SBdum, the number of observations and the regression R^2.

[122] In our model there is one endogenous variable – SBdum – and five instrumental variables, hence it is overidentified. This is favorable from an asymptotic efficiency perspective. For robustness, we test the models with only the four state dummy variables, i.e., without the variable Ret3Y. The results are qualitatively the same, that is, the coefficient of SBdum is insignificantly different from zero in all four models in Table 3, Panel A. Then we test the models including only one instrumental variable in each test, that variable being the state dummy variable. The model is thus not overidentified since we have one endogenous variable, SBdum, and one instrument. In all these tests for each of the four instruments, the coefficient of SBdum is insignificantly different from zero for all four models in Table 3, Panel A. The strength of our instruments is reflected in the high values of the first-stage F-statistic (or Wald test statistics), which well exceed the benchmark values set in James Stock and Motohiro Yogo, Testing for Weak Instruments in Linear IV Regression. *See* James H. Stock & Motohiro Yogo, *5, in* TESTING FOR WEAK INSTRUMENTS IN LINEAR IV REGRESSION: ESSAYS IN HONOR OF THOMAS ROTHENBERG 80, 80–108 (Donald W.K Andrews & James H. Stock, eds., Cambridge Univ. Press 2005).

[123] In unreported results, we check the robustness of our results as follows. Between 1.3% and 1.5% of the values of SBdum from the first-stage linear probability regression in Table 2 have values that are outside of the segment zero-one, which is unreasonable. We therefore trim or winsorize the estimated values of SBdum at zero and one. We obtain that the effect of the instrumented SBdum on logQ remains insignificant and mostly positive.

It could be argued that the choice of state of incorporation is endogenous, just as the choice of the staggered board provision is, given that states differ in their corporate governance statutes that relate to takeovers. State adoptions of the major anti-takeover laws occurred around the mid-1980s.[124] We therefore replicate our analysis including only firms that were in existence before 1981. These firms chose their state of incorporation before the passage of laws that would make hostile acquisitions more difficult.

The results, presented in Panel C, show again that the coefficient of SBdum is insignificantly different from zero. In this model, all five instrumental variables are significant in the first-stage regression and the R^2 of this regression hovers between 0.133 for model 1 and 0.154 for model (4).

As a robustness check, we re-estimate the model in Panel A separately for Delaware-incorporated firms and for non-Delaware incorporated firms. This is because when firms choose their state of incorporation, they usually either incorporate in their own state of domicile or they choose to incorporate in the state of Delaware. It is thus more likely that firms that are not incorporated in Delaware were in this state initially and did not choose that state because of its takeover-related laws. We estimate the model for these firms using the five instrumental variables and deleting the Delaware dummy variable. We find that all four coefficients of SBdum, for models (1)-(4), are positive and insignificantly different from zero.

In Panel D we add two instruments in the first-stage regressions, Geo5Y and IPO5Y, proposed by Karpoff, Schonlau, and Wehrly, which make use of peer firms' characteristics.[125] The dependent variable is again logQ. Geo5Y is the number of firms having a staggered board provision, observed five years before the year of analysis, using rolling values, for geographically proximate firms that are not in the same industry as the focus firm. IPO5Y is the number of firms having a staggered board provision among the firms that went public within one year of the focus firm's IPO that are not in the same industry, again using data from five years before the year of analysis.

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[124] Marianne Bertrand and Sendhil Mullainathan, *Enjoying the Quiet Life? Corporate Governance and Managerial Preferences.* 111 J. Polt. Econ. 1043 (2003)

[125] Karpoff, Schonlau & Wehrly, *supra* note 24, at 4. We are grateful to Robert Schonlau for providing the two instruments.

Karpoff, Schonlau, and Wehrly provide the following rationale for using the geography-based instrument.[126] First, managers and directors of firms in geographical proximity are likely to interact and influence each other's corporate actions, including decisions regarding takeover defenses. Second, firms being located in the same geographic area are more likely to share law firms. Law firms influence their client firms' use of takeover defenses.[127] Hence, geographic proximity will result in similar takeover defenses being adopted for reasons that are not directly related to the specific takeover likelihood in later years. Third, firms rarely change their takeover defenses during the sample period.[128] Hence, while these two factors affect the firms' decision to employ takeover defenses, and this decision may have been endogenous at the time it was taken, five years or more after that time, the environment in which they operate might have changed making the instrument plausibly (and locally) exogenous.

The rationale for the IPO cohort-based instruments provided by Karpoff, Schonlau, and Wehrly is based on the studies by Daines and Klausner, who find a strong time component in the propensity to adopt takeover defenses by IPO firms, and Hannes, who shows that a firm's use of takeover defenses is sticky over time.[129] Consistently, Johnson, Karpoff, and Yi report that IPO firms have an average E-Index of 2.4 when they go public, which grows to only 2.7 fifteen years after the IPO, with 83% of these firms never removing any takeover defenses during that period.[130] This suggests that a firm's use of takeover defenses is strongly influenced by the year it went public. Accordingly, we use the incidence of staggered board provisions adopted by the firms in a sample firm's IPO cohort, but that are not in the same industry, to identify arbitrary variation in the firm's staggered board that is not directly related to that firm's specific takeover likelihood many years after its IPO. The non-industry IPO cohort information is predetermined because it is from a number of years before the year of analysis.

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[126] Karpoff, Schonlau & Wehrly, *supra* note 24, at 4.
[127] *See* John C. Coates, *Explaining variation in takeover defenses: Blame the lawyers*, 89 CAL. L. REV. 1301 (2001) (finding a correlation between takeover defenses and firm lawyers).
[128] *See, e.g.*, Sharon Hannes, *A demand-side theory of antitakeover defenses*, 35 J. LEG. STUD. 475 (2006); William C. Johnson, Jonathan M. Karpoff & Sangho Yi, *The life-cycle of firm takeover* defenses (Feb. 9, 2016) (working paper) (electronic copy available at http://business.gwu.edu/wp-content/uploads/2016/02/JKY-09Feb2016-JMK.pdf).
[129] *See* Karpoff, Schonlau & Wehrly, *supra* note 24, at 5. *See also* Daines & Klausner, *supra* note 35; Hannes, *supra* note 128.
[130] *See* Johnson, Karpoff & Yi, *supra* note 126, at 3.

We find that both instruments have a statistically significant effect on SBdum ($p < 1\%$, highly significant) for all four model specifications in Table 2.[131] Because these two instruments are available from 1995 to 2008, their use significantly reduces the sample size. We then use the instrumented SBdum from these models to estimate the effect of a staggered board on logQ. The estimation results are reported in Panel C of Table 3. The results are very similar to those obtained in panels A and B. The coefficient on the instrumented SBdum is positive and statistically quite insignificant.

We further estimate the model including both SBdum and EInet, which are endogenous variables, having them both instrumented by the same set of instruments as used in Panel A. We find that as before, the coefficient on SBdum is insignificantly different from zero. The instrumented EInet also has an insignificant effect in the specifications that pertain to those in columns (6) through (8) in Table 1 while its coefficient is negative and significant in the terse specification that follows that of Bebchuk and Cohen, as in Column (5) in Table 1.[132]

In a robustness test we address a 1999 statute in the state of Maryland which permits the boards of directors of Maryland companies to classify themselves regardless of any contrary provision in the charter or bylaws and without a stockholder vote.[133] In our sample, Maryland companies contribute 1.6% of the total number of firm years. We do two tests. In one, we estimate our models deleting all Maryland firm-years and in the other we include Maryland firm-years and code them all as having staggered board after 1999. In both analyses, the results remain qualitatively the same as those reported in Tables 1 and 3. If anything, the estimated coefficients of SBdum move closer to zero and become less significant. When we code all Maryland firms as having SBdum = 1, the significance of the coefficient of SBdum declines. In particular, in the estimation of models (1) and (2) in Table 1, the coefficients of SBdum are no longer significant at 5%; now, their significance level is lower at 10%.

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[131] The first-stage results of the predictive model of SBdum with the added two instrumental variables are not reported in order to save space.

[132] The detailed results are available upon request.

[133] *See* Section 3-803 (1999) of the Maryland General Corporation Law. For a discussion of this statute see Venable, Board Classification in Maryland: Evaluating Section 3-803 of the MGCL, Apr. 9, 2014, available at https://www.venable.com/files/Publication/3034aa4a-28b2-433d-ad23-7b0e894bf2f6/Presentation/PublicationAttachment/3bfe9eaa-5f0b-49be-8ccb-94992ec7deec/Venable_Maryland_Law_Memo_Board_Classification_in_Maryland_Evaluating_Section_3-803_of.pdf

In a final robustness test, we note that a number of explanatory variables besides SBdum and EInet may be endogenous as well. We therefore estimate the models excluding all variables that we theorize may be endogenous. In addition to SBdum, we include the following explanatory variables: logTA, logAge, DE, SPdum, Ndeals, Ndeals0, and HHI. The dependent variable is logQ. The estimation is performed by the OLS method and by the IV method with the instruments CA, MA, NY, PA and Ret3Y. The results, presented in the Appendix Table A.2, are quite similar to those reported in Tables 1 and 3. In Columns (1) and (2) we employ all observations for which data are available. The results indicate a negative and significant coefficient of SBdum when using OLS, which under the IV method becomes positive and insignificantly different from zero. The substantial reduction of control variables results in a larger sample compared to the base case regressions in Tables 1 and 3. In columns (3) and (4) we restrict the sample to the observations included in the full specifications as reported in Tables 1 and 3. Again, we find the results to remain qualitatively unchanged.

In the Appendix Table A.3 we do the estimation in a way that allows the variables' slope coefficients to vary over time. More specifically, in the panel regression models that we estimate, the slope coefficients of the variables are constant over time. In Appendix Table A.3, the slope coefficients are estimated separately for each year. This estimation method is also employed by Bebchuk and Cohen and follows Fama and Macbeth's estimation procedure.[134]

To save space, we report the results of the IV procedure. The table shows the average of the coefficients of SBdum over the years (23 years for the model without the ownership variables and 21 years for the model that includes them). We find that the average effect of the instrumented SBdum on logQ or on Q is not negative but rather positive, and in some specifications its positive coefficient is statistically significant.[135] However, the statistical significance is not robust to various tests and it is safer to

[134] Bebcuk & Cohen, *supra* note 4, at Table 2; Eugene Fama & James D. MacBeth, *Risk, return, and equilibrium empirical tests*, 81 J. POL. ECON. 607 (1973).

[135] In the IV procedure, the first-stage regression of the determinants of SBdum is also estimated separately in each year.

conclude from this analysis that the effect of staggered board on firm value is, as before, statistically insignificant.[136]

Our results on the insignificant effect of staggered board on value are different from those of Cremers, Litov and Sepe[137] who find that staggered board is positively associated with the firm's Q. The two studies employ different estimation methodology. Cremers at el. estimate a model with firm fixed effects, which account for time-invariant omitted firm characteristics that affect Q and provides an estimation of changes in staggered board status for the same firm over time. The estimated effect of staggered board is the difference in average Q for the same firm between the periods of having and not having a staggered board, compared with changes in Q for other firms that through the entire period had staggered board or did not have staggered board. In our estimation, we employ industry fixed effects that control for unobserved time-invariant industry characteristics which affect Q and may be related to staggered board, and we also control directly for time-varying firm characteristics (we employ about twice as many firm characteristics than do Cremers et al.). There is the possibility of having omitted a firm-level time-invariant variable that affects Q, but on the other hand, we allow for time-varying firm characteristics that potentially affect the adoption or removal of staggered board. By using the IV method with instruments that include state of incorporation and past stock returns we account for time-invariant determinants of staggered board – state of incorporation – as well as for time-varying determinant of it, namely, past stock return. If the adoption or removal of staggered board is affected by time-varying characteristics, our method captures that while the use of firm fixed effects does not. The motivation for using our estimation method is that the adoption or removal of staggered board is a firm's decision variable rather than an exogenous event which is assumed in a plain estimation of the effect of staggered board with firm fixed effects.

iii. The effect of staggered board on profitability

If a staggered board reduces the firm's market value as some research has claimed, the question is: what is the channel trough which it happens? The firm's value is

[136] When using the Fama French 49 industries for the industry fixed effects, the average estimated coefficient of SBdum is more positive and more significant.
[137] Cremers, Litov & Sepe, *supra* note 9.

the present value of its future cash flows. A staggered board can reduce the firm's value by lowering its future profitability relative to its assets or by raising its cost of capital, which could happen if the firm's systematic risk rises. Consequently, if staggered board reduces firm value relative to its assets, it should come from a decline in the firm's future profitability.[138]

We test whether firms with a staggered board have lower cash flow relative to assets. We use in our analysis the return on assets, ROA, defined as the firm's EBITDA – earnings before interest, taxes, depreciation, and amortization – in one year divided by lagged assets.[139] Then we do a regression of ROA on SBdum and control variables. If a staggered board reduces the firm's cash flows relative to assets, the coefficient of SBdum should be negative and significant, just as it is claimed to be when regressing Tobin's Q (or logQ) on SBdum.

We replicate the models from Tables 1 and 3 with the dependent variable being ROA. The explanatory variables are the same as before except that we exclude lagged ROA. In the first-stage regressions of the IV specifications, we use the standard set of instruments: MA, PA, CA, NY, and Ret3Y.[140] The estimation results show that staggered board has no significant effect on the firm's ROA, even in the OLS regressions. The results are the same when we use log(1+ROA) instead of ROA. Our results on the insignificant effect of staggered board on ROA are consistent with our earlier results that staggered board has no significant effect on logQ or Q but they are inconsistent with Bebchuk and Cohen's claim that a staggered board reduces firm value.

IV. Policy Implications

Our results that a staggered board has no significant effect on firm value do not discredit earlier studies which found positive or significant effects of a staggered board.

[138] We also consider two other measures: cost of capital and corporate governance provisions. However, we are not aware of any theory nor findings suggesting that staggered board raises the firm's cost of capital. As for the corporate governance provisions, Bebchuk, Cohen, and Wang find that there is no significant relation between corporate governance provisions, which include staggered board, and the firms' equity return. *See* Lucian A. Bebchuk, Alma Cohen & Charles C.Y. Wang, *Learning and the disappearing association between governance and returns*, 108 J. FIN. ECON. 323 (2013).

[139] By using EBITDA, we overcome differences in depreciation policies between firms.

[140] Our regressions include year and industry fixed effects that use the two-digit SIC code.

Instead, it suggests caution in proposing that the staggered board in and of itself creates wealth effects. In some firms staggered board may be beneficial and in others it is detrimental, depending on their characteristics and on the reasons for having the staggered board, and still in other firms it is non-consequential. On average, a staggered board cannot be said to have an effect in one way or another. Therefore, a policy dictum on staggered board that equally applies to all firms is, in our view, inappropriate.

Our results also do not mean that in the heat of a takeover battle the staggered board does not have a real effect either frustrating a bid or causing a higher premium to be paid. Prior studies have addressed these issues, and our study takes no position on them. But what our results do show is that on average and looking forward at the firm's operations as a whole, the staggered board does not produce a wealth effect for companies. This implies that the staggered board in general does not serve as an entrenching device which facilitates managerial waste. It is important here to note that our results are in general and are not directed to specific instances or to subsets of firms.

We find that the existence of staggered board or its lack thereof is not random. It is more likely to be observed among firms that are incorporated in some states compared to firms in other states, and it is ubiquitous in certain industries and less common in others. This reflects a conscious, systematic choice by firms in some states and industries to have or not to have a staggered board, although it does not exclude the possibility that in some cases the staggered board is unnecessarily adopted or mistakenly removed (or absent in the first place). And, we find that past performance determines whether a firm has staggered board: better performing firms are less likely to adopt and retain a staggered board. This is evidence in support of the theoretical notion that companies adopt a staggered board to prevent an undervaluing takeover. Ultimately, this is a basis to analyze a staggered board on an individual company basis. In all, our analysis highlight the likely idiosyncrasy of the staggered board.

Our results set a path for future research on the staggered board. Bebchuk and Cohen as well as Cremers, Litov & Sepe have set an admirable standard for initial research on this matter. Future research may further examine the endogeneity and

omitted variable problems by testing with other, perhaps superior, instrumental variables. It may also examine whether market monitors can function independently of the staggered board to substitute for this governance function ameliorating its idiosyncratic effects. There is work to be done on why certain industries are more likely to adopt the staggered board than others. This agenda should more finely examine when the staggered board is an appropriate corporate governance function. Finally, it is important to note that our results cover only the ISS companies, about 1,400. There has been a paucity of research of the staggered board and its wealth effects in smaller companies due to a lack of available data. But it is uncertain whether the lack of value effects we find in larger, more analyzed and observed companies will hold for smaller companies.

More generally, our findings have implications for other corporate governance studies[141] which could also be plagued by endogeneity and omitted variable bias.[142] This has informed the debate over whether "one-size-fits-all" governance is appropriate for companies with different characteristics. Our results are thus in line with Cain, McKeon and Davidoff Solomon who examine 16 takeover laws and find that previous studies which had attributed negative wealth effects from the adoption of business combination laws were instead observing effects from other variables.[143] Similar findings have been made by Catan in the context of poison pills when controls for endogeneity are imposed.[144] The collective findings thus highlight that in examining other studies, accounting for not just endogeneity but omitted variable bias, is likely important. Like our results on staggered boards, this also suggests a measure of caution in wholesale acceptance of corporate governance provisions which apply uniformly to firms without clear empirical support.[145]

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[141] *See generally* Michael Klausner, *Fact and Fiction in Corporate Law & Governance*, 65 STAN. L. REV. 1325 (2013) (asserting that the failure of empiricists to pay attention to institutional facts, has biased prior corporate governance studies).

[142] *See* Ben Hermalin & Michael Weisbach, *Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature*, 9 ECON. POL'Y REV. 7 (2003). *See also* Lucian A. Bebchuk & Michael S. Weisbach, *The State of Corporate Governance Research*, 23(3) REV. FIN. STUD. 939 (2010).

[143] *See* Cain, McKeon & Solomon, *supra* note 112.

[144] Catan, *supra* note 100.

[145] Matthew D. Cain, Jill Fisch, Sean Griffith & Steven Davidoff Solomon, *How Corporate Governance is Made: The Case of the Golden Leash*, 164 U. PA. L. REV. 649 (2016).

Our findings also provide evidence against the theoretical linking of staggered board to short termism, contending that its presence can fight short termism and its absence induces it. In another view, the absence of a staggered board provides greater efficiencies and short termism is absent due to a rational market.[146] But this ignores other institutional factors that motivate, constrain or discipline boards and push them to take one or another action. Instead, perhaps the battle over the staggered board has become apocryphal, representing power centers and broader arguments over the proper allocation of power between the board and shareholders.[147] But this too is a topic for a future article. Ultimately, though, our results do point to caution on any regulatory proposals for reform of the staggered board, either favorably or disfavorably, at least to the extent it applies to the large companies which make-up our evidentiary sample.

V. Conclusion

We revisit the question of whether a staggered board affects firm value, given prior conflicting studies. Earlier studies starting with Bebchuk and Cohen have found that on average, a staggered board has negative effect on firm value while more recent studies suggest that the effect of a staggered board on firm value is positive. These conflicting results are supported by differing theoretical arguments: opponents of the

[146] The debate over long versus short termism in corporations and whether it really exists has been heated and failed to resolve the issue (and likely never will). For a discussion of the debate *see* Lynne L. Dallas & Jordan Barry, *Long-Term Shareholders and Time-Phased Voting*, 40 DEL. J. CORP. L. 541, 553-561 (2016). The Chief Justice of the Supreme Court of Delaware has also been quite thoughtful in expressing and delineating the concerns of surrounding short-termis. *See* Leo E. Strine, Jr., Chief Justice, *Delaware Supreme Court, Keynote Address at the First Annual American College of Governance Counsel Dinner: Securing our Nation's Economic Future: A Sensible, Nonpartisan Agenda To Increase Long-Term Investment And Job Creation In The United States* (Oct. 30, 2015) at 1 ("the pressures that can lead corporate managers to quick fixes . . . , which might give a balance sheet a short-term benefit, but cut our nation's long-term prospects" and "the relative tilt in corporate spending toward stock buybacks and away from spending on capital expenditures."), available at http://corpgov.law.harvard.edu/wp-content/uploads/2015/11/Securing-Our-Nation-Intermediate-Final.pdf.

[147] We readily acknowledge that in earlier times when capital markets were less robust, the staggered board may have had a greater effect on companies and, perhaps firm value, though we do not find evidence of such effects. This type of "disappearing effect" has been documented in governance contexts. *See* Lucian Bebchuk, et al., *supra* note 138 (finding that the correlation between value and certain corporate governance indexes has disappeared and attributing this change in part to increased attention to corporate governance and firm performance). *See also* Jeffrey N. Gordon, *The Rise of Independent Directors in the United States, 1950-2005: Of Shareholder Value and Stock Market Prices*, 59 STAN. L. REV. 1465 (2007) (attributing the rise of independent directors to "decreased frictions" in the market for corporate control).

staggered board claim that it induces and perpetuates underperformance by firms while proponents claim that it helps create long-term value.

Our empirical analysis addresses the issue of endogeneity and of omitted variable bias in these prior empirical studies. We find that variables that have been omitted in some earlier analysis provide significant explanatory power for the (negative) wealth effects of staggered-board firms found in prior studies and when they are accounted for, the effect of the staggered board becomes insignificant. That is, the omission of these variables biases the estimated effect of a staggered board to make it appear harmful to firm value.

The second part of our analysis addresses the issue of endogeneity and the staggered board. Obviously, it is not a random event for a firm to adopt, retain or remove a staggered board. Rather, it reflects a conscious decision by the firm's management and shareholders. We estimate the effect of staggered board by the instrumental variable method which accounts for the selectivity in having a staggered board and find that its effect on value is insignificantly different from zero. Furthermore, we find no evidence that firms with a staggered board have different ROA than those that do not have a staggered board.

Ultimately, our results highlight that in the staggered board debate it appears that the value effect of the staggered board provision (and perhaps other corporate governance provisions) is firm specific. In general, there is no evidence that it is harmful or helpful for all firms. On average, the staggered board is benign. Our results indicate caution in any wholesale advocacy for adoption or for removal of the staggered board. And also that policy proposals for mandatory staggered boards or a per se ban on these boards appear to be lacking in definitive empirical support.

Appendix A.1

Descriptive statistics for the variables used in our analysis

The sample includes all firm years between 1991 and 2013 for all firms on the ISS database (which includes governance provisions) for which data are available on the Compustat. *Q* is the ratio of the firm's book value to its market value. All variables that follow have their values for the previous year. *SBdum* equals 1 for firms with SB; *logTA* is the logarithm of the firm's total assets (the table reports TA, i.e., total assets in million USD); *logAge*, the logarithm of the firm's age (the table reports Age, i.e., firm age in years); *DE* is a dummy variable that equals 1 if the firm is incorporated in Delaware (zero otherwise); *ROA* is return on assets, defined as EBITDA divided by lagged total assets; *SGAnet* is selling, general and administrative costs net of R&D expenses, divided by lagged sales; *CAPEX* is capital expenditures relative to assets; *RND* is the ratio of research and development expenditures (R&D) to sales; *RNDmiss* is a dummy variable that equals 1 if the form does not report R&D; *EInet* is Bebchuk, Cohen and Ferrell's (2008) entrenchment index of six governance-related provisions, which excludes staggered board (hence its value ranges from 0 to 5); *InH* is insider holdings, the share of the company's stock held by the top five officers in the company; *InstH* is institutional holdings, the share of the company's stock held by institutional investors; *TAg* is the one-year growth rate of total assets (which may reflect recent acquisitions); *SALESg* is one-year growth rate of sales; *SPdum* equals 1 if the firm is in the Standard and Poor's 500 index; *Leverage* is the ratio of total debt (long term and short term) to the firm's total assets; *PM* is the profit margin, the ratio of the difference between sales and cost of goods sold to total sales; *Illiq* is the Amihud (2002) illiquidity measure, defined as the average daily ratio of absolute stock return to dollar volume over the year – we exclude the top 1% of daily observations within each year and require at least 150 daily observations to compute the annual variable; *LIQ* is the asset liquidity, defined as current assets minus the difference between current liabilities and debt in current liabilities, all divided by total assets; *HHI* is the Herfindahl-Hirschman index of market concentration based on sales; *Ndeals* is the number of acquisitions in the industry; *Ndeals0* is a dummy variable that equals 1 if *Ndeals* = 0; these variables are based on four-digit SIC code.
In addition, there are four instrumental dummy variables: *MA* (Massachusetts), *NY* (New York), *CA* (California) and *PA* (Pennsylvania). Firms incorporated in these states have the value of the respective dummy variable equals 1 and zero otherwise. Another instrumental variable is *Ret3Y*, the average annual stock return over the last three years. Two additional instrumental variables based on Karpoff, Schonlau, and Wehrly (2016) are *Geo5Y* and *IPO5Y* which measure, respectively, the adoption of an SB provision at least five years back by firms in the same geographical area or the same IPO cohort year that are not in the same industry as the firm that is analyzed.

All ratios are winsorized at the 1% and 99% level to avoid outliers. The sample excludes REITs, dual-class share firms, and firms in the lowest and highest 1% of market capitalization in the respective year. We also delete an entire industry if *all* firms in that industry either have an SB or do not have an SB.

Variable	Mean	Median	Stdv.	Min.	Max.	Obs.
Q	1.795	1.422	1.157	0.563	11.852	27,016

SBdum	0.592	1.000	0.491	0.000	1.000	27,016
TA	9,521	1,577	57,228	10	2,265,792	27,016
Age	26.485	22.000	18.742	1.000	88.000	27,016
DE	0.589	1.000	0.492	0.000	1.000	27,016
ROA	0.145	0.136	0.115	-0.986	0.565	27,016
SGAnet	0.221	0.193	0.147	0.017	1.091	22,012
CAPEX	0.061	0.043	0.064	0.000	0.515	27,016
RND	0.055	0.000	0.316	0.000	6.117	27,016
RNDmiss	0.474	0.000	0.499	0.000	1.000	27,016
EInet	1.620	2.000	1.061	0.000	5.000	27,016
InH	0.031	0.007	0.066	0.000	0.415	21,813
InstH	0.675	0.708	0.232	0.011	1.000	22,721
TAg	1.105	1.060	0.262	0.580	2.959	27,016
SALESg	1.098	1.070	0.240	0.488	2.729	27,005
SPdum	0.319	0.000	0.466	0.000	1.000	27,016
Leverage	0.236	0.224	0.183	0.000	0.928	26,919
PM	0.366	0.334	0.225	-0.830	0.920	27,011
Illiq	0.086	0.043	0.158	0.002	9.580	26,956
LIQ	0.237	0.212	0.189	-0.084	0.815	24,126
HHI	0.248	0.188	0.199	0.034	1.000	27,016
Ndeals	47.664	13.000	111.666	0.000	2,201.000	27,016
Ndeals0	0.287	0.000	0.452	0.000	1.000	27,016
MA	0.021	0.000	0.144	0.000	1.000	27,016
NY	0.035	0.000	0.183	0.000	1.000	27,016
CA	0.017	0.000	0.130	0.000	1.000	27,016
PA	0.030	0.000	0.170	0.000	1.000	27,016
Ret3Y	0.114	0.059	0.536	-0.826	18.677	25,253
Geo5Y	0.590	0.600	0.138	0.000	1.000	13,645
IPO5Y	0.606	0.588	0.087	0.000	1.000	13,645

Appendix A.2

The value effect of staggered board: Excluding potentially endogenous regressors

The table presents Ordinary Least Squares (OLS) and instrumental variables (IV) estimations of the determinants of the determinants of *logQ*, the natural logarithm of the ratio of the firm's book value to its market value. In addition to SBdum, the explanatory variables in this model include only those deemed exogenous: *logTA*, *logAge*, *DE*, *SPdum*, *Ndeals*, *Ndeals0*, and *HHI*. The models also include industry fixed effects (using two-digit SIC code) and year fixed effects. The instrumental variables included in the first-stage regression are MA, PA, CA, NY, and *Ret3Y*. The estimations in columns (1) and (2) employ all firm years for which data are available, and those in columns (3) and (4) restricts the number of observations to those in the full specifications as reported in column (3) of Table 1 (OLS) and column (3) of Table 3 (IV). The variable definitions and sample requirements are in Appendix Table A.1. To save space, we report only the coefficient of *SBdum*, the number of observations and the R^2 of the regression. The standard errors are clustered by firm. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

	Maximum number of observations		Observations of the full specifications	
Method:	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
SBdum	-0.027 **	0.090	-0.021	0.096
	(-2.175)	(1.237)	(-1.450)	(1.142)
N	28,831	28,432	23,962	22,353
R^2	0.297	0.282	0.238	0.225

Appendix A.3

Annual estimation – the Fama and Macbeth method, instrumental variables method

A regression is estimated in each year across firms by the instrumental variables method. There are 23 years in our sample, 1991-2013. The table presents summary statistics of the 23 coefficients that are obtained from these estimations. In the specifications that includes ownership variables, there are 21-years, 1993-2013. The table reports (i) the mean coefficient (Mean) and its *t*-statistic based on Newey-West standard errors, and (ii) the weighted mean or precision-weighted mean of the coefficient, by which we weigh each coefficient by its standard error (WMean). A more precisely-estimated coefficient, i.e., a coefficient with smaller standard error, will have a greater weight and will have greater effect on the mean. The table also reports (iii) the median value of the coefficient, such that half the estimated coefficients are above it and half of them are below it, and (iv) the proportion of the estimated coefficients that are negative and the p-value from a two-sided binomial probability test of whether the proportion is significantly different from 0.5, which would be obtained by chance (e.g., by flipping a coin). We report results from estimating model M2 with and without ownership variables, as reported in columns (3) and (4) of Table 3. In the first-stage of the IV procedure, we use the standard set of instruments: MA, PA, CA, NY, and *Ret3Y*. We present results both for *logQ* (Panel A) and for *Q* (Panel B) as dependent variables. All regressions include industry fixed effects using two-digit SIC code. The variable definitions and sample requirements are in Appendix Table A.1. To save space, we report only the coefficients of *SBdum*, the number of observations, the average R^2 of the second-pass regression and the average R^2 of the first-pass regression. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Model M2					Model M2 with ownership variables				
N (R^2) [R^2-first]	Mean (t-stat)	WMean (t-stat)	Median	Neg. (*p*)	N (R^2) [R^2-first]	Mean (t-stat)	WMean (t-stat)	Median	Neg. (*p*)
Panel A: Dependent variable: *logQ*									
23,225 (0.511) [0.122]	0.055** (2.536)	0.042** (2.148)	0.043	0.391 (0.405)	15,924 (0.558) [0.163]	0.065** (2.406)	0.045* (1.945)	0.034	0.381 (0.383)
Panel B: Dependent variable: *Q*									
23,225 (0.462) [0.122]	0.034 (0.465)	-0.041 (-0.724)	-0.035	0.565 (0.678)	15,924 (0.506) [0.163]	0.089 (0.759)	-0.040 (-0.687)	0.036	0.429 (0.664)

Table 1

Ordinary Least Squares (OLS) regression: the value effect of staggered board

The table presents OLS estimations of the determinants of *Q*, the ratio of the firm's book value to its market value. In Panel A, the dependent variable is *logQ*, the logarithm of *Q*. In Panel B, the dependent variable is *Q*. The variable definitions and sample requirements are in Appendix Table A.1. The estimation is done by pooled OLS regression with industry fixed effects (using two-digit SIC code) and year fixed effects. The standard errors are clustered by firm. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. Panel A presents the coefficients of *SBdum* and all control variables. Panel B includes all the variables that appear in Panel A but to save space, we report only the coefficients of *SBdum* and of *EInet* and the R^2 of the model.

Panel A: Dependent variable: ***LogQ***; Industry FE: **2-digit SIC**

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
SBdum	-0.023	**	-0.025	**	-0.014		-0.013		-0.009		-0.013		0.001		-0.003	
	(-2.110)		(-2.292)		(-1.306)		(-1.141)		(-0.844)		(-1.183)		(0.119)		(-0.242)	
EInet									-0.024	***	-0.025	***	-0.029	***	-0.023	***
									(-4.842)		(-4.889)		(-5.560)		(-4.161)	
logTA	-0.021	***	-0.018	***	-0.075	***	-0.093	***	-0.020	***	-0.018	***	-0.077	***	-0.095	***
	(-4.697)		(-3.655)		(-9.028)		(-9.792)		(-4.637)		(-3.784)		(-9.200)		(-9.970)	
logAge	-0.012		-0.010		-0.022	***	-0.018	**	-0.008		-0.007		-0.018	**	-0.015	*
	(-1.490)		(-1.117)		(-2.858)		(-2.131)		(-1.052)		(-0.759)		(-2.333)		(-1.773)	
DE	0.023	*	0.022	*	0.025	**	0.027	**	0.026	**	0.025	**	0.028	**	0.029	**
	(1.908)		(1.797)		(2.157)		(2.064)		(2.146)		(2.041)		(2.413)		(2.228)	
ROA	1.899	***	2.044	***	1.606	***	1.700	***	1.893	***	2.035	***	1.602	***	1.696	***
	(20.674)		(20.049)		(15.053)		(13.037)		(20.684)		(20.022)		(15.071)		(13.066)	
CAPEX	-0.131		-0.267	**	0.004		-0.249	**	-0.133		-0.267	**	-0.006		-0.252	**
	(-1.280)		(-2.287)		(0.039)		(-2.202)		(-1.299)		(-2.284)		(-0.063)		(-2.225)	
RND	0.311	***	0.440	***	0.313	***	0.414	***	0.310	***	0.437	***	0.311	***	0.411	***
	(7.262)		(8.637)		(7.939)		(7.895)		(7.266)		(8.668)		(7.941)		(7.936)	
RNDmiss	-0.116	***	-0.108	***	-0.072	***	-0.064	***	-0.118	***	-0.109	***	-0.074	***	-0.065	***
	(-7.705)		(-6.654)		(-5.113)		(-4.143)		(-7.816)		(-6.727)		(-5.290)		(-4.263)	
InH			0.135				0.128				0.070				0.082	
			(1.315)				(1.070)				(0.689)				(0.688)	
TAg					-0.129	***	-0.140	***					-0.128	***	-0.139	***
					(-7.839)		(-7.370)						(-7.759)		(-7.345)	
SALESg					0.107	***	0.082	***					0.104	***	0.079	***

	(4.560)		(2.748)		(4.494)		(2.696)	
SPdum	0.211	***	0.206	***	0.217	***	0.209	***
	(13.777)		(11.286)		(14.045)		(11.424)	
Leverage	-0.032		-0.012		-0.024		-0.007	
	(-0.881)		(-0.265)		(-0.644)		(-0.153)	
PM	0.271	***	0.289	***	0.268	***	0.286	***
	(6.717)		(6.134)		(6.663)		(6.101)	
Illiq	-0.366	***	-1.278	***	-0.374	***	-1.279	***
	(-4.190)		(-9.078)		(-4.179)		(-9.146)	
LIQ	0.146	***	0.135	***	0.131	***	0.125	**
	(3.147)		(2.604)		(2.840)		(2.420)	
Ndeals	0.000		0.000		0.000		0.000	
	(1.173)		(0.347)		(1.168)		(0.369)	
Ndeals0	-0.039	***	-0.035	**	-0.039	***	-0.034	**
	(-2.898)		(-2.256)		(-2.904)		(-2.196)	
HHI	0.059	**	0.050	*	0.056	**	0.044	
	(2.134)		(1.695)		(2.036)		(1.494)	
InstH			-0.185	***			-0.177	***
			(-5.207)				(-5.017)	
N	27,016	21,806	23,962	16,599	27,016	21,806	23,962	16,599
Firms	2,961	2,456	2,593	2,006	2,961	2,456	2,593	2,006
R^2	0.408	0.442	0.433	0.477	0.410	0.444	0.436	0.479

Panel B: Dependent variable: ***Q***; Industry FE: **2-digit SIC**

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
SBdum	-0.083	***	-0.086	***	-0.061	**	-0.057	*	-0.049	*	-0.055	*	-0.023		-0.031	
	(-2.957)		(-2.918)		(-2.125)		(-1.767)		(-1.713)		(-1.839)		(-0.800)		(-0.953)	
EInet									-0.061	***	-0.064	***	-0.071	***	-0.058	***
									(-4.764)		(-4.841)		(-5.137)		(-3.764)	
R^2	0.333		0.364		0.361		0.400		0.335		0.366		0.364		0.402	

Table 2

The determinants of staggered board (SB)

The dependent variable is *SBdum* which equals 1 if the firm has an SB. The variables are those that appear in Table 1, including five instrumental variables: MA, PA, CA, NY, and *Ret3Y*. The model also includes industry fixed effects using two-digit SIC code and year fixed effects. The variable definitions and sample requirements are in Appendix Table A.1. The standard errors are clustered by firm. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The Wald test is for the joint significance of the five instrumental variables.

	(1)		(2)		(3)		(4)	
NY	-0.042	**	-0.058	***	-0.017		-0.089	***
	(-2.411)		(-2.989)		(-0.908)		(-4.028)	
CA	-0.423	***	-0.419	***	-0.401	***	-0.382	***
	(-18.277)		(-16.564)		(-16.286)		(-13.863)	
PA	0.088	***	0.107	***	0.105	***	0.129	***
	(4.859)		(5.153)		(5.508)		(5.273)	
MA	0.375	***	0.379	***	0.403	***	0.421	***
	(17.432)		(15.953)		(17.802)		(15.755)	
Ret3Y	-0.016	***	-0.014	*	-0.018	***	-0.018	**
	(-2.906)		(-1.803)		(-3.130)		(-2.093)	
logTA	-0.013	***	-0.018	***	-0.022	***	-0.026	***
	(-5.684)		(-6.848)		(-5.434)		(-5.127)	
logAge	-0.036	***	-0.046	***	-0.035	***	-0.037	***
	(-7.305)		(-8.292)		(-6.532)		(-5.821)	
DE	-0.012		-0.011		-0.007		-0.025	***
	(-1.640)		(-1.465)		(-0.933)		(-2.785)	
ROA	-0.058	*	-0.121	***	-0.011		-0.007	
	(-1.819)		(-3.432)		(-0.297)		(-0.154)	
CAPEX	0.077		0.037		0.003		-0.176	**
	(1.207)		(0.532)		(0.048)		(-2.226)	
RND	-0.074	***	-0.118	***	-0.065	***	-0.120	***
	(-7.002)		(-8.096)		(-5.590)		(-6.942)	
RNDmiss	-0.002		0.009		-0.005		-0.006	
	(-0.205)		(0.979)		(-0.591)		(-0.534)	
InH			-0.049				-0.098	
			(-0.941)				(-1.561)	
TAg					0.021		0.027	
					(1.358)		(1.484)	
SALESg					-0.033	**	-0.037	*
					(-2.068)		(-1.882)	
SPdum					-0.030	***	-0.046	***
					(-2.929)		(-3.850)	
Leverage					-0.055	**	-0.047	*
					(-2.488)		(-1.739)	
PM					-0.102	***	-0.091	***
					(-5.044)		(-3.746)	
Illiq					-0.185	***	-0.337	***
					(-7.246)		(-5.365)	
LIQ					-0.194	***	-0.233	***

				(-7.671)			(-7.769)	
0Ndeals				-0.000	***		-0.000	***
				(-3.144)			(-4.929)	
Ndeals0				0.070	***		0.057	***
				(8.160)			(5.612)	
HHI				0.005			-0.019	
				(0.292)			(-0.887)	
InstH							-0.117	***
							(-4.915)	
Wald	145.81	***	122.33	***	135.20	***	107.49	***
(p-value)	(0.000)		(0.000)		(0.000)		(0.000)	
N	25,253		21,251		22,353		16,173	
Firms	2,854		2,396		2,493		1,953	
R^2	0.084		0.094		0.094		0.110	

Table 3

Instrumental variables regressions: the value effect of staggered board

The dependent variable is *logQ* or *Q*. These are the second-stage regressions; the first-stage regression results of the four models in Panel A are reported in Table 2. The variable definitions are in Appendix Table A.1. The instrumental variables used in Panels A and B are MA, PA, CA, NY, and *Ret3Y*. The second-stage estimations here are done by pooled regressions with industry (using two-digit SIC code) and year fixed effects. To save space, we report only the coefficient on *SBdum*, the sample size and R^2. Columns (1) to (4) include the same set of control variables as used in the respective columns (1) to (4) in Table 1. The standard errors are clustered by firm. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. In panels A and C, the dependent variable is *logQ* while in panel B it is *Q*. Panel C reports the results of the second-stage regression as reported in Panel A, where the first-stage model is augmented by two instruments: *Geo5Y* and *IPO5Y* which measure, respectively, the adoption of an SB provision at least five years back by firms in the same geographical area or the same IPO cohort year that are not in the same industry as the firm that is analyzed. These measures are available from 1995 to 2008 only and thus reduce the sample size.

Panel A: Dependent variable: ***logQ***; Industry FE: **two-digit SIC**	(1)	(2)	(3)	(4)
SBdum	0.019	0.044	0.035	0.045
	(0.292)	(0.655)	(0.532)	(0.634)
N	25,253	21,251	22,353	16,173
R^2	0.409	0.439	0.433	0.473
Panel B: Dependent variable: ***Q***; Industry FE: **two-digit SIC**				
SBdum	-0.003	0.103	0.015	0.090
	(-0.017)	(0.610)	(0.078)	(0.481)
N	25,253	21,251	22,353	16,173
R^2	0.333	0.360	0.360	0.397
Panel C: Replication Panel A, including only firms in existence before 1981				
SBdum	0.062	0.016	0.059	-0.053
	(0.961)	(0.203)	(0.856)	(0.585)
N	12,460	10,169	11,237	7688
R^2	0.483	0.517	0.617	0.556
Panel D: Dependent variable: ***logQ***; Industry FE: **two-digit SIC**. Add'l instruments: ***Geo5Y* and *IPO5Y***				
SBdum	0.006	0.004	0.065	0.063
	(0.076)	(0.051)	(0.901)	(0.850)
N	13,599	12,021	13,588	10,217
R^2	0.360	0.397	0.431	0.467