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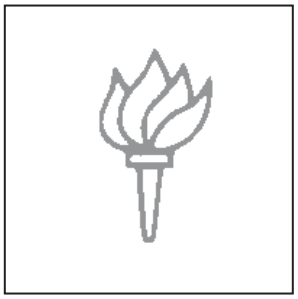

"The Insignificance of Clear-Day Poison Pills"

Emiliano M. Catan

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By

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Abstract

Exploiting a hand-collected database with over 2100 firms during 1996-2014, I analyze the relationship between the presence of poison pills and firm value (Tobin's Q). Consistent with earlier results, I document a strong negative association between pills and firm value cross-sectionally and within firm. However, I document that (a) all the within-firm association is driven by pill adoptions (and none by the dropping of pills); (b) all the drop in value associated with adoptions actually precedes the pills' adoption; and (c) firms adopted their pill after experiencing sharp, largely temporary, drops in their operating performance. These results indicate that the ostensive negative effect of pills on firm value is due to reverse causality, and that prior analyses were incorrect in concluding that pills are harmful and using pills as indicators of "bad governance". Moreover, the results call into question the usefulness of the dramatic drop in the incidence of pills that took place during the last decade due to the pressure of ISS and institutional investors.

Introduction

The creation of the poison pill was one of the most innovative pieces of corporate lawyering of the past 30 years. Pills were a game-changer: they allowed the board of directors of a corporation targeted by a tender offer to have a say in the offer even though –unlike in the case of a merger– the board does not have any statutory role in such an offer. The poison pill was revolutionary for several reasons: first of all, the pill gave the incumbent members of the board –as long as they were not replaced– the power to effectively veto a tender offer. Moreover, a pill could be adopted on a very short notice, without shareholder approval, and without high transaction costs. Finally, pills did not require the firm to modify any real feature of its business or capital structure.

The poison pill was not just innovative. It was also very controversial. At the time of the inception of pills, not only law and finance academics, but also practitioners

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were already entangled in an intense debate about takeovers, takeover defenses, and the allocation of the power to decide how to respond to an unsolicited offer. By affording managers a tool that was much more effective than any antitakeover device previously available, poison pills only raised the stakes in that debate. Managers and practitioners generally supported pills, and criticized limitations on the use of pills imposed by judicial decisions, arguing that managers and directors could use the power that the pill afforded them to protect the interest of the targets' shareholders (for example, by bargaining for a better price). On the other hand, shareholders and a majority of academic commentators often decried pills, and the judicial decisions that gave boards increasing freedom to keep the pills in place, arguing that incumbent directors and managers would entrench behind the pill, and that this would defang the market for control as a disciplining device.

Just as one would expect, given how controversial the pill was, many papers have attempted to document empirically whether the adoption of a poison pill is beneficial or harmful for shareholders. Although earlier findings were mixed and inconclusive, law and finance research over the past decade has consistently reached the conclusion that the presence of a pill is negatively correlated with firm value (Tobin's Q). Those results are intriguing, since there are institutional reasons to believe that most –and perhaps all– of the effect of poison pills is likely to arise from the *availability* of the pill –and little, if any, from the *actual presence* of a poison pill–. Nevertheless, some scholars have taken that negative correlation as evidence for the conclusion that management adopt pills in order to entrench themselves and act in ways that are detrimental to shareholder value. This conclusion fanned the flames of the long-dated dislike for pills among institutional investors. As a result of this increasing dislike, the fraction of large publicly traded firms with a "clear-day" poison pill in place dropped from a high of approximately to 60 percent in 2002 to less than 10 percent in 2014.[1]

In this paper I exploit a hand-collected database and follow over 2100 publicly traded firms during 1996-2014 to analyze the relationship between the presence of clear-day poison pills and firm value (Tobin's Q). As a preliminary step in my analysis, I systematically document the influential role played by Institutional Shareholder Services (ISS) –the most prominent proxy advisor– and the voting decisions of institutional investors in inducing firms to get rid of their poison pills. In December 2004, ISS adopted a new set of voting guidelines that recommended ISS's clients –typically, institutional investors– to withhold their vote from the directors of firms that either renewed a clear-day pill or adopted one from scratch. I find that firms responded to the new guidelines in a systematic way: over 90 percent kept their pill in place until the pill's scheduled expiration date, and more than 70 percent of those firms refrained from renewing the pill at the pill's scheduled expiration date. Given that a pill's scheduled expiration date is

[1] "Clear-day" poison pills are pills that are adopted in a purely preemptive way (and not in response to any particular threat like a hostile tender offer, or the disclosure by an investor that the investor has acquired a significant block of the firm's shares).

determined when a pill is adopted, the systematic way in which firms let go of their pills suggest that, during the period under analysis, the decision to drop a pill is less likely to be driven by confounding considerations related to firm value than the decision to adopt a pill.

Turning to the analysis of the association between pills and firm value, I first document that, consistent with the results of recent studies, the presence of pills is negatively associated with firm value both in pooled-OLS regressions and in "within-firm" designs that control for firm fixed effects. Although these specifications rule out certain types of selection bias, they are still incapable of ruling out stories whereby firms adopt (or drop) pills in response to firm-level idiosyncratic shocks that are correlated with firm value (for example, the estimate of the effect of the pill in those specifications would be downward-biased if firms tended to adopt a pill after the firms' business hits a rough patch that causes firm value to decrease). Next, I break up the within-firm association between the presence of poison pills and firm value into its two components: the association that is driven by pill adoptions and the association that is driven by the dropping of pills. I then document that pill adoptions are the exclusive drivers of the baseline within-firm results.

In the following steps, I take advantage of the richness of my hand-collected data to study the dynamic evolution of firm value in the 10-year window around the adoption of a pill. Focusing on annual data, I document that, although firm value seems to drop significantly during the year of adoption of the pill, firms that adopt pills only do so after having experienced very substantial relative drops in value over multiple years. This stylized fact suggests that the "parallel trends" assumption that is necessary for difference-in-difference analyses to be identified is not satisfied: If the value of eventual pill adopters dropped in the years leading to the adoption of the pill, one cannot infer that the drop in value experienced in the year in which they adopt the pill can be ascribed to the adoption of the pill. In the final step of my analysis of firm value, I use quarterly, instead of annual data. I document (a) that the drop in value experienced by firms during the year in which they adopt the pill is driven by a sharp drop in value that pill-adopters experience in the third and second quarters *before* the adoption of the pill, (b) that firm value does *not* drop significantly in the quarter during which the pill is adopted, and (c) that it remains stable thereafter. The analysis of quarterly data also reveals that firms adopt pills in the wake of sharp –and to a large extent temporary– drops in their operating performance, and that following the adoption of the pill firms significantly cut back their investments in research and development.

This paper relates to two broad strands of the law and finance literature. The first strand involves studies analyzing the effect of corporate governance mechanisms –and in particular the poison pill– on firm value. Coates (2000) criticized earlier empirical work regarding the impact of poison pills on firm value. He argued that the reason why the conclusions of the analyses –most of which had used an event-study methodology to look at the price effects of the adoption of a pill– had been

weak and inconsistent was that researchers had missed a key institutional detail: every firm can adopt a poison pill on short notice, and thus even firms that have not effectively adopted a pill have a "shadow pill". Thus, Coates concluded that, subject to a caveat, the adoption of a pill cannot have any direct effect. As Coates speculates in a footnote, the caveat is that, to the extent that adopting a pill involves costs for management and directors, one may come up with a story whereby the adoption –through a costly signaling mechanism– induces a separating equilibrium in which only those who are systematically more willing to use the pill to fend off an unsolicited offer will adopt one. Later research has resorted to this caveat to argue that the negative statistical association between clear-day pills and firm value reported by those studies need not be driven by reverse causality (see, for example, Bebchuk et al. 2009, pp. 792-3).

In a very influential paper, Gompers, Ishii, and Metrick (2003) use twenty-four governance provisions –one of which is the presence of a poison pill– to create a governance index ("G-index"). Using data from a large number of large, publicly traded firms during the 1990s, they show that, in the cross section, firms with a higher G-index (which they see as firms where shareholders have "fewer rights" against management) tend to have lower firm value, poorer operating performance, and lower risk-adjusted stock returns.

In another very influential paper, Bebchuk et al. (2009) document that clear-day poison pills are among the six provisions in the G-index that drive the correlations described by Gompers, Ishii, and Metrick and construct an alternative to the G-index (the "E-index") on the basis of those six provisions. Although Bebchuk et al. put forward several arguments for why the presence of a clear-day pill could lead in a causal way to some of the results they report, they end up with a candid assessment of their econometric findings, noting that they "conjecture that the correlation that [clear-day] poison pills . . . have with lower firm value at least partly reflects the greater tendency of managers of firms with lower firm value to adopt [pills]" (Bebchuk et al. 2009, p 823), and call for further efforts to establish whether the statistical associations described in their paper identify a causal channel.

My findings suggest that Bebchuk et al.'s caveats about the interpretation of the impact of clear-day pills were well founded. These caveats, however, seem to have gone unnoticed by the empirical literature. Starting from the hypothesis that the negative association between the E-index and firm value reflects the fact that firms with high E-index have "poor governance", more than three hundred empirical papers have used that index as a measure of how "well governed" a firm is.[2] To the extent that the presence of a clear-day poison pill drives a substantial fraction of that index over the 1990-2006 period covered in Bebchuk et al.'s dataset, a finding that the association between the presence of a poison pill and firm value is spurious suggests that many of the results that the literature has ascribed to "poor governance" may themselves be questionable.

[2] See http://www.law.harvard.edu/faculty/bebchuk/studies.shtml

Cremers and Ferrell (2014) construct a database that extends the G-index to the 1978-1989 period. They find that the adoption of a poison pill drives most of the impact of the G-index on firm value over 1978-2006 (in fact, for firms having a clear-day pill in place, firm value is not significantly associated with the remaining 23 components of the G-index), and that having a poison pill in place is associated with a 5 percent –in some specifications, up to 16 percent– reduction in firm value. On the basis of this evidence, they conclude that "poison pill adoption is a central shareholder rights decision" (Cremers and Ferrell 2014, p. 1170). Cremers and Ferrell attempt to tackle the identification concerns raised by Bebchuk et al. (2009) by exploiting the within-firm variation in governance provisions in their extended sample, which allows them to include firm fixed effects in their regressions. Nevertheless, the identification strategy in Cremers and Ferrell (2014) is not airtight, for there remains a concern: Firms may have adopted or dropped a pill in response to some unobservable firm-level shock likely to be correlated with the outcome variable of interest. Hence –as the evidence in this paper shows– controlling for firm and year fixed effects is insufficient to fully deal with the identification concerns noted by Bebchuk et al. (2009).

In a recent piece, Cremers, et al. (2016) revisit the results in Bebchuk et al. (2009). They split the components of the E-index into two sub-sets. They document that, in a within-firm analysis, only one of the subsets (the "I-index", which consists of the presence of a poison pill, the presence of a golden parachute, and the presence of supermajority shareholder approval requirements to amend the bylaws) of the E-index is actually negatively associated with firm value (while the other subset is actually *positively* associated with firm value). They interpret all the components of the E-index as provisions that protect incumbents, and argue that the components of the I-index "all share the features of unilateral –and thus 'dictatorial'– governance provisions", and that the "unilateral protection arrangements that can be adopted without any dialectical confrontation with the shareholders are more likely to be motivated by managerial moral hazard" (Cremers et al. 2016, p. 34). To the extent that the negative association between the I-index and firm value documented in Cremers et al. (2016) is driven by reverse causality, the hypothesis that "unilateral" governance provisions are motivated by moral hazard may need to be revised.

The second strand of literature relates to the influence of proxy advisors and institutional investors over corporate governance. Choi et al. (2010) analyze the influence of proxy advisors' recommendations on director elections. Consistent with received wisdom, they conclude that Institutional Shareholder Services (ISS) is the most influential proxy advisor, but argue that the typical estimates of ISS's influence are overblown, and that ISS's influence is significantly due to its role as an information aggregator (and not necessarily due to the ultimate content of ISS's recommendations). Cremers et al. (2016) argue that proxy advisors' continued push for governance reforms that erode anti-takeover provisions –even in the face of evidence that seems to indicate that some of the promoted reforms may actually destroy shareholder value– suggests that proxy advisors may not have

shareholders' best interest in mind –but rather their own financial wellbeing–. In a recent working paper, Romano and Sanga (2016) argue that proxy advisors and institutional investors seem to have deterred publicly traded firms from adopting exclusive forum provisions (other than at the IPO stage), and offer evidence that seems inconsistent with the proxy advisors' implied view that such provisions –when unilaterally adopted by the board of directors– can be detrimental for the interest of shareholders. To the best of my knowledge, my paper is the first to systematically document the role that ISS's voting guidelines (together with voting by institutional investors in line with ISS's recommendations) played in the demise of clear-day poison pills, and to show that there is no evidence that the drop of pills brought about a significant change in firm value. The paper's results provide no support for the campaign championed by proxy advisors and institutional investors that led to the demise of clear-day poison pills during the last decade.

The rest of the paper will proceed as follows. In Part 1, I provide a description of the institutional setting, explain how poison pills work, and discuss the channels through which clear-day pills may (and may not) have an impact on firm value. In Part 2, I describe the data and present the empirical findings. In Part 3, I discuss the implications of the empirical findings. In Part 4, I conclude.

1. Institutional setting: why may clear-day pills be relevant (and why not)?

A board of directors adopts a poison pill by issuing a dividend of stock purchase rights (See generally Fleischer & Sussman 2013, §5.01[B][1]). Initially, the rights have no economic value. However, if someone acquires more than a pre-set fraction of shares of the firm –the "trigger percentage", typically between 10 and 20 percent of the firm's shares– without the approval of the firm's board, the rights enable every shareholder –except the person who has triggered the pill– to acquire newly issued shares of the firm at a steep discount. A pill blocks hostile acquisitions through two complementary channels: to begin with, given that the stockholdings of anyone who triggered the pill would be dramatically diluted, no hostile bidder will want to buy or accept a number of tendered shares that would cause the pill to be triggered. In addition, even if a hostile bidder attempted to trigger the pill, the other shareholders would find it in their best interest not to sell or tender their shares to the bidder (since by holding out they would be able to acquire the newly issued shares at a discount if the pill is triggered). (See Catan & Kahan 2016)

If nobody triggers the pill, the stock purchase rights expire at a date that is stipulated in the rights plan as of the date when the plan is adopted (typically, the pill's tenth anniversary). Additionally, as long as nobody has triggered the pill, the board can always terminate the rights plan before the plan's scheduled expiration date by either (a) amending the plan's terms to shorten the rights' expiration date or (b) redeeming the rights for a nominal sum. Going forward, I will not distinguish between the two ways of terminating the pill prematurely, and I will refer to the three ways through which a firm can stop having a poison pill as "dropping the pill".

Anyone who wants to acquire a firm that has a poison pill, then, has three options: first, it can try to bargain with the incumbent board and convince it to drop the pill; second, it can try to challenge before the courts the target board's decision to keep the pill in place by arguing that that decision violates the directors' fiduciary duties; finally, it can try to run a proxy contest to replace a majority of the incumbent directors by new directors that will then drop the pill.

Since boards have the power to issue stock purchase rights and declare and issue dividends unilaterally,[3] pills can be adopted without shareholder approval. Moreover, since board meetings can be convened on short notice, and the Williams Act requires every tender offer to remain open for at least 20 business days,[4] every firm that happens not to have a pill in place will have more than enough time to adopt one if someone launches an unsolicited tender offer. In addition, the fiduciary duty constraints on the board's ability to keep the pill in place in the face of a hostile bid are relatively mild: The board can refuse to redeem the pill as long as it complies with *Unocal*[5], and the same standard of review will apply regardless of whether the pill that the board is refusing to redeem was adopted in response to the offer or whether, instead, it was adopted on a "clear day".[6,7] As a consequence of all this, every firm has a "shadow pill" (see Coates 2000, pp. 286-288): It is the availability – and not the actual presence– of a poison pill that has the effect of channeling hostile acquisition attempts into either negotiated agreements or proxy fights.

Although having a pill in place –as opposed to relying on the omnipresent "shadow pill"– is unnecessary to prevent a firm from being acquired by a hostile bidder, actually having a pill in place may be useful when it comes to preventing anyone from acquiring a large block of shares through creeping acquisitions or a street sweep (Fleischer and Sussman 2013, §5.02[A]). However, as argue in the following paragraphs, this argument should be taken with a grain of salt, since multiple early-warning mechanisms would most likely enable a board that has not adopted a clear-day pill to adopt a pill before anyone acquired a significant block of the firm's shares.

First of all, anyone becoming the beneficial owner of more than 5 percent of a firm's shares is required to file a Schedule 13D with the Securities and Exchange Commission within 10 days of reaching the 5 percent threshold.[8] Thus, unless a board of a firm is concerned that at the end of the 10-day window someone –say, an activist hedge fund– may end up owning a fraction of shares in excess of the pill's

[3] See, e.g., DGCL §§ 157, 170
[4] 17 C.F.R. §240.14e-1(a)
[5] Unocal Corp. v. Mesa Petroleum Co., 493 A.2d 946 (Del. 1985)
[6] Moran v. Household Int'l, 500 A.2d 1346, 1354 (Del. 1985)
[7] States other than Delaware give directors at least as much discretion as Delaware does. See Barzuza (2009).
[8] 17 C.F.R. §240.13d-1

trigger percentage, then adopting a clear-day pill is unnecessary. In addition, the probability that an activist will be bound by the pill's trigger percentage before the end of the 10-day window seems rather low: While the majority of the pills adopted in the second half of the 1990s had a trigger percentage of 15% (and less than 10 percent of those pills had a trigger lower than 15%)(Fleischer & Sussman (2013), § 5.05[C][1]), less than 10% of the Schedules 13D filed by activist hedge funds over 1996-2007 reported an ownership stake in excess of 15% of the target's shares (Bebchuk et al. 2013, Table 2).

A second early-warning mechanism arises from the Hart-Scott-Rodino Antitrust Improvements Act of 1976 (HSR Act). Under certain circumstances, the HSR Act requires a person who intends to engage in a transaction that will result in that person owning more than a given dollar value in voting securities of a firm (the "target firm") to notify the target firm,[9] the Department of Justice (DOJ) and the Federal Trade Commission (FTC) and wait for the DOJ and FTC to review whether the intended transaction raises antitrust concerns before completing the transaction.[10] This notification would put the target on notice that someone is trying to acquire a significant block of its stock (although the early-warning mechanism is relatively less effective for firms with lower market capitalization[11]). A third, and final, early-warning mechanism consists of monitoring the trading volume in the firm's shares (which would enable the firm to adopt a pill in response to abnormal trading patterns that suggested that someone is accumulating a block of shares). To the extent that small-cap firms have shares that trade in less liquid markets, this third mechanism may be relatively more effective for smaller firms (and hence make up for the relatively lower effectiveness of the second mechanism for those firms).

In sum, given the available early-warning mechanisms, the marginal impact of a clear-day pill on the likelihood that someone will become a blockholder is probably low. Thus, it follows that the impact that the adoption of a clear-day pill can have on stock prices as a result of the pill's effect in preventing the emergence of a blockholder must be modest, and given by the product of (a) the expected change in firm value if someone were to acquire a block larger than the pill's trigger percentage[12] and (b) (the market's assessment of) the marginal effect of the adoption of a pill on the likelihood that anyone will acquire such a block.[13] Although the two arguments of the product are hard to quantify, one can arguably proxy for (a) by looking at the abnormal stock returns experienced by firms targeted by activist hedge funds (see Brav et al. 2013, Figure 2, reporting that those firms' shares experience a 5% positive abnormal return in the 40-day window surrounding the activist's intervention). (b) is even harder to quantify, although one

[9] 16 C.F.R. §803.5.
[10] 15 U.S.C.A. § 18a
[11] 15 U.S.C.A. § 18a(a)(2)(B)

thing worth noting is that it need not be negative: even if adopting the pill –ceteris paribus– marginally deterred potential activists, the adoption of the pill may reveal to the market that the board has private information that suggests that an activist attempt is more likely to occur.

Finally, as mentioned above, Bebchuk et al. (2009) put forward yet another argument that suggests that having a clear-day pill may actually have an effect: among the practitioners they interviewed in connection with the paper, "there was a widespread perception that maintaining a pill signals to hostile bidders that the board will 'not go easy' if an unsolicited offer is made and that, conversely, not adopting a pill or (even worse) dropping an existing pill could be interpreted as a message that incumbents are 'soft' and 'lack resolve.'" (Bebchuk et al. 2009, p. 793) Consistent with this view, Fleischer and Sussman indicate that "the adoption of a pill signals the board's resolve to resist takeover attempts that are not in the best interests of the company and its stockholders." (Fleischer & Sussman 2013, §5.02[C])

2. Empirical Analysis

2.1 Data description

The central dataset employed in this paper is a hand-collected database of pill-related information about all publicly traded firms that were part of the Standard & Poors (S&P) 1500 Index between 1996 and 2014, excluding financials, utilities (Daines (2001)), firms that had a dual-class share structure (Gompers, Ishii, and Metrick (2010)), and firms for which I could not find a corresponding match in the CRSP-Compustat database.[14] For each of the firms in my sample, and every year between 1996 and 2014, I searched a variety of sources for any pill-related information. I also searched online sources for information related to the structure of the board of directors of each of the firms in the sample at each point in time. The sample comprises a total of approximately 2175 unique firms and over 25,000 firm-year observations. I supplemented my main dataset with accounting data from CRSP-Compustat.

My main outcome variable of interest is firm value. Following a long strand of literature that analyzes the effects of corporate governance on firm value, my measure of firm value is Tobin's Q. I construct Tobin's Q using data from the CRSP-Compustat merged Fundamentals Annual database (or, for the case of regressions estimated using quarterly data, from Compustat Fundamentals Quarterly) as the ratio of the market value of the firm to the book value of its assets, where market value is defined as the sum of the book value of assets and the market value of equity minus the book value of equity. As is standard, in order to prevent my results from being driven by outliers, I winsorize Tobin's Q and other financial ratios at the 1st and 99th percentiles. Table 1 contains the descriptive statistics for the entire sample.

[14] A more detailed description of the construction of my main database and the definition of each of the variables used in regression analysis is available in Appendix A.

Table 1
Descriptive Statistics

The table presents the mean and standard deviation of the variables used in the analysis. The variables are defined in Appendix A. The statistics are calculated over the 1996-2014 period (except for those of Passed Expiration Date, which are only calculated over 2005-2014).

	N	Mean	Std. Dev.
Poison Pill[15]	25,599	0.397	0.489
Dropped Pill	25,599	0.151	0.358
Adopted Pill	21,737	0.211	0.408
Passed Expiration Date	6,429	0.522	0.500
Years since IPO	25,599	19.09	13.69
Staggered Board	25,563	0.530	0.499
Tobin's Q	25,599	2.157	1.501
Book Value of Assets ($M)	25,599	5,409	24,260
Return on Assets	24,884	0.159	0.133
R&D	25,599	0.0409	0.0714
Sales	24,933	1.285	0.830

2.2 The rise and fall of clear-day poison pills

Figure 1 describes the fraction of firms in the sample that had a clear-day poison pill in place for each year between 1996 and 2014. Two sub-periods can be clearly distinguished: between 1996 and 2002, the incidence of pills increased monotonically. The incidence of pills peaked at approximately 58% in 2002, and dropped monotonically starting in 2003. At the end of 2014, less than 10% of firms continued having a poison pill in place.

These patterns in the incidence of pills arise through two cross-sectional channels and two firm-level dynamics. On the one hand, firms entered and left the sample over time. The incidence of pills in the year when firms entered the sample is typically rather low (on average, throughout the 1997-2014 period, only 19% of firms had a pill in place on the firm's first year in the sample). The incidence of pills

[15] Throughout my analysis, I focus on clear-day pills not approved by the shareholders. This definition excludes (a) so-called NOL plans adopted to preserve net operating losses carryforwards; (b) "in play" pills adopted either in response to an unsolicited bid or the filing of a 13D; (c) pills adopted at the behest of an acquiror in the context of a negotiated transaction; (e) pills that are adopted conditional on receiving shareholder approval by the following annual meeting of the shareholders.

in the year when firms left the sample varies quite a bit from year to year,[16] though overall firms with pills in place are not systematically more (or less) likely to leave the sample.

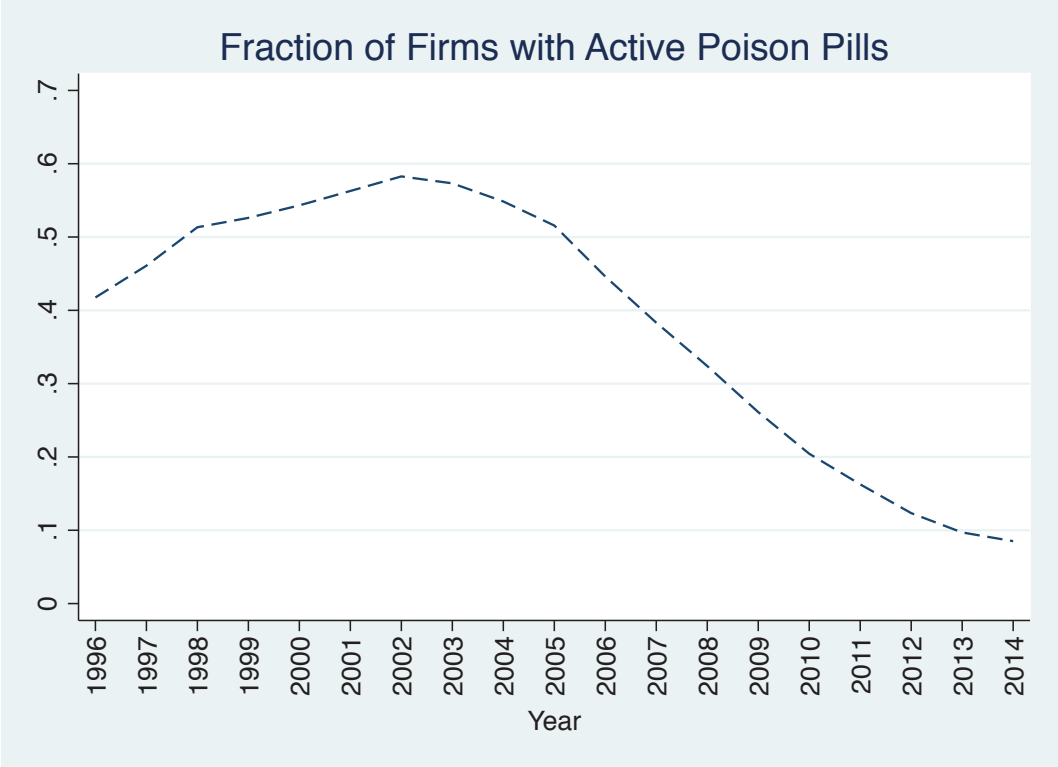

Figure 1

The remaining two channels driving the time series involve firms that initially did not have a pill in place and adopted one (and remained in the sample thereafter), and firms that initially had a pill in place that dropped their pill (and remained in the sample thereafter). The number of firms in either of these two situations is described in Figure 2. The 1996-2014 period can be clearly split into two sub-periods. During 1996-2002, the number of firms adopting pills greatly exceeded the number of firms that dropped their pills. Starting in 2004, the number of firms adopting pills became very small, and was greatly exceeded by the number of firms that dropped their pills.

In turn, these firm-level dynamics over the post-2003 period can arguably be explained by two institutional channels. As illustrated by Figure B-1 in Appendix B, between 2002 and 2004 there was a significant spike in the number of 14a-8 shareholder precatory resolutions targeting poison pills. Most of those resolutions were filed against firms that had a poison pill in place, and requested the board to redeem the pill and to adopt some kind of commitment not to adopt another one

[16] For example, while 44% of the firms that left the sample during 1999 had a pill in place, 70% of the firms that left the sample during 2000 had a pill in place.

without seeking shareholder approval. Forty percent (respectively, 52%) of the firms that dropped their pills in 2003 (respectively, 2004) did so after having been targeted by a shareholder proposal that asked the firm to redeem the pill (by comparison, only 17% of the firms that dropped their pills during 2001 or 2002 did so after having received a shareholder proposal).

Although the number of pill-related shareholder proposals dropped steeply starting in 2005, the number of firms dropping their pill continued to increase. This continued increase can be explained through a second institutional channel: the influence of the proxy advisor Institutional Shareholder Services (ISS) and institutional investors.

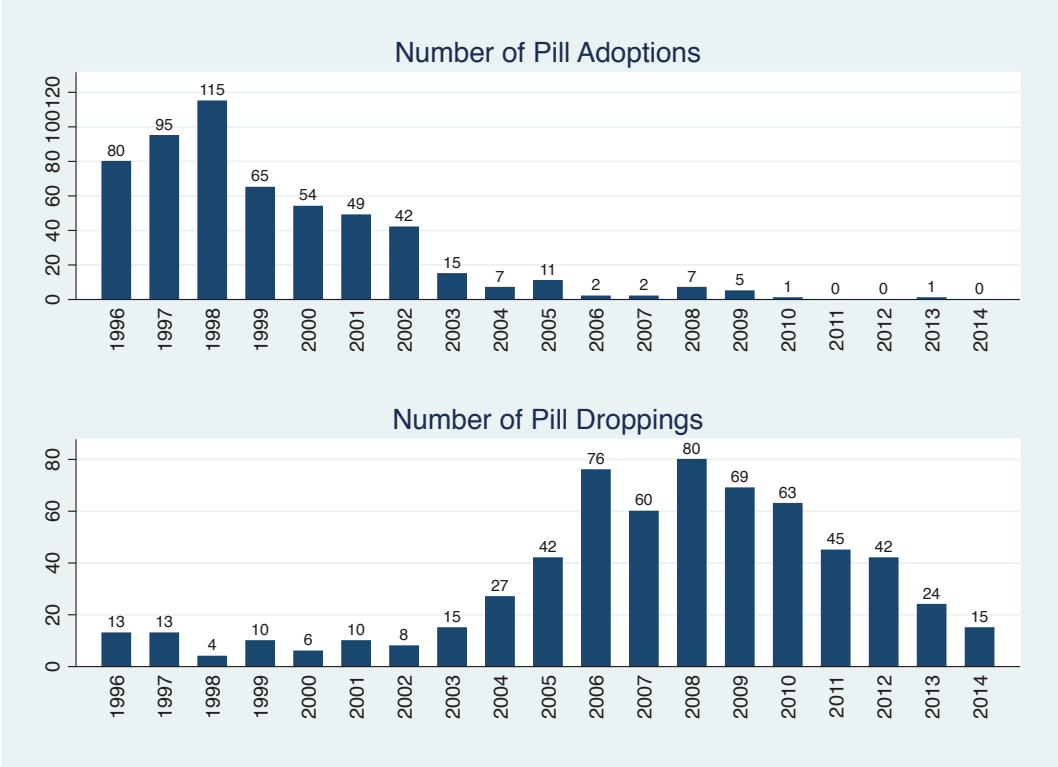

Figure 2

Proxy advisors are companies that advise shareholders (typically, institutional investors) how to vote their shares in corporate elections. ISS provides proxy advisory services to hundreds of institutional investors, and it is widely regarded as the most influential proxy advisor (Choi et al. 2010, p. 871). According to the popular press, ISS's recommendations can sway a significant fraction (under some accounts, up to 40 percent) of the votes in corporate elections.[17] On December 8th, 2004, ISS announced that, starting with the proxy season that began on February 15th, 2005, it would recommend its clients to withhold their votes from the

[17] http://dealbook.nytimes.com/2010/09/29/a-new-kind-of-defense-against-hostile-bids/

directors of firms that adopted a poison pill or renewed an expiring one, unless the new pill had been approved by the shareholders or the firm committed to submitting the pill to shareholder approval within twelve months. Interestingly, ISS's voting guidelines grandfathered the pills that were already in place: merely keeping in place a pill that was already present would not trigger ISS's "withhold vote" recommendation. Pills are implemented by distributing stock purchase rights that (typically) are exercisable for a 10-year period; thus, the approximately 750 pills in my sample that were in place when ISS announced the change in its guidelines had different shelf lives. Figure B-2 in Appendix B contains a histogram of the scheduled year of expiration for the pills that were active in December 2004.

In unreported results, I analyzed director election data to determine to what extent ISS followed its own guidelines. Although ISS did not always act according to the guidelines, the probability that a director in a firm that renewed a poison pill without seeking shareholder approval would receive a "withhold vote" recommendation from ISS in the following shareholders' meeting was approximately 50% (as compared to a baseline probability of about 10%). In addition, a sizable fraction of institutional investors seems to have actually withheld their vote for these directors.[18] On average, in the annual meeting following the renewal of a pill, approximately 20 percent of the outstanding shares were cast as "withheld votes" against the directors of firms that renewed a poison pill. That represents approximately four times the average fraction of votes withheld from a typical director.

ISS's guidelines (together with the decision by institutional investors to act according to ISS's recommendations) appear to have been extremely influential over the incidence of clear-day poison pills. Out of all the firms that had a pill in place when the new voting guidelines were announced, only 10% dropped their pill before the pill's scheduled expiration date. However, only 28% of the firms that held on to their pill until its scheduled expiration date renewed the pill thereafter.[19] This

[18] Admittedly, I have not corroborated this statement by looking at the actual voting records of institutional investors. However, retail shareholders typically do not get to see ISS's reports (see Choi et al. 2010, p. 901), and it would be implausible to expect them to do research about whether individual firms renewed a pill.

[19] These results are validated by (unreported) regression analysis. Using a sample that contains only all the firms in my main sample that had a pill in place as of December 2004, and follows all those firms from 2004 until 2014 (or until they are no longer part of CRSP-Compustat Fundamentals Annual) I estimate the following linear specification: $Poison\ Pill_{it} = \alpha_i + \delta Reached\ Scheduled\ Expiration_{it} + \gamma_t + \varepsilon_{it}$, where $Poison\ Pill_{it}$ is a dummy equal to 1 if firm i had a pill in place at the end of year t (and zero otherwise), α_i denotes a vector of firm fixed effects, γ_t is a vector of year fixed effects, and $Reached\ Scheduled\ Expiration_{it}$ is a dummy that equals 1 for firm i at the end of fiscal year t if the scheduled expiration date of the pill that firm i had in place as of December 2004 has been reached by time t (and zero otherwise). The point estimate for the coefficient of $Reached\ Scheduled\ Expiration$ is -.69 (with a t-statistic of -33). This indicates that, as

is illustrated by Figure 3, which looks at the presence of clear-day poison pills across all firms that had a pill in place in December 2004 in a window that starts two years before the pills' scheduled date of expiration, and ends two years after the pills' scheduled date of expiration. This stark stylized fact suggests that, in the absence of ISS's guidelines (and the ensuing withholding of votes by institutional investors), the vast majority of firms that dropped their pill upon the pill's expiration would instead have continued having a pill in place.

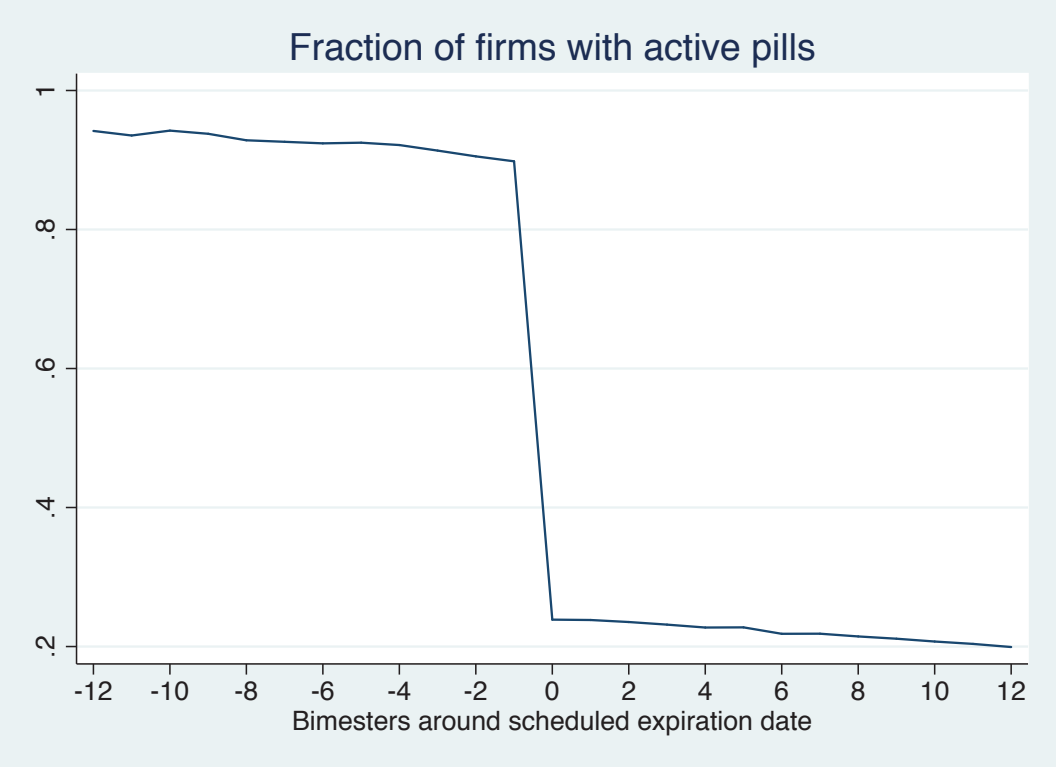

Figure 3

2.2. Poison Pills and Firm Value

2.2.1. Cross-Sectional and Within-Firm Analysis

As a first step in my empirical analysis of the association between clear-day pills and firm value, I estimate a series of regressions that replicate the analyses in the previous literature. The first specification focuses on whether the presence of a

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compared to another firm in the same year whose pill has not yet reached its scheduled expiration, the probability that a firm whose pill has already reached its scheduled expiration date continues having a pill in place is 69 percentage points lower. This statistical evidence is consistent with opinions expressed by practitioners in client memos and publications. See, for example, Glover et al. (2008) and Lewkow and ten Siethoff (2005).

clear-day poison pill is correlated with firm value in the cross-section. In order to answer that question, I estimate the following linear specification:

$$Tobin'sQ_{ijt} = \alpha + \theta PoisonPill_{it} + \gamma_{jt} + \eta_{it} + \varepsilon_{ijt}, \qquad (1)$$

where *Tobin's* Q_{ijt} is the outcome variable of interest for firm *i* operating in industry *j* at time *t*; *Poison* $Pill_{it}$ is an indicator that describes whether firm *i* had a poison pill in place as of time *t*; γ_{jt} is a vector of 3-digit SIC industry-by-year fixed effects; and η_{it} is a vector of "years since the firm became public" fixed effects.[20]

Column 1 of Table 2 reports the results of these regressions.[21] The results reflect a negative association between firm value and the presence of poison pills that is both statistically and economically significant. As compared to another firm without a poison pill in place of the same age, in the same industry and year, the value of a firm with a poison pill in place is approximately 9.5% lower.[22]

The next step in my empirical analysis is to study how the presence of poison pills correlates with firm value in a "within-firm" design. I do this adding a vector of firm fixed effects to the specification estimated in Equation 1. The results of this regression, reported in column 2 of Table 2, are surprisingly similar to the ones recovered in column 1, suggesting that most of the cross-sectional association between poison pills and value is actually driven by the within-firm association.[23]

The point estimate in column 2 can be interpreted as follows: on average across firms, for each firm, the firm's value while the firm has a pill in place tends to be more than 9.5% lower than that same firm's value when the firm did not have a pill in place. Since the specification estimated in column 2 also includes the sets of fixed effects listed in Equation 1, the estimate for the Poison Pill dummy is, in fact, a

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[20] Prior studies have attempted to control for the cross sectional differences in value due to the fact that different firms may be in different points in their life cycle by including "firm age" –or some functional transformation of it– as a linear control. I adopt a more robust approach by simply including fixed effects for the number of years elapsed since the firm became public. Prior studies have also systematically included as controls measures of book value of assets, return on assets, capital expenditures, investments in research and development, fraction of shares owned by directors and officers, etc. Those variables are more properly regarded as outcome variables. Thus, it is not appropriate to include them as controls in panel regressions, even if one were to use one-year lags of the variables of interest (see, e.g., Angrist & Pischke 2015, pp. 214-217). Hence, I refrain from doing so.

[21] These and all other regressions in this paper are estimated using the *REGHDFE* Stata command (Correia (2015)).

[22] Throughout the paper, whenever I quantify the economic significance of a point estimate I do so by comparing the point estimate with the average value of the outcome variable in the relevant sample. Thus, the 9.5% drop follows from dividing the -0.205 point estimate by 2.157.

[23] This conjecture is bolstered by additional evidence offered below (See Figure 4 and corresponding text).

(generalized) difference-in-differences estimate. Consequently, the within-firm association between pills and value cannot simply be explained by stories whereby firms tend to adopt (drop) pills when the firms' industries tend to experience busts (booms), or stories whereby firms tend to adopt (or drop) pills at particular points in the firms' life cycles were firm value tends to be lower (or higher).

Table 2

The effect of poison pills: baseline cross-sectional and within-firm results + disentangling effects of adoptions and droppings

The dependent variable is fiscal year-end Tobin's Q using data from 1996 to 2014. All specifications include (3-digit SIC) industry-by-year fixed effects, and a vector of fixed effects for the number of years elapsed since the firm became publicly traded. Specifications 2, 3, and 4 include firm fixed effects. Standard errors adjusted for clustering at the firm level are reported in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
Poison Pill	-0.205***	-0.209***		
	(0.0432)	(0.0463)		
Adopted Pill			-0.461***	
			(0.0824)	
Dropped Pill				0.0337
				(0.0555)
Observations	24,848	24,757	20,779	24,757
R-squared	0.326	0.634	0.657	0.633
SIC3 x Year FE	Yes	Yes	Yes	Yes
Years since IPO FE	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes

Having said that, it is also important to notice the limitations of the estimation techniques I (and the prior literature) have been focusing on so far. Although the within-firm design rules out some omitted variables and reverse causality stories that may underlie the negative point estimate, all one can learn from the within-firm regressions is that, *on average*, a given firm's value tends to be lower *across all the years* when the firm has a pill than across all the years when the firm does not have a pill. It follows that there still remain multiple scenarios in which poison pills *do not* have any causal effect on firm value under which one would recover point estimates like the ones of columns 1 and 2 in Table 2. For example, one would recover a negative point estimate (both in the cross-sectional and in the within-firm designs) if boards tend to adopt pills in advance of the disclosure of news that would cause stock prices to drop in a relatively persistent way. In fact, the firm's adoption of the pill does not even need to precede the drop in firm value in order for one to recover estimates like the ones I have recovered: as long as the drop in firm value that

preceded the adoption of the pill is sufficiently persistent, a difference-in-differences approach like the one in column 2 of Table 2 may still yield negative point estimates for the Pill coefficient. By the same token, if boards drop their pills only once they feel that their firms' market valuations are sufficiently lofty, and market valuations are sufficiently persistent over time, one may recover a negative point estimate for the Pill dummy even if clear-day poison pills have no causal effect whatsoever. In all of these hypothesized scenarios, the estimated effect of the pill would be purely driven by reverse causality.

The best the literature has done so far to mitigate these concerns is to show that, in the cross section, if one looks at firms that adopted a pill, and compares the value of those firms one year before the firms adopted the pill with the value of other firms that did not go on to adopt a pill one year later, it does not seem to be the case that the firms that adopted the pill were systematically less valuable than those that did not adopt one (see Cremers & Ferrell 2009, Table VIII). Although that robustness check helps to reduce the set of factors that may confound the within-firm estimates, the evidence is in no way conclusive. In what remains of this article, I will try to exploit several novel empirical strategies to shed additional light on the interpretation of the results I have reported so far.[24]

2.2.2. The Adoption and the Dropping of Pills

The within-firm estimates reported in column 2 of Table 2 are driven by two separate groups of firms: firms that did not have a pill and went on to adopt one, and firms that had a pill in place and dropped it. Boards obviously decide when and whether to adopt a pill. In principle, boards also decide when and whether to drop a pill. However because of the peculiar institutional features (discussed in Part 1 above) that led to the demise of pills, the concerns about confounding factors are somewhat lesser for the dropping of pills than they are for pill adoptions (especially so for the pills dropped starting in 2005). Given that every pill has a pre-determined expiration date from the date when the pill is adopted, the concerns about confounding factors are mitigated for the pills that were dropped simply because their expiration date has been reached.[25]

As a first step of this analysis, one can revisit the within-firm specification of the second column of Table 2 and try to see to what extent the estimates for the

[24] Firms with a poison pill in place are systematically more likely to have a staggered board of directors (the correlation between the two variables in my main sample is 0.18). In unreported analyses, I verify that the negative association between firm value and poison pills reported in columns 1 and 2 of Table 2 is not driven by that positive correlation.

[25] To be sure, although the concerns about confounding factors are mitigated, they are by no means eliminated. Even though a board that simply decides to let its pill run its course is not actively deciding *when* to let the pill expire, the board could still decide to let the pill expire as scheduled (as opposed to renewing it) in light of the situation in which the firm finds itself at the scheduled expiration date.

coefficient of the *Poison Pill* dummy are driven by the adoption or the dropping of pills. I do that by estimating the following specifications:

$$Tobin'sQ_{ijt} = \alpha_i + \lambda AdoptedPill_{it} + \gamma_{jt} + \eta_{it} + \varepsilon_{ijt} \quad (2.a)$$
$$Tobin'sQ_{ijt} = \alpha_i + \mu DroppedPill_{it} + \gamma_{jt} + \eta_{it} + \nu_{ijt}, \quad (2.b)$$

where α_i denotes firm fixed effects, *Adopted Pill*$_{it}$ is a dummy equal to one if Firm *i* has adopted a pill during the sample period by time *t* (and zero otherwise), and *Dropped Pill*$_{it}$ is a dummy equal to one if firm *i* has dropped a pill during the sample period by time *t* (and zero otherwise).[26]

The results of these estimations are reported in columns 3 and 4 of Table 2. Those columns strongly suggests that all the within-firm effect of the Poison Pill dummy reported in column 2 of Table 2 is driven by pill adoptions: the adoption of a pill seems to be associated with a drop in firm value of 21%. Conversely, the firms that dropped a pill do not seem to have experienced a statistically significant change in value.[27] To the extent that the concerns about potential confounding factors are

[26] γ_{jt} and η_{it} are defined as in Equation 1.

[27] Although Figure 2 documents that the vast majority of the pills that were dropped were dropped after 2005 (when most of the pills were arguably dropped in order to avoid the negative consequence at the ballot box), one may still be concerned that some of the pre-2005 drops may have been adopted in reaction to a firm-specific shock that also affected the outcome variable. In Table B-2 of Appendix B I report the results of two robustness tests on this result.

In the first robustness test, I re-estimate Equation 2.b using a subset of the observations used in to run the estimation of column 4 of Table 2. The subset is constructed as follows: I start by dropping from the original sample the firms that did not have a pill in place as of December 2004 (this implies that the point estimates will be driven by the comparison of firms that had pills as of that date with other firms that *also* had pills as of that date, which is arguably cleaner than the approach followed in column 4 of Table 2). I then exclude the subset of those firms that had either adopted or renewed a pill between 2002 and 2004 (presumably, for these firms, the adoption or renewal of the pill was prompted by a firm-specific shock, and thus they provide a poor counterfactual). I then follow the remaining firms over the 2002-2014 period (including observations from before 2005 ensures that we have baseline observations for all firms in the estimation sample).

In the second robustness test, I use the sample of the first robustness test to estimate an alternative specification in which the regressor of interest is not $DroppedPill_{it}$, but instead the dummy $ReachedExpirationDate_{it}$, which equals 1 if the pill that firm *i* had in place as of December 2004 had reached its expiration date by time *t* (regardless of what firm *i* actually did with its pill after December 2004), and zero otherwise. In this specification, the estimate of interest is only identified off the staggered, pre-determined expiration dates. This further mitigates concerns that the firms that dropped the pills at dates other than the scheduled expiration dates may have done so in response to firm-specific shocks. As one would expect (given that most of the droppings of pills that drive the estimate of column 4 in Table 2 actually took place in connection with the scheduled expiration of a pill that was in place in December 2004), the point estimates for the coefficient of interest in both

stronger for pill adoptions than they are for the dropping of pills, the results of columns 3 and 4 of Table 2 do not bode well for anyone attempting to interpret the results of columns 1 and 2 of that table as evidence of a causal impact of pills on firm value. This, of course, prompts the question: what exactly drives the large point estimates associated with the adoption of poison pills? In order to answer these questions, I now focus on the dynamic evolution of firm value around the pill-adoption events.

2.2.3. The Evolution of Value over Time around Pill Adoptions

As an initial step of my dynamic analysis, I adopt a more granular version of Equation 2. Instead of focusing simply on $Adopted\ Pill_{it}$ as the regressor of interest, I replace that regressor by a vector of lags and leads. That is to say, I estimate the following specification,

$$Tobin'sQ_{ijt} = \alpha + \sum_{\tau=-5}^{\tau=+5} \lambda_\tau AdoptedPill_{\tau it} + \gamma_{jt} + \eta_{it} + \varepsilon_{ijt}, \qquad (3)$$

where for $\tau < 0$ $AdoptedPill_{\tau it}$ equals 1 for a firm that will adopt a pill τ years in the future, and zero otherwise; for $\tau = 0$ $AdoptedPill_{\tau it}$ equals 1 in the fiscal year during which the pill was adopted, and zero otherwise; and for $\tau > 0$ $AdoptedPill_{\tau it}$ equals 1 for a firm that has adopted a pill τ years in the past, and zero otherwise (γ_{jt} and η_{it} are defined as in Equation 1). The estimation sample consists of the following observations: (1) for all firms that adopted a poison pill during the sample period, all firm-year observations in the 5 years leading to the adoption of the pill, the year during which the pill was adopted, and the 5 years following the adoption of the pill; (2) for all firms that never had a pill in place, all firm-year observations (the latter set of observations make up the control group; for them, by construction, the value of $AdoptedPill_{\tau it}$ is equal to zero for all τ and t). The results of this estimation are summarized in the top panel of Figure 4 (the detailed estimates are available in column 1 of Table B-1 of Appendix B), which also contain 95% confidence bands around the point estimate.[28]

columns of Table B-2 are similar in magnitude and (lack of) statistical significance to the point estimate recovered for the coefficient of $DroppedPill_{it}$ in column 4 of Table 2.

[28] The dashed vertical line indicates that the pill was adopted at some point between years "minus 1" and "zero".

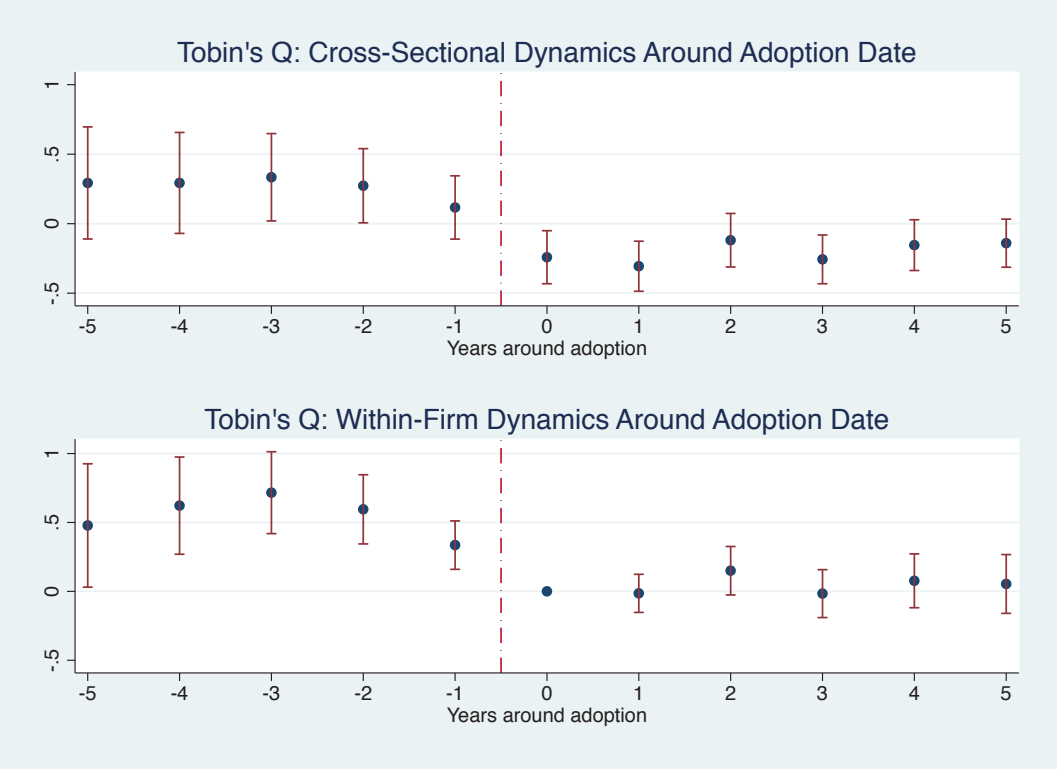

Figure 4

Since Equation 3 does not control for firm fixed effects, the estimates of the coefficients for each of the $AdoptedPill_{\tau it}$ can be interpreted as the cross-sectional differences in average value between eventual pill adopters and the control group at each point in the time window around the date of adoption. Thus, the point estimate of 0.293 for the coefficient of Adopted Pill$_{-5it}$ indicates that, if one compared the set of firms that would adopt a pill 5 years in the future with other firms of the same age, in the same industry and year, that never adopted a pill, the former set of firms had an average Tobin's Q that was 0.293 units *higher* than that of the latter (a difference that is noisily estimated, with a p-value of 0.16). The point estimates remain fairly stable, but become increasingly precise, over the fourth, third, and second years leading to the adoption of the pill. As a result, the point estimates for the coefficients of $AdoptedPill_{-3it}$ and $AdoptedPill_{-2it}$ are significantly different from zero at the 95% level. This indicates that, in the third and second years prior to the adoption of the pill, eventual pill adopters were statistically significantly *more* valuable than their peers, (a difference that is highly economically significant – corresponding to approximately 14% of firm value–).

Starting on the first year before the adoption of the pill, however, the difference in value between the future pill adopters and their peers begins to drop: the point

estimate for the coefficient of $AdoptedPill_{-1it}$ is 0.12, and its p-value is 0.32.[29] The point estimates for the coefficients of $AdoptedPill_{0it}$ and $AdoptedPill_{+1it}$ are both highly statistically significant, and suggest that at the end of the fiscal year during which the firms adopted a pill (and the year thereafter) the value of the firms that adopted a pill was approximately 11% to 14% lower than that of their peers. The magnitude of the point estimates corresponding the coefficients of $AdoptedPill_{\tau it}$ for $\tau \geq 2$ suggests that the cross-sectional difference in value between pill adopters and their peers shrank (non-monotonically) as time continued to elapse. However, the magnitude of the differences remains economically large, and often statistically significant at conventional levels.

The bottom panel of Figure 4 summarizes the results of the estimation of the following specification

$$Tobin'sQ_{ijt} = \alpha_i + \sum_{\substack{\tau=-5 \\ \tau\neq 0}}^{\tau=+5} \lambda_\tau AdoptedPill_{\tau it} + \gamma_{jt} + \eta_{it} + \varepsilon_{ijt}, \qquad (4)$$

the within-firm counterpart of Equation 3.[30] Each of the point estimates can now be interpreted as the differential evolution in firm value experienced by the (eventual) pill adopters between year τ around the year of pill adoption and end of the fiscal year during which the firm adopted a pill (relative to the change experienced in the same period by equally-aged firms of the same industry that never adopted a pill). Thus, the point estimate of 0.336 for $AdoptedPill_{-1it}$ indicates that, relative to their peers, eventual pill adopters experienced a drop in firm value of over 15% between the year immediately preceding the adoption of the pill and the end of the fiscal year during which the pill was adopted (a drop that is highly statistically significant).

However, that is far from the end of the story: one can in fact meaningfully compare the point estimates of the coefficients for $Adopted\ Pill_{-1it}$ and $AdoptedPill_{\tau it}$ for each $\tau \leq -2$: Future pill adopters saw their value drop by 15% in the year leading to the adoption of the pill, but they also saw their value drop by over 27% between the second year before the pill was adopted and the end of the fiscal year during which they adopted their pill (as indicated by the .595 point estimate for the coefficient of $Adopted\ Pill_{-2it}$). Thus, it follows that eventual pill adopters had already seen their value drop by about 12% (relative to their peers) between the second and the first year preceding the year when the firms adopted the pill (a difference which is highly statistically significant, with a p-value of 0.018). And there is more: eventual pill

[29] This is consistent with the results in earlier studies, which indicated that if one focuses on firms that will adopt a pill one year in the future, those firms do not seem to have levels of Tobin's Q that are meaningfully different from those of the firms that do not go on to adopt a poison pill. See Cremers & Ferrell (2014, pp. 1192-93).

[30] In this specification, the excluded category for eventual pill adopters is $AdoptedPill_{0it}$. The specification is estimated using the same sample used to estimate Equation 4. The detailed regression results are available column 2 of Table B-1 of Appendix B.

adopters had seen their value drop by 18 percent between the third year and the first year before pill adoption.[31]

These results have important implications: To be sure, the difference between the point estimates for the coefficients of *Adopted Pill*$_{-1it}$ and *Adopted Pill*$_{+0it}$ is highly statistically significant (and economically very large). However, given the evidence about the differential evolution of firm value the eventual pill adopters had experienced leading to the adoption of the pill, one cannot really ascribe the differential evolution in value that pill adopters experienced during the year when they adopted the pill to the fact that some firms adopted the pill while others did not. To put this in terms of jargon: This difference-in-differences design has failed the "parallel trends" test.[32]

Admittedly, the fact that the results so far suggest that there is no unconfounded evidence that the adoption of a pill leads to a drop in firm value does not mean that those results offer conclusive evidence that the adoption of a pill *does not* lead to a drop in firm value. To rephrase this in terms of a cliché: absence of evidence is not evidence of absence. To shed further light on this issue, I resort to higher frequency data. The analysis so far has followed the literature in focusing on annual data. However, one can perform a similar analysis using quarterly data to construct measures of Tobin's Q. In order to do that, I obtain data from Compustat Fundamentals Quarterly, and use that data to estimate the following specification:

$$Tobin'sQ_{ijt} = \alpha_i + \sum_{\substack{\tau=-20 \\ \tau\neq 0}}^{\tau=+20} \lambda_\tau AdoptedPillQ_{\tau it} + \gamma_{jt} + \eta_{it} + \varepsilon_{ijt}, \qquad (5)$$

where α_i denotes year fixed effects, γ_{jt} is a vector of (3-digit SIC) industry-by-year-by-quarter fixed effects, and η_{it} is a vector of quarters since IPO fixed effects. $AdoptedPillQ_{\tau it}$ is the an extension of $AdoptedPill_{\tau it}$ to the quarterly setting. Thus, $AdoptedPillQ_{+0it}$ –the excluded category– is now a dummy equal to 1 at the end of the quarter during which firm i adopted the pill (and zero otherwise); $AdoptedPillQ_{-1it}$ is a dummy equal to 1 on the last quarter before the one during which the firm adopted a pill (and zero otherwise), etc. Since the summation spans the {-20; …;-1; 1; +20} window, the dynamics –as in the case of Equation 5– span 5 years leading to the adoption of the pill and 5 years thereafter. Reporting 40 point estimates would be unmanageable (even for the Appendix), so I instead summarize the results of the estimation in Figure 5, which includes the point estimate for the

[31] The p-value for the F-test of the null hypothesis that $\lambda_{-1it} = \lambda_{-3it}$ is 0.012.

[32] In Figure B-4 of Appendix B I take a closer look at the bottom panel of Figure 4, and corroborate that the dynamic evolution of firm value documented in that panel is not just driven by firms with a particular (i.e., annual or staggered) board structure.

coefficients of each of the $AdoptedPillQ_{\tau it}$ regressors (the dots) together with the respective 95% confidence band (in the corresponding vertical lines line).[33]

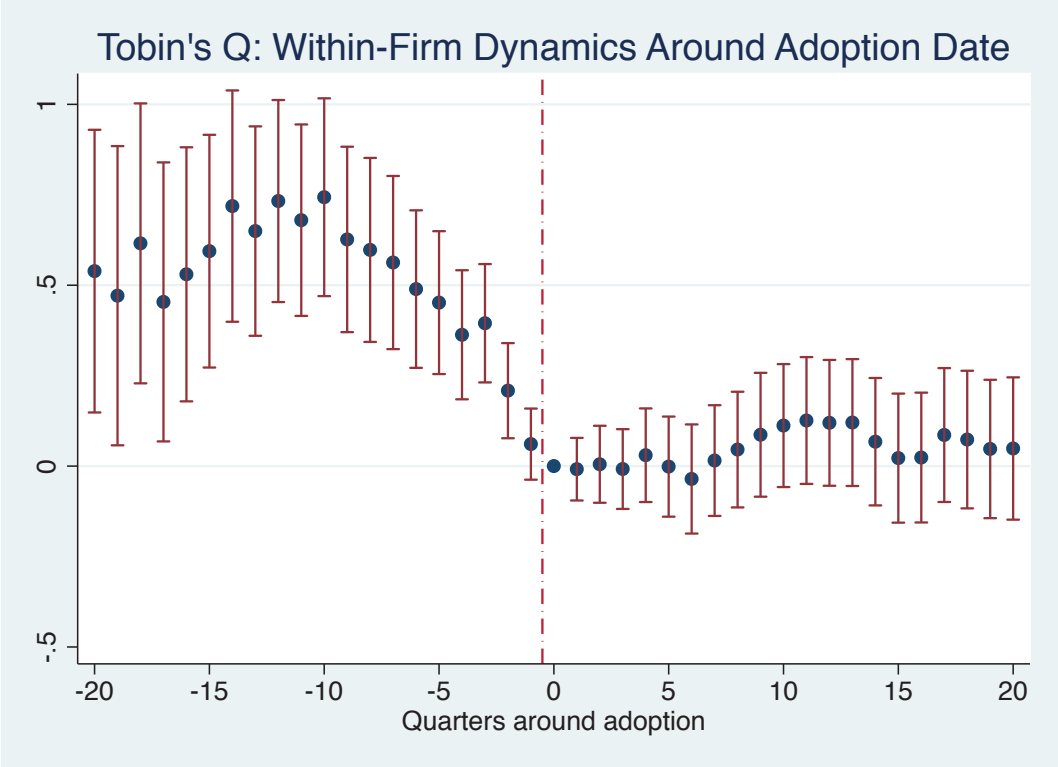

Figure 5

A broad brush look at Figure 5 leads (as one would expect) to the same conclusions we recovered in the bottom panel of Figure 4: Firms that adopt a pill do so after having experienced a dramatic drop in value over a multi-year period. However, the more fine-grained data allows us to focus more closely on the evolution of Tobin's Q in year leading to the adoption of the pill. The conclusions are stark: Beginning on the third quarter before the adoption of the pill, firm value for the future pill adopters starts to go into a tailspin. The tailspin only begins to subside during the quarter in which the pill is adopted, and it stops during the first quarter after the adoption of the pill. The vast majority of the drop in value experienced by firms between the end of the fiscal year immediately prior to the one when the firm adopts a pill and the end of the fiscal year during which the firm adopts the pill takes place *before* the firms adopt the pill. In fact, as shown by the corresponding confidence band, the difference between the point estimates of the coefficients for *Adopted* $PillQ_{-1it}$ and *Adopted* $PillQ_{+0it}$ is statistically insignificant (and economically

[33] The sample employed to estimate Equation 5 is the quarterly analogue of the sample used to generate Figure 4. The dashed line indicates that the pill was adopted at some point between quarter "minus 1" and quarter "zero".

small). Consistent with the results from Figure 4, firm value remains stable in the 5 years following the adoption of the pill.

The analysis of quarterly data thus bolsters the cross-sectional and within-firm conclusions recovered using annual data in Figure 4. To the extent that –as columns 3 and 4 of Table 2 suggest– the point estimates recovered in the basic difference-in-differences analysis of column 2 of the same Table are driven by pill adoptions, the negative cross-sectional and within-firm correlation between the presence of a pill and firm value seems to be a textbook example of reverse causality: Firms adopted pills *after* they had experienced a massive drop in their value.

This conclusion can be further strengthened by analyzing the operating performance of the firms that adopted pills around the date when the pill was adopted. In order to do that, I use quarterly data to estimate the analogue of Equation 5, but using, respectively, Return on Assets and Sales as the outcome variables of interest. The results are summarized in the two panels of Figure 6. Both measures of operating performance seem to have experienced significant negative shocks leading to the adoption of the pill (and both seem to recover after the pill's adoption –although the point estimates are somewhat noisy–).

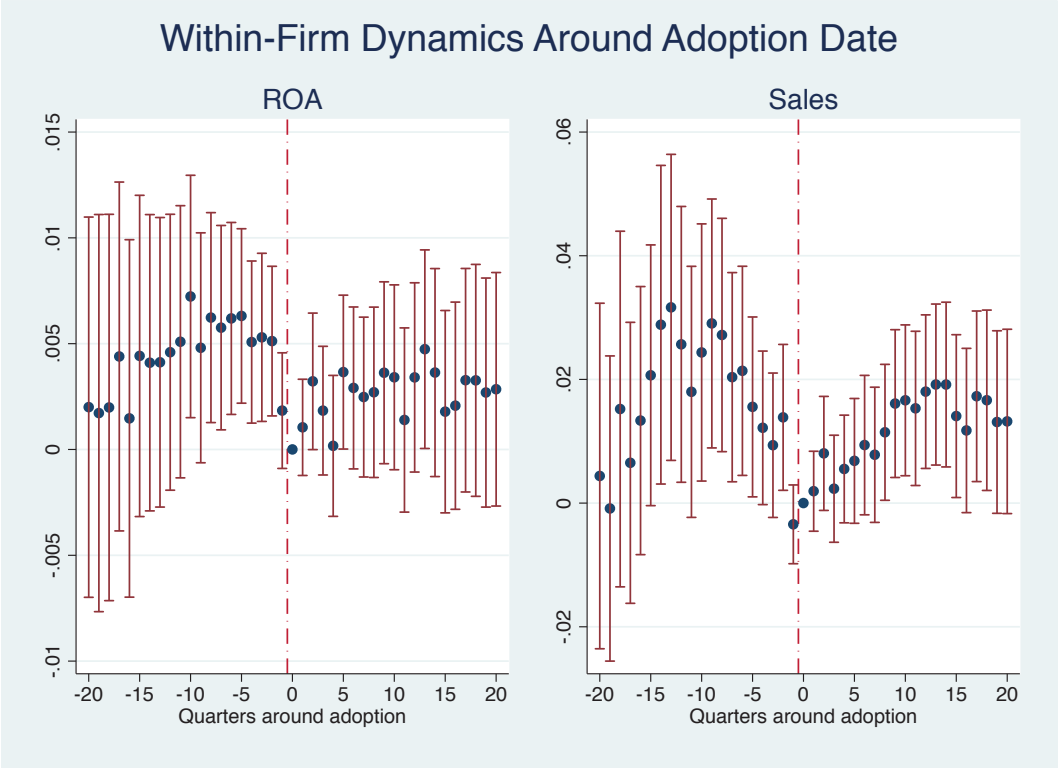

Figure 6

3. Discussion

In this part, I discuss how the results from Part 2 can help us (a) understand directors' decisions to adopt clear-day pills; (b) evaluate directors' decisions to renew an expiring pill in the face of the potential threat of a significant number of withheld votes in the following director election; and (c) interpret the empirical results in the earlier literature, and assess the anti-pill campaign led by ISS and institutional investors.

3.1. Why did directors adopt clear-day pills?

As summarized in Figure 1, at the heyday of clear-day pills, the directors of more than half of publicly traded firms had gone out of their way to adopt a pill. Can the prior analysis help to shed light on the question "why did boards adopt a pill before any unsolicited offer was on the table"?

The first thing to keep in mind is that one should probably not overthink the level of strategizing involved in a board's decision to adopt a clear-day pill, particularly so for the case of pills adopted between 1996 and 2004 (when adopting a pill did not involve significant personal costs for the directors). If one focuses on pills adopted by firms in my sample during that period, as of the time when the firms adopted the pill, almost 37% of the adopting firms were not even part of the S&P 1500 index; 36% of the adopters were part the of the S&P SmallCap index; 16% were part of the S&P MidCap index, and only 12% were part of the S&P 500. This suggests that a majority of the pills probably were not adopted pursuant to the advice of high-stakes M&A lawyers.

Be that as it may, any answer to the question "why were clear-day pills adopted" must involve some speculation. However, I would argue that that best way to interpret clear-day pills is to think of them as a kind of "keep out" or "no trespassing – private property" sign. Owners of property often spend small sums to post those signs in order to prevent inattentive pedestrians from entering the property. In the same way, managers and directors of a firm whose stock price has dropped dramatically may adopt a rights plan (at a nominal cost to be borne by the shareholders) simply to let potential suitors know that, from the incumbents' perspective, the current stock price is unwarrantedly low, and should not be considered as a plausible starting point for any acquisition offer. The flip-side of this analogy is that, just like a "keep out" sign is unlikely to deter anyone who is bent on trespassing, the fact that a firm has adopted a pill is unlikely to do much to deter any potential suitor who is determined to go hostile if any initial approach is rejected by the incumbent management (particularly so when any sensible would-be hostile bidder should expect that its offer will trigger the adoption of a pill if the target happens not to have a clear-day pill in place). (Coates 2000, pp. 295-296)

Although this hypothesis is obviously speculative, it has the virtue of being consistent with another oft-cited stylized fact: Conditional on being acquired, firms that have a clear-day pill in place tend to be acquired at higher premia than firms

that did not have a pill in place at the moment they were approached by a suitor (See Heron & Lie 2006, Table 6; and the studies cited in Coates 2000, pp. 311-314). Casual empiricism suggests that, if a firm's market valuation has been systematically dropping over a multi-year period, the firm's management is likely to think (correctly or incorrectly) that the firm's stock prices are unwarrantedly low. Such a manager would thus only be willing to entertain acquisition offers at a premium significantly larger than the one that would be required by the manager of a firm who has not seen its market valuation plummet.[34] Admittedly, there are alternative channels through which some of the stylized facts leading to the adoption of the pill could also bring about the result that firms with clear-day pills obtain higher premia (conditional on being acquired). If the CEO of a firm has continued at the helm over a multi-year period during which her firm's stock price plummeted, a sizable fraction of that CEO's option holdings are likely to be out of the money. If someone then approached the CEO with an offer to acquire the firm that does not involve a sizable premium, that CEO would be more reluctant to accept the offer than she would be if her options were in the money.

Another virtue of the hypothesis is that it seems consistent with the stylized fact that, once adopting or renewing a pill became meaningfully costly for directors (due to the consequences for director elections), the vast majority of the directors (even those that had adopted a pill) decided that the extra costs were not worth incurring.

The fact that under this hypothesis the adoption of a clear-day pill (when the cost for directors of doing so was small) was unlikely to have a strong effect is not inconsistent with the fact that the drop in firm value that firms experienced leading to the adoption of a pill subsided in connection with the pill's adoption. One could try to argue that, by adopting a pill even though pills were frowned upon by the governance officers of institutional investors (see Fleischer & Sussman 1997, §5.11; and Coates 2000, n. 107),[35] boards issued some kind of costly signal that generated a separating equilibrium through which the pill adopters could credibly convey that they thought that any further drop in stock price was not justified.[36]

However, there are arguably more plausible explanations. First of all, the downward trend may have subsided simply because the firms' business improved following the

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[34] For more systematic evidence consistent with the hypothesis that past stock prices play an "anchoring" role in negotiated acquisitions, see Baker, Pan & Wurgler (2012).

[35] The dislike of clear-day pills among institutional investors does not seem to have translated into a sizable fraction of withheld votes for directors of firms adopting pills until ISS provided a coordination mechanism –and presumably also made it easier for its clients to identify which firms had renewed an expiring pill or adopted a clear-day pill from scratch– starting in 2005.

[36] The fact that other scholars have used a similar argument to justify why the adoption of a pill could lead to an ostensible *drop* in firm value (see *supra* Part 1) simply highlights how little discipline this bare-bones signaling theory imposes on researchers interpreting the data.

adoption of the pill (in fact, since management would have access to non-public forecasts suggesting that that improvement was in the horizon, that would be a natural point to adopt a pill whose objective is to convey that further drops in stock price are unwarranted). This can be clearly grasped from both panels of Figure 6: firms adopted their pill at the nadir of their performance –both in terms of sales and return on assets– in a 10-year window. Although one could conceive stories whereby the adoption of a pill conveys private information to the firm's stockholders –and thus has an effect over the firm's market value–, it would be harder to come up with arguments for why the adoption of a pill should cause the dynamic evolution in sales and return on assets documented in Figure 6.

Moreover, changes in firm strategy adopted by the board in connection with the adoption of the pill may also have caused the downward trend in firm value to ameliorate. This can be grasped, for example, by looking at how the firms' investment in research and development (R&D) changed around the date when the pill was adopted. To do that, I use quarterly data to estimate a specification similar to Equation 5 in which the outcome variable is a measure of the quarterly investment in R&D. The results (reported in Figure B 3 of Appendix B) suggest that the quarter when the pill was adopted marks a turning of the tide for those investments: While R&D investments had followed a (weakly) increasing trend leading to the adoption of the pill, the trend became unequivocally decreasing following the adoption of the pill.[37] As a result of the downward-sloping path followed by R&D after the adoption of the pill, by the end of the tenth quarter after the pill's adoption, the average within-firm drop experienced in quarterly R&D investment represents almost 20 percent of the average quarterly investment in R&D across all firms in the sample.

3.2. Why did *any* firm renew its pill upon expiration, given the threat of withheld votes?

Firms that decided to go against ISS and institutional investors probably had particular reasons to do so. Several potential reasons come to mind: Perhaps their

[37] A creative pro-pill partisan may come up with arguments for why the potential explanations for the change in the downward-sloping trend in firm value I put forward in this and the previous paragraph were *themselves* caused (or at least facilitated) by the adoption of the clear-day pill. Although I cannot offer conclusive empirical evidence against that hypothesis, I do not see any of the stylized facts reported in this paper as convincing evidence for the hypothesis, either. In addition, insofar as one can see investments in R&D as a proxy for the extent to which managers are focusing on the long run, the stylized fact documented in Figure B 3 would put the hypothesized pro-pill partisan in an awkward position: She would have to argue that the adoption of the pill gave managers elbow room to improve firm value by focusing *less* on the long run –an argument that would seem to run against the standard approaches used to justify anti-takeover defenses–. Regardless of that, I note that if the hypothesis of the pro-pill partisan were true, and adopting pills had indeed helped managers to weather the storm, that would run strongly against the earlier results in the empirical literature about the effect of poison pills.

directors really did not care much about the potential withheld votes (after all, as far as I can tell, no director failed to be reelected simply because their firm renewed a poison pill). Perhaps directors doubted that ISS would really issue a withhold vote recommendation, or that shareholders would withhold a significant fraction of votes.[38] Perhaps the board had already decided to act in a way that would probably trigger a "withhold vote" recommendation from ISS (e.g., by failing to adopt a precatory resolution that had received the support of the majority of the outstanding shares in the previous year), so that the expected marginal cost of renewing the pill was low. Perhaps the situation of their firm as of the scheduled date of expiration was peculiar (and, potentially, more similar to the situation that had prompted the board to adopt a pill in the first place, as compared to those firms that decided not to renew their pill as of the expiration date).

3.3 What do these results imply for earlier studies and the policy debate?

The results of Subsection 2.2.3 offer strong evidence that the negative association between the presence of pills and firm value identified by the relatively less sophisticated statistical analyses of Subsection 2.2.2 is driven by reverse causality. Those results are relevant for (a) interpreting the findings of earlier analyses that suggested that clear-day pills were harmful; (b) raising further doubts about widely used governance indexes; (c) assessing the battle against clear-day poison pills led by ISS and institutional investors over the past decade.

Do those results mean that the estimates recovered in the studies about the impact of clear-day pills discussed in the introduction are also confounded by selection bias? That question cannot be answered conclusively. On one hand, the periods covered in earlier studies do not always perfectly overlap with the sample period analyzed in mine. For example, the vast majority of the variation in the incidence of pills in the sample employed by Cremers and Ferrell seems to be driven by the adoption of pills between 1984 and 1990 (See Cremers and Ferrell 2014, Figure 2). Consequently, most of the negative association between pills and firm value detected by their study may be driven by pills that were adopted during the mid-1980s (and the adoption of pills may have been perceived differently in that period than in the mid-1990s and early 2000s)[39]. On the other hand, the results in the

[38] As noted above (see *supra*, Section 2.2), ISS only seems to have issued a "withhold vote" recommendation against approximately half of the directors at risk of being punished for renewing a pill. Perhaps some directors actually knew that they could renew their pill without suffering any punishment.

[39] In fact, in defending the institutional plausibility of the way in which they interpret their findings, Cremers and Ferrell (2014, n.19) cite to *Moran* to argue that "it was not at all clear at that time that all firms had in effect a 'shadow pill'" (Id. at n. 19). Although I do not see this as an accurate inference from *Moran*, any potential lingering doubt about the availability of the "shadow pill" dissipated long before the beginning of my sample period. For example, Gordon (1997, n. 154) stated that "The board can put in a pill at any time; shareholders will have anticipated this possibility and so the board's actual decision is . . .

previous studies are based on statistical analyses of the same level of sophistication of the ones I used in Subsection 2.2.1. In addition, if one used my sample to estimate the kind of robustness tests employed by earlier analyses to rule out the possibility of reverse causality, one would not find any evidence against the claim that the baseline results of that Subsection actually reflect a direct causal chain.

However, regardless of the exact implications of my analysis for the internal validity of earlier studies, it is the implications for their *external* validity that are most relevant for the present-day analyses of corporate governance and policy. Corporate governance suffered dramatic changes between the 1980s and the second half of the 1990s (let alone the first half of the 2000s).[40] Hence, even if one stipulated that the estimates of earlier studies were unconfounded (and that clear-day pills *were* harmful at some point in time), one would not be able to extrapolate those results to assess more recent corporate governance practices.

Thus, for example, to the extent that other scholars have used the negative statistical association between the presence of poison pills and firm value to back up the hypothesis that governance mechanisms that enable management to act unilaterally tend to be used to pursue objectives other than creating shareholder value (see Cremers et al. 2016), the results of this paper suggest that those conclusions may need to be revised.

By the same token, the evidence in this paper calls into question the interpretation of some of the widely used academic governance indexes (like the E-index) as proxies for the quality of corporate governance, and hence raises further doubts about whether the statistical association between these indexes and firm value reported by Bebchuk et al. (2009) actually reflect the causal effect of governance on value (for other recent studies criticizing the use of that index on other grounds, see Klausner 2014 and Larcker et al. 2016). More generally, if the association between the presence of a pill –on one hand– and firm value and operating performance –on the other– flows from the latter to the former, including the E-index as a control variable in a regression would amount to having an outcome variable on the right hand side (i.e., a case of "bad control"). That would not only raise questions about whether the estimate of the coefficient associated with the index in a linear regression actually reflects the effect of governance on the dependent variable. It could also bias the estimates of the coefficients for other regressors (even if those

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not an event that affects the shareholder's evaluation of the firm's susceptibility to takeover."

[40] Just to name a few: (i) the judicial decisions issued during the second half of the 1980s and the first half of the 1990s that clarified how fiduciary duties constrain the use of poison pills (see Catan & Kahan (2016)); (ii) the continued increase in the incidence of independent directors (see Gordon (2007)); (iii) the rise of equity based compensation (see Kahan & Rock (2002)); (iv) the accounting scandals of the early 2000s, and the regulatory backlash they triggered (see Romano (2005)); (v) the increasing concentration of shares in the hands of institutional investors (see Gilson & Gordon (2013)).

regressors were exogenous to begin with).[41] (Angrist and Pischke 2015, pp. 214-217)

In the same vein, the results raise concerns about commercial governance indexes. (for a more thorough analysis of those indexes, see Daines et al., 2010) The most popular among those indexes was the so-called "GRId" (or Governance Risk Indicator) index, also developed by ISS.[42] ISS describes its index as a tool "to help institutions and other financial market participants measure and flag investment risk"[43], and to "[p]rovide companies with a basis for aligning their corporate governance structure and practices with shareholder interests".[44] The index maps certain dimensions of a firm's governance structure into a qualitative assessment of the "concern level" (low, medium, or high) raised by such a governance structure. The presence of a clear-day pill not approved by the shareholders receives a substantial (negative) weight in the mapping.[45] To the extent that the presence of a pill is a consequence (and not a cause) of the decline in firm value, the conclusion that clear-day pills raise "governance risk" must rest only on ideological underpinnings.[46]

Finally, the results provide a new vantage point from where to assess the role that ISS and institutional investors played in driving clear-day poison pills into extinction. A campaign against clear-day poison pills would be praiseworthy (at least on average) in a world in which having pills caused a negative impact on firm

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[41] Admittedly, the presence of a poison pill is only one out of six components in the E-index. However, Larcker et al. (2016) suggests that four other components of the E-index- seem to be miscoded for a substantial number of observations in the dataset used by Bebchuk et al. (2009) –and all studies that employ the E-index–. As a result of those miscodings, a disproportionate fraction of the association of the true underlying E-index with the outcome variables of the studies is likely to be driven by whether the firms in the database had a poison pill in place.

[42] At the beginning of 2013, ISS replaced its GRId index by another rating called "Quickscore".

[43] https://www.issgovernance.com/file/files/FAQ-GRId-corporate.pdf

[44] https://www.issgovernance.com/file/files/GRId2.0_TechnicalDocument20120306.pdf

[45] For the sake of illustration, assume a firm that has a single class of common stock issued and outstanding, a staggered board of directors that is authorized to issue blank-check preferred stock, and a charter that (i) requires supermajority shareholder approval to be amended; (ii) rules out shareholder action by written consent and (iii) does not allow shareholders to call special meetings. If that firm does not have a poison pill in place, the GRId index will assign to that firm's governance structure a "medium" concern level. If the same firm were to adopt a standard clear-day pill, that firm's governance structure would raise a "high" concern level. (The calculations in this footnote were performed using a spreadsheet made available by Wachtell, Lipton, Rosen & Katz).

[46] Firms that do not have a clear-day pill occasionally emphasize that feature of their governance structure as evidence for the conclusion that they are "well governed". To the extent that this diverts shareholders' attention from other, potentially relevant, features of the firms' governance structures, this can probably be seen as a negative side effect of the weight that clear-day pills receive in commercial governance ratings.

value.[47] By contrast, in a world in which there is no evidence that having a pill in place is harmful for shareholder value, such a campaign amounts to at least a waste of time –and arguably an unnecessary distraction for time-pressed managers and directors–. The evidence in this paper indicates that –regardless of what the causal effect of pills may have been in other periods– the battle against pills was not fought in the former world, but rather on the latter. To be sure, the results of this paper do not suggest that the dropping of pills spurred by ISS and institutional investors had any systematic negative effect on firm value. However, I would submit that "not having a systematic negative effect" is a rather undemanding standard whereby to judge such large-scale governance intervention.

4. Conclusion

The use of clear-day poison pills was a fixture of the corporate governance landscape between the second half of the 1980s and the mid-2000s. Over the last decade, however, clear-day pills have almost disappeared under the pressure of ISS and institutional investors. Recent studies in the law and finance literature have found that, even in specifications that might at first sight appear to do a good job at mitigating estimation biases, clear-day poison pills are negatively correlated with firm value. To the extent that those results reflect a causal effect of clear-day pills on firm value –as the studies suggest– the results paint a very negative picture of the pills and those that adopted them, and suggest that there may be reasons to praise the anti-pill campaign led by ISS (and backed by institutional investors). At the same time, though, the identification strategies employed by those studies are far from airtight, and institutional analysis suggests that –given the omnipresent "shadow pill"– the causal effect of clear-day pills is unlikely to be large.

Exploiting a hand-collected database, I follow over 2100 publicly traded firms over 1996-2014. After documenting the role that ISS's voting guidelines –together with the vote by institutional investors– played in the near-extinction of clear-day pills, I analyze the relationship between the presence of poison pills and firm value (Tobin's Q). Consistent with earlier results, I document a strong –and economically very large– negative association between the presence of poison pills and firm value both in the cross section and within firm. However, I document that (a) all of the within-firm association between poison pills and firm value is driven by pill adoptions (and none of it is driven by pills being dropped); (b) all of the within-firm effect recovered in the simple difference-in-differences analysis of pill adoptions is

[47] In fact, the 14a-8 shareholder proposals filed against poison pills during the early 2000s frequently highlighted that some academic studies suggested that pills were negatively associated with firm value. Although I have been unable to find information about the discussions between institutional investors and ISS that led ISS to adopt the voting guidelines that punish the adoption/renewal of pills, I would not be surprised if similar (mis)perceptions about the effects of poison pills on firm value had played a role in that decision.

in turn driven by the fact that firm value dropped *prior* to the adoption of the pill (while it remained stable thereafter); and (c) firms appear to have adopted their pill in the wake of sharp -and largely temporary- drops in their operating performance.

These results offer strong evidence that, during the sample period under analysis, the negative statistical association between firm value and the presence of clear-day pills is due to reverse causality, and render the external validity –and probably also the internal validity– of earlier studies questionable. By implication, several of the conclusions drawn by earlier studies will need to be revisited: If the adoption of clear-day pills does not lead to a drop in firm value, then (i) there is no reason to see a firm with a clear-day pill as a "poorly governed" firm (as implicitly done by widely-used academic and commercial governance indexes); (ii) there are no grounds to claim that the adoption of a clear-day pill is a central shareholder rights decision; (iii) and there are fewer grounds to conclude that governance mechanisms that enable management to act unilaterally will be exploited by management to act in ways that are detrimental to shareholder value. Finally, the results do not provide any statistical evidence that the campaign against clear-day pills led by ISS and institutional investors brought about a significant improvement in firm value.

Appendix A: Dataset Description

The central dataset employed in this paper is a hand-collected database of pill-related information about all publicly traded firms that were part of the Standard & Poors (S&P) 1500 Index between 1996 and 2014. I identify the components of the S&P index at each point in time by using the *spmim* variable in the Compustat – Securities Monthly database available through WRDS. I excluded from the sample financials (firms with SIC codes between 6000 and 6999), utilities (firms with SIC codes between 4900 and 4999) (Daines (2001)), firms that had a dual-class share structure (Gompers, Ishii, and Metrick (2010)), and firms for which I could not find a corresponding match in the CRSP-Compustat database. For each of the firms in my sample, and every year between 1996 and 2014,[A1] I searched a variety of sources for any pill-related information.[A2] Relevant information includes whether the firm had an clear-day pill in place at a given point in time -and, in that case, the scheduled expiration date for the pill-, whether (and when) they dropped a pill -and, in that case, whether they dropped it by accelerating their pill's expiration or by allowing the pill to expire without renewal-. I also searched online sources for information related to the structure of the board of directors of each of the firms in the sample at each point in time.

The following table describes the construction and source of each of the variables used in regression analyses.

Variable Name	**Definition®**	**Source**
Poison Pill$_t$	Dummy variable. Equal to 1 if and only if the firm had a clear-day poison pill in place as of the relevant point in time. Excludes NOL pills, pills adopted at the behest of an acquiror in connection with a negotiated transaction, "in play" pills adopted in response to an unsolicited bid or a 13D filing, and pills that were adopted conditional on receiving shareholder approval by the following annual meeting of the shareholders	Shark Repellent, EDGAR, Westlaw
Adopted Pill$_t$	Dummy variable. Equal to 1 as of a given point in time if and only if (1) the firm has adopted a clear-day poison pill during the sample period and (2) the firm has kept on having a pill in place until the relevant point in time.	Shark Repellent, EDGAR, Westlaw
Dropped Pill$_t$	Dummy variable. Equal to 1 as of a given point in time if and only if (1) the firm has dropped a poison pill during the sample period and (2) the firm has not adopted a new poison pill as of the relevant point in time. A pill is deemed to have been "dropped" regardless of the exact way through which the stock purchase rights stopped being available to the shareholders (e.g., expiration as scheduled, redemption,	Shark Repellent, EDGAR, Westlaw

[A1] Once a firm becomes a component of the S&P index at any point during 1996-2014, that firm is part of the sample for every year in 1996-2014 in which the firm was publicly traded (including any years before the firm became part of the S&P index, and any years after the firm stopped being a part of the S&P index).

[A2] Relevant pill information was available from a series of reports kindly shared with me by Shark Repellent, searches in Westlaw and the SEC's EDGAR website, and from a series of annual volumes published by Charles E. Simon & Company titled "Corporate Anti-Takeover defenses: The Poison Pill Device". I limited my searches to 1996 and later years because 1996 is the earliest year as of when EDGAR is reasonably well populated.

	amendment of the terms of the plan to accelerate the expiration)	
Staggered Board$_t$	Indicator variable. Equal to 1 if and only if the firm had a staggered board as of the relevant point in time. (For firms that switched their board structure, my coding reflects the switch as taking place on the moment when the relevant governing documents were amended –e.g. if a firm amended its charter so as to adopt a phased-in board declassification, I code the board as being annually elected from the date when the charter was amended-)	EDGAR, Westlaw
Years since IPO	Years elapsed since the first year in which the firm appeared in with a non-empty price in CRSP-Compustat	CRSP-Compustat
Tobin's Q$_t$	Market Value/Book Value of assets, where Market Value is constructed as $prcc\_f_t * csho_t + at_t - ceq_t$, and Book Value of assets equals at_t	CRSP-Compustat annual/ Compustat quarterly
Lagged Assets$_t$	at_{t-1}	CRSP-Compustat annual/ Compustat quarterly
ROA$_t$	$oibdp_t/at_{t-1}$	CRSP-Compustat annual/ Compustat quarterly
Sales$_t$	$sale_t/ at_{t-1}$	CRSP-Compustat annual/ Compustat quarterly
R&D$_t$	xrd_t/at_{t-1} (xrd_t is assumed to be equal to zero if its value is empty)	CRSP-Compustat annual/ Compustat quarterly

⊗ In the case of regressions estimated using quarterly data, the Compustat variables used to construct the quarterly version of the variable of interest are the quarterly counterparts of the annual variables described in this column (and one-period lags correspond to observations dated as of the previous quarter). All financial ratios are winsorized at the 1st and 99th percentile.

Appendix B – Additional Analyses

Table B-1

The dependent variable is fiscal year-end Tobin's Q using data from 1996 to 2014. The estimation sample consists of (a) for firms that adopted a pill during the sample period, the five years preceding the adoption of the pill, the year when the pill was adopted, and the 5 years following the adoption of the pill and (b) for firms that never had a pill during the sample period, all available firm-year observations. Firms that entered the sample with a clear-day pill in place are excluded from the estimation sample. All specifications include (3-digit SIC) industry-by-year fixed effects, and a vector of fixed effects for the number of years elapsed since the firm became publicly traded. Specification 2 includes firm fixed effects. Standard errors adjusted for clustering at the firm level are reported in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
$Adopted\_Pill_{-5}$	0.293	0.478**
	(0.206)	(0.228)
$Adopted\_Pill_{-4}$	0.293	0.622***
	(0.185)	(0.180)
$Adopted\_Pill_{-3}$	0.334**	0.716***
	(0.160)	(0.152)
$Adopted\_Pill_{-2}$	0.273**	0.595***
	(0.136)	(0.128)
$Adopted\_Pill_{-1}$	0.117	0.336***
	(0.116)	(0.0896)
$Adopted\_Pill_{+0}$	-0.241**	0
	(0.0973)	
$Adopted\_Pill_{+1}$	-0.306***	-0.0144
	(0.0919)	(0.0705)
$Adopted\_Pill_{+2}$	-0.119	0.150*
	(0.0982)	(0.0897)
$Adopted\_Pill_{+3}$	-0.257***	-0.0162
	(0.0895)	(0.0887)
$Adopted\_Pill_{+4}$	-0.154*	0.0768
	(0.0931)	(0.0997)
$Adopted\_Pill_{+5}$	-0.140	0.0538
	(0.0882)	(0.109)
Observations	12,859	12,757
R-squared	0.347	0.676
SIC3 x Year FE	Yes	Yes
Years since IPO FE	Yes	Yes
Firm FE	No	Yes

Table B-2

The dependent variable is fiscal year-end Tobin's Q using data from 2002 to 2014. The estimation sample consists of firms that had a clear-day poison pill in December 2004 that had been adopted or renewed before December 31, 2001. All specifications include (3-digit SIC) industry-by-year fixed effects, a vector of fixed effects for the number of years elapsed since the firm became publicly traded, and firm fixed effects. Standard errors adjusted for clustering at the firm level are reported in parentheses. ***, **, and * refer to statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
Dropped Pill	0.0337	
	(0.0716)	
Passed Scheduled Expiration		0.0374
		(0.0445)
Observations	6,179	6,435
R-squared	0.723	0.722
SIC3 x Year FE	Yes	Yes
Years since IPO FE	Yes	Yes
Firm FE	Yes	Yes

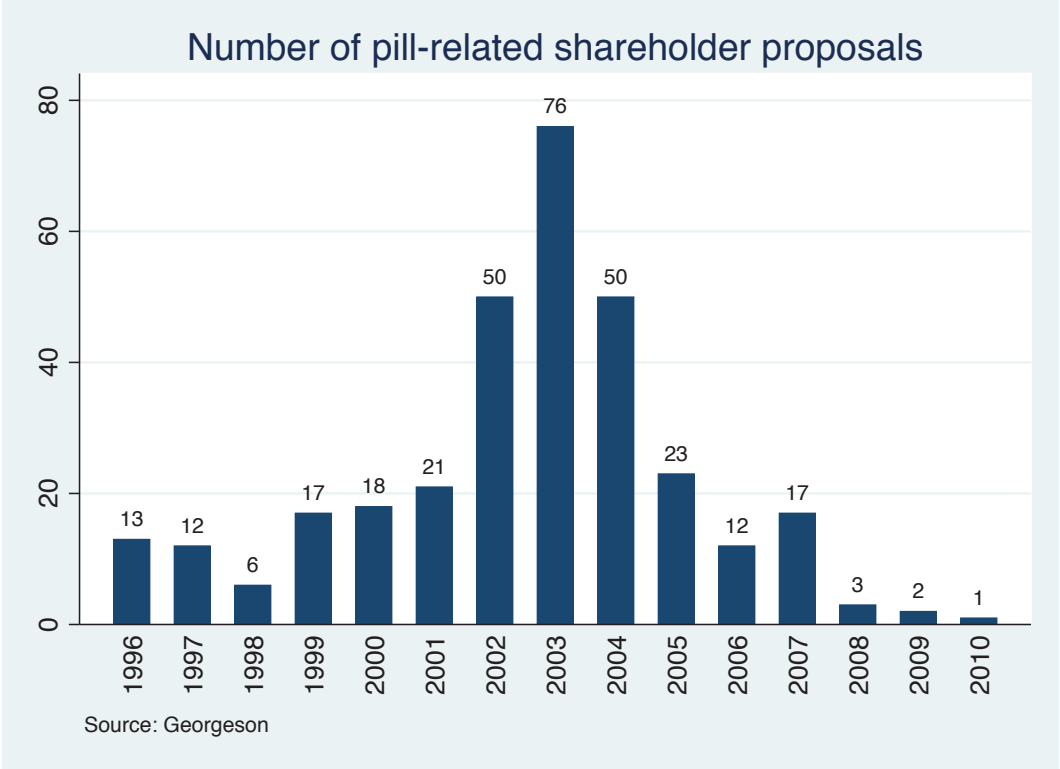

Figure B 1

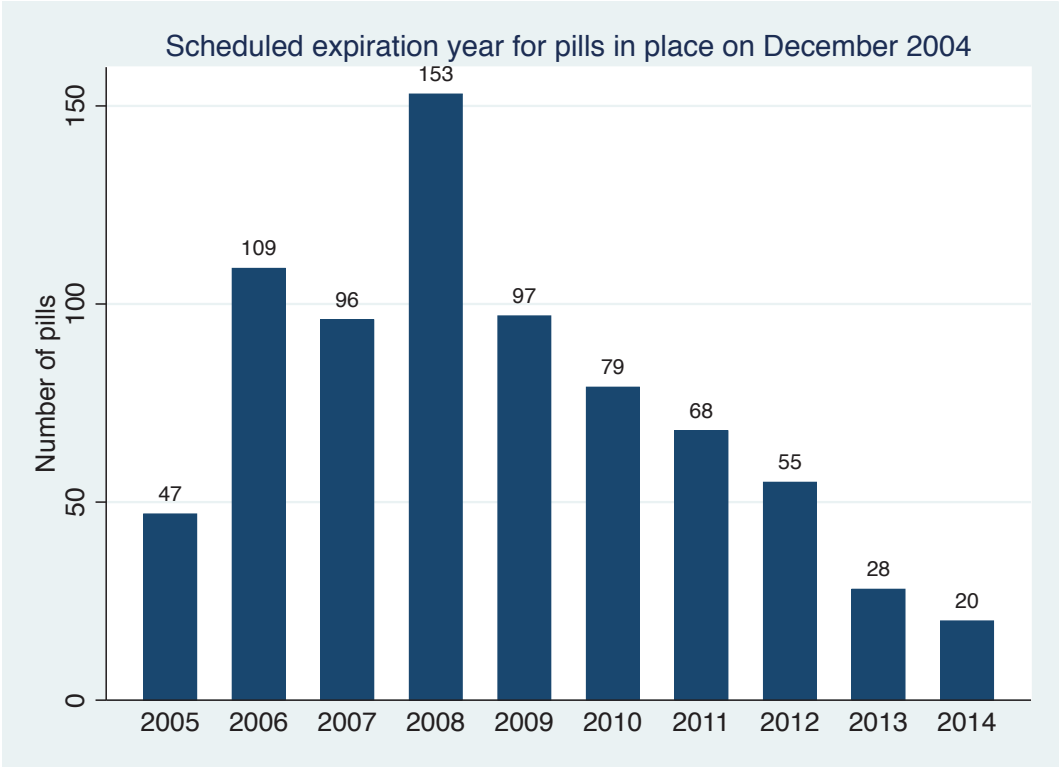

Figure B 2

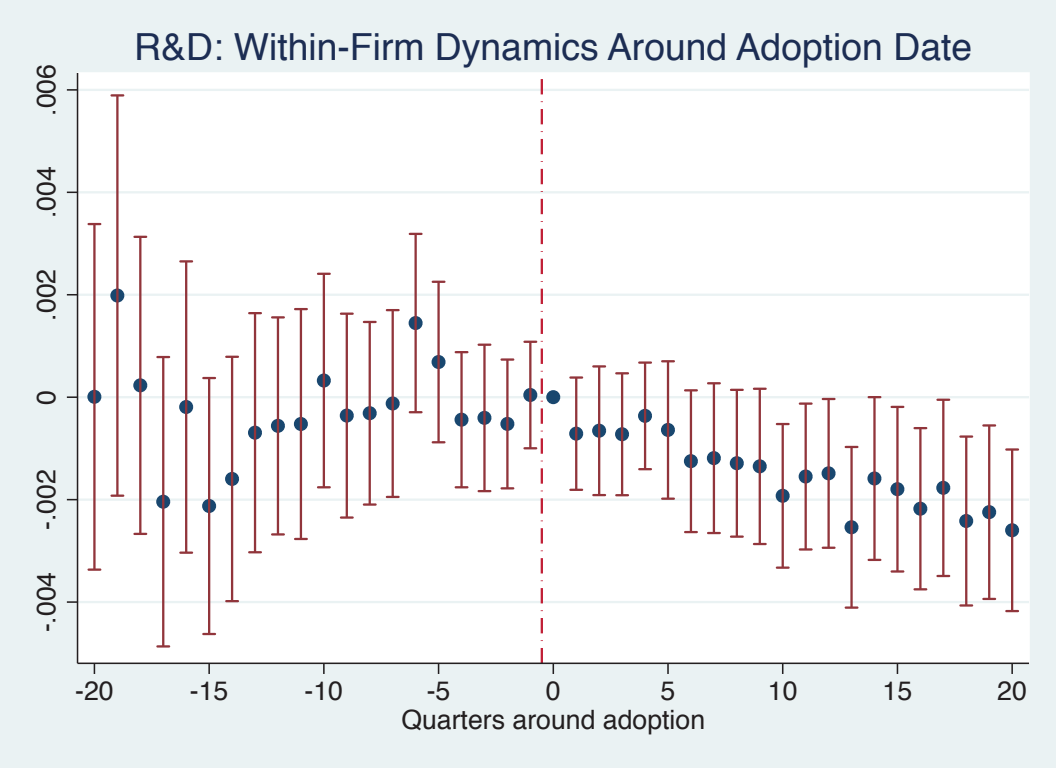
R&D: Within-Firm Dynamics Around Adoption Date
.006
.004
.002
0
-.002
-.004
-20
-15
-10
-5
0
5
10
15
20
Quarters around adoption

Figure B 3

Figure B 4 corroborates that the results reported in the bottom panel of Figure 4 are not driven by firms with a particular board structure. For each firm in my sample, I determine whether the firm's board was staggered as of the earliest year in which the firm appears in my sample (conditioning the break-up on the *current* board structure could raise concerns about conditioning on the outcome). I then partition my entire sample into two subsamples: the set of firm-year observations corresponding to firms whose board was staggered as of the earliest observation (regardless of whether the firms changed their board structure later) and the set of firm-year observations corresponding to firms whose board was annually elected as of the earliest observation (again, regardless of whether the firms changed their board structure later). I then re-estimate Equation 5 using only each of the subsamples. The results (summarized in both panels of Figure B 4) indicate that the results of the bottom panel of Figure 4 do not seem to be driven by firms with a particular board structure: in both subsets, eventual pill adopters have experienced an economically large (and statistically significant) drop in firm value relative to their peers over a multi-year period that precedes the adoption of the pill.

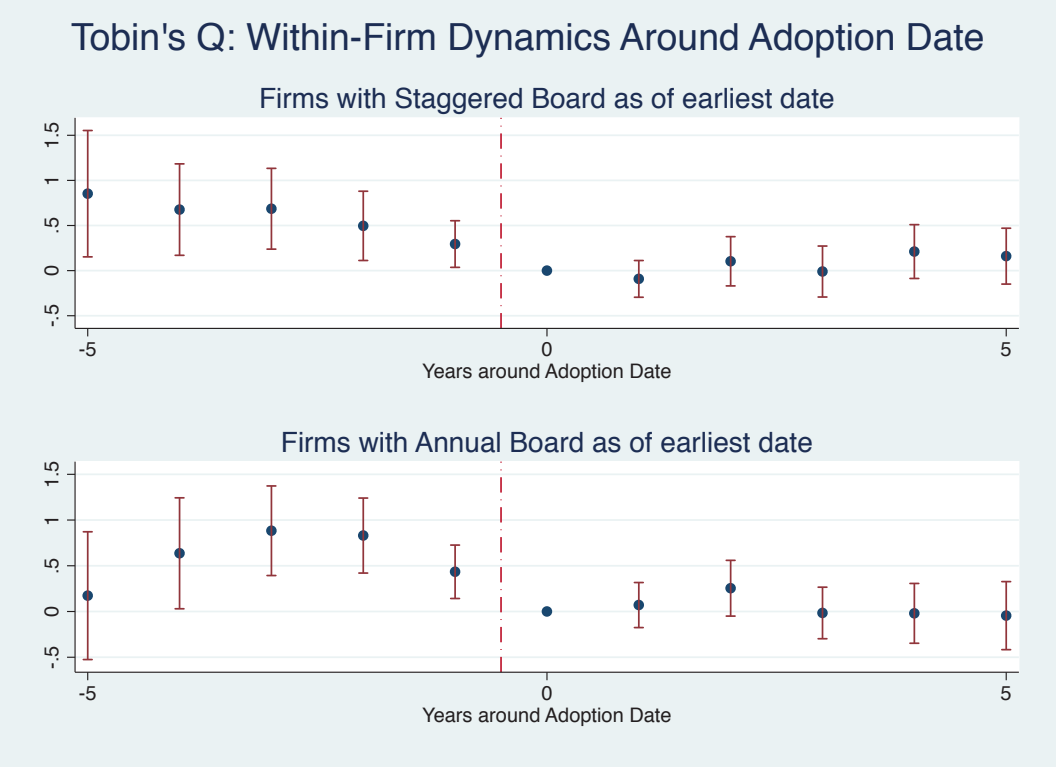

Figure B 4

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