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Corporate Governance and Loan-Syndicate Structure

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Abstract

Firms with greater shareholder rights have a greater risk-shifting incentive, requiring more lender monitoring. Thus, a reduction in shareholder rights implies more diffused (less monitoring-intensive) loan syndicates. Using the passage of U.S. second-generation anti-takeover laws as an exogenous shock that reduces shareholder rights as a natural experiment, we find that loan syndicates become significantly more diffuse after the passage of these laws. These results are confirmed in a large sample of bank loans made during the 1990–2007 period when the loan syndicate market matured. Our results show how corporate governance causally affects financial contracting and creditor control in firms.

I. Introduction

The traditional view of a standard debt contract assumes that creditors swing into controlling the operating decisions of their borrower only if there is a default (e.g., Gale and Hellwig (1985), Hart and Moore (1998)). However, recent research provides convincing empirical evidence that creditors play an active role in the governance of corporations well outside of a debt-default state. Nini, Smith, and Sufi (2012) examine debt-covenant violations, but not in default. They provide extensive evidence that creditors exert substantial control over the governance of covenant-violating firms, such as an increase in chief executive officer (CEO) turnover subsequent to a covenant violation. They also document significant amendments to credit contracts following such violations that are likely drivers of such governance changes. They conclude that "creditors play an active role in the governance of corporations well outside of payment default states."

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Thus, credit-contract provisions can have a meaningful impact on how a firm is governed. However, can the relationship between corporate governance and credit contracts also run in the opposite direction? This motivates the question we seek to address in this article: Do changes in the corporate governance of a borrower affect the incentives and actions of its creditors? Corporate-governance mechanisms' causal effect on creditor financial contracting is not well understood and has received limited attention from researchers. An important exception is Chava, Livdan, and Purnanandam (2009), who use the governance index of Gompers, Ishii, and Metrick (2003) and traditional regressions to show that firms with the most shareholder rights pay a 25% higher spread on their bank loans than firms with the fewest shareholder rights. They argue that "firms with higher takeover vulnerability (equivalently with more shareholder rights) are charged higher loan spreads." Our article extends their finding along three dimensions. First, we focus on loan-syndicate structure, an important nonprice feature of debt contracts. Second, we employ a natural-experiment setting to identify the causal effect of changes in corporate governance on syndicate structure. Third, using the same sample as Chava et al. (2009), we show that shareholder rights also matter for syndicate structure. Lin, Ma, Malatesta, and Xuan (2012) explore the issue of syndicate concentration and the divergence between cash-flow rights and control rights for Western European and East Asian borrowers. They report that an increase in control–ownership divergence is associated with a significantly more concentrated syndicate and attribute their finding to the need for more intensive monitoring. Our article complements their results by focusing on borrowers in the United States. The divergence between ownership and control in U.S. firms is not as common as it is for non-U.S. firms. The results of both the natural experiment and the cross-sectional tests agree: Lower (higher) shareholder rights are associated with significantly more diffuse (concentrated) syndicates.

Syndicated loans are an ideal setting for studying the effect of corporate governance on creditors' financial-contracting practices. Syndicated loans have become a dominant form of bank lending in the United States. Ivashina ((2009), p. 300) observes that "the syndicated loan market has become the largest source of worldwide corporate financing." Syndicated loans are loans made by multiple lenders in which one of the lenders plays the role of arranging, pricing, and monitoring the loan. Although this "lead arranger" plays the traditional role of an informed lender, the loan amount itself is shared with one or more "syndicate participants." These non-lead syndicate participants are concerned about the level of monitoring effort put in by the lead arranger. Concerns about the lead arranger shirking the monitoring effort are especially relevant in situations that *require* more intense monitoring (see Holmström and Tirole (1997)). Sufi (2007) shows that syndicate structure, as proxied by the share of loan retained by the lead, the Herfindahl index of loan shares, and the size of the syndicate, is related to information asymmetry. He reports that informationally opaque borrowers tend to have significantly more concentrated syndicates (e.g., a higher share of the loan is retained by the lead) and argues that this result is driven by the need to monitor such borrowers more closely. Using the same argument, Ivashina (2009) shows that the information asymmetries between the lead and the participants account for almost 4% of the total cost of credit. Thus, syndicate structure is an important

feature in loan-contract design. In this article, we extend these findings by showing that corporate governance also plays a significant role in the composition of lending syndicates.

As shown by Jensen and Meckling (1976), equity holders (or shareholder-aligned managers) have strong incentives to undertake risky investments that shift value from creditors to equity holders. Arguably, stronger shareholder rights create a greater alignment of incentives between shareholders and managers. Thus, managers of such firms will have higher risk-shifting incentives. These managers will in turn require more intensive monitoring by the lenders. We refer to this as the "risk-shifting" channel of shareholder rights. The need for greater monitoring can also arise from an alternative channel described as "recapitalization risk" by Chava et al. (2009). Firms with greater shareholder rights are easier to acquire. Postacquisition, the leverage may increase significantly, which can also lead to wealth transfer from existing creditors to the shareholders. Thus, both effects predict that as shareholder rights are reduced, the need to form more concentrated (monitoring-intensive) syndicates would be reduced as well.

Our first empirical strategy is based on exploiting the variation in shareholder rights to identify the effect of corporate governance on syndicate structure. A number of U.S. states passed antitakeover statutes (ATSs) between 1985 and 1991. These laws made it difficult for corporate raiders to acquire firms based in the states that passed ATSs. The passage of such laws and the resulting loss of discipline from the market for corporate control are widely viewed as reducing shareholder rights and leading to poorer corporate governance. To paraphrase Giroud and Mueller (2010), the passage of antitakeover laws increases managerial slack; in other words, managers are less inclined to undertake risk-shifting investments.[1] The creditors of firms incorporated in states with strong antitakeover laws will thus have less need to watch out for activities that can transfer wealth from debt to equity. An obvious empirical implication is that the debt-contracting environment in a state will change significantly once antitakeover laws are adopted by that state. We focus on syndicate structure, an important element of the debt-contracting environment.

It should be noted that this approach of using the passage of second-generation ATSs to identify causality has come under recent criticism by Catan and Kahan (2016), who argue that state antitakeover laws have little effect on firms' takeover protection. In a similar vein, Karpoff and Wittry (2018) also demonstrate that institutional and political economy considerations have first-order effects in tests that use state antitakeover laws for identification. However, unlike Catan and Kahan (2016), they do not advocate that finance researchers abandon the use of state antitakeover laws to identify tests but, rather, conclude with five suggestions that should increase the power and accuracy of such tests and their interpretations. We implement each of the five suggestions outlined by Karpoff and Wittry and find that our results are robust to these specifications.

We provide causal evidence that a reduction in a firm's shareholder rights leads to a more diffuse loan-syndicate structure for its future loans. The share retained

[1]This argument is consistent with Bertrand and Mullainathan (2003), who argue that a reduction in shareholder rights is associated with managers preferring a "quiet life" in which difficult operational decisions can be avoided.

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by the lead bank is 6.3% smaller in the post-ATS enactment period. This is an economically significant 18% causal effect because the average fraction of a loan retained by the lead bank during this period is approximately 32%. Using the Herfindahl index of loan share by all syndicate members as an alternative measure of syndicate concentration produces a decrease of 6% in the post-ATS adoption period. The number of lenders increases by approximately 6% in the average syndicate after the antitakeover laws are passed. Because both the fraction held by the lead and the Herfindahl index must lie between 0 and 1, we employ alternative estimations using the generalized linear model (GLM) as suggested by Papke and Wooldridge (1996) and confirm that our results are robust to this specification. We reestimate our results taking into account all the suggestions discussed by Karpoff and Wittry (2018). Our results hold in these tests as well. In other tests, we also find that the effect on syndicate structure appears to be driven primarily by "risk shifting" rather than by "recapitalization."

Although the ATSs provide a clean econometric setting in which to obtain causal inferences, the syndicated-loan market for firms underwent substantial expansion in the 1990s after the passage of these laws (Sufi (2007)). Thus, to assess the economic importance of the effects we estimate in our natural-experiment setting, we also conduct a second set of analyses. In these tests, we use the G-Index (of Gompers et al. (2003)) as a measure of corporate governance and examine how syndicate structure responds to changes in this measure. As noted earlier, Chava et al. (2009) employ this same methodology and a similar data sample to assess the relationship between shareholder rights and the cost of bank loans. We follow their approach in our study of syndicate structure. We find that the lending syndicates for borrowers with a high G-Index (i.e., low shareholder rights) are significantly more diffuse. Thus, our syndicate-structure results supplement the loan-pricing results of Chava et al. (2009). This confirms our natural-experiment results using a different methodology. Also, the sample periods used in the two analyses are different: The natural-experiment tests are focused largely on the 1986–1991 period, whereas the G-Index tests are focused on the post-1990–2007 period. Given that we continue to find a significant relationship between corporate governance and syndicate structure using different methodologies and in different time periods, we conclude that this economic effect is robust and pervasive over time.

Our article is also related to work by Lin et al. (2012), who also focus on determinants of syndicate structure. However, they focus on the impact of borrowers' ownership structure on syndicate structure. They exploit the significant cross-country variation in the difference between the cash-flow rights and control rights of dominant shareholders. Their key argument is that significant divergence between the cash-flow rights and control rights of the controlling shareholder poses significant risks for a lender because that shareholder will have a strong incentive to transfer cash out of the company (tunneling) and engage in self-dealing transactions. Such firms would need intense monitoring, and Lin et al. report findings consistent with this argument. However, the issue of extracting private benefits via control affects both *lenders* and *minority shareholders.* Our approach differs from theirs in the sense that we focus on broader shareholder rights, including those that protect minority shareholders. Thus, our study brings into focus the wider conflict

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of interest between lenders and managers who are aligned with all shareholders rather than with a single dominant shareholder whose control rights are disproportionately greater than its cash-flow rights.

By relating financial-debt contracting to shareholder rights, our article primarily contributes to the literature on creditor rights. Previous authors highlighted the role of financial covenants as a contracting device to exert corporate control outside of payment default states, for example, through capital structure (Roberts and Sufi (2009)), investment and financing behavior, and management turnover (Chava and Robert (2008), Nini et al. (2012)). By looking at the impact of exogenous shocks in corporate governance on syndicate structure, we provide new evidence that corporate governance has a causal effect on financial contracts. The mechanism behind this effect is that lower shareholder rights reduce manager–shareholder alignment, thus reducing the need for monitoring by the creditors. Lower monitoring costs are captured by a more diffuse syndicate structure (Sufi, 2007). More broadly, the results in this article can serve as motivation for further theoretical study of the impact of corporate governance on financial-contract design.

The remainder of the article is organized as follows: Section II discusses the motivation for the empirical predictions based on existing theoretical work; Section III describes our data and our sample-selection process; our methodology and major results are presented in Section IV. We conclude in Section V.

II. Development of Empirical Hypotheses

It is well known from the literature (e.g., Holmström and Tirole (1997)) that firms with limited public information require due diligence and monitoring by an "informed" lender before "uninformed" lenders invest in the firm. We add the notion that this due diligence is even more critical for firms that have greater shareholder rights. The reason is that shareholder-friendly firms are more likely than less shareholder-friendly firms to indulge in risk-shifting actions that benefit equity at the expense of debtholders (Jensen and Meckling (1976)). Because an informed lender's monitoring and due diligence efforts are unobservable, such a lender must retain a larger financial stake in the borrowing firm to form a viable lending syndicate. In the Supplementary Material, we use a formal model to derive precise empirical predictions to guide our empirical tests. We describe the key empirical implications as follows:

Empirical Implication 1. An increase in shareholder rights will increase the share retained by the lead bank in the loan syndicate.

Empirical Implication 2. Syndicated lending is feasible only for firms in which shareholder rights are below a critical level. Firms above this level have to resort to sole-lender loans.

Empirical Implication 3. Opaque firms need greater monitoring efforts by the lead lender, and in the presence of syndicate moral hazard, such monitoring can be accomplished by having the lead retain a larger fraction of the loan. This implication is not unique to our model and was first highlighted by Holmström and Tirole (1997).

We test these empirical implications in the data using a combination of natural experiments that exogenously shift shareholder rights, as well as by employing panel regressions that use empirical proxies for shareholder rights.

III. Data and Sample Selection

To conduct our natural experiment, we use the passage of second-generation antitakeover laws as an exogenous shock to shareholder rights. The implicit reduction in shareholder rights caused by the adoption of these laws provides a natural setting in which to study how the debt-contracting environment differs between the preadoption and postadoption periods. First, we provide a brief description of these laws and the context in which they were adopted.

The Williams Act, passed in 1968, is the federal statute that governs mergers and acquisitions activity in the United States. It was aimed at protecting minority shareholders against coercive cash tender offers. In the decade following the adoption of the Williams Act, a number of states passed additional laws that supplemented the hostile-takeover defenses of firms incorporated in those states. These laws are collectively referred to as the "first generation" of state ATSs. However, these laws were challenged in the courts, and in 1982 the Supreme Court ruled these laws to be unconstitutional (*Edgar v. Mite Corp.*). Following this decision, individual states adopted modified versions of ATSs over the next several years. These laws are now broadly referred to as "second-generation" state antitakeover laws. A number of Supreme Court decisions in the late 1980s established the legality of these laws.

The state ATSs take many different forms. A significant body of literature, starting from Bertrand and Mullainathan (2003), has focused on a single class of ATS, namely, business-combination (BC) laws. These laws (sometimes also referred to as *freeze-out laws*) allow the incumbent management to resist a takeover by imposing a moratorium on significant asset sales or mergers between a large shareholder and the target firm for a specified number of years (usually 3–5 years) unless the target board votes otherwise. These laws can help entrenched management retain control even in the face of a hostile bid. Giroud and Mueller (2010) note that the moratorium severely constrains the future financial policies of hostile corporate raiders to extract value for their efforts. By reducing the threat of a hostile takeover, BC laws weaken the corporate governance (and increase the opportunity for managerial slack) of firms based in states that adopt these laws.

Other researchers have used a broader set of ATSs than just BC laws. For example, Cheng, Nagar, and Rajan (2005) focus on three common forms of antitakeover laws: BC, fair price (FP), and control-share (CS) acquisitions. FP laws require that unless approved by a supermajority, a merger/acquisition can only take place if the acquirer offers a "fair price" set by a prestipulated formula that guarantees the "fair price" will be prohibitively high. This provision restricts takeover activity by requiring the acquirer to pay an exorbitant price for shares and by impeding two-tier offers. Gompers et al. (2003) argue that FP laws make acquisitions more expensive by allowing the target's shareholders to avoid tendering their shares immediately in a two-tiered tender offer. CS acquisition laws (sometimes called *supermajority laws*) put severe restrictions on the voting of shares by a

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potential acquirer. Typically, CS provisions stipulate that to obtain the voting rights associated with a controlling share, the potential acquirer must receive majority approval by all *disinterested shares* (i.e., shares not owned by the acquirer). Karpoff and Wittry (2018) supplement these three ATSs by including provisions for poison-pill (PP) and director-duties (DD) laws. *Poison pill* is a common term used to describe the so-called "shareholder-rights plan." A typical PP allows all shareholders *except* the hostile bidder to receive additional shares at a minimal price once a hostile bidder has acquired a certain fraction of the equity (typically 10%). If triggered, the PP dilutes the existing "toehold" of the bidder immediately. The net effect is to raise the cost of acquisition substantially. DD laws are sometimes referred to as *constituency laws.* These laws specifically allow the directors of a company to take into account the interests of constituencies other than just the shareholders (e.g., employees, communities). In effect, they allow directors to "just say no" to a bidder even if its offer is the highest.

Following the approach of Cheng et al. (2005), we focus on BC, FP, and CS acquisition laws. In robustness tests, we expand our set of ATSs to include PP and DD laws.[2] Because syndicate structure is the primary economic variable of interest in this article, we obtain information on loan syndicates from the DealScan database maintained by the Loan Pricing Corporation (LPC). The LPC DealScan database collects the data on loans made to large (mostly publicly traded) U.S. firms. In the past decade, it has become the primary data source for studies of bank financing in the United States.[3] Following previous empirical studies of syndicate structure (Sufi (2007), Lin et al. (2012)), we use the percentage of the total loan held by the lead bank and the concentration of the syndicate based on the Herfindahl index as our two primary measures of syndicate structure. We use the number of members in the loan syndicate as a third measure of syndicate structure. We calculate the Herfindahl index by squaring the share of the loan for each syndicate member and summing the squared shares of all the syndicate lenders. Thus, the Herfindahl index can range from nearly 0 (when a large number of banks hold an equal and small share of the loan) to almost 10,000 (when one syndicate member holds almost all of the loan). Although the LPC database allows us to gather data on loan-syndicate structure, it does not provide details about the borrowers' characteristics. We hand-match the borrowers' names in the LPC database with the Compustat database following the procedure outlined by Bharath, Dahiya, Saunders, and Srinivasan (2007). We then use Compustat to extract data on accounting variables for each borrower. To ensure that we only use accounting information that is publicly available at the time of a loan, we employ the following procedure: For loans made in calendar year t, if the loan activation date is 6 months or more after the fiscal-year-ending month in calendar year t, we use the data for that fiscal year. If the loan activation date is less than 6 months after the fiscal-year-ending month, we use the data from the fiscal year ending in the calendar year $t-1$.

[2]We use the years in which each of these laws was adopted by various U.S. states, which we obtain from Bertrand and Mullainathan (2003) and Cheng et al. (2005).

[3]LPC collects information on bank loans to large U.S. corporations (and more recently on international bank loans as well), primarily through self-reporting by lenders, U.S. Securities and Exchange Commission (SEC) filings, and its staff reporters. Among recent studies based on LPC data are Bharath, Dahiya, Saunders, and Srinivasan (2011) and Ivashina (2009).

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For our natural-experiment tests, we create two samples (Appendix A provides details of how each sample is constructed). We refer to the first sample as the *calendar-time sample.* This sample consists of *all* loan facilities contracted during the 1986–1991 period. Almost all states that eventually adopted antitakeover laws had passed these laws in the mid- to late 1980s (the only exceptions being Texas and Iowa, both of which enacted these laws in 1997). Our focus on this period is similar to the approach taken by Cheng et al. (2005) and reflects the belief that any impact on loan-syndicate structure caused by a shock to shareholder rights is likely to be most concentrated in this period. Panel A of Table 1 provides the sample description. The final sample consists of 1,748 loan facilities, of which 1,709 were obtained by firms incorporated in states that passed antitakeover laws and 39 by firms in states that have never passed such laws. Of the 1,709 facilities borrowed by firms from states that eventually enacted antitakeover laws, 536 were obtained before the laws were passed, and 1,173 were obtained after the passage of the laws. As in the studies by Bertrand and Mullainathan (2003) and Cheng et al. (2005), Delaware-incorporated firms constitute a significant proportion of our sample.

It is worth highlighting that unlike a typical difference-in-differences analysis using Compustat data, our sample is *not* a panel of annual observations. Firms do not randomly decide when to obtain a loan. The fact that the passage of antitakeover laws may have an impact on such a decision is relevant for our analysis because it raises the issue of sample selection. To address this concern, we create a more narrowly defined sample for our tests. We refer to this second sample as the *event-time sample.* The process for creating this sample is as follows: For every state that passed an antitakeover law, we concentrate on the 7-year window surrounding the passage of the law (3 years before and 3 years after the year of the law's enactment). Thus, if the year the antitakeover law was adopted (the event year) is denoted as year 0, 61 the event window for that state is year −3 to year +3. First, we focus exclusively on the states that passed antitakeover laws. Of all firms based in these states, we retain only those that borrow at least once both *before* and *after* the passage of the law. Thus, by construction, this sample is limited to borrowers for which we have at least one loan origination from both the pre- and post-ATS adoption periods. These restrictions augment the firm fixed effects because every borrower from states with ATSs has at least one loan observation from both the pre- and post-adoption periods. The main advantage of this sample is that it compares the syndicate structure of only those firms that issued bank loans in a narrow time window around the passage of the antitakeover laws. This should enhance our confidence in drawing causal inferences. The states that never passed ATSs provide an additional control sample, and we include all the loan facilities contracted by firms incorporated in these states in the event-time sample as well. The details of the event-time sample are presented in Panel B of Table 1. This sample consists of 557 loan facilities, 195 of which were obtained in the period before the law was adopted and 235 from the postadoption period. An additional 127 facilities from firms incorporated in states that never passed antitakeover laws are also included.

Table 2 reports the descriptive statistics for the three dependent variables used to measure loan-syndicate structure and main borrower characteristics.[4] As

TABLE 1

Sample Distribution by State of Incorporation

Table 1 reports the distribution of the loan facilities by the borrowers' state of incorporation. Panel A reports the distribution of the *calendar-time sample*. Panel B reports the distribution of the *event-time sample*. The construction of both of these samples is described in Appendix A. [a] Indicates this state passed its first antitakeover law beyond the sample period.

Panel A. Calendar-Time Sample (1986–1991)

	Before	After	Total	% Sample		Before	After	Total	% Sample
States That Passed Antitakeover Laws									
Arizona	0	3	3	0.17	Nevada	1	22	23	1.32
Connecticut	0	4	4	0.23	New Jersey	0	17	17	0.97
Delaware	406	719	1,125	64.36	New York	0	68	68	3.89
Florida	8	19	27	1.54	North Carolina	0	12	12	0.69
Georgia	0	23	23	1.32	Ohio	38	12	50	2.86
Hawaii	0	1	1	0.06	Oklahoma	0	8	8	0.46
Illinois	0	7	7	0.40	Oregon	1	9	10	0.57
Indiana	0	19	19	1.09	Pennsylvania	17	18	35	2.00
Iowa[a]	7	0	7	0.40	Rhode Island	1	0	1	0.06
Kansas	3	5	8	0.46	South Carolina	0	5	5	0.29
Kentucky	0	1	1	0.06	Tennessee	6	12	18	1.03
Louisiana	0	11	11	0.63	Texas[a]	42	0	42	2.40
Maine	1	1	2	0.11	Utah	0	3	3	0.17
Maryland	0	19	19	1.09	Virginia	0	21	21	1.20
Massachusetts	4	37	41	2.35	Washington	1	18	19	1.09
Michigan	0	25	25	1.43	Wisconsin	0	23	23	1.32
Minnesota	0	21	21	1.20	Wyoming	0	2	2	0.11
Missouri	0	8	8	0.46					
States That Never Passed Any Antitakeover Law									
Alabama, Alaska, California, Colorado, New Mexico, West Virginia								39	2.22
Total						536	1,173	1,748	100

Panel B. Event-Time Sample

	Before	After	Total	%
States That Passed Antitakeover Laws				
Delaware	143	183	326	58.53
Iowa	2	1	3	0.54
Kansas	3	5	8	1.44
Nevada	1	2	3	0.54
Ohio	12	18	30	5.39
Pennsylvania	7	9	16	2.87
Rhode Island	1	1	2	0.36
Tennessee	3	6	9	1.62
Texas	23	10	33	5.92
States That Never Passed Antitakeover Laws				
Alabama, Alaska, Arkansas, California, Colorado, New Hampshire, New Mexico; Vermont; Washington, DC; West Virginia			127	22.81
Total	195	235	557	100.0

mentioned earlier, we measure the syndicate concentration in three ways: the percentage of the loan facility that is retained by the lead bank; the Herfindahl index of loan share across all the syndicate members; and the number of lenders in the syndicate, measured as the natural logarithm of (1 + number of lenders). The choice of these proxies for syndicate structure is motivated by their use by Sufi (2007). In the larger calendar-time sample (Panel A of Table 2), the average (median) fraction of the loan retained by the lead lender is 32.17% (29.76%). The average Herfindahl index for a loan syndicate in the calendar-time sample is 2,747, and the median syndicate consists of 5 lenders. We also report descriptive statistics for key loan and firm characteristics. Almost 83% of the firms in the

[4] Appendix B provides the definition and construction methodology for all the main variables we employ in this article.

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TABLE 2

Description of Key Variables

Table 2 reports the descriptive statistics of the key variables in the *calendar-time* and the *event-time* samples. The construction of these two samples is described in Appendix A. All variables are defined in Appendix B.

Variable	Mean	Std. Dev.	P25	P50	P75	*N*
Panel A. Calendar-Time Sample (1986–1991)						
%_HELD_BY_LEAD	32.17	20.14	15.22	29.76	50.00	1,748
HERFINDAHL	2,747	1,760	1,220	2,247	4,158	1,748
NO_OF_LENDERS	8.17	8.25	3	5	10	1,748
OPAQUE	0.83	0.3772	1	1	1	1,748
ASSETS ($millions)	1,928	4,103	209.9	568.6	1,932	1,748
FACILITY_AMOUNT ($millions)	272.6	460.5	42.5	103.3	274.2	1,748
MATURITY	53.4	31.8	27	53	78	1,748
Panel B. Event-Time Sample						
%_HELD_BY_LEAD	29.09	19.34	13.33	25.00	45.00	557
HERFINDAHL	2,408	1,691	1,048	1,820	3,560	557
NO_OF_LENDERS	9.52	9.14	3	7	12	557
OPAQUE	0.74	0.44	0	1	1	557
ASSETS ($millions)	2,655	5,170	241.9	746.6	2,662	557
FACILITY_AMOUNT ($millions)	304.6	472.0	45.6	118.9	360.0	557
MATURITY	53.4	32.7	25	55	79	557

calendar-time sample do not have a rating from Standard & Poor's (S&P). Following Sufi (2007), we classify these firms as opaque. The median firm has $569 million in book value of assets, and the median loan-facility size is $103 million. Panel B reports the same descriptive statistics for the event-time sample. The sample distribution of the event-time sample suggests that it consists of somewhat larger firms and larger loan facilities. For example, the firms' median reported assets are $747 million, and the median loan facility is $119 million. The syndicates also appear to be less concentrated in the event-time sample than in the calendar-time sample.

IV. Methodology and Results

A. Empirical Evidence Using a Natural Experiment

The key empirical challenge in linking shareholder rights (governance) to syndicate structure is that firms with good governance and those with bad governance probably also differ in other unobservable dimensions. Comparing syndicate-structure outcomes between firms with good and bad governance may capture the effect of these unobservable differences rather than the effect of governance. Similarly, changes in governance within a firm may be accompanied by other unobservable changes. We attempt to deal with this endogeneity problem by using the passage of state ATSs to measure changes in shareholder rights (i.e., corporate governance). The antitakeover laws, passed by many states at different points in time, restrict hostile takeovers of firms incorporated in those states. The adoption of ATSs blunts a key mechanism (the market for corporate control) of managerial discipline by removing the takeover threat. These laws avoid the endogeneity problem to the extent that they are passed by states and are not endogenously driven by firm-specific conditions and are not passed on a firm-by-firm basis.

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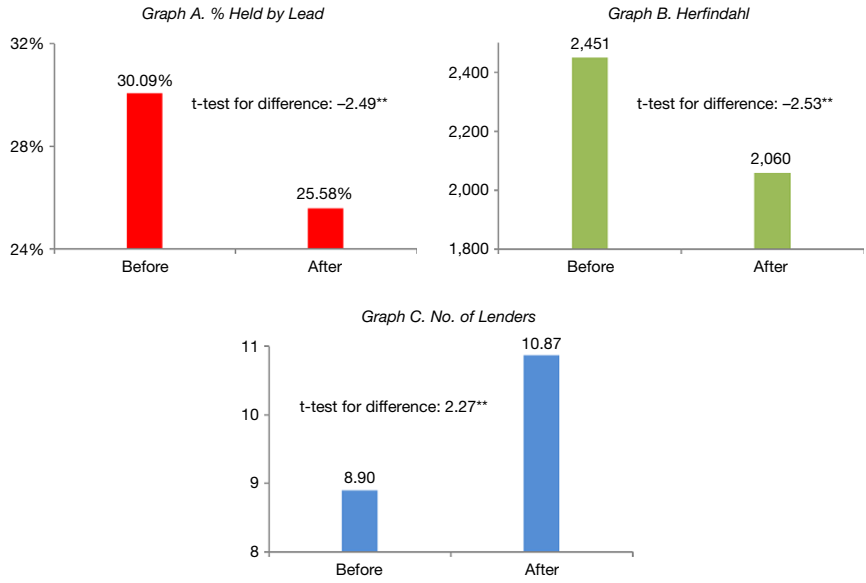
A straightforward way to examine if the enactment of these laws has an impact on the loan syndicate of a borrower is to look at the evolution of the syndicate structure in the pre- and post-enactment period for ATSs. Figure 1 provides a simple univariate comparison of the three syndicate-structure measures that we employ in this article for the event-time sample. The average share of the loan retained by the lead in the pre-enactment period was 30%, it and was 25.6% in the post-enactment period. This difference is significant at the 5% level (t-value of −2.49). Repeating this test for the Herfindahl index of the loan share and for the number of banks in the syndicate yields similar results. The Herfindahl index falls from 2,451 to 2,060 (the difference is significant at the 5% level, with a t-value of −2.53), and the average number of lenders in the syndicate increases from 8.90 to 10.87 (the difference is significant at the 5% level, with a t-value of −2.27). These unconditional results indicate that the syndicate structure became more diffuse after the passage of state antitakeover laws. Although these univariate tests do not control for the firm and borrower characteristics, they are still informative about the impact of corporate governance on syndicate structure.

We estimate a more formal specification based on a difference-in-differences approach to test if shareholder rights are related to loan-syndicate structure. Our goal is to estimate the marginal effect of a reduction in shareholder rights on the

FIGURE 1

Univariate Analysis

Graphs A, B, and C of Figure 1 show the univariate test of the impact of the first passage of an antitakeover law (business combination, fair price, control share acquisition) using the event-time sample described in Appendix A. Bars report the mean numbers of each of the syndicate-structure indicators, the percentage held by the lead, the Herfindahl index, and the number of lenders, both before and after the passage of the law. "Before" is defined as the period that covers the relative years [−3, 0], where 0 is the year of the passage of the law. "After" is defined as the period that covers the relative years [+1, +3]. The t-statistic of the test for difference is reported in the frame. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.



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concentration of loan syndicate for a given borrower. The loan-syndicate-structure model we estimate is as follows:

$$(1) \quad (\text{SYNDICATE_STRUCTURE})_{fist} = \alpha_f + \alpha_i + \alpha_t + \beta(\text{AFTER_ATS})_{st} + \mathbf{X}_{fit}\Gamma + \varepsilon_{fist},$$

where SYNDICATE_STRUCTURE is the outcome variable for a loan facility to firm f, in industry i (based on the Fama–French industry classification), incorporated in state s, in year t. We measure SYNDICATE_STRUCTURE in three different ways, namely, the share retained by the lead bank, the Herfindahl index of the loan share, and the number of lenders in the syndicate. The key right-hand variable is AFTER_ATS, which equals 1 if the loan was issued after the passage of the law in the state the borrowing firm is incorporated in, and 0 otherwise. α_i, α_f, and α_t are industry, firm, and year fixed effects, respectively. The firm fixed effects control for unobserved, time-invariant differences across firms.

The control variable X consists of various borrower and loan characteristics. We follow the specification employed by Sufi (2007) in his tests of syndicate structure. These variables include OPAQUE, a dummy that equals 1 if that borrower does not have a credit rating, and 0 otherwise. We also control for firm size by including the natural logarithm of the assets adjusted to constant 2000 U.S. dollars. We also include a number of loan-facility characteristics, such as loan maturity, loan purpose, and loan size. Sufi (2007) documents important differences in loan amounts across opaque and nonopaque firms and employs a set of controls on the loan amount that includes 3 splines. We follow his empirical methodology and split our sample into 3 groups based on the amount of the loan facility. We include the dummy variable for the top and the middle terciles as well as the interaction of these with the natural logarithm of the loan-facility amount in our estimation. Effectively, this allows both the intercept and the natural logarithm of the amount of the loan to vary by each loan-size group.

We report the estimation results of the relationship between syndicate structure and corporate governance (equation (1)) in Table 3. We find that following the adoption of antitakeover laws, both the fraction of the loan retained by the lead bank and the Herfindahl index of the loan share are reduced significantly. The first 3 columns report the results for the calendar-time sample, which consists of all loans contracted during the period when antitakeover laws were adopted by most states (1986–1991). In column 1, the syndicate structure is measured using the fraction of the loan retained by the lead. The coefficient on AFTER_ATS is −0.0627 and is significant at the 5% level. This implies that after controlling for other firm and loan-facility characteristics, the share retained by the lead bank is 6.3 percentage points smaller in the post-enactment period. Given that the average fraction of the loan retained during this period is 32.17%, the reduction in shareholder rights due to the adoption of antitakeover laws reflects an economically significant reduction in syndicate concentration of almost 18%. The results in column 2 employ the Herfindahl index of loan-syndicate share as the dependent variable. Again, the coefficient for AFTER_ATS is −0.0641 (significant at the 5% level). The Herfindahl index used in the regression has been normalized to lie between 0 and 1. Thus, the coefficient of −0.0641 implies that the Herfindahl index

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TABLE 3

Effect of Change in Antitakeover State Laws on Loan-Syndicate Structure

Table 3 provides the ordinary least squares (OLS) estimates of the loan-syndicate-structure model (equation (1)):$(\text{SYNDICATE_STRUCTURE})_{fist} = \alpha_f + \alpha_i + \alpha_t + \beta(\text{AFTER_ATS})_{st} + \mathbf{X}_{fit}\Gamma + \varepsilon_{fist}$. We employ 3 dependent variables to proxy for the syndicate structure, %_HELD_BY_LEAD, HERFINDAHL, and NO_OF_LENDERS. The percentage held by the lead bank and the Herfindahl index are scaled to lie between 0 and 1. Columns 1–3 report estimates using the calendar-time sample. Columns 4–6 report estimates using the event-time sample. The construction of these two samples is described in Appendix A. All variables are defined in Appendix B. All models include all control variables, purpose of loan, year (α_t), Fama–French industry (α_t), and firm (α_t) fixed effects. Heteroscedastic robust *t*-statistics controlling for state of incorporation cluster effects are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Calendar-Time Sample			Event-Time Sample		
	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3	4	5	6
AFTER_ATS	−0.0627**	−0.0641**	0.1817*	−0.0960***	−0.1065***	0.3506***
	(−2.03)	(−2.26)	(1.88)	(−3.79)	(−3.99)	(3.48)
OPAQUE	0.0072	0.0247	−0.1636***	0.0131	0.0327	−0.1720**
	(0.36)	(1.66)	(−3.43)	(0.57)	(1.39)	(−2.17)
ASSETS	−0.0449***	−0.0242	0.1547***	−0.0505**	−0.0456***	0.2032***
	(−2.87)	(−1.17)	(2.80)	(−2.64)	(−3.84)	(6.31)
FACILITY_AMOUNT	−0.0061	−0.0134	0.0287	0.0030	−0.0251	0.0607
	(−0.61)	(−1.39)	(0.91)	(0.26)	(−1.14)	(1.00)
FACILITY_AMOUNT × MIDDLE	−0.0154	−0.0364**	0.1847**	0.0057	−0.0171	0.0525
	(−0.63)	(−2.29)	(2.57)	(0.25)	(−0.72)	(0.98)
FACILITY_AMOUNT × LARGE	−0.0190	0.0002	0.1523**	−0.0131	0.0194	0.1721*
	(−1.55)	(0.02)	(2.24)	(−0.57)	(1.09)	(1.76)
MATURITY	−0.0222***	−0.0096**	0.0666*	−0.0195*	−0.0098*	0.0330
	(−4.01)	(−2.28)	(1.78)	(−2.06)	(−1.89)	(1.33)
TERM_LOAN	0.0111	−0.0010	−0.0041	0.0107	−0.0029	−0.0064
	(1.62)	(−0.25)	(−0.25)	(0.84)	(−0.35)	(−0.14)
Loan-purpose indicators	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	1,748	1,748	1,748	557	557	557
Adj. R^2	0.742	0.765	0.773	0.664	0.699	0.732

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is 641 lower in the post-enactment period than in the pre-enactment period, a decrease of almost 23% from the sample average of 2,747. Both of these measures imply that the syndicates become more diffuse after the borrower's state of incorporation adopts antitakeover laws. Additional but more modest support for this finding is provided in column 3, where we use the number of lenders in the syndicate as a measure of syndicate concentration. The coefficient for AFTER_ATS is 0.182 and is significant at the 10% level. The positive coefficient implies that the syndicate size is significantly larger following the enactment of these laws, and the economic effect is significant, an increase of approximately 20%. This result suggests that the primary effect of the law is seen in all 3 proxies for syndicate structure.

Columns 4–6 of Table 3 report the same analysis using the event-time sample. As described earlier, this sample consists of only those borrowers that contracted at least one loan before and one loan after the passage of antitakeover laws in their respective states but within a reasonably narrow time period around the laws' passage. The results are much stronger for this sample. When we estimate the effect of antitakeover laws on the fraction of the loan retained by the lead lender (column 4), the coefficient for AFTER_ATS is −0.0960 (significant at the 1% level). This is almost 50% larger than the coefficient estimate for the calendar-time sample (column 1). Thus, for these firms, the passage of antitakeover laws is associated with a reduction of almost 10% in the share retained by the lead lender, which is approximately one-third of the sample mean, a sizable effect. Columns 5 and 6 provide similar evidence using alternative syndicate-structure proxies. The syndicates in the post-ATS period have a significantly lower Herfindahl index and are significantly larger in size. Again, the coefficients are larger (almost 2 times) than those obtained for the calendar-time sample. Taken together, the results presented in Table 3 demonstrate that the effect of a negative shock to corporate governance on loan-syndicate structure is both statistically and economically significant.

The loan-syndication market underwent some significant changes in 1998. In the pre-1998 period, lead arrangers would launch the credit at a spread and fee they believed would clear the market. If the loan was undersubscribed, the lead arrangers were left above their desired hold level. Investors, specifically peripheral ones, that are more concerned about potential losses (or other factors, e.g., the effect on their balance sheets) if the borrower is taken over than about the moral hazard stemming from undermonitoring would elect not to join the syndicate. Once the takeover threat is mitigated, the supply of credit to the lead arranger becomes more elastic, and syndicates become more diffuse. Thus, the regression results we report in Table 3 may reflect both the greater elasticity of the supply of capital by potential syndicate participants due to reduced takeover threats and the mitigation of concerns about undermonitoring by the lead because borrower risk shifting is lower after the passage of the ATSs.[5]

To ensure that we are controlling for changes in the elasticity of the credit supply due to reduced takeover threats, we exploit the introduction of the "dead-hand proxy put" provisions in loan agreements in our tests. This provision became a standard feature in all loan agreements after the 1988 takeover of RJR Nabisco by

[5]We thank the reviewer for suggesting this alternative interpretation.

Kohlberg Kravis Roberts & Co (KKR).[6] This provision triggers immediate default and repayment if a borrower is subjected to a hostile takeover and the dissident slate wins the majority of board seats. Thus, the dead-hand proxy put effectively removes the concerns of syndicate participants about loan losses due to takeover threats. We reestimate the results reported in Table 3. We split our AFTER_ATS variable into two variables: AFTER_ATS × PRE_1988 and AFTER_ATS × POST_1988. We expect the coefficient on AFTER_ATS × POST_1988 to be significant in the regressions, consistent with the clean interpretation that the law change affected the monitoring incentives of the lead arranger because the dead-hand proxy put was being used widely in debt contracts in the post-1988 period. We find that the coefficient of AFTER_ATS × POST_1988 is the correct sign and is statistically significant for all 3 syndicate0structure measures, consistent with our clean interpretation that the law change affected the monitoring incentives of the lender. These results are described in detail in the Supplementary Material.

1. Robustness Tests

Although the proxies we employ for measuring syndicate concentration have been used by other researchers, they have some idiosyncratic features that are worth discussing. Both the percentage of the share retained and the Herfindahl index are bounded on the low and high ends. For example, the lead lender cannot retain less than 0% of the loan and cannot retain greater than 100%. Furthermore, for a large mass of the data, both the loan share of the lead and the Herfindahl index are likely to have repeated values within a range because many firms might have similar syndicate structures. Just as a linear probability model on the data can generate predictions outside the unit interval, using a proportion in a linear-regression model can yield nonsensical predictions for extreme values of the regressors. Although a logit transformation of the data might address these issues, it cannot accommodate the values at the boundaries that can arise for some firms. Thus, assuming a distribution such as a beta distribution for y given x to estimate $E(y|x)$ would not work because there is a distributional failure: The beta distribution implies that each value in [0,1] is taken on with a probability of 0. Papke and Wooldridge (1996) solve this econometric problem by specifying a logistic functional form for $E(y|x)$ and estimate the parameters using Bernoulli quasi-likelihood methods. Note that a logistic regression would model the logarithmic odds ratio as a linear function (i.e., $E(\log((y/(1-y))|x) = x\beta$ and not model $E(y|x)$). This equation cannot be true if y takes the value of 0 with positive probability, as in our case. The Papke and Wooldridge (1996) method is briefly described next.

Consider an independent sequence of observations $[(x_i,y_i): i = 1,2,\ldots,N]$, where $0 \leq y_i \leq 1$ and N is the sample size. The assumption is that for all $i, E(y_i|x_i) = G(x_i\beta)$, where $G(z)$ is a known function satisfying $0 < G(z) < 1$ for all $z \in$ (in estimation, the logistic function $exp(z)/(exp(z)+1)$ is used). Papke and

[6]The RJR Nabisco deal is one of the largest leveraged buyouts, and KKR added layers of additional leverage without refinancing the existing debt, thereby reducing the value of existing bonds by almost 15%. After 1988, the chastened creditors started using the dead-hand proxy put to protect themselves against such future losses.

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Wooldridge (1996) propose a quasi-maximum likelihood estimate (QMLE) to maximize the Bernoulli log-likelihood function given by

$$l_i(b) \equiv y_i \log(G(x_i\beta)) + (1 - y_i) \log(1 - G(x_i\beta)). \tag{2}$$

Gourieroux, Monfort, and Trognon (1984) show that the QMLE of β obtained from the maximization problem $\max \sum_{i=1}^{N} l_i(b)$ is a consistent estimate for β, provided the conditional expectation assumption holds. Papke and Wooldridge (1996) apply this generalized linear model (GLM) estimation technique for 401 (k) plan participation rates, where the dependent variable is a proportion between 0 and 1. Our case is similar in that the share retained and the Herfindahl index are also a proportion between 0 and 1, with many points in the interval at which observations cluster.

We reestimate our specification described in equation (1) using a GLM, as suggested by Papke and Wooldridge (1996), to address these issues. The syndicate-structure proxy based on the number of lenders in the syndicate also takes discrete values. Given that the dependent variable is discrete, its distribution places the probability mass at nonnegative integer values only. To accommodate this feature, we employ a Poisson-regression model when we measure syndicate concentration using the number of lenders.

We report our findings in Table 4. The statistical significance of coefficients for AFTER_ATS is very similar to those observed in Table 3. However, unlike the ordinary least squares (OLS) estimates of Table 3, the interpretation of coefficients for the GLM and the Poisson-regression models is not straightforward. To facilitate a comparison of economic significance, we report the marginal effect of AFTER_ATS for each model in the third row from the bottom. GLM estimates of the impact of AFTER_ATS on the percentage held by the lead bank and the Herfindahl index are very similar to those reported for the OLS estimates for both the calendar-time sample (columns 1–3) and the event-time sample (columns 4–6). For instance, the marginal impact of AFTER_ATS on the percentage held by the lead bank amounts to −0.0630 (column 1 of Table 4) using the calendar-time sample, which is very close to the −0.0627 coefficient that we obtained in our OLS estimation (column 1 of Table 3), and it is significant at the 1% level. In column 2, we report the GLM results for the Herfindahl index. The marginal effect of ATS passage, holding all else constant, is −0.0668 and is significant at the 1% level. Again, this coefficient is essentially identical to the coefficient of −0.0641 obtained from the OLS regression (column 1 of Table 3). We obtain strong results for the number of lenders using the Poisson regression, where the marginal impact of AFTER_ATS on the number of lenders is positive and statistically significant. Repeating the same set of estimations over the event-period sample provides larger coefficients (columns 4–6) than the calendar-time sample. Again, this pattern is also similar to the one we report for the OLS estimations in Table 3.

Overall, the GLM and Poisson estimates show that the effect of a reduction in corporate governance on syndicate structure is fairly robust and is not driven by the idiosyncratic nature of our syndicate-structure measures. Taken together, Tables 3 and 4 show that our results continue to hold across different econometric methodologies. However, the use of ATS adoption by states as an identifying event has

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TABLE 4

Effect of Change in Antitakeover State Laws on Loan-Syndicate Structure: Generalized Linear Model and Poisson-Regression Estimates

Table 4 provides results from estimating the generalized linear model (Papke and Wooldridge (1996)) of the percentage held by the lead bank and the Herfindahl index, as well as Poisson-regression estimates of the number of lenders of the loan-syndicate-structure model (equation (1)) described in the caption of Table 3. We employ 3 dependent variables to proxy for the syndicate structure, %_HELD_BY_LEAD, HERFINDAHL, and NO_OF_LENDERS. The percentage held by the lead bank and the Herfindahl index are scaled to lie between 0 and 1. Columns 1–3 report estimates using the calendar-time sample. Columns 4–6 report estimates using the event-time sample. The construction of these two samples is described in Appendix A. All variables are defined in Appendix B. Columns 1, 2, 4, and 5 report estimates of the generalized linear model (Papke and Wooldridge (1996)). Columns 3 and 6 report Poisson estimates. All models include all control variables, purpose of loan, year (α_t), Fama–French industry (α_t), and firm (α_t) fixed effects. Heteroscedastic robust *t*-statistics controlling for state of incorporation cluster effects are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Calendar-Time Sample			Event-Time Sample		
	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3	4	5	6
AFTER_ATS	−0.3445***	−0.3888***	0.1531*	−0.4812***	−0.5694***	0.4089***
	(−2.73)	(−3.03)	(1.86)	(−4.22)	(−4.55)	(4.16)
OPAQUE	0.0695	0.2273***	−0.1164***	0.1184	0.2783*	−0.1284***
	(0.78)	(2.65)	(−3.46)	(1.03)	(1.89)	(−3.69)
ASSETS	−0.2094***	−0.1055	0.2309***	−0.2505***	−0.2410***	0.2574***
	(−3.51)	(−1.28)	(4.59)	(−3.31)	(−4.65)	(7.36)
FACILITY_AMOUNT	−0.0229	−0.0553*	0.0684**	0.0244	−0.1179	0.0744
	(−0.67)	(−1.65)	(2.42)	(0.58)	(−1.36)	(1.48)
FACILITY_AMOUNT × MIDDLE	−0.1031	−0.2437***	0.2101***	0.0492	−0.1267	0.0717
	(−1.17)	(−3.78)	(3.92)	(0.65)	(−1.59)	(1.14)
FACILITY_AMOUNT × LARGE	−0.1598***	−0.0776	0.1061**	−0.1718**	−0.0421	0.1636**
	(−3.27)	(−1.52)	(2.22)	(−1.93)	(−0.43)	(2.32)
MATURITY	−0.1252***	−0.0598***	0.0526*	−0.1263***	−0.0748***	0.0057
	(−5.79)	(−3.22)	(1.70)	(−2.70)	(−2.60)	(0.42)
TERM_LOAN	0.0648**	0.0014	0.0145	0.0858	0.0202	0.0152
	(2.35)	(0.08)	(1.12)	(1.48)	(0.40)	(0.57)
Loan-purpose indicators	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
AFTER_ATS, marginal effect	−0.0630	−0.0668	1.2509	−0.0851	−0.0909	3.8941
No. of obs.	1,748	1,748	1,748	557	557	557
McFadden pseudo-R^2	0.190	0.168	0.568	0.167	0.159	0.558

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been criticized by Karpoff and Wittry (2018) (KW hereafter). They argue that tests based on BC laws that attempt to examine the influence of takeover vulnerability on firm decisions may be misspecified depending on their sensitivity to a number of concerns tied to the legal and institutional features of the laws' passage. KW suggest empirical modifications to address the drawbacks that they document. In the following discussion, we provide the results of our reestimation, taking into account the concerns raised by KW. We find that our natural-experiment results are robust to the suggestions made by KW to improve identification.

The first issue raised by KW concerns the identifying assumption that the passage of a BC law represents an exogenous increase in the level of takeover protection. The implicit assumption here is that the level of takeover protection was low prior to the BC laws' passage. However, KW point out that until 1982, 38 states had first-generation antitakeover laws that provided extremely high takeover protection (until their repeal by a Supreme Court decision, *Edgar v. Mite Corp.*, in 1982). This fact invalidates the identifying assumption that takeover protection was low prior to the BC laws' passage if the sample includes observations from the pre-1982 period. By not including data before 1982 in our empirical tests, we sidestep this first concern.

KW provide an additional criticism of the identifying assumption that BC laws generate an increase in takeover protection arising largely from the adoption of ATSs. They argue that individual firm-level takeover defenses can effectively serve as substitutes for state antitakeover laws and that the passage of BC laws may have no appreciable effect on takeover protection for firms that already had strong takeover defenses in place. We address this concern in two ways. First, we note that this argument merely serves to bias the experiment against finding significant results. That is, we find results despite this bias. Second, as reported by Gompers et al. (2003), firm-level takeover defenses, once instituted, are sticky and are rarely changed. By specifically including firm fixed effects in our regressions, the effect of firm-level takeover defenses in place at the time of the passage of BC laws are differenced out in our tests.

Apart from the two issues just discussed, KW also describe various complications that arise when one considers the possibility that the adoption of ATSs by a state was *not* exogenous for some of the firms incorporated in that state. For example, they list specific firms that actively lobbied their state legislatures for the adoption of antitakeover laws. Also, Georgia and Tennessee, in adopting their ATSs, also adopted an "opt-in" provision. This requires that the benefits of ATSs are not automatically available to firms in these two states; each firm must proactively opt in to gain the antitakeover protection. We take each of these concerns into account by reestimating our natural experiment along the lines suggested by KW. These results are reported in Table 5 (to conserve space, we only report the coefficient on AFTER_ATS).

First, we specifically exclude firms incorporated in Georgia and Tennessee in our tests. The results from reestimating our baseline specification are reported in Panel A of Table 5. The coefficients on AFTER_ATS are remarkably similar to those reported for our original specification in Table 3. For example, on average, the share retained by the lead bank in the post-ATS period is almost 6.7% lower, holding all else constant (column 1 of Panel A). The results are stronger for the

TABLE 5

Effect of Change in Antitakeover State Laws on Loan-Syndicate Structure: Karpoff and Wittry (2018) Robustness Tests

Table 5 reports the ordinary least squares (OLS) estimates of the loan-syndicate-structure model (equation (1)) described in the caption of Table 3. We employ 3 dependent variables to proxy for the syndicate structure, %_HELD_BY_LEAD, HERFINDAHL, and NO_OF_LENDERS. The percentage held by the lead bank and the Herfindahl index are scaled to lie between 0 and 1. Columns 1–3 report estimates using the calendar-time sample. Columns 4–6 report estimates using the event-time sample. The construction of these two samples is described in Appendix A. All variables are defined in Appendix B. To conserve space, we only report the impact of AFTER_ATS. All models include all control variables, purpose of loan, year (α_t), Fama–French industry (α_i), and firm (α_f) fixed effects. Heteroscedastic robust *t*-statistics controlling for state of incorporation cluster effects are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A excludes borrowing firms incorporated in Georgia and Tennessee, whose antitakeover laws are *opting-in laws*. Panel B excludes borrowing firms, which are listed among the *motivating companies* in Karpoff and Wittry (2018). Panel C includes all syndicated facilities in the samples, but AFTER_ATS controls for the first passage of any of the *5* antitakeover laws reported by Karpoff and Wittry (2018) (i.e., business combination, fair price, control share acquisition, director duties, and poison pill).

	Calendar-Time Sample			Event-Time Sample		
	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3	4	5	6
Panel A. Exclusion of Borrowing Firms Incorporated in States with Opting-In Antitakeover Laws						
AFTER_ATS	−0.0669**	−0.0658**	0.1853*	−0.0950***	−0.1066***	0.3554***
	(−2.11)	(−2.22)	(1.89)	(−3.73)	(−3.96)	(3.51)
No. of obs.	1,707	1,707	1,707	548	548	548
Adj. R^2	0.745	0.766	0.772	0.663	0.698	0.730
Panel B. Exclusion of Motivating Companies						
AFTER_ATS	−0.0634**	−0.0642**	0.1831*	−0.0953***	−0.1062***	0.3485***
	(−2.05)	(−2.23)	(1.89)	(−3.80)	(−4.00)	(3.50)
No. of obs.	1,729	1,729	1,729	550	550	550
Adj. R^2	0.740	0.763	0.770	0.663	0.698	0.731
Panel C. Controlling for 5 Antitakeover Laws						
AFTER_ATS	−0.0736**	−0.0666**	0.1751*	−0.1225***	−0.1229***	0.3983***
	(−2.27)	(−2.43)	(1.79)	(−3.08)	(−3.31)	(3.28)
No. of obs.	1,748	1,748	1,748	487	487	487
Adj. R^2	0.743	0.765	0.773	0.675	0.716	0.735

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event-time sample (columns 4–6), as in Table 3. The evidence also remains unchanged for the other 2 syndicate-structure proxies, the Herfindahl index and the number of lenders, as reported in columns 2 and 3. KW also provide a list of firms that lobbied for changes in takeover laws ("motivating firms"). For these firms, the passage of the antitakeover laws was plausibly not exogenous. For our next test, we specifically exclude these motivating firms and report the results in Panel B of Table 5. Again, the coefficient on AFTER_ATS for all 3 measures of syndicate structure remains essentially unchanged for both the calendar-time and the event-time sample. Finally, KW argue for using a broader definition of ATSs. They note that a host of other antitakeover laws were passed during the post-1982 sample period. Specifically, they list 5 distinct types of ATSs: BC, CS acquisition, FP, PP, and DD laws. KW argue that there is little theoretical justification for focusing only on BC laws to the exclusion of other types of antitakeover laws. For our baseline specification, we follow the methodology outlined by Cheng et al. (2005) and focus on 3 of these 5 types of ATSs (BC, FP, and CS). We use the earliest adoption of any of these 3 laws as the start of the AFTER_ATS period. In Panel C of Table 5, we examine all 5 laws listed by KW and redefine AFTER_ATS as a dummy variable that equals 1 if a loan facility was issued any time after the year in which any of the 5 laws was adopted by a state for the first time, and 0 otherwise. Again, our results continue to hold. For example, in the calendar-time sample, the coefficient for AFTER_ATS is −0.0736 (significant at the 5% level) for the share of the loan held by the lead bank (column 1 of Panel C). The effect of ATS adoption is much larger for the event-time sample, implying a 12.25% reduction in the share held by the lead bank, which is significant at the 1% level (column 4 of Panel C). The results for the Herfindahl index and the number of lenders remain essentially unchanged from our baseline specification.

A final concern raised by KW is that the incremental impact of an antitakeover law can depend crucially on the legal environment. KW identify four court rulings that could have had large effects on the takeover protections offered by various antitakeover laws: *Edgar v. MITE* (1982), *CTS Corp. v. Dynamics Corp. of America* (1987), *Amanda Acquisition Corp. v. Universal Foods Corp.* (1989), and *Unitrin Inc. v. American General Corp.* (1995). In *Edgar v. Mite* (1982), the U.S. Supreme Court effectively invalidated all first-generation antitakeover laws. Because our sample period does not include any observations from the pre-1982 period, this decision is not relevant to our study. However, the remaining 3 court rulings could have had important implications for establishing the validity of CS acquisition laws (*CTS Corp.*, 1987 ruling), BC laws (*Amanda*, 1989 ruling), and PP adoption (*Unitrin*, 1995 ruling). As suggested by KW, we include the interaction of these 3 rulings with the AFTER_ATS variable. We reestimate our baseline specification in Table 6. Because the *Unitrin* decision was delivered in 1995, the results in Table 6 cover the sample period from 1986 to 1998 (3 years after the *Unitrin* decision). Thus, we have a longer sample period than for the calendar-time or the event-time samples used in our earlier tests. As reported in Table 6, our tests show that the inclusion of these court rulings does not have a material impact on our earlier findings. The coefficient for AFTER_ATS is negative and significant for the loan share kept by the bank and for the Herfindahl index of syndicate concentration. The coefficient for AFTER_ATS is positive and significant when we use the number of

TABLE 6

Effect of Change in Antitakeover State Laws on Loan-Syndicate Structure Using All Antitakeover State Laws and Supreme Court Decisions

Table 6 reports the ordinary least squares (OLS) estimates of the loan-syndicate-structure model (equation (1)) described in the caption of Table 3. We employ 3 dependent variables to proxy for the syndicate structure: %_HELD_BY_LEAD_BANK, HERFINDAHL, and NO_OF_LENDERS. The percentage held by the lead bank and the Herfindahl index are scaled to lie between 0 and 1. The sample includes all facilities in the period 1986–1998. In this sample, AFTER_ATS is a dummy variable that takes the value of 1 if the facility was issued any time after the year that the first of the *5* antitakeover laws (business combination, fair price, control share acquisition, director duties, and poison pill) was passed. CONTROL_SHARE × CTS is an interaction variable that takes the value of 1 if the facility was issued after the Supreme Court decision in *CTS Corp. v. Dynamics Corp. of America* (1987) and after the control-share antitakeover law was passed in the state of incorporation of the borrower, and 0 otherwise. BUSINESS_COMBINATION × AMANDA is an interaction variable that takes the value of 1 if the facility was issued after the Supreme Court decision in *Amanda Acquisition Corp. v. Universal Foods Corp.* (1989) and after the business-combination antitakeover law was passed in the state of incorporation of the borrower, and 0 otherwise. POISON_PILL × UNITRIN is an interaction variable that takes the value of 1 if the facility was issued after the Supreme Court decision in *Unitrin, Inc. v. American General Corp.* (1995) and after the poison-pill antitakeover law was passed in the state of incorporation of the borrower, and 0 otherwise. All other control variables are defined in Appendix B. All models include all control variables, purpose of loan, year (α_t), Fama–French industry (α_i), and firm (α_f) fixed effects. Heteroscedastic robust *t*-statistics controlling for state of incorporation cluster effects are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3
AFTER_ATS	−0.0704**	−0.0536**	0.1822*
	(−2.38)	(−2.39)	(1.91)
CONTROL_SHARE × CTS	0.0087	−0.0100	0.0218
	(0.21)	(−0.38)	(0.21)
BUSINESS_COMBINATION × AMANDA	0.0013	0.0115	0.0468
	(0.04)	(0.42)	(0.60)
POISON_PILL × UNITRIN	−0.0015	−0.0066	0.0004
	(−0.08)	(−0.42)	(0.01)
OPAQUE	0.0125*	0.0121**	−0.0552***
	(1.76)	(2.22)	(−2.98)
ASSETS	−0.0414***	−0.0348***	0.1271***
	(−2.82)	(−3.45)	(4.19)
FACILITY_AMOUNT	−0.0066	−0.0149***	0.0450***
	(−0.97)	(−3.23)	(3.06)
FACILITY_AMOUNT × MIDDLE	−0.0405**	−0.0452***	0.2239***
	(−2.15)	(−3.02)	(4.60)
FACILITY_AMOUNT × LARGE	−0.0212***	−0.0080	0.2383***
	(−3.74)	(−1.65)	(6.60)
MATURITY	−0.0187***	−0.0108***	0.0554***
	(−6.19)	(−3.83)	(4.11)
TERM_LOAN	0.0134***	0.0011	0.0094
	(5.37)	(0.48)	(0.75)
Loan-purpose indicators	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
No. of obs.	5,824	5,824	5,824
Adj. R^2	0.685	0.728	0.765

lenders as a measure of syndicate concentration. The results indicate that the court rulings did not significantly affect the syndicate-structure outcomes. These results, combined with the results described in Table 5, imply that our results are robust to the concerns raised by KW.

So far, we have analyzed the syndicate structure on the intensive margin, that is, conditional on the decision to syndicate the loan and the share of loan taken up by the lead lender. We now focus on the extensive margin and address the issue of why some loans are syndicated at all. After all, a loan that is not syndicated reflects the corner solution to a hypothetical contract-design problem. All loans that are done by a sole lender would appear to have characteristics (including the shareholder rights of the borrower) that would make syndication of the loan to that borrower too difficult. To confirm that our results are robust to syndication-screening issues,

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we create a dummy variable, SOLE_LENDER, which equals 1 if the loan is not syndicated and the lead bank retains 100% of the loan, and 0 otherwise. If the level of shareholder rights of a borrower has an impact on the syndicate structure of its loans, we should expect the likelihood of a loan being made by a sole lender to go down once the antitakeover laws are adopted by the state in which the borrower is incorporated. Our empirical strategy is to estimate the marginal effect of a change in corporate governance on the likelihood of a loan being not syndicated (i.e., a loan being a sole-lender loan). Thus, our dependent variable is the probability of a loan being a sole-lender loan, which is a discrete (0,1) variable. We estimate a logistic regression model as follows:

$$(3) \qquad (\text{SOLE_LENDER})_{fist} = \alpha_f + \alpha_i + \alpha_t + \beta(\text{AFTER_ATS})_{st} + \mathbf{X}_{fit}\Gamma + \varepsilon_{fist}.$$

Table 7 reports the estimates from the previous specification. Column 1 provides results from the estimation of the logistic model described in equation (3) for the calendar-time sample; column 2 reports the same estimation for the event-time sample. For both samples, we focus only on those borrowers that had issued at least one sole-lender loan in the before-ATS period. To facilitate economic interpretation, we also report marginal effects in the third row from the bottom of Table 7.

TABLE 7

Effect of Change in Antitakeover State Laws on the Decision to Syndicate the Loan

Table 7 provides the logistic estimates of the loan-syndication model (equation (3)), described as follows:

$$(\text{SOLE_LENDER})_{fist} = \alpha_f + \alpha_i + \alpha_t + \beta(\text{AFTER_ATS})_{st} + \mathbf{X}_{fit}\Gamma + \varepsilon_{fist}.$$

The dependent variable is SOLE_LENDER, a dummy variable that takes the value of 1 if the loan is funded by a single lender (i.e., the loan is *not* syndicated), and 0 otherwise. Column 1 reports estimates using the calendar-time sample. Column 2 reports estimates using the event-time sample. We extend the calendar-time and event-time samples as described in Appendix A to also include loan facilities made by a single lender. To be included in the sample, we require that a firm that is incorporated in a treated state must have a contract with *at least* one sole-lender facility *before* the passage of the law. For firms incorporated in nontreated states, we include all loan facilities. Control variables AFTER_ATS, OPAQUE, and MATURITY are defined in Appendix B. RELATIONSHIP is a dummy variable that takes the value of 1 if one of the lead banks was a lead bank of the borrowing firm in the previous 5 years, and 0 otherwise. NO_OF_PREVIOUS_DEALS is the number of loan facilities issued in the previous 5 years by the borrower. SECURED is a dummy variable that takes the value of 1 if the facility is secured. All models include purpose of loan, year (α_t), Fama–French industry (α_i), and firm (α_f) fixed effects. Heteroscedastic robust *z*-statistics controlling for firm cluster effects are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	SOLE_LENDER	SOLE_LENDER
	1	2
AFTER_ATS	−4.1957***	−4.2116***
	(−5.77)	(−6.88)
OPAQUE	0.6364**	1.0084***
	(2.16)	(3.28)
MATURITY	−0.0055	−0.0124**
	(−0.98)	(−2.52)
RELATIONSHIP	−0.7813	−0.9420***
	(−1.34)	(−2.81)
ln(1 + NO_OF_PREVIOUS_DEALS)	−1.4749***	−0.7744**
	(−6.51)	(−2.24)
FACILITY_AMOUNT	−0.0022***	−0.0024***
	(−7.07)	(−4.16)
SECURED	0.0144	0.2075*
	(0.09)	(1.82)
Loan-purpose indicators	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
AFTER, marginal effect	−0.3080	−0.3370
No. of obs.	1,785	1,975
Pseudo-R^2	0.616	0.608

The coefficient for AFTER_ATS is negative and significant at the 1% level for both samples. The economic impact is quite large; the probability of obtaining a loan from a sole lender (i.e., a nonsyndicated loan) is more than 30% lower in the period after the passage of ATSs. Stated differently, borrowers who received at least one sole-lender bank loan before the passage of antitakeover laws in their state of incorporation have an approximately 30% higher probability of syndicating the loan after the passage of the law.

To sum up, we exploit the significant change in state ATSs as a setting for our natural experiment. This exogenous shock resulted in a significant reduction in shareholder rights, allowing us to study the evolution of loan syndicates in the period before and after these laws were enacted. Our approach is similar to the one adopted by Bertrand and Mullainathan (2003) and Cheng et al. (2005). Both of these articles, which focused on the agency issues between managers and shareholders, demonstrated that the weakening of shareholder rights was associated with a lower alignment of manager and shareholder incentives. In contrast, we explore how credit contracting evolved once the governance environment underwent a significant change. Our results provide robust evidence that shareholder governance has a direct impact on financial-debt contracting. We find that loan-syndicate structure, on average, is significantly less concentrated in the period after the adoption of antitakeover laws. Following the arguments outlined by Sufi (2007) and Lin et al. (2012), we interpret less concentrated loan syndicates as a contracting mechanism that reflects lower monitoring intensity. Therefore, our results provide robust evidence that as shareholder rights are reduced, the need to form more concentrated (i.e., monitoring-intensive) syndicates is reduced as well. Our results support and complement empirical evidence showing the effect of creditor monitoring provided by Chava and Roberts (2008), Roberts and Sufi (2009), and Nini et al. (2012).

2. Risk-Shifting Versus Recapitalization

The results presented so far provide strong evidence that an exogenous shock to the corporate-governance environment (a reduction in shareholder rights) makes loan syndicates less concentrated. However, the exact channel through which this happens is not clear. A higher level of shareholder rights implies a greater need for monitoring by the lead lender (i.e., higher syndicate concentration) on account of two possible concerns. First, managers with shareholder-aligned incentives are more likely to undertake investment strategies that seek to transfer wealth from the debt holders to shareholders via "risk shifting." Managers will have less incentive to risk-shift after the passage of ATSs because they are less inclined to pursue shareholder interests. This change in priorities, in turn, should lead to less concentrated syndicates because the need for intense monitoring is reduced. A second possible channel is the risk of borrower "recapitalization." Firms with high shareholder rights (i.e., that are easy acquisition targets) but with low leverage are especially attractive targets for leveraged buyouts (LBOs). Lenders to firms based in states that do not have antitakeover laws need to be especially vigilant to protect themselves against potential LBOs of their borrowers. In response to this risk, they will form more concentrated syndicates. However, after the passage of ATSs, lenders in these states need not undertake the same level of monitoring, leading

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to a less concentrated syndicate structure. We examine both of these possible explanations next.[7]

A major source of conflict between a firm's shareholders and its debt holders is the difference in the risk-shifting incentives between managers and shareholders (Jensen and Meckling (1976)). As default risk increases, managers have a stronger incentive to take on high-risk investments that have a small probability of achieving a high return. Such incentives are especially powerful in firms facing financial distress (Eisdorfer (2008)). Lenders to a distressed firm need to look out for and curb such opportunistic behavior. Doing so implies more intense monitoring of distressed firms. Because the adoption of ATSs reduces the alignment of incentives between managers and shareholders, the managers of firms based in ATS-adopting states are less likely to engage in risk shifting. Thus, antitakeover laws reduce monitoring costs, which should result in less concentrated syndicates. This effect will be especially powerful for distressed firms where shareholders can gain significant wealth expropriation from creditors by investing in low-probability, high-return projects. To test the risk-shifting hypothesis, we focus on the subset of firms facing financial distress. We calculate the Altman *Z*-score for all our sample firms using the most recent publicly available financial data at the time of loan-facility origination. Following Altman (1968), we create a dummy variable, DISTRESSED, that equals 1 if the *Z*-score of the borrower is less than 1.81, and 0 otherwise. We estimate the baseline loan-syndicate-structure model (equation (1)) for distressed and nondistressed firms separately. If the risk-shifting hypothesis is correct, we expect the impact of antitakeover laws on syndicate structure to be larger for distressed companies than for nondistressed companies.

Panel A of Table 8 reports the estimates of the model for the distressed and nondistressed subsamples. The top half of Panel A reports the results for the calendar-time sample. To conserve space, we only report the coefficient estimates for AFTER_ATS. The first cell of column 1 provides the estimate of our baseline model (equation (1)) for distressed firms using the fraction of the loan held by the lead bank as a proxy for syndicate structure. The coefficient for AFTER_ATS is −0.1446, and it is significant at the 5% level. Column 2 describes the results of estimating the same specification as column 1 for the nondistressed firms. The coefficient for AFTER_ATS is −0.0142 and is statistically indistinguishable from 0. Thus, the adoption of ATSs is associated with a decrease in syndicate concentration only for the distressed firm. The fourth row reports the *p*-values for a formal test of the difference in the impact of ATS adoption on distressed and nondistressed firms. This row shows that the differential impact of ATS adoption is statistically significant for the percentage held by the lead bank (at the 5% level of statistical significance). When we use the Herfindahl index as a measure of syndicate structure (columns 3 and 4), the difference between distressed firms and nondistressed firms continues to be significant (at the 10% level). Repeating the analysis for the number

[7]A third, but unlikely, channel is that of managerial moral hazard. Once the threat of takeovers is removed, managers are free to pursue value-destroying activities. This may make debt riskier and give lenders a stronger incentive for risk sharing. Forming less concentrated syndicates is one possible way to manage risk. But as Bertrand and Mullainathan (2003) have shown, managers prefer the "quiet life" and do not actively indulge in value-destroying actions after the passage of ATSs, so this third possibility is unlikely to explain our results.

TABLE 8

Risk Shifting, Recapitalization, and Loan-Syndicate Structure

Table 8 reports the ordinary least squares (OLS) estimates of the loan-syndicate-structure model (equation (1)) described in the caption of Table 3. We employ 3 dependent variables to proxy for the syndicate structure, %_HELD_BY_LEAD, HERFINDAHL, and NO_OF_LENDERS. The percentage held by the lead bank and the Herfindahl index are scaled to lie between 0 and 1. Columns 1–3 report estimates using the calendar-time sample. Columns 4–6 report estimates using the event-time sample. The construction of these two samples is described in Appendix A. All variables are defined in Appendix B. To conserve space, we only report the impact of AFTER_ATS. In Panel A, columns 1, 3, and 5 report the model estimates using the sample of distressed companies; columns 2, 4, and 6 report estimates using the sample of nondistressed firms. Firms are defined as being in distress if their Altman (1968) *Z*-score is less than 1.81. In Panel B, columns 1, 3, and 5 report the model estimates using the sample of low-leverage firms (firms with leverage ratios in the lowest quartile). Columns 2, 4, and 6 report estimates using the sample of companies with leverage above the lowest quartile. In each panel, the top half reports the OLS estimates using the calendar-time sample, and the bottom half reports the results from the event-time sample. The construction of these samples is described in Appendix A. The table also reports the *p*-values of the Wald tests measuring the significance of the difference in the impact of AFTER_ATS between distressed firms and nondistressed firms (Panel A) and between low-leverage firms and other firms (Panel B). Heteroscedastic robust *t*-statistics controlling for state of incorporation cluster effects are reported in parentheses. *, **, and *** indicated statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Distressed Versus Other Companies

	%_HELD_BY_LEAD		HERFINDAHL		ln(1 + NO_OF_LENDERS)	
	Distressed	Nondistressed	Distressed	Nondistressed	Distressed	Nondistressed
Calendar-Time Sample						
AFTER_ATS	−0.1446**	−0.0142	−0.1238*	−0.0302	0.4862**	0.1326
	(−2.13)	(−0.30)	(−1.85)	(−0.94)	(2.32)	(1.02)
No. of obs.	411	936	411	936	411	936
Adj. R^2	0.778	0.734	0.799	0.770	0.814	0.769
p-value		0.017		0.059		0.032**
Event-Time Sample						
AFTER_ATS	−0.4234***	−0.0246	−0.3998***	−0.0530	1.5532***	0.3063***
	(−37.34)	(−0.52)	(−23.51)	(−1.50)	(23.16)	(3.08)
No. of obs.	109	297	109	297	109	297
Adj. R^2	0.849	0.692	0.876	0.750	0.871	0.767
p-values		0.000***		0.000***		0.000***

(continued on next page)

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TABLE 8 (continued)

Risk Shifting, Recapitalization, and Loan-Syndicate Structure

Panel B. Low-Leverage versus Other Companies

Calendar-Time Sample

	Low Leverage	High Leverage	Low Leverage	High Leverage	Low Leverage	High Leverage
AFTER_ATS	0.0057	−0.0792**	−0.0101	−0.0724**	0.1680	0.2370*
	(0.10)	(−2.08)	(−0.13)	(−2.11)	(0.43)	(1.85)
No. of obs.	432	1302	432	1302	432	1302
Adj. R^2	0.730	0.757	0.774	0.777	0.827	0.775
p-value		0.009***		0.187		0.760

Event-Time Sample

AFTER_ATS	−0.1951	−0.1297***	−0.1811	−0.1547***	0.5688*	0.4609**
	(−1.64)	(−3.06)	(−1.63)	(−4.42)	(1.84)	(2.53)
No. of obs.	137	415	137	415	137	415
Adj. R^2	0.706	0.689	0.772	0.726	0.828	0.776
p-value		0.337		0.667		0.586

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of lenders (columns 5 and 6) shows the same result (significant at the 5% level). The bottom half of Panel A reports the results of the same estimation as the top half but now for the event-time sample. Again, we find that ATS adoption has a significantly greater impact on the syndicate structure of distressed firms than on nondistressed firms. For all 3 measures of the syndicate structure, the differences are significant at the 1% level. These results suggest that lenders form a less concentrated syndicate in response to a reduction in shareholder rights when they are less concerned about risk shifting by their borrowers, especially in more distressed firms. These results provide strong support for the risk-shifting hypothesis.

In order to test for the recapitalization hypothesis, we follow Chava et al. (2009). We create subsamples by leverage quartiles and define *low-leverage firms* as those with a leverage ratio in the bottom (lowest) quartile. Again, we estimate the baseline loan-syndicate-structure model (equation (6)) for the low-leverage and the remaining (high-leverage) firms separately. The recapitalization hypothesis predicts that the impact of antitakeover laws on syndicate structure should be larger for the low-leverage firms because the firms with an already-high leverage level are unlikely to experience additional leverage increases.

Panel B of Table 8 reports the results of the estimates and the *p*-values measuring the statistical significance of the difference in the impact of ATS adoption for the low- and the high-leverage firms. As in Panel A, the top half of Panel B uses the calendar-time sample, and the bottom half reports the estimates from the event-time sample. In all the regressions of loan-syndicate structure (using both the calendar-time and event-time samples), the coefficient on AFTER_ATS is insignificant for the low-leverage firms. This implies that the passage of ATSs does not have a significant effect on the loan-syndicate structure of low-leverage firms. Furthermore, in our tests of the difference in the AFTER_ATS coefficients for the low- versus high-leverage firms, we fail to reject the null hypothesis that the difference between the two coefficients is statistically equal to 0 in 5 of the 6 tests. Thus, we do not find strong evidence that the possibility of recapitalization plays a significant role in how syndicate structure is determined. The results in Table 8 suggest that risk shifting is a more important channel in determining the loan-syndicate structure.

B. Evidence Using the Shareholder-Rights Index

Our natural-experiment results show that when a firm's shareholder rights are reduced, its lenders respond by forming larger and less concentrated syndicates. Furthermore, lenders appear to be responding to risk-shifting concerns arising from lower shareholder rights. However, the coverage of DealScan (our primary source for loan-syndicate data) becomes far more extensive in the 1990s. Because the overwhelming proportion of states that adopted antitakeover laws did so in the late 1980s, our natural-experiment analysis covers the period when the DealScan database was not as complete. In this section, we outline an alternative set of tests that provide additional support for our natural-experiment results. In these tests, we use a different set of measures that proxy for the strength of a firm's shareholder rights. These include the G-Index created by Gompers et al. (2003) and two additional alternative measures that focus on the entrenchment of the board.

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All of these measures are available from 1990 to 2006. Thus, there is little overlap between the natural-experiment sample period and the sample period for these additional tests. We estimate the effect of change in these measures on the syndicate structure of the borrower. Further, Chava et al. (2009) also use the G-Index as a measure of governance and study the pricing of bank loans. They find that the firms with the highest shareholder rights pay a significantly higher interest rate than the firms with the lowest shareholder rights. Our tests of a nonprice credit-contract term (i.e., syndicate concentration) therefore provide an interesting complement to their findings on price-related contract features.

The source for the shareholder-rights measures is the Investor Responsibility Research Center Institute (IRRC) corporate-governance database. The IRRC had historically published 24 distinct types of corporate-governance provisions for individual firms. These publications occurred in 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006. The universe of firms covered by the IRRC largely comprised the S&P 500 in the early years and was expanded extensively in 1998. The database also reports the G-Index as calculated by Gompers et al. (2003). Their methodology for the G-Index construction involves examining 24 corporate-governance provisions and adding 1 point for every provision that *reduces* shareholder rights. Thus, a high value of the G-Index corresponds to a lower level of shareholder rights. Although the G-Index has been used by a number of subsequent studies, it has also faced some criticism. For example, Bhagat, Bolton, and Romano (2008) criticize the use of the G-Index to measure governance, arguing that there is no consistent relationship between these measures and corporate performance. To address this concern, we use 2 alternative proxies for shareholder rights instead of the G-Index as additional robustness tests. Daines and Klausner (2001) argue that some of the antitakeover provisions that are enshrined in the charter and bylaws of a corporation are especially powerful in reducing the threat of hostile takeovers. In particular, they focus on a classified (staggered) board combined with other provisions that restrict shareholder rights. They argue that "[w]hen combined with the potential to adopt a poison pill, a classified board can impose up to a two-year delay on an acquirer, and a prohibition on voting by written consent or at a special meeting can impose a 12- to 18-month delay." Having a classified (staggered) board is a highly effective antitakeover mechanism. It can be combined with other provisions, such as limiting the ability of shareholders to vote by written consent or the adoption of a PP, to impose significant delays on a potential acquirer. We replace the G-Index in our empirical specification with dummy variables that capture the joint effect of a classified board in conjunction with other antitakeover measures. First, we proxy the weak shareholder rights with the dummy variable CLASSIFIED_BOARD_WITH_PROHIBITIONS_ON_VOTING. This variable equals 1 if the borrower has a classified board *and* it limits the ability of shareholders to act by written consent, and 0 otherwise. Second, we create an alternative antitakeover proxy, which equals 1 if the borrower has a staggered board and has adopted a PP along with a blank-check provision, and 0 otherwise.

We take the intersection of the sample of firms for which shareholder-rights measures (e.g., the G-Index) are available from the DealScan database. The resulting sample consists of 11,932 loan facilities, of which 3,555 involve more than one lender and thus meet the definition of a syndicated loan. For a loan facility to be

included in our sample, we require details on the loan share held by the lead, the share of all syndicate members, and the number of lenders in the syndicate to be available. We hand-match the borrower names in the LPC database with the Compustat database using the same process that we employed in creating the natural-experiment samples described earlier in the article. This procedure produces the final matched sample of 3,223 loan facilities, for which we are able to obtain data from Compustat.

To test how the variation in shareholder-rights provisions affects syndicate structure, we test a general specification described as follows:

$$(4)\quad (\text{SYNDICATE_STRUCTURE})_i = \alpha + (\text{SHAREHOLDER_RIGHTS})_i\lambda + (\text{OPAQUE}_i)\gamma + \mathbf{X}_i\beta + \varepsilon_i.$$

The syndicate structure is proxied by the same 3 measures we used in our natural-experiment tests: loan share retained by the lead, the Herfindahl index, and the size of the syndicate. The key right-hand-side variable is SHAREHOLDER_RIGHTS, which we measure in 3 different ways (G-Index, classified board combined with prohibition on voting, and classified board combined with PP). The main coefficient of interest is λ, which captures the effect of the *level* of shareholder rights on syndicate concentration. As in our natural-experiment regressions, the other right-hand-side variables in the model in equation (4) are similar to those used by Sufi (2007).[8]

We report our findings in Table 9. In the first 3 columns, we use the G-Index as a measure of shareholder rights. Because the G-Index is a count measure of all provisions that *reduce* shareholder rights, a *higher* value of the G-Index for a firm implies a *lower* level of shareholder protection. The result reported in column 1 of Table 9 shows that the coefficient is −0.0031 and significant (at the 1% level) for the share of a loan retained by the lead bank. The top 25% of the firms with the strongest shareholder rights have a G-Index of 8 or lower, whereas the lowest 25% of shareholder-rights firms have a G-Index of 11 or greater. Thus, an increase of 3 in a firm's G-Index will move it from the top quartile to the bottom quartile. Based on the coefficient reported in column 1, holding all else constant, the share retained by the lead will decrease by almost 1% (3×-0.0031) if a firm moves from the top quartile to the bottom quartile of shareholder rights as measured by the G-Index. Because the average share retained by the lead bank is 20.1% in this sample, this implies an economically meaningful reduction of 5%.

The coefficient for the Herfindahl index of loan-syndicate concentration is also negative and significant at the 5% level (column 2), implying a decrease in syndicate concentration with the increasing G-Index. The economic effect of moving from the top quartile to the bottom quartile of the G-Index is approximately 4.14% of the

[8]Sufi (2007) includes a measure of past borrowing activity that we could not include in our natural-experiment regression because DealScan did not yet have enough data to create that variable. Following Sufi's methodology, for the tests in this section, we include OPAQUE (equals 1 for firms with S&P rating, and 0 otherwise) and ln(1 + NO_OF_PREVIOUS_LOANS), as well as the interaction of this variable with OPAQUE, in our regression model. We also estimate and include a relationship measure (Bharath et al. (2011)) that captures the strength of past interactions between the borrower and the lead lender in our specifications.

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TABLE 9

Effect of Shareholder Rights on Loan-Syndicate Structure

Table 9 provides the ordinary least squares (OLS) estimates (corrected for heteroscedasticity and clustering) of the following model:

$$(\text{SYNDICATE_STRUCTURE})_i = \alpha + (\text{SHAREHOLDER_RIGHTS})_i\lambda + \mathbf{X}_i\Gamma + \varepsilon_i.$$

We employ 3 dependent variables to proxy for the syndicate structure: %_HELD_BY_LEAD, HERFINDAHL, and NO_OF_LENDERS. %_HELD_BY_LEAD is the share of the loan retained by the lead bank at the time of loan origination, as reported by the Loan Pricing Corporation (LPC). If a loan has multiple lead banks, it is the average of shares reported for all the lead banks. HERFINDAHL is the sum of the squares of the loan shares retained by all the syndicate members. NO_OF_LENDERS is the total number of lenders in the syndicate. We employ 3 independent variables to measure corporate governance. G_INDEX measures shareholder rights. The G-Index is obtained from the Investor Responsibility Research Center Institute (IRRC) database and is constructed using the methodology described by Gompers et al. (2003). We also use 2 additional indicators to measure entrenched boards. CLASSIFIED_BOARD_COMBINED_WITH_PROHIBITIONS_ON_VOTING is a dummy variable that takes the value of 1 if the firm has a classified board and limited ability to act by written consent or a classified board and limited ability to call a special shareholder meeting, and 0 otherwise.

CLASSIFIED_BOARD_COMBINED_WITH_POISON_PILL_AND_BLANK_CHECK is a dummy variable that takes the value of 1 if the firm has classified-board, poison-pill, and blank-check provisions, and 0 otherwise. OPAQUE is a dummy variable that takes the value of 1 if the borrower has no Standard & Poor's (S&P) credit rating at the time of issuance, and 0 otherwise. RELATIONSHIP is a dummy variable that takes the value of 1 if one of the lead banks of the deal was a lead bank of the borrowing firm in the previous 5 years, and 0 otherwise. NO_OF_PREVIOUS_DEALS is the number of previous loans the borrower issued in the sample. ASSETS is the logarithm of the book value of assets (constant dollars). FACILITY_AMOUNT is the loan-facility amount (constant dollars). The entire sample is sorted based on the loan-facility amount and divided into 3 terciles. LARGE is a dummy variable that equals 1 if the loan amount falls in the top tercile, and 0 otherwise. MIDDLE equals 1 if the loan amount is in the middle tercile, and 0 otherwise. SMALL equals 1 if the loan amount is in the lowest tercile, and 0 otherwise. MATURITY is the length in months between the facility activation date and the maturity date. TERM_LOAN equals 1 if the loan type is a term loan, and 0 otherwise. All models include Fama–French industry fixed effects, year fixed effects, and loan-purpose indicators. Heteroscedastic robust *t*-statistics controlling for firm cluster effects are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3	4	5	6	7	8	9
G_INDEX	−0.0031***	−0.0022**	0.0077*						
	(−3.09)	(−2.33)	(1.75)						
CLASSIFIED_BOARD_COMBINED WITH_PROHIBITIONS_ON_VOTING				−0.0127**	−0.0118**	0.0496**			
				(−2.41)	(−2.46)	(2.11)			
CLASSIFIED_BOARD_COMBINED_WITH_POISON_PILL_AND_BLANK_CHECK							−0.0126**	−0.0091*	0.0243
							(−2.31)	(−1.85)	(1.02)
OPAQUE	0.0627***	0.0542***	−0.1681***	0.0629***	0.0544***	−0.1688***	0.0621***	0.0538***	−0.1670***
	(4.01)	(3.93)	(−3.13)	(4.00)	(3.93)	(−3.14)	(3.94)	(3.88)	(−3.10)
RELATIONSHIP	−0.0157**	−0.0147**	0.1078***	−0.0159**	−0.0150**	0.1090***	−0.0152**	−0.0143**	0.1065***
	(−2.22)	(−2.36)	(3.34)	(−2.25)	(−2.42)	(3.39)	(−2.14)	(−2.30)	(3.30)
OPAQUE × RELATIONSHIP	−0.0107	−0.0126	−0.0557	−0.0098	−0.0120	−0.0578	−0.0106	−0.0126	−0.0563
	(−0.84)	(−1.10)	(−1.13)	(−0.77)	(−1.05)	(−1.18)	(−0.83)	(−1.10)	(−1.14)
ln(1 + NO_OF_PREVIOUS_DEALS)	−0.0000	0.0015	0.0157	0.0005	0.0018	0.0144	0.0001	0.0016	0.0152
	(−0.01)	(0.33)	(0.70)	(0.09)	(0.40)	(0.64)	(0.01)	(0.34)	(0.67)
OPAQUE × ln(1 + NO_OF_PREVIOUS_DEALS)	−0.0281***	−0.0241***	0.0897***	−0.0280***	−0.0241***	0.0900***	−0.0271***	−0.0234***	0.0875***
	(−3.31)	(−3.09)	(2.83)	(−3.30)	(−3.10)	(2.85)	(−3.20)	(−3.01)	(2.76)

(continued on next page)

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TABLE 9 (continued)

Effect of Shareholder Rights on Loan-Syndicate Structure

	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3	4	5	6	7	8	9
ln(ASSETS)	−0.0191***	−0.0119***	0.0948***	−0.0190***	−0.0117***	0.0940***	−0.0197***	−0.0123***	0.0959***
	(−4.80)	(−3.15)	(5.34)	(−4.79)	(−3.14)	(5.40)	(−4.91)	(−3.24)	(5.39)
AMOUNT	−0.0788***	−0.0822***	0.2496***	−0.0786***	−0.0820***	0.2489***	−0.0781***	−0.0816***	0.2482***
	(−8.05)	(−8.63)	(7.96)	(−8.02)	(−8.63)	(7.98)	(−7.94)	(−8.55)	(7.90)
AMOUNT × MIDDLE	0.0164	0.0255**	0.1495***	0.0152	0.0247**	0.1522***	0.0148	0.0244*	0.1533***
	(1.18)	(2.02)	(3.00)	(1.10)	(1.97)	(3.08)	(1.06)	(1.93)	(3.10)
AMOUNT × LARGE	0.0716***	0.0697***	−0.0063	0.0712***	0.0693***	−0.0045	0.0712***	0.0694***	−0.0055
	(6.36)	(6.76)	(−0.15)	(6.32)	(6.73)	(−0.11)	(6.28)	(6.70)	(−0.13)
MATURITY	−0.0260***	−0.0241***	0.1284***	−0.0260***	−0.0241***	0.1284***	−0.0259***	−0.0240***	0.1282***
	(−6.21)	(−6.01)	(6.68)	(−6.22)	(−6.04)	(6.72)	(−6.14)	(−5.95)	(6.66)
TERM_LOAN	0.0268***	0.0144	0.1328***	0.0272***	0.0147	0.1320***	0.0272***	0.0146	0.1318***
	(2.61)	(1.52)	(3.86)	(2.66)	(1.55)	(3.83)	(2.65)	(1.55)	(3.83)
No. of obs.	3,223	3,223	3,223	3,223	3,223	3,223	3,223	3,223	3,223
R^2	0.428	0.429	0.585	0.427	0.429	0.585	0.426	0.429	0.584

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sample mean of the Herfindahl index. Finally, using ln(1 + NO_OF_LENDERS) yields a coefficient of 0.0077 (column 3), which is significant at the 10% level. This implies that higher levels of the G-Index are associated with larger syndicates, although the economic effect is rather small (0.1% of the sample mean). The other control variables yield plausible and consistent coefficients. For example, firm opacity has a large and significant impact (both statistically and economically) on syndicate structure. Opaque firms are associated with more concentrated syndicates, which is consistent with the need for greater monitoring of such firms. We also find that a borrower's good reputation, as proxied by the number of previous syndicated loans, helps reduce the need for higher syndicate concentration for the opaque firms because the interaction of OPAQUE and ln(1 + NO_OF_PREVIOUS_LOANS) is negative and significant. We also find that having a prior relationship with the lead bank also reduces the need for more concentrated syndicates.

To test for robustness, we use an alternative proxy for shareholder rights instead of the G-Index. Daines and Klausner (2001) discuss that some antitakeover provisions are enshrined in the charter and bylaws of a corporation. Having a classified (staggered) board is a highly effective antitakeover mechanism. This can be combined with other provisions, such as limiting the ability of shareholders to vote by written consent or adoption of a PP, to impose significant delays on a potential acquirer. We replace the G-Index in our empirical specification with dummy variables that capture the joint effect of a classified board in conjunction with other antitakeover measures. These results are reported in the final 6 columns of Table 9. First, we proxy the weak shareholder rights with the dummy variable CLASSIFIED_BOARD_WITH_PROHIBITIONS_ON_VOTING. This variable equals 1 if the borrower has a classified board *and* it limits the ability of shareholders to act by written consent. The results reported in columns 4–6 are similar to those reported for the G-Index (columns 1–3). For example, when we employ the share of the loan held by the lead as a proxy for syndicate structure, the coefficient for this shareholder-rights provision is −0.0127, which is significant at the 5% level. Thus, the lead lender to a borrower with a classified board and restriction on shareholder voting, on average, holds a share that is 1.27% lower than that for a similar borrower that does not have these provisions. Because the sample mean for the share held by the lead is 20.1%, this represents an economically significant effect. As a final robustness test, we create another proxy for shareholder rights. This variable equals 1 if the firm has a classified board and has adopted a PP. We find similar results (reported in columns 6–9) when we employ this alternative antitakeover proxy, although the statistical significance is weaker. These results provide additional support for our earlier findings from the natural experiment. With the results taken together, we conclude that there is a robust and significant relationship between loan-syndicate structure and the shareholder rights of the borrower: Greater shareholder rights are associated with a more concentrated syndicate.

To address potential endogeneity issues, in which an omitted variable may be driving both the level of shareholder rights and the syndicate structure, we also perform a change regression. If the omitted variable is firm specific and time invariant, using the *changes* in our economic variables rather than the *levels* should eliminate this bias. We need to take into account the fact that the G-Index changes infrequently for most firms. We follow an approach adopted by Chava et al. (2009)

and focus on only those borrowers that experience a change in the G-Index. Specifically, we estimate the following model:

$$(5)\quad \Delta(\text{SYNDICATE_STRUCTURE})_i = \alpha + \Delta(\text{G_INDEX})_i\lambda + \Delta(\text{ASSETS})_i\delta + \Delta(\text{AMOUNT})_i\gamma + \Delta(\text{MATURITY})_i\beta + \varepsilon_i.$$

Because some borrowers obtained multiple loans between subsequent IRRC publications, we retain the first loan facility obtained by the borrower during the period covered by the IRRC report. For these borrowers, we calculate the change in syndicate structure as well as changes in firm and loan characteristics. We are left with 280 observations once we impose this screen. Table 10 describes the results of our change regression. In columns 1–3, we use the difference in the G-Index (be it positive or negative) as the explanatory variable. We also include changes in the book assets of the borrower, loan amount, and maturity as control variables. Our dependent variable is the change in (Δ) syndicate structure. The coefficient for the ΔG_INDEX is −0.0149; thus, a 1-point increase in the G-Index score is associated with a 1.5% decline in the share of the loan held by the lead bank. The coefficient is significant at the 5% level. Using the changes in the Herfindahl index and the number of lenders provides similar results in that the decrease in shareholder rights (increasing G-Index) is strongly associated with a less concentrated syndicate structure (greater number of lenders and lower Herfindahl index). In columns 4–6, we focus on only those cases where the G-Index increases (i.e., the subsequent loans are made to a firm that has lowered its shareholder rights). We create a dummy variable, $\Delta\text{G_INDEX}^+$, that takes the value of 1 if ΔG_INDEX is greater than or equal to 1, and 0 otherwise. This delineates the cases of those borrowers where shareholder rights were unequivocally decreased as measured by the G-Index. The coefficient for $\Delta\text{G_INDEX}^+$ using the percentage held by the lead bank is −0.0394 and significant at the 5% level, and the economic effect is also much larger (for a unit increase in the G-Index, the lead retains 3.94% less than before, a 19.6% effect relative to the mean share of the lead bank). When we use the Herfindahl index or number of lenders as a measure of syndicate concentration, we obtain similar results. These results provide additional support for our earlier findings.

After the Russian debt crisis in 1998 (i.e., the period covered by our G-Index sample), arrangers adopted a strategy known as *market-flex language*, which allowed them to change the pricing of the loan based on investor demand (in some cases within a predetermined range), as well as shift amounts between various tranches of a loan, as a standard feature of loan-commitment letters, thus tailoring the loan to make it more attractive to potential subscribers. Because of these flex provisions, a loan syndication functions as a "book-building" exercise. A loan is originally launched to market at a target spread or with a range of spreads. Potential subscribers then will make commitments that in many cases are tiered by the spread. At the end of the process, the arranger will total up the commitments and then make a call on where to price, or "print," the paper. This has two important implications. First, the price of the loan and the composition of its syndicate are jointly determined. Second, what we potentially measure is the relation between the G-Index and the "quality" of the flex provisions affecting the syndication success because we do not control for flex provisions directly. We address these issues next.

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TABLE 10

Effect of Changes in Shareholder Rights on Syndicate Structure

Table 10 provides the ordinary least squares (OLS) estimates of the following model:

$$\Delta(\text{SYNDICATE_STRUCTURE})_i = \alpha + \Delta(\text{G_INDEX})_i\lambda + \Delta(\text{ASSETS})_i\gamma + \Delta(\text{AMOUNT})_i\delta + \Delta(\text{MATURITY})_i\beta + \varepsilon_i.$$

Δ indicates a change in the variable of interest. We employ 3 dependent variables to proxy for the syndicate structure, %_HELD_BY_LEAD, HERFINDAHL, and NO_OF_LENDERS. %_HELD_BY_LEAD is the share of the loan retained by the lead bank at the time of loan origination, as reported by the Loan Pricing Corporation (LPC). In the event that a loan has multiple lead banks, it is the average of the shares reported for all the lead banks. HERFINDAHL is the sum of the squares of the loan shares retained by all the syndicate members. NO_OF_LENDERS is the total number of lenders in the syndicate. G_INDEX measures shareholder rights. The G-Index is obtained from the Investor Responsibility Research Center Institute (IRRC) database and is constructed using the methodology described by Gompers et al. (2003). A higher G-Index indicates weaker shareholder rights. ASSETS is the book value of total assets in millions of dollars (as reported in the Compustat database) for the most recent fiscal year preceding the date of loan origination. FACILITY_AMOUNT is the dollar amount of the loan facility reported in constant year 2000 millions of dollars. MATURITY is the length in months between the facility activation date and the maturity date. In forming the sample, only one loan per firm and period covered by the shareholder-rights-index number is retained. We retain the first loan issued during the period covered by the shareholder-rights-index values. For instance, if shareholder-rights-index values apply to the years 1990–1993, we select the first deal of each firm in the period 1990–1993. All observations for which the shareholder-rights index remained constant are omitted. ΔG_INDEX is the change in the G-Index. ΔG_INDEX^{+} is a dummy variable that takes the value of 1 if $\Delta G_INDEX \geq +1$, and 0 otherwise. Heteroscedastic robust *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	ΔHELD_BY_LEAD	ΔHERFINDAHL	ΔNO_OF_ LENDERS	ΔHELD_BY_LEAD	ΔHERFINDAHL	ΔNO_OF_LENDERS
	1	2	3	4	5	6
ΔG_INDEX	−0.0149**	−0.0140**	0.6491**			
	(−2.29)	(−2.46)	(2.29)			
ΔG_INDEX^{+}				−0.0394**	−0.0421***	1.7553**
				(−2.38)	(−2.78)	(2.05)
ΔASSETS	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000
	(−1.54)	(−0.94)	(−0.43)	(−1.39)	(−0.89)	(−0.54)
ΔAMOUNT	−0.0001***	−0.0001***	0.0074***	−0.0001***	−0.0001***	0.0075***
	(−4.10)	(−4.00)	(5.20)	(−4.04)	(−3.99)	(5.19)
ΔMATURITY	−0.0000***	−0.0000***	0.0014**	−0.0000***	−0.0000***	0.0014**
	(−3.01)	(−2.79)	(2.37)	(−2.90)	(−2.75)	(2.26)
No. of obs.	280	280	280	280	280	280
R^2	0.091	0.092	0.204	0.087	0.092	0.201

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Based on the previous discussion, we note that the syndicate structure is determined jointly with the pricing of the loan. To address this issue, we follow the methodology of Denis, Nandy, and Sharpe (2000) and Bharath et al. (2011): We estimate a joint system of equations, one of which is the syndicate structure, and the other is the natural logarithm of the loan spread, using instrumental-variable (IV) methods. To uniquely identify the system, we need an instrument for the loan spread. We use the lagged average loan spread for all loans made to firms in the same industry (using the 12 Fama–French industry classifications) over the previous 6 months. The argument is that past market pricing (a proxy for market conditions) on other similar loans is an important consideration for bankers when determining the current market pricing of loans. Further, past loan rates are unlikely to affect the current loan's syndicate structure except possibly through the current loan rates, thus potentially satisfying the exclusion restriction. We note that this instrument has also been used by Bharath et al. (2011). We find that the G-Index continues to be strongly statistically significant even after accounting for the joint determination of loan spread and syndicate structure. We provide the details of this estimation in the Supplementary Material.

We identify the subset of loans in our sample that are most likely to be subject to flex pricing, and we classify these loans using the indicator variable FLEX_PRICING, which equals 1 for these loans, and 0 otherwise. We run a regression in which we include the flex-pricing indicator as a proxy for the flex-pricing features as an additional control variable. We find that our results on shareholder rights reported in Table 9 remain essentially unchanged (see the Supplementary Material for the identification of the flex-pricing loans in the sample and the results). We also find that flex pricing is an important factor in determining the syndicate structure as measured by the number of lenders. We find that the presence of flex pricing is associated with more lenders in the syndicate.

Finally, we check that our results are not driven by differences in syndication types, given that there are different types of loan syndication, including "best-efforts" syndication, "club deal," and others. The DealScan database has a field called "Distribution Method," which reports the method of syndication for each facility. The distribution of the syndication method for the entire database is as follows: syndication, 73.4%; sole lender, 5.7%; private placement, 4.9%; club deal, 3.2%; public underwriting, 2.1%; missing, 7.5%; and others, 3.2%. We tabulate the distribution method for the 3 syndication samples we use for analysis in this article: the event-time sample, the calendar-time sample, and the G-Index sample. For all 3 samples, we find that our sample-selection criteria (e.g., dropping sole lenders, requiring data to be available on loan shares, etc.) result in virtually all of our sample deals being the syndication type. Specifically, 99.1% of the event-time samples, 97.4% of the calendar-time samples, and 99.5% of the G-Index samples list syndication as the method of distribution. Thus, differences in syndication types are unlikely to affect our results.

1. Tests of Risk Shifting versus Recapitalization Using the G-Index

We next reexamine the two potential channels of risk shifting and borrower recapitalization via which the shareholder rights of a firm may influence its loan-syndicate structure. First, the need for more intense monitoring (resulting in a more

concentrated syndicate) can arise because the risk of asset substitution increases if a firm's high shareholder rights (e.g., low G-Index) align the interests of shareholders and managers. In such firms, managers are more likely to undertake investment strategies that seek to transfer wealth from the debt holders to the shareholders via risk shifting. Alternatively, stronger shareholder rights make a firm easier to acquire via an LBO. The resulting increase in leverage or "borrower recapitalization" should be a serious concern of lenders. On the other hand, if a borrower has low shareholder rights, its lenders do not need to monitor quite so intensively and may form less concentrated syndicates.

Jensen and Meckling (1976) describe the likely conflict between a firm's shareholders and its debt holders arising primarily via the risk-shifting incentives faced by the shareholders. Given the fixed amount of upside payment (face value of debt) for the debt holders, shareholders (or managers perfectly aligned with shareholders) can transfer wealth from debt holders by undertaking riskier projects that have low (or even negative) net present value (NPV) but have a small likelihood of delivering a large payoff. The incentive to risk-shift into such projects is especially strong for financially distressed firms.

Another way of characterizing this incentive is by viewing equity as a call option on the firm's assets, which explains why increasing risk is value enhancing for shareholders. These incentives are especially strong for firms that are closer to financial distress (Eisdorfer (2008)). The equity of such firms can be viewed as an out-of-the-money call option. This implies that a borrower with high shareholder rights *and* a high likelihood of default has the greatest incentive to risk-shift into wealth-transferring investments. In such a situation, potential syndicate members need greater assurance of close monitoring by the lead lender.[9] In such circumstances, syndicate structure, with its monitoring implication, can be related to the governance structure of the borrower via the risk-shifting channel.

We modify the general test specification of equation (4) to test the asset-substitution hypothesis. Because risk shifting is most relevant for financially distressed firms, we create a dummy variable, DISTRESSED, that equals 1 if the *Z*-score (based on Altman (1968)) of the borrower is less than 1.81, and 0 otherwise. We also include an interaction of this dummy variable with the G-Index. Thus, our general test specification of the model described in equation (4) is modified as follows:

$$(6)\quad (\text{SYNDICATE_STRUCTURE})_i = \alpha + (\text{G_INDEX})_i\lambda + (\text{DISTRESSED})_i\theta_1 + \left[(\text{G_INDEX})_i \times (\text{DISTRESSED})_i\right]\theta_2 + \mathbf{X}_i\beta + \varepsilon_i.$$

If syndicate structure is partly determined by the perception of risk shifting, we should expect syndicates to be significantly more concentrated when borrowers are distressed. However, the incentives to risk-shift will be lower if managers' incentives are not perfectly aligned with those of the shareholders. Thus, even if taking on riskier projects would be optimal for the shareholders, managers may choose not to

[9]Lenders frequently use restrictive covenants to protect themselves against such a situation. However, these covenants cannot provide complete protection and are costly to enforce without a high level of monitoring by the lenders.

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do so because it increases the likelihood of job loss for them if the risky project fails. Therefore, the incentive to risk-shift will be mitigated in low-shareholder-rights (high–G-Index) borrowers where managers are less aligned with the shareholders. In such firms, managers are more likely to avoid risky projects to preserve their jobs and to aim for low levels of cash-flow variability. We should therefore expect the coefficient (θ_2) of the interaction term G_INDEX × DISTRESSED to have a sign that is opposite the sign for θ_1 coefficient for DISTRESSED.

We report our results in columns 1–3 of Table 11. Again, we use the fraction of the loan retained by the lead (in column 1), the Herfindahl index of loan-share concentration (in column 2), and the number of lenders (in column 3) as our measures of syndicate structure. The results provide strong support for the risk-shifting hypothesis. Column 1 reports the estimation when we use the fraction held by the lead bank as a measure of syndicate concentration. We include the dummy variable for borrowers that have a high probability of default (DISTRESSED) and its interaction with the G-Index. The coefficient for DISTRESSED is 0.0870 and significant at the 1% level. This implies that holding all else constant, the syndicate lead bank holds an additional 8.7% of the loan if the borrower is distressed. More important, the coefficient (θ_2) for the interaction term, G_INDEX × DISTRESSED, is negative and significant at the 1% level. Thus, increasing the G-Index (i.e., lowering shareholder rights) significantly reduces the share retained by the lead bank *for a distressed borrower.* In other words, although a distressed borrower requires that its lead bank hold a significantly higher loan share, this requirement is mitigated if the borrower also happens to have *low shareholder rights.* As reported in column 2, using the Herfindahl index as a syndicate-structure proxy yields results that are of similar statistical and economic significance. When we use the number of lenders as the proxy for syndicate concentration (reported in column 3), we obtain similar results, albeit with a lower level of statistical significance. The G-Index is no longer significant in any of the specifications reported in columns 1–3. This coefficient should be interpreted as the marginal effect of shareholder rights for borrowers that are not distressed. Thus, the entire effect of corporate governance on syndicate structure appears to be limited to the distressed borrowers.[10] Overall, these results provide strong evidence that syndicate structure is influenced significantly by the shareholder rights in firms at a high risk of default. This finding supports the results we obtained for the natural-experiment estimation reported earlier. This finding is consistent with our conjecture that the potential for wealth transfer *via* risk shifting is a major concern for loan-syndicate members, and the observed syndicate structure is designed to reflect and mitigate this concern. However, as documented by Chava et al. (2009), there could be an additional explanation for how shareholder rights affect syndicate size, which we explore next.

The G-Index of a firm has been interpreted as a good measure of how easy it is to launch a takeover of that firm (Chava et al. (2009)). A lower G-Index indicates a smaller number of corporate-governance provisions that can be used to delay or

[10]We note that all the established results on syndicate structure continue to hold. For example, although more opaque firms require a significantly more concentrated syndicate, this effect is mitigated if the firm has borrowed repeatedly in the past. Historical lending relationships continue to be associated with lower levels of syndicate concentration.

TABLE 11

Risk Shifting Risk, Recapitalization, and Loan-Syndicate Structure

Table 11 provides the ordinary least squares (OLS) estimates of the following model:

$$(\text{SYNDICATE_STRUCTURE})_i = \alpha + (\text{G_INDEX})_i\lambda + (\text{VARIABLE})_i\theta_1 + \left[(\text{G_INDEX})_i \times (\text{VARIABLE})_i\right]\theta_2 + \mathbf{X}_i\Gamma + \varepsilon_i.$$

We employ 3 dependent variables to proxy for the syndicate structure, %_HELD_BY_LEAD, HERFINDAHL, and NO_OF_LENDERS. %_HELD_BY_LEAD is the share of the loan retained by the lead bank at the time of loan origination, as reported by the Loan Pricing Corporation (LPC). In the event that a loan has multiple lead banks, it is the average of the shares reported for all the lead banks. HERFINDAHL is the sum of the squares of the loan shares retained by all the syndicate members. NO_OF_LENDERS is the total number of lenders in the syndicate. G_INDEX measures shareholder rights. The G-Index is obtained from the Investor Responsibility Research Center Institute (IRRC) database and is constructed based on the methodology described by Gompers et al. (2003). A higher G-Index indicates weaker shareholder rights. VARIABLE is DISTRESSED in columns 1–3) and LOW_LEVERAGE in columns 4–6. DISTRESSED equals 1 if the Altman (1968) *Z*-score is less than 1.81, and 0 otherwise. LEVERAGE is the ratio of total debts (current and long term) to the book value of assets. We partition our sample based on LEVERAGE every year. LOW_LEVERAGE is a dummy variable that equals 1 if the borrower's leverage at the time of loan origination places it in the lowest quartile, and 0 otherwise. OPAQUE is a dummy variable that takes the value of 1 if the borrower has no Standard & Poor's (S&P) credit rating at the time of issuance. RELATIONSHIP is a dummy variable that takes the value of 1 if one of the lead banks of the deal was a lead bank of the borrowing firm in the previous 5 years, and 0 otherwise. NO_OF_PREVIOUS_DEALS is the number of previous loans the borrower issued in the sample. ASSETS is the book value of total assets in millions of dollars (as reported by Compustat) for the most recent fiscal year preceding the date of loan origination. FACILITY_AMOUNT is the dollar amount of the loan facility reported in constant year 2000 millions of dollars. The entire sample is sorted based on the loan-facility amount and divided into 3 terciles. LARGE is a dummy variable that equals 1 if the loan amount falls in the top tercile, and 0 otherwise. MIDDLE equals 1 if the loan amount is in the middle tercile, and 0 otherwise. SMALL equals 1 if the loan amount is in the lowest tercile, and 0 otherwise. MATURITY is the length in months between the facility activation date and the maturity date. TERM_LOAN equals 1 if the loan type is a term loan. All models include Fama–French industry fixed effects, year fixed effects, and loan-purpose indicators. Heteroscedastic robust *t*-statistics controlling for firm cluster effects are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3	4	5	6
G_INDEX	−0.0015	−0.0006	0.0033	−0.0031***	−0.0024**	0.0062
	(−1.30)	(−0.59)	(0.71)	(−2.60)	(−2.17)	(1.18)
G_INDEX × DISTRESSED	−0067***	−0.0062***	0.0185*			
	(−3.03)	(−2.75)	(1.71)			
DISTRESSED	0.0870***	0.0800***	−0.1471			
	(3.52)	(3.26)	(−1.50)			
G_INDEX × LOW_LEVERAGE_1/4				−0.0003	0.0008	0.0054
				(−0.13)	(0.41)	(0.63)
LOW_LEVERAGE_1/4				0.0031	−0.0071	−0.1218
				(0.15)	(−0.38)	(−1.52)
OPAQUE	0.0614***	0.0530***	−0.1637***	0.0625***	0.0542***	−0.1371**
	(3.98)	(3.91)	(−3.07)	(3.94)	(3.88)	(−2.53)
RELATIONSHIP	−0.0162**	−0.0152**	0.1105***	−0.0157**	−0.0147**	0.1070***
	(−2.29)	(−2.43)	(3.42)	(−2.22)	(−2.37)	(3.34)
OPAQUE × RELATIONSHIP	−0.0094	−0.0115	−0.0581	−0.0107	−0.0127	−0.0601
	(−0.74)	(−1.02)	(−1.19)	(−0.83)	(−1.10)	(−1.23)

(continued on next page)

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TABLE 11 (continued)

Risk Shifting Risk, Recapitalization, and Loan-Syndicate Structure

	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)	%_HELD_BY_LEAD	HERFINDAHL	ln(1 + NO_OF_LENDERS)
	1	2	3	4	5	6
ln(1 + NO_OF_PREVIOUS_DEALS)	−0.0010	0.0006	0.0152	−0.0000	0.0015	0.0136
	(−0.21)	(0.13)	(0.68)	(−0.01)	(0.32)	(0.61)
OPAQUE × ln(1 + NO_OF_PREVIOUS_DEALS)	−0.0275***	−0.0235***	0.0888***	−0.0281***	−0.0241***	0.0811***
	(−3.24)	(−3.03)	(2.84)	(−3.31)	(−3.10)	(2.59)
ln(ASSETS)	−0.0204***	−0.0130***	0.0937***	−0.0192***	−0.0118***	0.0941***
	(−5.10)	(−3.41)	(5.26)	(−4.80)	(−3.14)	(5.34)
AMOUNT	−0.0768***	−0.0803***	0.2493***	−0.0788***	−0.0822***	0.2519***
	(−7.97)	(−8.49)	(7.87)	(−8.05)	(−8.63)	(8.08)
AMOUNT × MIDDLE	0.0131	0.0224*	0.1528***	0.0165	0.0254**	0.1473***
	(0.95)	(1.79)	(3.06)	(1.18)	(2.01)	(2.97)
AMOUNT × LARGE	0.0710***	0.0691***	−0.0042	0.0716***	0.0698***	−0.0071
	(6.39)	(6.77)	(−0.10)	(6.35)	(6.75)	(−0.17)
MATURITY	−0.0265***	−0.0245***	0.1290***	−0.0260***	−0.0241***	0.1279***
	(−6.35)	(−6.16)	(6.74)	(−6.20)	(−6.01)	(6.65)
TERM_LOAN	0.0267***	0.0143	0.1328***	0.0269***	0.0143	0.1298***
	(2.62)	(1.53)	(3.88)	(2.63)	(1.52)	(3.80)
No. of obs.	3,223	3,223	3,223	3,223	3,223	3,223
R^2	0.432	0.434	0.586	0.428	0.429	0.586

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defeat a takeover bid that is not fancied by the managers, even if such a deal would be approved by the shareholders. Why should a firm's higher vulnerability to becoming a takeover target be a concern to that firm's lenders? Chava et al. argue that a takeover can increase the financial risk of the target firm if it is accompanied by a large increase in leverage. A number of previous articles (see, e.g., Warga and Welch (1993), Ghosh and Jain (2000), Cremers and Nair (2005)) have indeed shown that most takeovers lead to an increase in leverage for the targets. Thus, lenders face a "recapitalization risk" for a low-leverage borrower because it is a tempting target for an LBO.[11]

Given the almost-uniform increase in the debt levels of targets in the post-acquisition period, it is natural to assume that the lenders to a borrower with a high vulnerability to takeover should anticipate this potential future increase in risk. In fact, studies of bond markets (see Klock, Mansi, and Maxwell (2005), Cremers, Nair, and Wei (2007)) show that the bond yields demanded by borrowers with stronger shareholder rights are significantly higher than those demanded by similar borrowers with low shareholder rights. A concentrated loan syndicate provides a stronger incentive to monitor for a possible increase in financial risk.

Because the risk of an increase in debt levels matters most for firms with low leverage *and* high shareholder rights, it provides us with an empirical strategy to test if this risk is a significant driver of syndicate structure. We sort all our borrowers based on the reported leverage at the time of the loan origination and partition them into quartiles based on leverage. We define LOW_LEVERAGE as a dummy variable that equals 1 if the borrower is in the lowest quartile as ranked by leverage, and 0 otherwise. We also include the G_INDEX and the interaction term G_INDEX $\times$ LOW_LEVERAGE. To test this, we devise an empirical strategy similar to the one we used for testing the risk-shifting hypothesis. Our general test specification of model 4 is modified as follows:

$$\begin{aligned}(7)\quad (\text{SYNDICATE_STRUCTURE})_i = {} & \alpha + (\text{G_INDEX})_i\lambda \\ & + (\text{LOW_LEVERAGE})_i\delta_1 \\ & + \left[(\text{G_INDEX})_i \times (\text{LOW_LEVERAGE})_i\right]\delta_2 \\ & + \mathbf{X}_i\beta + \varepsilon_i.\end{aligned}$$

The coefficients δ_1 and δ_2 provide estimates of the effect of recapitalization risk on syndicate structure. If shareholder rights affect the syndicate structure because of a higher risk of an increase in leverage, we should expect δ_1 to be significant, implying that firms with the potential for a future increase in leverage are associated with a more concentrated syndicate. Because we are interested in how shareholder rights influence syndicate structure, δ_2 estimates the impact of decreasing shareholder rights for the firms with the largest potential for a leverage increase (the lowest leverage quartile). We should expect δ_2 to be opposite the sign for δ_1 because the need for a more concentrated syndicate would decline as the G-Index increases (takeover risk decreases).

[11]Chava et al. (2009) find a 25% increase in the loan rate for these types of firms (compared with firms with low shareholder rights that cannot be acquired easily but have low leverage) and interpret it as supporting the recapitalization risk channel.

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The results reported in columns 4–6 of Table 11 fail to provide significant support for the "borrower-recapitalization" hypothesis. In column 4, we use the fraction of the loan held by the lead as our dependent variable. We also include the dummy variable for the lowest leverage quartile and the interaction term (G_INDEX × LOW_LEVERAGE). The coefficient for the G_INDEX is negative (−0.0031) and significant (t-value of −2.60), implying that lower shareholder rights (higher G-Index) continue to be associated with a lower loan fraction being retained by the lead bank (i.e., the loan syndicate is less concentrated). Interestingly, neither the coefficient for low leverage (estimate of δ_1) nor the coefficient on the interaction term (estimate of δ_2) is significant. Thus, the borrower's leverage at the time of the loan origination appears to provide little explanatory power for the cross-sectional variation in the percentage of the loan retained by the lead bank. In column 5, we employ the Herfindahl index as the measure of syndicate structure and find similar results. Although the G-Index continues to be highly significant, the leverage level at the time of origin is not related to the syndicate structure in any significant way; both the coefficient estimates for LOW_LEVERAGE (δ_1) and its interaction term with the G_INDEX (δ_2) are statistically indistinguishable from 0. Column 6 reports the estimates from a similar regression using the number of lenders as a proxy for syndicate structure. Once again, there is no evidence that low leverage is associated with syndicate-structure design. Thus, the risk of borrower recapitalization after being acquired does not appear to be a significant factor influencing the syndicate structure. Although Chava et al. (2009) show that recapitalization risk drives new loan rates, our results suggest that the threat of risk-shifting also plays a role and affects the design of syndicate structure for these new loans. These findings are consistent with the natural-experiment results.

V. Conclusion

In this article, we investigate how the corporate-governance structure of a borrower is related to the syndicate structure of its lenders. We show that changes in a borrower's corporate-governance structure play an economically and statistically significant role in causally affecting the loan-syndicate structure. These results are robust to alternative econometric methodologies and a number of concerns related to the legal and institutional aspects of the passage of antitakeover laws. Our results have important implications for theories that relate creditor control and security design to corporate governance in firms. To date, theories and empirical evidence have studied how creditor control and security design can affect corporate governance. Our results show that changes in the corporate-governance environment also causally affect the incentives for creditor control and security design. We hope our results will spur efforts to develop a richer theory of the 2-way interaction between creditor control, security design, and corporate governance in firms.

Appendix A. Calendar- and Event-Time Samples

Appendix A describes the way we constructed the 2 samples of syndicated facilities for our analysis. Except as mentioned otherwise, the three antitakeover laws are BC, FP, and CS acquisition.

A.1. Calendar-Time Sample

The calendar-time sample includes all syndicated facilities in the period 1986–1991 with relevant information. The variable AFTER_ATS takes the value OF 1 if the facility was contracted any time after the year THAT the first of the 3 antitakeover laws was passed in the state in which the borrower is incorporated.

A.2. Event-Time Sample

The event-time sample is constructed in 3 steps:

1. We retain all syndicated facilities and remove those with insufficient information for the analysis.
2. For each (*treated*) state that passed an antitakeover law (BC, FP, CS acquisition), we set the year of the first passage of a law as 0. We then define BEFORE, the time window that covers relative years [−3, 0], and AFTER, the time window that covers relative years [+1, +3]. For a firm that is incorporated in a treated state to be selected, we ensure that for all of its syndicated facilities, the sample includes at least one syndicated facility that is issued *before* the passage of the law and one syndicated facility that is issued *after* the passage of the law. We retain all syndicated facilities of the selected firms issued in the time window [−3, +3] around year 0 of the passage of the law.
3. We select all facilities issued by firms incorporated in nontreated states and issued in calendar years for which the sample includes treated states' facilities.

The dummy variable AFTER_ATS takes the value of 1 if the facility was contracted in the time window [+1, +3] around year 0 of the passage of the law, and 0 otherwise.

Appendix B. Main Variables

Appendix B provides the definitions and construction methodologies of the main variables.

Syndicate Structure (LPC DealScan)

%_HELD_BY_LEAD: Share of the facility retained by the lead bank. In DealScan, the lead bank is the *lead-arranger*; we alternatively use the item *lead-role* if lead-arranger is missing. Whenever DealScan reports multiple lead banks, we use the average share held by the lead banks.

HERFINDAHL: Herfindahl–Hirschman concentration index of the syndicate. It equals the sum of the squares of each syndicate member's share. The Herfindahl index can range from nearly 0 (dispersed) to almost 10,000 (concentrated).

NO_OF_LENDERS: Number of lending participants in the syndicate.

Loan Characteristics (LPC DealScan)

AFTER_ATS: Dummy variable that takes the value of 1 if the facility is issued after the passage of the antitakeover law, and 0 otherwise.

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FACILITY_AMOUNT: Logarithm of the size of the facility in millions of U.S. dollars (adjusted to constant 2000 USD). Consistent with Sufi (2007), we construct 3 size-category variables. The entire sample is sorted based on the loan-facility amount and divided into 3 terciles. LARGE is a dummy variable that equals 1 if the facility amount falls in the top tercile, and 0 otherwise. MIDDLE equals 1 if the facility amount is in the middle tercile, and 0 otherwise. SMALL equals 1 if the facility amount is in the lowest tercile, and 0 otherwise.

MATURITY: Logarithm of the length in months between the facility activation date and the maturity date.

OPAQUE: Dummy variable that takes the value of 1 if the firm has no S&P credit rating at the time of issuance, and 0 otherwise.

TERM_LOAN: Dummy variable that takes the value of 1 if the facility is a term loan, and 0 otherwise.

Firm Characteristics (Compustat)

ASSETS: Logarithm of the book value of assets (at) in millions of U.S. dollars (adjusted to constant 2000 USD).

DISTRESSED: Dummy variable that takes the value of 1 if the firm's Altman (1968) *Z*-score is less than 1.81. *Z*-score = (1.2 × working capital (wcap) + 1.4 × retained earnings (re) + 3.3 × pretax income (pi) + 0.999 × sales (sale))/assets (at) + 0.6 × (market value of equity (csho × prcc_f) + preferred stocks (pstkl) (if available))/total liabilities (lt).

LEVERAGE: Equal to (current debt (dlc) + long-term debt (dltt))/assets(at).

Supplementary Material

To view supplementary material for this article, please visit http://dx.doi.org/10.1017/S0022109020000745.

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