The Choice of Corporate Liquidity and Corporate Governance

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In this paper, I study how corporate governance influences firms' choices between cash and lines of credit. Stakeholders may disagree about firms' liquidity choices because they differ in the allocation of ex-post control rights for the firms' liquidity reserves. Using state-level changes in takeover protection as exogenous shocks to corporate governance, I find that firms increase cash relative to lines of credit when the threat of takeover weakens. Consistent with the theory, this tendency is weaker for firms with good internal governance. Overall, my findings suggest the choice of corporate liquidity is a channel through which corporate governance works. (*JEL* G32, G34)

According to a Federal Reserve statistical release, nearly 80% of all commercial and industrial loans are made under commitment contracts from banks. Along with cash holdings, lines of credit (also referred as credit lines or loan commitments) constitute the primary means to meet firms' liquidity needs.[1] Despite such prevalent use, stakeholders often disagree about which alternative to use to secure firms' liquidity needs. For example, when Kirk Kerkorian attempted a takeover of Chrysler Corporation, he proposed increasing shareholder value by returning most of Chrysler's $7.5 billion in cash to shareholders. In doing so, he argued that Chrysler's remaining $2.5 billion in cash and $2.5 billion in bank lines of credit would provide sufficient liquidity (*The Washington Post*, 1995). Chrysler's management, however, insisted on keeping the $7.5 billion cash reserve because they considered drawing on $2.5 billion lines of credit during a financial crisis unrealistic (*The New York Times*, 1995). Although this takeover

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[1] Outstanding unused lines of credit of U.S. corporations are $1.7 trillion (as of December 31, 2004, www2.fdic.gov/SDI). Aggregate corporate cash holdings for public firms are $1.67 trillion (sum of item 1 for all firms in Compustat).

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attempt did not succeed, Chrysler, pressured by this incident, increased its level of lines of credit and lowered its cash reserves by raising dividends.

This example suggests that management and shareholders may have conflicting preferences between cash and lines of credit, and the resulting composition is likely to be influenced by corporate governance. This paper tests whether corporate governance influences managerial decisions by examining firms' choices between cash and lines of credit, which differ primarily in the discretion afforded to management. Cash gives managers more discretion and operational flexibility, but also exposes the firm to managerial opportunism. On the other hand, lines of credit limit managerial discretion through monitoring and covenants, but the firm also incurs banking costs (e.g., transaction costs, holdup by the bank, and excessive creditor activism). In a firm with strong internal governance (e.g., independent board and shareholder activism), shareholders need not worry too much about ex-post misuses of the cash retained as a liquidity reserve to efficiently oversee a firm's operation and prevent opportunistic actions. However, in a firm with weak internal governance, shareholders anticipate management's misuse of cash and therefore want to limit management's discretion by reducing cash and substituting lines of credit, which are monitored by banks and are subject to covenants. When a manager of such a firm decides to keep too much cash and too few lines of credit, shareholders may prefer costly actions to discipline (or replace) the manager. As a result, a manager of such a firm will choose the optimal mix of cash and lines of credit to balance private benefits provided by the discretion of cash against the fewer control challenges provided by increased oversight of lines of credit. This logic suggests that a firm should consider lines of credit as part of its overall cash holding strategy, yet it is rare to find empirical research on corporate liquidity based on firm-level data that considers both cash and lines of credit.[2]

I use the passage of antitakeover legislation as a natural experiment to infer firms' preferences on liquidity choices. This differences-in-differences approach accounts for the endogenous nature of firms' liquidity choices and corporate governance; a firm's state of corporate governance may covary with unobserved heterogeneity such as a firm's unobservable investment opportunities. Hence, comparing liquidity choices between firms with good and bad corporate governance may capture the effect of this unobserved heterogeneity rather than the effect of corporate governance. Recent state-level adoption of antitakeover legislation increased the difficulty of successful takeovers, while weakening managerial discipline by removing or reducing the threat of takeover. Therefore, we would expect firms to increase the fraction of cash, because managers could maintain the prior level of control with an even larger fraction of cash in firms' liquidity reserves.

[2] A notable exception is Sufi (2008), where he examines factors that determine the use of cash and lines of credit in corporate liquidity management.

Using a unique dataset of unused lines of credit for 212 manufacturing firms in the United States (SIC Codes 2000–3999) collected from 10-K SEC filings from 1987 to 2000, I find that state-level changes in takeover protection are associated with changes in the use of lines of credit relative to cash for firms incorporated in those states. This finding is supported by several changes in takeover laws, including the mid-1990s validation of the poison pill by Delaware (Subramanian, 2004), and the adoption of the second-generation antitakeover laws (Romano, 1987). For example, firms incorporated in Delaware reduced their level of unused lines of credit relative to cash by 19% after Delaware allowed the use of the poison pill in conjunction with a staggered board. Furthermore, this preference for cash relative to lines of credit is stronger for firms without large shareholders or institutional investors. These findings are robust to various measures of corporate governance, to various controls to account for the heterogeneity in borrower's financial characteristics, and to alternative hypotheses such as supply effects from lenders. Evidence from the antitakeover legislation is broadly consistent with the optimizing behavior of managers trading off empire-building ambitions with the need to operate efficiently enough to avoid control challenges.

In addition, this paper also examines the effect of state-level changes in takeover protection on firms' governance structures and capital structures. I find no significant changes in ownership by large blockholders or institutional investors after the legal change. Also, I find no evidence that firms adjust their leverage due to changes in takeover threats after Delaware's legal change. However, I find both cash holdings divided by noncash assets and unused lines of credit divided by noncash assets change significantly after changes in takeover protection, which suggests that both cash and lines of credit are important in corporate liquidity management policies.

Research presented here is related to the large literature on the relationship between cash holdings and corporate governance (e.g., Opler et al., 1999; Dittmar, Mahrt-Smith, and Servaes, 2003; Pinkowitz, Stulz, and Williamson, 2006; Dittmar and Mahrt-Smith, 2007; and Harford, Mansi, and Maxwell, 2008). I extend these previous studies by incorporating lines of credit in the analysis. Previous research documents that lines of credit are crucial sources of liquidity for firms, and that firms consider both lines of credit and cash holdings when implementing their optimal liquidity policy. My findings suggest that exogenous removal of takeover threats leads poorly governed firms to shift from lines of credit to cash, which highlights the importance of considering *both* lines of credit and cash when examining governance structures.

From a broad perspective, results of this paper complement the growing literature relating corporate governance to firm value (e.g., Gompers, Ishii, and Metrick, 2003). An underlying idea of this literature is that governance affects value, and this paper contributes to the literature by identifying a specific channel through which corporate governance works. Since the composition of a firm's liquidity reserve reflects managerial discretion, any changes caused by

corporate governance shocks provide insight into how corporate governance influences managerial discretion. For example, firms with poor internal governance may exploit the opportunity provided by the introduction of antitakeover laws, which weakened managerial discipline and increased discretion, by holding more cash relative to lines of credit. Conversely, firms with good internal governance typically have constraints on managerial opportunism, which limit the increase in cash relative to lines of credit.

Section 1 provides motivation for the empirical section of this paper. Section 2 includes the description of the dataset used for this study and provides summary statistics of the variables. Section 3 presents evidence on the liquidity choices of firms that are associated with the antitakeover laws. Section 4 provides concluding remarks.

1. Cash, Lines of Credit, and Corporate Liquidity Management

1.1 Existing research

Studies such as Blanchard, Lopez-de-Silanes, and Shleifer (1994); Kim, Mauer, and Sherman (1998); Opler et al. (1999); Himmelberg, Love, and Sarria-Allende (2003); Almeida, Campello, and Weisbach (2004); and Faulkender and Wang (2006) show that firms use cash reserves as buffers to shield themselves against future liquidity shocks.[3] The cash literature finds that cash is very important as a means of liquidity insurance when capital markets are imperfect due to various sources of frictions such as asymmetric information and transaction costs. For example, Almeida et al. (2004) find that financially constrained firms, who are likely to have limited access to external capital markets, save more cash out of their cash flow. Opler et al. (1999) find that large firms and firms with credit ratings, who have good access to external capital market, hold less cash than those who have poor access to external capital market.

As Boot, Thakor, and Udell (1987); Martin and Santomero (1997); and Holmstrom and Tirole (1998) emphasize, banks can mitigate problems associated with insufficient provision of liquidity insurance from imperfect capital markets by selling promises of future lending (i.e., lines of credit). Furthermore, lines of credit can give borrowers cost advantages over holding cash, as Kashyap, Rajan, and Stein (2002) and Gatev and Strahan (2006) show, and mitigate the agency problem by self-interested management as Boot, Thakor, and Udell (1987) and Holmstrom and Tirole (1998) show. Melnik and Plaut (1986) and Shockley and Thakor (1997) provide empirical support on the use of lines of credit as a means of liquidity insurance and show how loan prices are determined from a contract design viewpoint.

In a recent study, Sufi (2008) shows how firms jointly use cash and lines of credit to manage liquidity risk. He finds that firms may rely on cash instead

[3] Studies on other possible motivations for corporate cash holdings include Foley et al. (2007), who provide a tax-based explanation.

of lines of credit due to the high cash-flow level requirement imposed by the covenants of lines of credit. His data reveal that, in such situations, cash flow becomes an important determinant of a firm's choice between cash and lines of credit.

This paper investigates a firm's tradeoff between cash and lines of credit from a corporate governance perspective. While cash can provide an operational flexibility to a manager, it can also make the firm vulnerable to managerial opportunism such as overinvestment (e.g., Jensen, 1986; and Myers and Rajan, 1998). Conversely, while lines of credit can limit such misuse of cash through covenants and monitoring, they can also impose costs on firms due to excessive creditor activism or holdup problems by loaning banks, as Rajan (1992) shows. In equilibrium, a firm should trade off costs and benefits of these two alternatives, which is likely to be influenced by corporate governance.

1.2 Theoretical motivation

This paper builds on the premise that firms use cash and lines of credit to meet their liquidity needs. I focus on the choice between cash and lines of credit, which mainly differ in control rights over the use of funds. Cash gives managers more discretion by allowing the use of funds without shareholders' preapproval. Conversely, lines of credit limit discretion by allowing managers to draw funds only when their firms are in compliance with prespecified covenants.

The importance of proper allocation of control rights has been widely advocated in the financial contracting literature. Grossman and Hart (1986) and Hart and Moore (1995) show that when contracts are incomplete, the allocation of control rights affects *ex-ante* incentives to provide efforts because it influences the distribution of ex-post surplus. Subsequent work by Aghion and Bolton (1992) extends the allocation of control rights in financial contracting decisions of a wealth-constrained agent. They show that a contingent-control allocation, which can be interpreted as a debt contract, is a feasible equilibrium allocation. In general, this literature suggests that proper allocation of control rights is essential in attaining economic efficiency when a firm faces an incomplete contracting environment.

In this paper, the contractual incompleteness comes from investment opportunities to use the funds of liquidity reserves. In reality, investment decisions are often not clear-cut cases. For example, a firm's decision to purchase a corporate jet may be driven by executives' selfish private rent-seeking motives, as Yermack (2006) details, or may be an outcome of value-enhancing perks to let their executives arrive fresh to crucial negotiations, as Rajan and Wulf (2006) suggest. To reflect this reality, I assume that ex-post investment decisions to use funds in liquidity reserves are not verifiable to third parties.

In the presence of agency conflicts within a firm (e.g., Jensen and Meckling, 1976), managers and shareholders may disagree about firms' liquidity choices between cash and lines of credit because the differences in control rights of these two types of contracts may distort the distribution of ex-post surplus

among stakeholders of a firm. For example, a manager with empire-building preferences, as Baumol (1959) and Williamson (1964) describe, will have an investment bias. Managers with an access to cash have full discretion on the use of liquidity reserves, and thus may invest in negative net present value (NPV) projects that harm shareholders' wealth. On the other hand, lines of credit grant the manager conditional control rights based on covenants. According to Berlin and Mester (1992), these covenants generate verifiable signals that can be contracted upon. By making investment decisions contingent on these covenants, shareholders can limit a manager's welfare-destroying overinvestment activities.

In order to assess the influence of corporate governance on firms' choices between cash and lines of credit, I rely on the work of Zwiebel (1996). In a three-period model, he considers managers' leverage decisions in the presence of takeover threats. High leverage removes free cash flow, and prevents managers from investing in bad (negative NPV) projects to pursue their own empire-building ambitions. Low leverage not only increases the free cash flow at managers' disposal, but also increases the chances of control challenges by raiders. Replacing low leverage with cash holdings and high leverage with lines of credit in Zwiebel's model reveals that managers will choose an optimal mix of cash and lines of credit to balance private benefits provided by cash against the prospect of fewer control challenges provided by lines of credit. That is, managers will try to hold as much cash as possible as long as they can avoid takeovers.[4]

Based on the above discussion, I expect that firms will increase their fraction of cash relative to lines of credit when the threat of takeovers weakens, because managers can keep their prior level of control with a larger fraction of cash. Also, such a tendency toward cash is expected to be weaker for firms with strong internal governance (firms' self-policing ability, such as a well-functioning board), since the private benefit gains from increased discretion are smaller for these highly self-policed firms.[5] In the following sections, I use legal changes in takeover laws as exogenous shocks to external governance and test these predictions.

2. Data and Summary Statistics

2.1 Construction of the sample

Lines of credits are banks' promises for future lending sold to borrowers. Once a borrower draws funds from lines of credit, this used portion of the line of

[4] These predictions can be derived from a formal model, which is available upon request.

[5] Suppose a firm with perfect internal governance, where bad (e.g., negative NPV) projects are always prohibited. There is no downside of holding cash, and it is optimal from the shareholder's point of view to hold all cash. So, even when the takeover threat weakens, firms will not change their liquidity composition. But in firms with imperfect internal governance, the binding constraint for liquidity composition is the threat of takeover. Hence, a shock in external governance matters more for firms with weak internal governance.

credit becomes a debt obligation, which is formally recorded in a firm's balance sheet. The remaining unused portion of the line of credit stays available for future lending unless covenants of the line of credit are violated, and the unused portion remains as an off-balance-sheet item. In this paper, I focus on the unused portion of firms' lines of credit because it provides a liquidity buffer and can substitute for cash-holding demands by firms.

According to Kaplan and Zingales (1997), firms document their lines of credit in the annual 10-K SEC filings to comply with the Regulation S-K, which requires firms to disclose their liquidity and capital resources. This paper uses information on firms' liquidity and capital resources disclosed in 10-K SEC filings.

Due to the high cost of manually collecting unused lines of credit data from 10-K filings, I mainly focus on manufacturing firms (SIC Codes 2000–3999) in the United States that appear in all years available in the Investor Responsibility Research Center (IRRC) database until 2000: 1990, 1993, 1995, 1998, and 2000. I focus on manufacturing firms because the majority of lines of credit are issued to manufacturing firms.[6] The IRRC database was chosen because corporate governance characteristics are well documented for these firms. I searched LexisNexis for these firms' 10-K filings until 1995, and searched Edgar thereafter. LexisNexis was used for the earlier periods because the SEC mandated electronic filings only after 1996. The collected documents were then parsed through a program to search for keywords related to lines of credit. Sufi (2008) recommends seven terms: credit lines, credit facility, revolving credit agreement, bank credit line, working capital facility, lines of credit, and line of credit. Whenever one of the above keywords is encountered, the program retrieves 200 characters before and after each keyword. I read the retrieved information and identified the unused portion of the firm's line of credit. Similarly, I retrieved every paragraph that contains keywords for commercial papers: commercial paper and commercial papers. The outstanding amount of commercial paper is recorded for each firm in each year. Following Sufi (2008), if a portion of the unused lines of credit was used to back up commercial papers, I subtracted the outstanding amount of commercial paper from the unused amount of the line of credit to determine the actual unused amount.

This panel of lines of credit data was then matched with Compustat to obtain borrowers' financial characteristics. For an observation to be valid, I required the total asset (item 6) to be positive. The resulting sample consisted of 2,533 observations for 212 firms from 1987 to 2000, where 1,606 observations have

[6] Based on estimates from Dealscan (a corporate loan database from Loan Pricing Corporation), 40% of the lines of credit were issued to manufacturing firms from 1987 to 2002. During this period, 0.4% were issued to agriculture, forestry, and fishing firms (SIC Codes 100–999); 6% were issued to mining and construction firms (SIC Codes 1000–1999); 13.7% were issued to transportation, communications, electric, gas, and sanitary services firms (SIC Codes 4000–4999); 12.8% were issued to wholesale and retail trade firms (SIC Codes 5000–5999); 12.6% were issued to finance, insurance, and real estate firms (SIC Codes 6000–6999); 14% were issued to services firms (SIC Codes 7000–8999); and 0.5% were issued to public administration firms (SIC Codes 9000–9999).

lines of credit data available in their 10-K filings, and 927 observations have a 10-K available, but have no information on lines of credit. I focus on the 1987–2000 period because 10-K filings are available from LexisNexis starting in 1987, and the main event for the natural experiment of this paper (i.e., Delaware's validation of poison pills in conjunction with a staggered board) occurred during 1995–1996, and therefore, data prior to 1995 are needed to compare firms' behavior before and after the legal change in takeover laws. I end my study period at 2000 to avoid an excessively long postevent duration, which might interfere with other macroeconomic events, such as the burst of the dot-com bubble in 2001.

During the manual keyword inspection process, I encountered several instances where 10-K filings referred to a prior year's lines of credit, but my program did not retrieve any paragraphs of lines of credit in those years. I suspect two main explanations for this outcome. First, the list of keywords is incomplete and firms do change the way they record their lines of credit. Second, perhaps firms deliberately skipped mentioning their lines of credit because they are already mentioned in other sources, such as supplementary documents to 10-K filings. In order to account for the incomplete data, I corrected for sample selection bias using a standard procedure, as Greene (2002) describes.[7]

2.2 Description of the data

The main variable of interest for this study is the bank liquidity to total liquidity ratio, which is measured by the fraction of unused lines of credit among firms' total liquidity demand (sum of cash, item 1, and unused lines of credit). This quantity addresses firms' relative preference of lines of credit relative to cash in their liquidity management.

To account for the heterogeneity of borrowers' financial characteristics that may influence firms' tradeoff between cash and lines of credit, I control for the following eight variables: firm size, leverage, market-to-book asset ratio, cash flow, property plant and equipment, industry sales volatility, net worth, and dummies for Standard & Poor's (S&P) debt rating. Firm size is measured by the natural log of noncash total assets (item 6 − item 1). Leverage is measured by book debt (item 9 + item 34) divided by the total asset (item 6). The market-to-book asset ratio, (item 6 + item 199 times item 25 − item 60) divided by item 6, captures firms' growth prospects. Cash flow (item 18 + item 14 − item 9 − item 21) measures firms' profitability. Property plant and equipment (item 8) measures firms' asset tangibility. To measure business variability, I follow Sufi (2008) and use the within-year standard deviation for sales (item 12) for all firms in Compustat in the given firm's 3-digit SIC Code industry, which is scaled by its cross-sectional mean. Prior studies such as Faulkender and Petersen (2006) and Sufi (2007) suggest that the degree of

[7] I ran a probit regression for an indicator variable, which is 1 if information on unused lines of credit is available and 0 if otherwise. From this probit regression, I obtained the inverse Mill's ratio and incorporated it in the main regression as a control variable.

information asymmetry is important in bank lending. I use dummy variables for the availability of the debt rating (S&P senior debt rating) as a measure for a firm's level of information asymmetry. Finally, net worth is measured by non-cash assets (item 6 − item 1) less total liabilities (item 181). Among these financial variables, cash flow, property plant and equipment, and net worth are divided by noncash assets.

In addition to the financial variables, I use the ownership of 5% blockholders and institutional investors from Compact disclosure's 13F filing data and dual-class share data from the IRRC database. The choice of these variables as measures for internal governance is motivated by existing theories. Coffee (1991) notes that institutional investors, such as pension funds, actively monitor firms. Shleifer and Vishny (1986) show that large shareholders are likely to monitor firms, because they can internalize the gains from costly monitoring. Also, Gillan and Starks (2000) provide empirical evidence for active monitoring roles by institutional investors. Since the IRRC database covers governance data for 1990, 1993, 1995, 1998, and 2000, I filled in governance characteristics for the years not covered by the IRRC database by taking the data from the nearest prior year.

2.3 Summary statistics

Table 1 shows median, mean, and standard deviation of the variables used in this paper. The first set of columns show the summary statistics for observations with lines of credit, the second set of columns show the summary statistics for observations without lines of credit, and the last set of columns show the difference in means and *t*-statistics between these two samples.

As mentioned in Section 2.1, I focus on Compustat firms in the manufacturing industry that are in the IRRC data and exist for all years from 1987 to 2000. In another study on lines of credit using 10-K data, Sufi (2008) uses a less restrictive random sample of all Compustat firms. Results from Table 1 show that the firms considered in this paper are much larger (mean noncash assets of $6350.5 million versus $1608 million) and have higher cash flows (mean cash flow to noncash asset ratio of 0.101 versus 0.026) than those considered in Sufi (2008). The differences in firm characteristics between these two samples may have a significant impact on firms' access to lines of credit. According to Sufi (2008), maintaining high cash flows is crucial in accessing lines of credit. His study also contains evidence that large firms are more likely to use lines of credit. Hence, I expect the firms in my sample (which, on average, have higher cash flows and are larger) to have better access to lines of credit than those used in his study. Consistent with this prediction, the ratio of unused lines of credit to total liquidity demand (i.e., the sum of cash and unused lines of credit) is much higher in this sample (mean unused lines to total liquidity demand of 0.668 versus 0.45) than in the sample Sufi (2008) uses. Also, all firms considered in this paper receive more than one line of credit during the sample period. In contrast, 15% of the firms Sufi (2008) considers never receive any lines of

Table 1
Summary statistics

	Observations with lines of credit			Observations without lines of credit			Lines versus no-lines sample	
	Median	Mean	Standard deviation	Median	Mean	Standard deviation	Difference	*t*-stat
Liquidity characteristics								
Undrawn lines/total liquidity	0.757	0.668	0.287	0	0	0	0.668	21.339***
Undrawn lines/noncash assets	0.126	0.159	0.136	0	0	0	0.159	35.548***
Cash/noncash assets	0.035	0.092	0.156	0.077	0.192	0.443	−0.998	−8.208***
Borrower characteristics								
Noncash assets (million dollars)	1, 544	6, 350.5	25, 118	826.66	2, 930.2	5, 471.5	3, 420.3	4.09***
Leverage	0.233	0.240	0.136	0.181	0.181	0.123	0.058	10.834***
Market-to-book	1.557	1.960	1.298	1.548	1.921	1.046	0.039	0.781
Cash flow/noncash assets	0.093	0.101	0.080	0.107	0.116	0.077	−0.015	−4.478***
PPE/noncash assets	0.315	0.348	0.166	0.350	0.364	0.161	−0.016	−2.354**
Industry sales volatility	4.107	4.085	0.555	4.139	4.118	0.485	−0.034	−1.538
Net worth/noncash assets	0.400	0.404	0.171	0.475	0.480	0.185	−0.076	−10.392***
Dummy for S&P senior debt rating	1	0.752	0.432	1	0.661	0.474	0.091	4.924***
Governance characteristics								
5% blockholders	0.218	0.274	0.249	0.071	0.173	0.235	0.101	10.05***
Institutional investors	0.592	0.551	0.216	0.544	0.497	0.196	0.054	6.266***
Observations	1, 606	1, 606	1, 606	927	927	927	2, 533	2, 533

Sample from Edgar-Compustat-IRRC intersection (SIC 2000-3999, 1987–2000).
Undrawn lines of credit data are obtained from 10-K filings. Cash (item 1), noncash assets (item 6 − item 1), leverage (item 9 + item 34 divided by item 6, market-to-book asset (item 6 + item 199 times item 25 − item 60 divided by item 6), cash flow (item 18 + item 14 − item 19 − item 21), PPE (item 8), industry sales volatility (standard deviation of item 12 for the 3-digit SIC in each year), net worth (item 6 − item 1 − item 181) and dummy for S&P senior debt rating are obtained from Compustat. 5% blockholder and institutional investor holdings data are obtained from 13F filings.

credit during 1996–2003. The sample in this paper is well suited for the study of corporate liquidity choice because the tradeoff theory of corporate liquidity choice described in Section 1 is applicable only when firms have access to both cash and lines of credit.[8]

Comparing cash divided by noncash assets of firms with and without lines of credit, I find that firms with lines of credit have a smaller amount of cash divided by noncash assets. This is consistent with prior research, which finds that firms with poor access to lines of credit rely more heavily on cash in their liquidity management (Sufi, 2008).

On average, firms with lines of credit are larger, are more levered, have less cash flow divided by noncash assets, have smaller PPE divided by noncash assets, have less net worth divided by noncash assets, and are more likely to have an S&P senior debt rating than those without lines of credit. However, firms with lines of credit do not differ significantly from other firms in the market-to-book ratio and industry sales variability.

I use 5% blockholders and institutional investors as measures of internal governance, where a larger number corresponds to better corporate governance. Results from Table 1 show that firms with lines of credit have a higher fraction held by both blockholders and institutional investors. Hence, firms with lines of credit appear to have better internal governance than firms without lines of credit.

2.4 States of incorporation

Since I use changes in state law as exogenous shocks to corporate governance, the correct assignment of state of incorporation for each observation is important. However, Compustat records only the recent state of incorporation, which may differ from the historical one if a firm changed its state of incorporation, as Subramanian (2004) documents. For example, if a currently incorporated state passes a law that affects a firm negatively, a firm may choose to reincorporate in another state. Also, if a state passes a law that can provide substantial benefits to firms incorporated in this state, a firm may choose to reincorporate into this state.

I obtained the historical state of incorporation from Compact disclosure and crosschecked with the IRRC database for available years. Table 2 shows the historical distribution of the states of incorporation. Similar to other studies, such as Rauh (2006), I found that nearly half of the firms in the sample were incorporated in Delaware. Other major states of incorporation were Ohio, New York, Pennsylvania, Massachusetts, and California, which together hold approximately 20% of the sample. Since the sample considers only firms that are present in the IRRC database for all years (i.e., the sample does not include

[8] Firms in Sufi's sample (a fraction of which received no lines of credit during his sample period) are well suited for studying supplier credit rationing (e.g., financing constraints), while firms in my sample (all of which have a history of accessing lines of credit) are well suited for studying borrowers' choice of corporate liquidity between cash and lines of credit.

Table 2
Summary statistics on states of incorporation

	States of incorporation						
Year	DE (%)	CA (%)	NY (%)	PA (%)	OH (%)	MA (%)	Other (%)
1987	46.226	2.3585	6.6038	4.2453	7.0755	2.8302	30.66
1988	46.226	2.3585	6.6038	4.2453	7.0755	2.8302	30.66
1989	47.642	0.9434	6.6038	4.2453	7.0755	2.8302	30.66
1990	48.113	0.9434	6.6038	4.2453	6.6038	2.8302	30.66
1991	48.113	0.9434	6.6038	4.2453	6.6038	2.8302	30.66
1992	48.113	0.9434	6.6038	4.2453	6.6038	2.8302	30.66
1993	47.642	0.9434	6.1321	4.2453	7.0755	2.8302	31.132
1994	47.642	0.9434	6.1321	4.2453	7.0755	2.8302	31.132
1995	47.642	0.9434	6.1321	4.2453	7.0755	2.8302	31.132
1996	46.698	0.9434	6.1321	4.2453	7.0755	2.8302	32.075
1997	46.226	0.9434	6.1321	4.2453	7.0755	2.8302	32.547
1998	46.226	0.9434	6.1321	4.2453	7.0755	2.8302	32.547
1999	46.226	0.9434	6.1321	4.2453	7.0755	2.8302	32.547
2000	46.698	0.9434	5.6604	4.2453	7.0755	2.8302	32.547
Δ2000−1987	0.4717	−1.4151	−0.9434	0	0	0	1.8868

Source: Compact disclosure (1987–2000) for manufacturing industry (SIC Codes 2000–3999).
There are 2,968 observations (212 firms for 14 years). The numbers indicate fraction (%) of firms incorporated in the corresponding state in each year in the sample. The last row (Δ2000−1987) shows the difference of fraction of incorporated firms in a corresponding state in 2000 and 1987.

newly founded firms or closed firms), the distribution of the states of incorporation is very stable. For example, less than 1% of firms incorporated in Delaware, where half of the firms in the sample are incorporated, later changed their state of incorporation. Hence, changes of the state of incorporation are not likely to impact the results. One reason for the stable distribution of the states of incorporation in this sample can be attributed to transaction costs. As long as there is a cost to changing states of incorporation, firms will not always respond to legal changes of their incorporated states, and will only do so if the benefits significantly outweigh and justify the costs.

3. Evidence of Firms' Liquidity Choices from Antitakeover Legislation

3.1 Background

U.S. corporations are subject to the laws of the state in which they are incorporated, rather than where most of their business activities occur or where they are headquartered. This aspect of the U.S. corporate law permits use of state variation in takeover protection to account for the endogeneity of firms' financing decisions with corporate governance decisions. By examining changes in the compositions of firms' liquidity reserves following this event, the impact of exogenous changes in external governance on firms' preferences for cash or lines of credit can be isolated.

For most of the paper, I consider Delaware's validation of the poison pill in conjunction with a staggered board, which occurred in the mid-1990s. A staggered board restricts replacement of a firm's directors to a certain fraction

in a year. This provision makes it difficult for a raider to take control of the firm because the raider cannot immediately remove incumbent directors, who may in the meantime adopt policies that can reduce the firm's value and harm the raider's wealth. According to Bebchuk, Coates, and Subramanian (2002), staggered boards in conjunction with poison pills are an effective takeover deterrent. Unlike poison pills, which can quickly be adopted upon a takeover attempt, a staggered board requires shareholder approval. Delaware's decision to allow the use of poison pills by a target's staggered board significantly impeded raiders' ability to conduct a successful hostile takeover.

One of the benefits of focusing on Delaware's legal change in takeover is its large impact on the economy. As shown in Table 2, nearly half of the firms in the sample are incorporated in Delaware, and hence, any significant legal change in the takeover environment is likely to have a noticeable impact on the sample. Also, Delaware's event occurred in the mid-1990s, which is separate from other major takeover changes, such as the second-generation antitakeover laws. This aspect mitigates identification problems due to clustering of various legal changes in a short period.

In addition to Delaware's legal change, I also consider the second-generation antitakeover legislation, which occurred in the late 1980s and early 1990s. According to prior studies, such as Karpoff and Malatesta (1989); Matheson and Olson (1991); and Comment and Schwert (1995), the laws adopted during this period to deter hostile takeovers were mostly business combination, fair price, and control share acquisition laws.

Business combination laws prohibit a potential bidder from taking over for a prespecified number of years before the bidder becomes an interested shareholder, unless the directors of the target firm vote otherwise. Incumbent managers can influence the board of directors, who decide whether to freeze takeover attempts for several years. Hence, business combination laws are likely to weaken the managerial discipline provided by the threat of takeovers.

Fair price laws require an acquirer to pay either the higher of any price paid for his or her shares or the current market price at the time of the combination. This law regulates the back-end price in two-tiered acquisitions, thereby making hostile takeovers through two-tier offers impractical.

Finally, control share acquisition laws grant the target firm's disinterested shareholders the right to determine whether the bidder's control shares may count in a vote on a takeover. This provision adds difficulty for a raider in a proxy fight and makes hostile takeovers less likely to occur.

To sum up, the prior literature suggests that the primary effects of the second-generation antitakeover laws are to deter takeovers and weaken managerial discipline. Also, as Romano (1987) shows, antitakeover laws are typically supported by a small number of exclusive groups of firms rather than by large coalitions. Hence, these legal changes should be regarded as exogenous events for most firms, and therefore can be used as natural experiments in cases where corporate governance is weakened for firms incorporated in the legislated states.

3.2 Testable hypotheses

Antitakeover legislation mentioned in the previous section raised the level of difficulty in launching a successful takeover bid by restricting hostile takeovers of firms incorporated in the legislating states. Following theoretical arguments explored in Section 1, I expect firms in those states will increase their fraction of cash relative to lines of credit after their states of incorporation adopt antitakeover laws, because managers of these firms can keep the prior level of control with a larger fraction of cash. In addition, I expect the tendency toward cash to be weaker for firms with strong internal governance because private benefit gains from increased discretion are smaller for these highly self-policed firms.

Using these two hypotheses, I can infer how corporate governance influences firms' preferences on liquidity choice by observing changes in the fraction of unused lines of credit among firms' total liquidity demand (i.e., the sum of cash and lines of credit) upon changes in legal environment. The second-generation antitakeover laws mainly affected costs of holding cash due to weakened managerial discipline, and changes in liquidity choices due to this event reveal firms' preferences for the discretion of cash.

3.3 Empirical specifications

The main difficulty in testing a firm's liquidity choice is the unobserved firm heterogeneity and the endogenous nature of a firm's liquidity decisions. I use a differences-in-differences methodology to infer firms' preferences on liquidity choices, which are measured by the fraction of unused lines of credit among firms' total liquidity demand. According to the theory in Section 1, a firm's liquidity choice depends on the agency costs of cash and the banking costs of lines of credit. The antitakeover legislation mentioned in Section 3.1 weakened managerial discipline and caused an exogenous shock to the agency costs of cash, while having no significant impact on the banking costs of lines of credit. I expect firms with weak corporate governance to increase the fraction of cash in their liquidity reserves as the takeover threat weakens, because the self-interested manager tries to exploit this opportunity to seek more private benefits. Hence, the changes in the composition of liquidity reserves in response to the enactment of the antitakeover legislation reflect shifts in firms' preferences for cash due to changes in external governance.

The basic regression model to estimate the differences-in-differences effect of the antitakeover laws is

$$\left(\frac{\text{Unused line}}{\text{Total liquidity}}\right)_{it} = \alpha_t + \alpha_{\text{State}} + \alpha_{\text{Industry}} + \beta_1 \cdot \textit{Delaware}_i \cdot \textit{After 1995}_{it} + X' \cdot \Gamma + \varepsilon_{it}, \quad (1)$$

where α_t is a year-fixed effect, α_{State} is a state-fixed effect, α_{Industry} is a dummy variable for a firm's 2-digit SIC industry, $\textit{Delaware}_i$ is an indicator variable that

is 1 if a firm is incorporated in Delaware, $After1995_{it}$ is an indicator variable that is 1 if an observation is after 1995, X are variables to control for a borrower's financial characteristics, and ε_{it} is an error term.

This regression implements the differences-in-differences methodology for multiple comparison groups, where α_{State} controls for fixed differences between firms in the passing and the nonpassing states of the antitakeover law, and α_t controls for aggregate fluctuations. Under this specification, the coefficient estimate on $Delaware_i \cdot After1995_{it}$ measures the differences-in-differences effect of the antitakeover laws on the fraction of unused lines of credit among the total liquidity demand (Bertrand and Mullainathan, 2003; and Rauh, 2006).

The dependent variable is $(\text{Unused line}/\text{Total liquidity})_{it}$, which is the fraction of unused lines of credit among the total liquidity demand (i.e., sum of cash and lines of credit). This quantity is the main variable of interest and measures a firm's preference for intermediated liquidity insurance among total liquidity insurance needs. One of the advantages of using this ratio is the ability to isolate systematic shifts in total liquidity demand from a preference for the composition of its liquidity reserve.

In this regression, I control (X) for various firm characteristics: firm size, leverage, market-to-book asset ratio, cash flow, net property plant and equipment, industry sales volatility, net worth, and dummies for S&P senior debt rating. Cash flow, net property plant and equipment, and net worth are divided by noncash assets as opposed to total assets to avoid spurious mechanical correlations. For example, if cash and lines of credit are jointly used, the increase in cash will lead to an increase in total assets. Hence, scaling by total assets will cause mechanical negative correlation for an increase in cash. The use of these variables is motivated by the theoretical exposition provided in Section 1, and is expected to influence tradeoffs between holding cash and relying on a bank's lines of credit. For example, Sufi (2008) finds that lines of credit often require high cash-flow levels, and therefore influence firms' ease of access to lines of credit. Similarly, asset tangibility measured by net PPE and growth opportunity measured by market-to-book asset ratio are likely to influence a firm's cost of bank lending.

Standard errors are clustered at the state level to account for the serial correlation concerns associated with a differences-in-differences estimation (Bertrand, Duflo, and Mullainathan, 2004).

3.4 Main results

Columns 1 to 3 of panel A of Table 3 report parameter estimates from the differences-in-differences regression of Equation (1). In the first column, the Delaware incorporation indicator variable, $Delaware_i$, is used to account for fixed differences between firms in the passing and the nonpassing states of the antitakeover law, and post-1995 indicator variable $After\ 1995_{it}$, is used to account for aggregate fluctuations. In the second column, state dummies, α_{State}, are used instead of $Delaware_i$ and year dummies, α_t, are used instead of

Table 3
Effect of antitakeover laws on corporate liquidity choice

	Dependent variable: unused lines of credit/total liquidity demand		
	Panel A		
Legal characteristics			
Delaware * After 1995	−0.194 (0.051)***	−0.171 (0.046)***	−0.102 (0.050)***
Borrower characteristics			
Firm size	−0.041 (0.007)***	−0.040 (0.004)***	0.009 (0.016)
Leverage	0.558 (0.179)***	0.591 (0.182)***	0.507 (0.117)***
Market-to-book	−0.031 (0.004)***	−0.026 (0.006)***	−0.019 (0.007)***
Cash flow/noncash assets	−0.494 (0.080)***	−0.498 (0.063)***	−0.258 (0.080)***
PPE/noncash assets	−0.035 (0.065)	−0.031 (0.057)	−0.051 (0.090)
Industry sales volatility	−0.019 (0.021)	−0.073 (0.031)**	−0.024 (0.026)
Net worth/noncash assets	0.479 (0.105)***	0.445 (0.110)***	0.669 (0.077)***
S&P debt rating dummy	0.090 (0.033)***	0.083 (0.031)***	−0.309 (0.164)
Adjusted R^2	0.306	0.356	0.665
Fixed effects	Delaware and After 1995	State and year	Firm and year
Control for 2-digit SIC	Yes	Yes	Yes
Observation	2,533	2,533	2,533

Panel B

Legal change	Business combination	Fair price	Control share acquisition	All
Legal characteristics				
Business combination	−0.541 (0.028)***			−0.737 (0.072)***
Fair price		−0.329 (0.027)***		0.257(0.022)***
Control share acquisition			−0.364 (0.081)***	−0.091 (0.023)***
Borrower characteristics				
Firm size	−0.099 (0.006)***	−0.126 (0.011)***	−0.097 (0.019)***	−0.093 (0.014)***
Leverage	0.327 (0.148)**	0.103 (0.212)	0.330 (0.160)**	0.337 (0.124)***
Market-to-book	−0.068 (0.009)***	−0.112 (0.014)***	−0.098 (0.017)***	−0.063 (0.008)***
Cash flow/noncash assets	−0.377 (0.058)***	−0.046 (0.088)	−0.343 (0.123)***	−0.476 (0.079)***
PPE/noncash assets	−0.006 (0.076)	0.061 (0.089)	0.057 (0.069)	0.008 (0.073)
Industry sales volatility	−0.407 (0.093)***	−0.530 (0.082)***	−0.505 (0.115)***	−0.408 (0.117)***
Net worth/noncash assets	0.947 (0.120)***	1.001 (0.107)***	1.012 (0.202)***	0.995 (0.180)***
S&P debt rating dummy	0.036 (0.033)	0.049 (0.033)	0.049 (0.040)	0.023 (0.035)
Adjusted R^2	0.371	0.367	0.358	0.376
Fixed effects	State and year	State and year	State and year	State and year
Control for 2-digit SIC	Yes	Yes	Yes	Yes
Observations	2,533	2,533	2,533	2,533

Sample from Edgar-Compustat-IRRC intersection (1987–2000) from all manufacturing industries (SIC Codes 2000–3999).
The amounts of undrawn lines of credit are taken from Edgar's 10-K filings. Borrower characteristics taken from Compustat are firm size, leverage, market-to-book asset, cash flow, PPE, industry sales volatility, net worth, and dummy for S&P debt rating. The dependent variable is the ratio of undrawn lines of credit to the total liquidity demand, which is the sum of cash and undrawn lines of credit. The key variable for panel A is the Delaware-After 1995 interaction term, which is one for post-1995 Delaware incorporated firms. The key variables for panel B are dummies for business combination, fair price, and control share acquisition laws, which are 1 if a firm's incorporated state passed the corresponding law. Intercepts, state- and year-fixed effects, and 2-digit SIC Code dummies are not shown in the table. Standard errors are clustered at the state level (shown in parentheses). Significant at the 1% (***), 5% (**), and 10% (*) levels.

After 1995$_{it}$. This specification is more restrictive because it controls for any fixed differences across different states and different years as opposed to fixed differences between Delaware and non-Delaware, and between pre-1995 and post-1995 observations. In the third column, a more restrictive specification is considered by replacing the state dummies with firm-fixed effects to account for any fixed difference across firms.

Results from panel A of Table 3 show that the Delaware court's validation of poison pills in conjunction with a staggered board has a negatively significant impact on firms' use of lines of credit relative to cash. For example, based on column 1, accounting for fixed differences between Delaware and non-Delaware incorporated firms, and between pre-1995 and post-1995 years, the Delaware court's decision is followed by a 19% decrease in unused lines of credit among its liquidity reserve. This finding is robust to various factors that account for heterogeneity in borrowers' financial characteristics, and various combinations of fixed effects. Also, this negative impact decreases using the more restrictive specifications—from *Delaware*$_i$ and *After 1995*$_{it}$ to state- and year-fixed effects, and from state- and year-fixed effects to firm- and year-fixed effects. Among other independent variables, firms with high leverage, low market-to-book assets, low cash flows divided by noncash assets, and high net worth divided by noncash assets rely more on unused lines of credit than cash.[9]

Panel B of Table 3 checks whether the theoretical expositions are robust to other antitakeover legislation, which had a similar effect of reducing the threat of takeover, as in Delaware's case in the mid-1990s. Column 1 replaced the *Delaware*$_i \cdot$ *After1995*$_{it}$ indicator with a business combination law indicator, which is 1 if an observation is in a state that already passed the business combination law. Similarly, the *Delaware*$_i \cdot$ *After1995*$_{it}$ indicator is replaced with a fair price law indicator in the second column, and with a control share acquisition indicator in the third column. For all three specifications, a negatively significant impact of these antitakeover laws on firms' use of lines of credit is found relative to cash. For example, the adoption of a business combination law caused a 54% reduction of unused lines of credit among firms' liquidity reserves.

Subramanian (2004) and Rauh (2006) point out that several second-generation antitakeover laws are clustered because they were passed in a short period of time. Along with the persistence of unused lines of credit and cash,

[9] In a similar study, Sufi (2008) finds a positive relationship between cash flows divided by noncash assets and unused lines to total liquidity demand. This discrepancy between this paper and Sufi's stems mainly from different choices of the sample. As mentioned in Section 2, firms considered in this paper are larger and have higher cash flows divided by noncash assets than those in Sufi's. When large firms with high cash flows divided by noncash assets in the manufacturing industry from Sufi's sample are examined, I find a significantly negative relationship between unused lines to total liquidity demand and cash flows divided by noncash assets, which is consistent with the findings of this paper. Such a negative relationship between unused lines of credit to total liquidity demand and cash flows divided by noncash assets can also be inferred from Figure 1 of Sufi's paper, where at the very high end of the cash flow distribution, firms on average become less likely to use lines of credit and rely more on cash.

this makes it difficult to separately identify the impact of each legal provision. For example, column 4 of Table 3 shows a joint test of the impact of business combination, fair price, and control share acquisition laws. Results show that business combination and control share acquisition laws are still negatively significant, while the fair price provision changed to be positively significant. Also, the levels of the coefficient estimates changed significantly, which suggests that these three sets of events are highly correlated with each other. In the following sections, I focus on Delaware's legal change, which is relatively free of clustering and interference of other similar events.

Findings from the compositional choice of firms' liquidity reserves are broadly consistent with those of prior studies. Managers respond to increased protection from takeover by adjusting firms' financial structures. Garvey and Hanka (1999) find that firms protected by antitakeover laws reduce the use of debt, which serves as a takeover defense. Cheng, Nagar, and Rajan (2005) find that managers hold fewer risky shares for maintaining control of firms when antitakeover laws provide added protection from takeover threat. Masulis, Wang, and Xie (2007) find that acquirers with more antitakeover provisions experience significantly lower announcement-period stock returns than other acquirers. Similarly, Rauh (2006) shows that passage of antitakeover laws is followed by a significant decline in employee ownership shares in their defined contribution plans, which are often used to defend firms against takeovers. Firms do respond to changes in state-level external governance by adjusting their liquidity choices between cash and lines of credit (i.e., firms consider the agency costs of cash in determining their composition of liquidity reserves). More fundamentally, these findings show how external governance influences managerial decisions and thereby helps to identify a channel through which corporate governance works.

3.5 Impact of antitakeover laws on capital structure

Since this paper uses the ratio of lines of credit among total liquidity demand as a dependent variable, there is a concern that the results obtained in the previous tables are driven by changes in cash (or lines of credit), while lines of credit (or cash) remain constant. In this case, the results in the previous tables still show relative preferences between cash and lines of credit, and support the main hypothesis of this paper (i.e., weakened threat of takeover leads to an increase in cash relative to unused lines of credit). However, it is better (parsimonious) to describe the results in terms of only the one that varies significantly, while leaving out the constant.

The first two columns in Table 4 show that the differences-in-differences impact of Delaware's legal change in takeover protection is positively significant for cash divided by noncash assets while it is negatively significant for unused lines of credit divided by noncash assets. That is, firms increased cash divided by noncash assets and decreased unused lines of credit divided by noncash assets after Delaware validated the use of poison pills in conjunction with a

Table 4
Impact of antitakeover laws on capital structure

Dependent variable	Liquidity		Leverage	
	Cash/noncash assets	Lines/noncash assets	Leverage	Lines/total liquidity
Legal characteristics				
Delaware * After 1995 * Leverage				0.062 (0.039)
Delaware * After 1995	0.062 (0.026)**	−0.063 (0.037)*	0.043 (0.041)	−0.313 (0.048)***
Borrower characteristics				
Firm size	−0.007 (0.002)***	−0.046 (0.005)***	0.005 (0.003)	−0.048 (0.004)***
Leverage	−0.362 (0.085)***	−0.137 (0.112)		0.371 (0.180)**
Market-to-book	0.019 (0.002)***	0.004 (0.005)	−0.015 (0.002)***	−0.034 (0.006)***
Cash flow/noncash assets	0.335 (0.037)***	−0.114 (0.065)*	−0.217 (0.025)***	−0.415 (0.064)***
PPE/noncash assets	0.038 (0.046)	−0.087 (0.051)*	−0.010 (0.034)	0.027 (0.053)
Industry sales volatility	0.035 (0.009)***	−0.013 (0.015)	−0.001 (0.013)	−0.079 (0.029)***
Net worth/noncash assets	−0.311 (0.041)***	−0.221 (0.138)	−0.519 (0.064)***	0.503 (0.108)***
S&P debt rating dummy	−0.009	0.022	0.024	0.087
	(0.008)	(0.030)	(0.008)***	(0.031)***
Adjusted R^2	0.522	0.263	0.599	0.364
Observations	2,533	2,533	2,533	2,533

Sample from Edgar-Compustat-IRRC intersection (1987–2000) from all manufacturing industries (SIC Codes 2000–3999).
The amounts of undrawn lines of credit are taken from Edgar's 10K filings. Firm size, leverage, market-to-book asset, cash flow, PPE, industry sales volatility, net worth, and dummy for S&P debt rating are taken from Compustat. Cash flow, PPE, and net worth are scaled by noncash assets. The dependent variables are cash divided by noncash assets (Cash/noncash assets), unused lines divided by noncash asset (Lines/noncash assets), leverage, and the ratio of unused lines to total liquidity demand (Lines/total liquidity). Key independent variables are the Delaware-After 1995 interaction term, which is 1 for post-1995 Delaware incorporated firms, and its interaction with leverage. Intercepts, state- and year-fixed effects, and 2-digit SIC Code dummies are included, but not shown in the table. Standard errors are clustered at the state level (shown in parentheses). Significant at the 1% (***), 5% (**), and 10% (*) levels.

Table 5
Heterogeneous impact of antitakeover laws on liquidity choice

Governance variables	5% blockholders	Institutions	Dual-class shares
Legal characteristics			
Delaware * After 1995 *	0.273 (0.073)***	0.128 (0.057)**	0.108 (0.041)***
Governance			
Delaware * After 1995	−0.198 (0.057)***	−0.244 (0.049)***	−0.217 (0.046)***
Governance	−0.240 (0.094)**	0.076 (0.060)	−0.129 (0.055)**
Borrower characteristics			
Firm size	−0.043 (0.006)***	−0.044 (0.005)***	−0.039 (0.004)***
Leverage	0.669 (0.188)***	0.595 (0.178)***	0.548 (0.177)***
Market-to-book	−0.022 (0.006)***	−0.027 (0.006)***	−0.029 (0.006)***
Cash flow/noncash assets	−0.563 (0.049)***	−0.492 (0.060)***	−0.488 (0.054)***
PPE/noncash assets	−0.037 (0.063)	−0.030 (0.055)	−0.014 (0.058)
Industry sales volatility	−0.061 (0.033)*	−0.073 (0.029)**	−0.082 (0.027)***
Net worth/noncash assets	0.396 (0.111)***	0.441 (0.108)***	0.471 (0.110)***
S&P debt rating dummy	0.075 (0.027)***	0.082 (0.029)***	0.072 (0.032)**
Adjusted R^2	0.359	0.366	0.363
Fixed effects	State, year	State, year	State, year
Observations	2,533	2,533	2,533

Sample from Edgar-Compustat-IRRC intersection (manufacturing firms, 1987–2000).
The amounts of undrawn lines of credit are taken from Edgar's 10-K filings. The borrower characteristics taken from Compustat are firm size, leverage, market-to-book asset, cash flow, PPE, industry sales volatility, net worth, and dummy for S&P debt rating. The dependent variable is the ratio of undrawn lines of credit to the total liquidity demand, which is the sum of cash and undrawn lines of credit. The key variable is the Delaware-After 1995 interaction term, which is one for post-1995 Delaware incorporated firms. Governance variables are 5% blockholders, institutional investors, and dummy for dual shares. Intercepts, state- and year-fixed effects, and 2-digit SIC Code dummies are included, but not shown in the table. Standard errors are clustered at the state level (shown in parentheses). Significant at the 1% (***), 5% (**), and 10% (*) levels.

staggered board. These findings are consistent with managers' joint determination of cash and unused lines of credit to balance private benefits of discretion with the increased oversight by banks, ensuring sufficient efficiency to prevent control challenges.

In the third and fourth columns of Table 4, I further explore the influences of Delaware's legal change on a firm's capital structure. As shown in the third column, no evidence is found that firms adjust their leverage due to changes in takeover threats. Also, no evidence is found that firms with a high prelaw level of leverage are less responsive in rebalancing the composition of their liquidity reserves after Delaware's legal change.

3.6 Differential impact of antitakeover laws due to heterogeneity in internal governance

Table 5 further investigates which group of firms responded to Delaware's legal change. As suggested by the theory in Section 1, I expect firms with a good self-policing ability (e.g., good internal governance) to be less responsive to changes in takeover protections. In order to test this hypothesis, the differences-in-differences variable, $Delaware_i \cdot After\ 1995_{it}$, is interacted with internal governance. To measure internal governance, I follow Cremers and Nair (2005) and use the fraction of outstanding shares held by 5% blockholders and those held by institutional investors, where a larger fraction of shares

held by these investors is considered better internal governance.[10] Institutional investor holdings are ignored if a firm's shares held by institutions are less than 5% in order to filter out passive institutional investors who only hold very small stakes and have little motive to act as a monitor of firms' activity. In order to avoid endogenous association of internal governance variables and legal change, the prelaw level of internal governance is used in the interaction term.

In the first and second columns of Table 5, the $Delaware_i \cdot After\ 1995_{it} \cdot Governance$ variable captures the incremental portion of the differences-in-differences effect of antitakeover laws due to an increase in internal governance measures, while the $Delaware_i \cdot After1995_{it}$ variable measures the differences-in-differences effect of antitakeover laws of firms without any internal governance mechanism. As shown in columns 1 and 2, I find a negatively significant impact of antitakeover law on the use of lines of credit among firms' total liquidity reserves. However, there are positively significant estimates for the coefficient of $Delaware_i \cdot After\ 1995_{it} \cdot Governance$, which suggests that such negative impact diminishes as the internal governance strengthens.

I also expect firms with prior takeover defenses to respond less to additional state-level takeover protections. In column 3 of Table 5, I interact an indicator variable for dual-class shares with the differences-in-differences variable, $Delaware_i \cdot After1995_{it}$. Results show that the negatively significant impact of state-level takeover protection on firms' use of unused lines of credit relative to cash is concentrated in firms without prior dual-class shares, and those firms that had dual-class shares prior to the state-level takeover protection do not respond significantly to this legal change.

The prior literature suggests that managers have incentives to refrain from keeping an excessively large amount of cash because it invites attention from raiders (Jensen, 1986). This may lead to an alternative nongovernance explanation for keeping less cash under a high level of takeover threats. For example, if the continuation values of firms' products are less known to outsiders and thus more likely to be cut by outsiders upon successful takeovers, then even well-governed firms (with high-quality products) may want to keep less cash to reduce the probability that they lose access to these products. When threat of takeover weakens after the passage of antitakeover laws, this theory predicts that managers will increase cash. The fact that the shift toward cash (and away from lines of credit) is stronger for firms with weak internal governance upon changes in takeover protection supports the governance-based tradeoff theory described in Section 1. This is because there is no reason in the alternative explanation why only firms with weak internal governance would increase cash relative to lines of credit in response to changes in takeover protection.

[10] I do not use the governance index that Gompers, Ishii, and Metrick (2003) propose, because it measures the number of takeover defenses (which is closely related to external governance) rather than internal governance. Interaction of the governance index with the state-level changes in takeover protection will lead to results that are different from the internal governance-based predictions presented in Section 1.

Table 6
Impact of antitakeover laws on corporate governance structure

Dependent variable	5% blockholders	Institutional investors
Legal characteristics		
Delaware * After 1995	0.086	0.0578
	(0.059)	(0.052)
Borrower characteristics		
Firm size	−0.060 (0.009)***	0.023 (0.008)***
Leverage	−0.015 (0.116)	0.031 (0.109)
Market-to-book	−0.022 (0.010)**	−0.006 (0.003)*
Cash flow/noncash assets	−0.172 (0.179)	0.195 (0.048)***
PPE/noncash assets	0.078 (0.095)	0.011 (0.050)
Industry sales volatility	0.001 (0.075)	0.033 (0.040)
Net worth/noncash assets	−0.207 (0.090)**	0.039 (0.114)
S&P debt rating dummy	−0.001 (0.034)	0.041 (0.032)
Adjusted R^2	0.254	0.221
Fixed effects	State and year	State and year
Control for 2-digit SIC	Yes	Yes
Observations	2,533	2,533

Sample from Edgar-Compustat-IRRC intersection (1987–2000) from all manufacturing industries (SIC Codes 2000–3999).
The amounts of undrawn lines of credit are taken from Edgar's 10-K filings. The borrower characteristics taken from Compustat are firm size, leverage, market-to-book asset, cash flow, PPE, industry sales volatility, net worth, and dummy for S&P debt rating. The dependent variables are 5% blockholders and institutional investors. The key variable is the Delaware-After 1995 interaction term, which is one for post-1995 Delaware incorporated firms. Intercepts, state- and year-fixed effects, and 2-digit SIC Code dummies are included, but not shown in the table. Standard errors are clustered at the state level (shown in parentheses). Significant at the 1% (***), 5% (**), and 10% (*) levels.

3.7 Impact of antitakeover laws on corporate governance

There is a possibility that the structure of firms' internal governance may be endogenous to changes in external governance. For example, consider shareholders of a firm that relies mainly on external governance to discipline a manager. When the threat of takeover weakens after the passage of antitakeover laws, shareholders may optimally decide to change internal governance to control the manager. This will cause the coefficient estimate on $Delaware_i \cdot After\ 1995_{it} \cdot Governance$ in Table 5 to be biased if the current level of internal governance measure is used. Such bias may lead to false inferences of the effect of antitakeover laws on firms' liquidity choices between cash and lines of credit. Since the prelaw level of internal governance is used, the results from the previous section are still robust to such endogenous changes. However, it is instructive to see how firms respond to changes in external governance in restructuring their level of internal governance.

I examine whether internal governance systematically changed after the passage of the antitakeover law in Delaware. In particular, I run a regression of internal governance (fraction of shares held by 5% blockholders and institutional investors) on the antitakeover law dummy variable, $Delaware_i \cdot After1995_{it}$, to check whether the coefficient estimate is statistically insignificant.

Table 6 shows parameter estimates of the differences-in-differences impact of Delaware's legal change (i.e., increase in takeover protection) on the level

of internal governance. As shown in the first and the second columns, there are no significant changes in the level of internal governance due to changes in external governance.

Empirical evidence suggests that shareholders do not change internal governance or managerial discretion of their firm's liquidity reserve in response to changes in external governance (i.e., threat of takeover). In the study discussed here, internal governance does not seem to be systematically correlated with the passage of antitakeover laws. Hence, internal governance can be considered as an exogenous variable for this legal event.

3.8 Alternative hypothesis: credit rationing

Findings from previous tables suggest that state-level changes in takeover protections led managers to rebalance their liquidity reserves to optimally adjust the threat of takeovers and private benefits from discretion. An alternative hypothesis is supply side credit rationing. That is, after the increase in state-level takeover protection, banks become more aware of managerial abuses of their discretion and contract lending to firms with poor lending quality. In order to investigate the possibility of heterogeneous impact of credit market accessibility due to state-level legal change, I consider how firms with and without commercial paper rating respond after the passage of the antitakeover law in Delaware. Firms with commercial paper ratings are generally considered as high-quality borrowers (Gatev and Strahan, 2006), who may receive preferential treatment from banks during the credit contraction periods.

The first column in Table 7 shows that there is no significant association of changes in commercial paper ratings due to legal changes in Delaware. So, even if Delaware's increase in takeover protection has a negative impact on firms' general level of corporate governance, no evidence is found that this led to a decrease in borrowers' credit quality. In the second column, I interact the prelaw level of commercial paper rating with the differences-in-differences variable, $Delaware_i \cdot After1995_{it}$, to see if the negative impact of Delaware's legal change on the use of unused lines of credit relative to cash is concentrated among firms with or without commercial paper ratings. According to the supplier-rationing hypothesis, I expect a positively significant estimate of the $Delaware_i \cdot After1995_{it} \cdot CP\ rating_i$ coefficient, which implies that firms in Delaware with commercial paper ratings are less responsive to Delaware's legal change than those without commercial papers. Contrary to this prediction, no significant difference is found between firms with and without commercial paper ratings in the use of lines of credit relative to cash after the legal change in Delaware.

Findings from Tables 3 to 7 are consistent with the borrowers' liquidity choice, where a manager optimally balances the composition of firms' liquidity reserves to maximize discretion from cash while not significantly raising the chance of takeovers.

Table 7
Effect of access to credit market

Dependent variable	CP rating	Unused lines/total liquidity
Legal characteristics		
Delaware * After 1995 * CP rating		0.012
		(0.008)
Delaware * After 1995	0.197 (0.198)	−0.259 (0.062)***
CP rating		0.031 (0.008)***
Borrower characteristics		
Firm size	0.464 (0.051)***	−0.061 (0.006)***
Leverage	0.420 (0.450)	0.471 (0.222)**
Market-to-book	0.018 (0.018)	−0.030 (0.006)***
Cash flow/noncash assets	−0.377 (0.198)*	−0.451 (0.071)***
PPE/noncash assets	−0.106 (0.469)	−0.0008 (0.061)
Industry sales volatility	−0.597 (0.211)***	−0.057 (0.028)**
Net worth/noncash assets	0.972 (0.273)***	0.451 (0.096)***
S&P debt rating dummy	0.401 (0.189)**	0.071 (0.028)**
Adjusted R^2	0.420	0.368
Fixed effects	State and year	State and year
Control for 2-digit SIC	Yes	Yes
Observation	2,533	2,533

Sample from Edgar-Compustat-IRRC intersection (manufacturing firms, 1987–2000).
The amounts of undrawn lines of credit are taken from Edgar's 10-K filings. The borrower characteristics taken from Compustat are firm size, leverage, market-to-book asset, cash flow, PPE, industry sales volatility, net worth, and dummy for S&P debt rating. The dependent variables are S&P CP ratings and the ratio of undrawn lines of credit to the total liquidity demand, which is the sum of cash and undrawn lines of credit. The key variable is the Delaware-After 1995 interaction term, which is 1 for post-1995 Delaware incorporated firms. Intercepts, state- and year-fixed effects, and 2-digit SIC Code dummies are included, but not shown in the table. Standard errors are clustered at the state level (shown in parentheses). Significant at the 1% (***), 5% (**), and 10% (*) levels.

4. Conclusions

This paper provides insight into how corporate governance influences firms' choices between cash and lines of credit to meet their liquidity needs. Anti-takeover laws, which tend to weaken corporate governance, are found to cause poorly governed firms to increase their cash relative to lines of credit, whereas no such tendencies are found for well-governed firms. This suggests that firms take into account the discretion and managerial opportunism associated with cash when choosing how to compose their liquidity reserves. The empirical evidence is consistent with optimizing behavior of self-interested managers, who, in order to avoid control challenges from shareholders, will balance the private benefits of discretion against increased oversight by the bank. In the post-antitakeover legislation period, self-interested management exploits the reduced threat of takeover and increased discretion by holding more cash, thereby increasing private benefits. I can infer how firms meet their liquidity needs from the antitakeover law: lines of credit not only substitute cash for liquidity, but also provide a unique function to limit managerial discretion on the use of liquidity reserves. Cash grants a manager a lot of discretion and flexibility, but this might be limited by market discipline caused by fear of managerial opportunism. On the other hand, lines of credit not only tend to limit a manager's discretion thereby reducing moral hazard, but are also

inflexible and typically incur banking costs. Hence, the optimal composition of firms' liquidity reserves should reflect the costs and benefits of these two options.

The natural experiment using the Delaware's validation of poison pills in conjunction with a staggered board in the mid-1990s and the second-generation antitakeover laws provides insight into how two different corporate governance mechanisms, external governance and internal governance, interact to influence firms' levels of managerial discretion (i.e., the composition of firms' liquidity reserves). When the enactment of antitakeover laws weakens firms' external governance, managers of firms with very few or no institutional investors further entrench themselves by increasing their discretion on the use of firms' liquidity reserves. On the other hand, firms with a substantial number of shares held by institutional investors are able to limit managers' scope for opportunistic behavior, which would have been caused by a weakened threat of takeover.

This tradeoff view of liquidity choice has several implications for a firm's cash holding and liquidity strategy. First, the tradeoff view of a firm's liquidity choice provides a cash-holding motivation for less financially constrained firms. The existing literature focuses mainly on explaining the cash-holding motives of financially constrained firms; however, there is little explanation as to why less financially constrained firms would hold cash, despite the fact that, in practice, these firms do. This paper asserts that both cash and lines of credit incur costs, and a firm's choice depends on the relative magnitude of the marginal costs and benefits of these two options. Hence, when the marginal costs of lines of credit are higher than those of holding cash, firms may voluntarily diversify away from banks by holding cash and reducing their unused lines of credit.

Second, this tradeoff view of liquidity strategies provides an operational rationale for firms to hold cash besides mere managerial opportunism. The recent trend of large corporations to accumulate cash holdings while limiting dividend payouts has led to concerns that large cash holdings might be an indicator of poor corporate governance. However, holding cash can be a shareholder value-maximizing decision when the associated agency costs are smaller than the alternatives. The proper assessment of the relationship between corporate cash holding and corporate governance requires a better understanding of a firm's cash-holding motives and corporate liquidity strategy.

Finally, this tradeoff view shows the importance of considering alternatives to cash in understanding firms' liquidity strategies. Since the decision to hold cash is jointly determined with its alternative (i.e., lines of credit in this paper), firms' cash holdings by themselves are not accurate measures of their liquidity states, and therefore, can lead to misleading inferences being made regarding firms' true liquidity state.

Results of this paper can be extended to consider the relationships between financing constraints and firms' behavior for financially less constrained firms that have good access to banks' lines of credit. The liquidity demand of these firms includes both cash and lines of credit, and therefore, their investment and

cash-holding decisions could be better measured by the sum of cash and lines of credit rather than by cash only.

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