

# Labor Unions and Forms of Corporate Liquidity

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**Abstract:** We examine how the presence of labor unions affects a firm's choice of corporate liquidity between bank lines of credit and corporate cash holdings. We find that firms in industries with higher unionization rates hold a higher fraction of corporate liquidity in the form of bank lines of credit. We divide the firms into sub-groups and find that this positive relationship holds for firms that are not in a state with right-to-work legislation and for firms that are financially constrained. Our findings are consistent with the hypothesis that a firm chooses the forms of corporate liquidity to take advantage of the bargaining benefits associated with bank lines of credit.

**Keywords:** bank lines of credit, corporate cash holdings, labor unions

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## 1. INTRODUCTION

Bank lines of credit and corporate cash holdings are two main forms of corporate liquidity. Bates, Kahle and Stulz (2009) find that the average cash-to-assets ratio for US firms was 23.2% in 2006. Sufi (2009) finds that bank lines of credit have an average magnitude of 16% of assets in a sample of US firms. In this paper, we examine how the presence of labor unions affects a firm's choice of corporate liquidity between bank lines of credit and corporate cash holdings.

Corporate cash holdings are a firm's internal resources, while bank lines of credit are an external source of financing. Previous research in the literature (e.g., Baldwin, 1983; Bronars and Deere, 1991) argues that debt increases a firm's bargaining power over labor. Because a firm obtains a certain amount of debt capacity when it receives bank lines of credit, the firm can increase the amount of debt by drawing down the lines of credit if it anticipates that bargaining with labor unions will take place. Moreover, while cash is a form of realized liquidity, the availability of bank lines of credit is usually subject to a firm's compliance with covenants (e.g., Sufi, 2009; Yun, 2009). A firm can make a more credible case that the risk associated with the unavailability of bank lines of credit can threaten its competitive viability, a situation that would be exacerbated by granting additional concessions to the union. Therefore, a firm can use more bank lines of credit as a source of corporate liquidity to gain a better bargaining position against labor unions.

We hypothesize that a firm holds a higher fraction of corporate liquidity in the form of bank lines of credit when unionization rates are higher. Moreover, we develop hypotheses on how right-to-work legislation and financial constraints affect the relation between unionization rates and forms of corporate liquidity.

In our empirical tests, we use industry unionization rates, defined as the fraction of workers in an industry who are covered by labor unions in collective bargaining, as our measure of the bargaining power of labor unions. We use the ratio of bank lines of credit to the sum of bank lines of credit and corporate cash holdings as our measure of a firm's choice of the forms of corporate liquidity. Because endogeneity can be a potential concern, we use instrumental variables with two-stage least squares estimation.

We find that firms hold a higher fraction of corporate liquidity in the form of bank lines of credit in the presence of stronger labor unions. The data show that a one standard deviation increase in the fraction of workers covered by labor unions leads to a 14.48% increase in the fraction of corporate liquidity held in the form of unused lines of credit. This corresponds to an increase in unused lines of credit with a dollar value of 37.20 million dollars. Moreover, we find that the level of bank lines of credit increases with unionization rates.

We divide the firms into sub-groups and find that a positive relation between unionization rates and the fraction of corporate liquidity held in the form of bank lines of credit exists in the sub-group of firms that are not in a state with right-to-work legislation. We conduct the analysis for a sub-sample of firms whose state of operation is the same as the state of incorporation and find similar results. Moreover, we use the Heckman two-stage estimation to control for a firm's self-selection of the state of incorporation/operation and find similar results. In addition, we examine labor costs and operating profitability. We find that there is a negative relation (no relation) between the fraction of corporate liquidity held in the form of bank lines of credit and labor costs for firms that are not in (are in) a state with right-to-work legislation and that there is a positive relation (no relation) between the fraction of corporate liquidity

held in the form of bank lines of credit and operating profitability for firms that are not in (are in) a state with right-to-work legislation.

We also divide the firms into sub-groups and find that a positive relation between unionization rates and the fraction of corporate liquidity held in the form of bank lines of credit exists in firms that are financially constrained. We conduct robustness checks and find similar results when we control for labor intensity and when we use union membership as an alternative measure of the bargaining power of labor unions. We conclude that our findings are consistent with the hypothesis that a firm chooses the forms of corporate liquidity to take advantage of the bargaining benefits associated with bank lines of credit.

Our study makes two main contributions. First, our research extends the literature by providing evidence on how labor, as a type of stakeholder, affects a firm's choice of corporate liquidity. While the literature reveals various reasons why a firm chooses corporate liquidity between bank lines of credit and cash holdings,<sup>1</sup> to our knowledge, no previous research documents the relation between labor and a firm's choice of the forms of corporate liquidity. For example, Sufi (2009) shows that high cash flows are an important determinant of the forms of corporate liquidity because they allow firms to comply with cash flow-based covenants associated with bank lines of credit. Yun (2009) finds that firms increase cash relative to lines of credit after a change in takeover legislation that weakens the threat of takeover. Lins, Servaes and Tufano (2010) find that lines of credit are strongly related to a firm's need for external

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<sup>1</sup> Besides a firm's choice of the forms of corporate liquidity, various determinants of corporate cash holdings have been examined in the literature. For example, Opler, Pinkowitz, Stulz and Williamson (1999) argue that corporate cash holdings can be explained by the tradeoff theory, the financing hierarchy theory and the agency theory. Dittmar, Mahrt-Smith and Servaes (2003) find that the level of corporate cash holdings is determined by the degree of shareholder protection in different countries. Tong (2010) finds that firms with higher CEO risk incentives have less cash holdings. Neamtiu, Shroff, White and Williams (2014) find that macroeconomic ambiguity is positively associated with cash holdings.

financing to fund future investment opportunities and that cash is primarily held as a general buffer against future cash flow shortfalls. Campello, Graham and Harvey (2010) show that small, private, junk-rated, and unprofitable firms have larger credit lines and that firms with high internal liquidity find lines of credit less valuable. Acharya, Almeida and Campello (2009) examine how a firm's exposure to aggregate risk affects its management of liquidity through bank lines of credit and cash holdings. Tong (2012) finds that diversified firms hold a higher fraction of corporate liquidity in the form of bank lines of credit due to the coinsurance effect. Therefore, we extend the literature by disclosing a new dimension that affects a firm's choice of the forms of corporate liquidity.

Second, we add to the literature on how strategic considerations that arise in bargaining between firms and labor unions affect corporate decisions. Specifically, we provide evidence that the bargaining power of labor unions affects a firm's choice between bank lines of credit and cash holdings. Previous research in the corporate finance literature focuses on the impact of labor unions on leverage (e.g., Bronars and Deere, 1991; Hanka, 1998; Matsa, 2010), earnings management (e.g., DeAngelo and DeAngelo, 1991; D'Souza, Jacob and Ramesh, 2001), and the cost of equity (e.g., Chen, Kacperczyk and Ortiz-Molina, 2012). Moreover, Agrawal (2012) finds that labor union pension funds have preferences that partly reflect union worker interests rather than equity value maximization alone. A previous study related to our research is Klasa, Maxwell and Ortiz-Molina (2009), who study how the bargaining power of labor unions affects a firm's management of corporate cash holdings. Our study differs from Klasa, Maxwell and Ortiz-Molina (2009) in that they only study corporate cash holdings, while we examine a firm's choice of the forms of corporate liquidity between bank lines of credit and corporate cash holdings.

The paper is organized as follows. Section 2 develops the hypotheses. Section 3 describes the data and the variables. Section 4 illustrates the methodology. Section 5 presents the results. Section 6 concludes the paper.

## **2. HYPOTHESIS DEVELOPMENT**

Corporate cash holdings are a firm's internal resources, while bank lines of credit are an external source of financing. A firm obtains a certain amount of debt capacity when it receives bank lines of credit. Used lines of credit are recorded as a debt obligation, while unused lines remain off balance sheet. We analyze the bargaining benefits associated with bank lines of credit relative to corporate cash holdings from the perspectives of debt capacity and the possible unavailability of bank lines of credit.

### *(i) Debt Capacity*

There is a body of literature on how a firm's use of debt can affect the bargaining between the firm and labor (e.g., Baldwin, 1983; Bronars and Deere, 1991; Dasgupta and Sengupta, 1993; Perotti and Spier, 1993; Sarig, 1998; Hanka, 1998; Matsa, 2010). The essential rationale in this literature is that if a firm has a substantial amount of debt, employees can accept a lower wage, provided that bankruptcy is costly for them. Consequently, debt increases a firm's bargaining position against labor.<sup>2</sup>

This feature implies that a firm can increase the amount of debt by drawing down bank lines of credit if the firm anticipates that bargaining with labor unions will take place. This will result in an increase in the firm's bargaining position against labor

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<sup>2</sup> For example, Bronars and Deere (1991) develop a model in which firms use debt to protect the wealth of shareholders from the threat of unionization. By issuing debt, firms can credibly reduce the funds that are available to a potential union when bankruptcy is costly. Bronars and Deere show that there is a cooperative Nash solution where the union moderates its demand in the face of outstanding debt, and that there is a negative relation between the union wage and debt.

due to the increase in debts. For example, Myers and Saretto (2011) find that unions are less likely to strike when a firm increases leverage prior to a contract negotiation. Previous research (e.g., Sufi, 2009; Yun, 2009) finds that bank lines of credit have an average magnitude of 16% of total assets. Given such a large magnitude of debt capacity, the increase in a firm's bargaining position against labor can be economically significant if the firm draws down a substantial number of lines of credit before the negotiation with labor takes place.

Therefore, as a source of debt capacity, bank lines of credit enable a firm to gain a better bargaining position against labor. This feature is not shared by corporate cash holdings as an alternative source of corporate liquidity.

#### *(ii) The Possible Unavailability of Bank Lines of Credit*

While cash is a realized form of corporate liquidity, the availability of bank lines of credit is usually conditional and subject to a firm's compliance with covenants (e.g., Sufi, 2009; Yun, 2009). By implementing a policy of holding more corporate liquidity in the form of bank lines of credit rather than cash holdings, a firm can make a more credible case that the risk associated with the unavailability of bank lines of credit can threaten its competitive viability, a situation that would be exacerbated by granting additional concessions to the union. This enables a firm to obtain a better bargaining position against labor.

#### *(iii) Hypotheses*

We hypothesize that a firm chooses the forms of corporate liquidity to take advantage of the bargaining benefits associated with bank lines of credit.

(a) Unionization Rates

If the unionization rate is higher, labor unions have stronger bargaining powers. Consequently, the benefits of holding more corporate liquidity in the form of bank links of credit are larger for a firm. We expect that a firm will hold more corporate liquidity in the form of bank lines of credit in the presence of stronger labor unions. Therefore, we have the following hypothesis.

**Hypothesis 1:** A firm holds a higher fraction of corporate liquidity in the form of bank lines of credit if the unionization rate is higher.

(b) Right-to-work Legislation

Several recent papers on labor and finance have developed their research setting based on various laws. For example, Agrawal and Matsa (2013) examine changes in state unemployment insurance laws and find that higher unemployment benefits lead to increased corporate leverage. Simintzi, Vig and Volpin (2012) investigate inter-temporal variations in employment protection laws across 21 countries and find that labor-friendly reforms are associated with a reduction in firm leverage. John, Knyazeva and Knyazeva (2013) examine the state variation in labor rights laws and find that acquirers with stronger labor rights experience lower announcement returns.

We also take advantage of the difference in state labor laws and develop another hypothesis based on right-to-work legislation. The Labor-Management Relations Act (the Taft-Hartley Act) passed in 1947 granted the states in the US the power to enact right-to-work legislation. Right-to-work legislation outlaws provisions in employment contracts that require employees to join or financially support labor unions. Previous research has found that the bargaining power of labor unions is lower in states with right-to-work legislation (e.g., Ellwood and Fine, 1987; Holmes, 1998). We expect



that a firm that is not in a state with right-to-work legislation is more motivated to take advantage of the bargaining benefits associated with bank lines of credit than a firm that is in a state with such legislation because right-to-work legislation weakens the bargaining power of labor unions. Therefore, we have the following hypothesis.

**Hypothesis 2:** The positive relation between the fraction of corporate liquidity held in the form of bank lines of credit and the unionization rate is stronger (weaker) for firms that are not in (are in) a state with right-to-work legislation.

(c) Financial Constraints

If a firm is financially constrained, the risk of liquidity shortage stemming from the possible unavailability of bank lines of credit is more credible. If a firm is financially unconstrained, labor will tend to believe that the firm can obtain alternative resources when bank lines of credit become unavailable. We expect that a financially constrained firm is more motivated to take advantage of the bargaining benefits associated with bank lines of credit than a financially unconstrained firm. Therefore, we have the following hypothesis.

**Hypothesis 3:** The positive relation between the fraction of corporate liquidity held in the form of bank lines of credit and the unionization rate is stronger (weaker) for financially constrained (unconstrained) firms.

### 3. DATA AND VARIABLES

We describe the data and the variables in this section.

#### *(i) Data*

We use U.S. data obtained from the following sources. We use the data of bank lines of credit in Sufi (2009).<sup>3</sup> The original sample in Sufi (2009) includes 300 randomly selected non-financial firms with complete data on lines of credit from 1996 to 2003. We use the Compustat database as the data source for the financial variables. We obtain data on unionization rates for 3-digit Census Industry Classification (CIC) industries from the Union Membership and Coverage Database.<sup>4</sup> We merge the data by matching CIC industry codes with SIC industry codes. We exclude observations with incomplete data. The final sample consists of 291 firms with 1773 firm-year observations.

#### *(ii) Variables*

We describe the variables in this section.

##### *(a) Bargaining Power of Labor Unions*

We use the variable Union Coverage as a measure of the bargaining power of labor unions. Union Coverage is defined as the fraction of total workers in an industry who are covered by labor unions in collective bargaining. A higher union coverage indicates that the labor unions have a higher bargaining power.

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<sup>3</sup> The data were publicly available from Sufi's webpage (<http://faculty.chicagogsb.edu/amir.sufi/>) when we wrote the first draft of the paper. Sufi (2009) collects the data for both a random sample with complete data and a larger sample with only a dummy variable indicating whether a firm has lines of credit.

<sup>4</sup> The database is maintained by Barry Hirsch and David Macpherson and was publicly available at the website [www.unionstats.com](http://www.unionstats.com) when we wrote the first draft of the paper.

### (b) The Forms of Corporate Liquidity

We use the ratio of bank lines of credit to the sum of bank lines of credit and corporate cash holdings as a measure of a firm's choice of the forms of corporate liquidity (e.g., Sufi, 2009; Yun, 2009).  $\text{Unused Line}/(\text{Unused Line} + \text{Cash})$  is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings are defined as cash plus marketable securities (e.g., Opler et al., 1999).  $\text{Total Line}/(\text{Total Line} + \text{Cash})$  is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings.

### (c) Control Variables

We use the following control variables in the regressions (e.g., Sufi, 2009). Size is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. M/B is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. Net Worth is defined as assets minus total liabilities divided by non-cash assets. Tangibility is the ratio of plant, property and equipment to non-cash assets. Cash Flow is the ratio of income before extraordinary items to non-cash assets. Leverage is the ratio of long-term debts to non-cash assets. Cash Flow Volatility is the standard deviation of Cash Flow in the prior 20 years. Industry Cash Flow Volatility is the standard deviation of the median of Cash Flow in an industry classified by 2-digit SIC codes in the prior 20 years. Over the Counter Dummy is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. Not in an S&P Index Dummy is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. Firm Age is approximated by

the number of years a firm is available on Compustat. Table 1 presents univariate statistics. We winsorize the data to reduce the impact of outliers.

#### 4. METHODOLOGY

In this section, we discuss the methodologies used to address the potential endogeneity problem.

##### *(i) The Potential Endogeneity Problem*

One may construct an argument that reverse causality exists, resulting in a potential endogeneity problem. For example, suppose a firm holds a higher fraction of corporate liquidity in the form of bank lines of credit. The workers may be concerned that when these bank lines of credit become unavailable (e.g., during an economic downturn), the firm will have a shortage of corporate liquidity and will fire workers to reduce expenditures. Consequently, more workers will join the labor unions to protect themselves, resulting in a higher bargaining power of labor unions. In this argument, the causality is the other way around.

##### *(ii) Instrumental Variables*

We use the instrumental variables approach (e.g., Greene, 1997) with two-stage least squares estimation (2SLS) to address the potential endogeneity problem.<sup>5</sup> In our research setting, instrumental variables are those variables that directly affect the bargaining power of labor unions but do not directly affect a firm's choice of the forms of corporate liquidity.

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<sup>5</sup> The instrumental variables approach can also address the potential endogeneity problem stemming from the omitted variables when one cannot exhaust all the control variables in a regression.

The labor economics literature has shown that both the gender (e.g., Hirsch, 1980; Hirsch, 1982) and age (e.g., Scoville, 1971) of workers affect the demand for union services. We follow the literature (e.g., Chen, Kacperczyk and Ortiz-Molina, 2011) and use these two variables as instrumental variables.

(a) The Gender of the Workers

The workers' gender variable is called Fraction of Female Workers and is defined as the fraction of female workers in the industry a firm belongs to, where the industry is classified by the 3-digit Census Industry Classification (CIC) codes.

(b) The Age of the Workers

The workers' age variable is called Average Age of the Workers and is defined as the average age of the workers in the industry a firm belongs to, where industry is classified by 3-digit Census Industry Classification (CIC) codes.

We collect the data on gender and age from the Current Population Survey. To our knowledge, no theory has been proposed in the literature to directly link the gender or age of workers to a firm's choice of the forms of corporate liquidity.

*(iii) The Validity of the Instruments and the Specification*

After we choose these instrumental variables, we use a series of tests to examine the validity of our instrumental variables and the specification.

(a) The Relevance of the Instruments

We examine the relevance of the instruments to determine whether they are weak. One way to detect weak instruments is to conduct a first-stage F-test on the null

hypothesis that the instruments are jointly zero (or a partial F-test in the presence of other control variables). Stock, Wright and Yogo (2002) develop the benchmarks for the necessary size of the F-statistic. If the first-stage F-statistic (or partial F-statistic) is below these critical values, the instrumental variables are regarded as weak instruments.

We also examine the first-stage partial  $R^2$ , which measures the strength of the instrumental variables (e.g., Shea, 1997). A higher partial  $R^2$  represents stronger instrumental variables, although there is no formal critical value for this test statistic.

#### (b) The Exogeneity of the Instruments

A common critique of the instrumental variables approach is that the instruments can be correlated with omitted variables. For example, the gender or age of the workers can be correlated with some omitted firm or industry characteristics, while the latter can affect a firm's choice of the forms of corporate liquidity. In this case, these omitted variables are at the root of the link between the unionization rate and the forms of corporate liquidity.

This type of critique questions whether the instruments are endogenous. One way to address this concern is to conduct the over-identifying restrictions test to examine the exogeneity of the instruments. The null hypothesis is that the instrumental variables are valid. Large p-values (i.e., an insignificant test statistic) indicate that the instrumental variables are exogenous.<sup>6</sup>

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<sup>6</sup> Although we have conducted the over-identifying restrictions test, we recognize that our instrumental variables might be related to the industry to which a firm belongs, and given that unionization is also an industry-level object, this might obscure the identification. This is a potential limitation of our study. In Section 5.(vi), we conduct the analysis based on right-to-work legislation. This can provide some remedy for the identification.

### (c) The Existence of the Endogeneity Problem

We also conduct the Hausman (1978) test. The Hausman test examines the differences between the OLS estimates and the 2SLS estimates. A low p-value (i.e., a significant test statistic) suggests that the endogeneity problem exists and that the 2SLS estimates are more consistent than the OLS estimates.

## 5. RESULTS

We report the results in this section. We begin by demonstrating the univariate analysis. We then report the regressions and investigate the difference in the relation between the unionization rate and the forms of corporate liquidity in the sub-groups.

### *(i) Univariate Analysis*

Table 2 shows the univariate analysis. We sort firms into quartiles according to the level of Union Coverage in year t-1 and report the mean of the variables Unused Line/(Unused Line + Cash) and Total Line/(Total Line + Cash) in each quartile. We find that the mean of Unused Line/(Unused Line + Cash) is 0.5673 in the 1st quartile, which includes observations with the highest union coverage. This mean is 0.3585 in the 4th quartile, which includes observations with the lowest union coverage. Moreover, there is a decreasing trend for the variable Unused Line/(Unused Line + Cash) from the 1st quartile to the 4th quartile. We conduct a t-test on the difference between the means of the 1st and 4th quartiles and find that the difference is significant at the 1% level. Table 2 also shows a similar pattern for the variable Total Line/(Total Line + Cash).

The results in Table 2 imply that firms with higher union coverage hold a higher fraction of corporate liquidity in the form of bank lines of credit. This is consistent with Hypothesis 1, which predicts a positive relation between the unionization rate and the fraction of corporate liquidity held in the form of bank lines of credit.

*(ii) First-stage Regression*

Table 3 shows the first-stage regression of the 2SLS estimation. The dependent variable is Union Coverage in year  $t-1$ . The independent variables are two instrumental variables and other control variables in year  $t-1$ .<sup>7</sup> We follow Sufi (2009) and include industry dummy variables defined by 1-digit SIC codes in the regression. We also include year dummy variables to control for time effects. We find that the coefficient of the instrumental variable Fraction of Female Workers $_{t-1}$  is -0.159 and that the coefficient of the instrumental variable Average Age of the Workers $_{t-1}$  is 0.018. Both are significant at the 1% level. The partial F-statistic is 65.79 ( $p = 0.01$ ), indicating that the instruments are not weak. The partial  $R^2$  is 0.15, indicating that the instrumental variables have a reasonable strength.

*(iii) Labor Unions and the Forms of Corporate Liquidity*

Table 4 shows the regressions for the relation between labor unions and the forms of corporate liquidity. We follow Sufi (2009) and use one-year lagged variables as independent variables in the regressions. We show both the OLS regressions and the second stage of the 2SLS estimation in this table.

The dependent variable is Unused Line/(Unused Line + Cash) in Columns 1 and 2.

Column 1 shows that the coefficient of Union Coverage $_{t-1}$  is 0.167 ( $p = 0.05$ ) in the

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<sup>7</sup> There is no lagging in Table 3 because both the dependent variable and the independent variables are in year  $t-1$ . We run the first-stage regression with the variables in year  $t-1$ , because we will use the lagged independent variables in the second stage of the 2SLS estimation.



OLS estimation. Column 2 shows that this coefficient is 1.208 ( $p = 0.01$ ) in the second stage of the 2SLS estimation. We conduct the over-identifying restrictions test and find that the F-statistic is 0.49, with an insignificant p-value of 0.48, which implies that the instrumental variables are exogenous and valid. We conduct the Hausman test and find that the F-statistic is 10.73 ( $p = 0.01$ ), which means there is a significant difference between the OLS estimates and the 2SLS estimates and that it is more proper to draw implications based on the 2SLS estimates due to the existence of the endogeneity problem.

We take the coefficients in Column 2 to illustrate the economic magnitude of the results. Column 2 shows that the coefficient of  $\text{Union Coverage}_{t-1}$  is 1.208 and is statistically significant ( $p = 0.01$ ). Table 1 shows that the standard deviation of the variable  $\text{Union Coverage}_{t-1}$  is 0.1196, which implies that a one standard deviation increase in the variable  $\text{Union Coverage}_{t-1}$  leads to a 14.48% increase ( $= 1.208 * 0.1196$ ) in the fraction of corporate liquidity held in the form of unused lines of credit. In our sample, the mean of the sum of unused lines of credit and corporate cash holdings is 256.92 million dollars. Therefore, the 14.48% increase in the fraction of corporate liquidity held in the form of unused lines of credit corresponds to a dollar value of 37.20 million dollars ( $= 14.48\% * 256.92$ ). This implies that the impact of union coverage on a firm's choice of the forms of corporate liquidity is economically significant.

We find a similar pattern in the results in Columns 3 and 4, where the dependent variable is  $\text{Total Line}/(\text{Total Line} + \text{Cash})$ . Column 3 shows that the coefficient of Union Coverage is 0.169 ( $p = 0.08$ ) in the OLS estimation. Column 4 shows that this coefficient is 1.407 ( $p = 0.01$ ) in the second stage of the 2SLS estimation. The over-

identifying restrictions test and the Hausman test show that it is more proper to draw implications based on the 2SLS estimates.

Therefore, the results in Table 4 are consistent with the interpretation that firms hold more corporate liquidity in the form of bank lines of credit in the presence of stronger labor unions. The results support Hypothesis 1.

*(iv) Union Coverage and the Level of Bank Lines of Credit*

Klasa et al. (2009) find that firms with stronger labor unions have lower corporate cash holdings. Our use of Unused Line/(Unused Line + Cash) and Total Line/(Total Line + Cash) as the measures of the forms of corporate liquidity allows an alternative explanation that the findings are driven by the reduction in corporate cash holdings instead of the increase in bank lines of credit because corporate cash holdings appear in the denominator of the measures. To examine this alternative interpretation, we investigate whether the unionization rate directly affects the level of bank lines of credit.

Table 5 shows the results. We report the second stage of the 2SLS estimation. The dependent variables in this table are the level of bank lines of credit. Unused Lines of Credit is the ratio of unused lines of credit to assets, and Total Lines of Credit is the ratio of total lines of credit to assets. Column 1 shows that the coefficient of  $Union\ Coverage_{t-1}$  is 0.170 ( $p = 0.07$ ), which implies that firms have a higher level of unused lines of credit in the presence of stronger labor unions. We find a similar pattern in Column 2, which shows the regression for Total Lines of Credit.

We examine whether the economic magnitude of the coefficients in Table 5 is consistent with the economic magnitude of the coefficients in Table 4. We take the coefficient in Column 1 of Table 5 as an example. Column 1 shows that the

coefficient of  $\text{Union Coverage}_{t-1}$  is 0.170 and is statistically significant ( $p = 0.07$ ), which implies that a one standard deviation increase in the variable  $\text{Union Coverage}_{t-1}$  leads to a 2.03% increase ( $= 0.170 * 0.1196$ ) in the level of unused lines of credit. In our sample, the mean of total assets is 1516.25 million dollars. Therefore, the 2.03% increase in the level of unused lines of credit corresponds to a dollar value of 30.78 million dollars ( $= 2.03\% * 1516.25$ ). This implies that the coefficients in Table 5 have a similar economic magnitude as the coefficients in Table 4.

Therefore, the results in Table 5 are consistent with the interpretation that the unionization rate directly increases a firm's holding of bank lines of credit. This is consistent with Hypothesis 1.

#### *(v) Industry-level Analysis*

Because our unionization data are at the industry level, industries with more firms will receive a larger weight in the regressions in Table 4. We therefore conduct an industry-level analysis by giving each industry an equal weight. We convert all firm-level variables into industry-level variables each year by taking the average of the variables across the industries classified by 3-digit Census Industry Classification (CIC) codes. We exclude observations where a firm is the only firm in an industry in our sample to avoid mixing industry-level data with firm-level data.

Table 6 shows the results. We report the second-stage regressions of the 2SLS estimation. Column 1 shows that the coefficient of  $\text{Union Coverage}_{t-1}$  is 1.012 ( $p = 0.01$ ) in the regression for  $\text{Unused Line}/(\text{Unused Line} + \text{Cash})$ . We find a similar pattern in Column 2, which shows the regression for  $\text{Total Line}/(\text{Total Line} + \text{Cash})$ .

Therefore, the results of the industry-level analysis in Table 6 are similar to those of the firm-level analysis in Table 4 and thus support Hypothesis 1, which predicts a

positive relation between the unionization rate and the fraction of corporate liquidity held in the form of bank lines of credit.

*(vi) Right-to-work Legislation*

We investigate how right-to-work legislation affects the relation between the unionization rate and the fraction of corporate liquidity held in the form of bank lines of credit. We obtain the data on the status of right-to-work legislation in each state from the website of the United States Department of Labor.<sup>8</sup> The state in which employees work determines whether right-to-work legislation governs their employment.<sup>9</sup> We use the “State” variable in Compustat to determine in which state a firm has the majority of its operations (e.g., Klasa, Maxwell and Ortiz-Molina, 2009).<sup>10</sup> We divide the sample into two sub-groups depending on whether a firm is in a state with right-to-work legislation. We estimate the regressions separately for these two sub-groups.

Table 7 shows the results. We report the second stage of the 2SLS estimation in Panel A. Columns 1 and 2 show the regressions for Unused Line/(Unused Line + Cash). Column 1 shows that the coefficient of Union Coverage<sub>t-1</sub> is 1.170 (p = 0.01) for the sub-group of firms that are not in a state with right-to-work legislation. Column 2 shows that this coefficient is 0.203 (p = 0.78) for the sub-group of firms that are in a state with right-to-work legislation. We conduct a t-test of the difference in the coefficients of Union Coverage<sub>t-1</sub> between the two sub-groups separated by the

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<sup>8</sup> The information on the status of right-to-work legislation in each state is publicly available at the website of the United States Department of Labor (<http://www.dol.gov>).

<sup>9</sup> For example, the Constitution of the State of Florida states that “The right of persons to work shall not be denied or abridged on account of membership or non-membership in any labor union or labor organization.” (Article I, Section 6). And the Florida Statutes states that “The term “labor organization” means any organization of employees or local or subdivision thereof, having within its membership residents of the state, whether incorporated or not, ..... shall be included in this definition .....” (Chapter 447.02). See the website of the Florida Legislature (<http://www.leg.state.fl.us>).

<sup>10</sup> See Klasa, Maxwell and Ortiz-Molina (2009), p427-p428.

status of right-to-work legislation, and report the results in Panel B. We find that the difference is significant ( $p = 0.01$ ). We find a similar pattern in Columns 3 and 4 for the regressions for Total Line/(Total Line + Cash).

Therefore, the results in Table 7 imply that there is a positive relation (no relation) between the unionization rate and the fraction of corporate liquidity held in the form of bank lines of credit for firms that are not in (are in) a state with right-to-work legislation. These results are consistent with Hypothesis 2.

#### (a) Robustness Check

A potential limitation of the analysis on right-to-work legislation is that the variable “State” in Compustat is measured with noise (e.g., Klasa, Maxwell and Ortiz-Molina, 2009).<sup>11</sup> Because a firm’s state of operation can be different from its state of incorporation, it is possible that some employees of the firm do not work in the state as identified by the “State” variable in Compustat. This can reduce the power of the analysis based on right-to-work legislation.

We conduct the robustness check in this section. We collect data on a firm’s state of incorporation from Compustat. Then, we obtain a sub-sample of firms whose state of operation is the same as the state of incorporation. This sub-sample includes 532 firm-year observations. Because the state of operation is the same as the state of incorporation for the firms in this sub-sample, it is more likely that most of their employees work in the state identified by the “State” variable in Compustat. This can mitigate concern over the potential limitation.

In the second-stage regressions of the 2SLS estimation for Unused Line/(Unused Line + Cash), the coefficient of Union Coverage<sub>t-1</sub> is 1.149 ( $p = 0.03$ ) for the sub-

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<sup>11</sup> See Klasa, Maxwell and Ortiz-Molina (2009), p428.

group of firms that are not in a state with right-to-work legislation, and this coefficient is -0.058 ( $p = 0.96$ ) for the sub-group of firms that are in a state with right-to-work legislation. A t-test shows a significant difference ( $p = 0.01$ ) in these coefficients between the two sub-groups separated by the status of right-to-work legislation. We find a similar pattern in the regressions for Total Line/(Total Line + Cash). Therefore, we find similar results when we use a sub-sample of firms whose state of operation is the same as the state of incorporation.<sup>12</sup>

#### (b) Heckman Two-stage Estimation

Because a firm may choose the state of operation or the state of incorporation, we apply the Heckman (1979) two-stage estimation to mitigate this self-selection problem. We conduct the analysis for the sub-sample of firms whose state of operation is the same as the state of incorporation because using this sub-sample can mitigate the potential limitation regarding the difference in the state of operation and the state of incorporation as discussed above.

In the first stage, we estimate a probit regression to model a firm's decision on whether to incorporate/operate in a state with right-to-work legislation. The dependent variable is a dummy variable that equals one if a firm is incorporated and operated in a state with right-to-work legislation and equals zero otherwise. The independent variables are motivated by Bebchuk and Cohen (2003) and include the logarithm of sales, market-to-book ratio, ROA, the logarithm of the number of employees, two dummy variables indicating when a firm went public, industry dummy variables for industries defined by 2-digit SIC codes<sup>13</sup>. Because we focus on labor law while

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<sup>12</sup> These results are not tabulated but are available on request.

<sup>13</sup> See the specification in Table 8 of Bebchuk and Cohen (2003, p403). Because we conduct the analysis for the sub-sample of firms whose state of operation is the same as the state of incorporation, we do not include the state dummy variables in the probit regression.

Bebchuk and Cohen (2003) focus on corporate law, we add labor intensity as an additional independent variable in the regression. Moreover, we include all the second-stage variables (except for Lambda) in the first stage as a standard procedure of the Heckman two-stage estimation.

We obtain Lambda from the probit estimates. The calculation of Lambda follows the standard Heckman methodology. Among the independent variables, we find that a firm is more likely to incorporate/operate in a state with right-to-work legislation if the firm has more employees or a higher labor intensity. This is consistent with the interpretation that a firm is more motivated to take advantage of right-to-work legislation to weaken the bargaining power of labor if the firm has more employees or a higher labor intensity.

In the second stage, we estimate the regressions with Lambda as an additional control variable. This provides the treatment for the self-selection problem. In the second-stage regressions of the 2SLS estimation for Unused Line/(Unused Line + Cash), the coefficient of Union Coverage<sub>t-1</sub> is 1.275 (p = 0.01) for the sub-group of firms that are not in a state with right-to-work legislation, and this coefficient is 0.015 (p = 0.98) for the sub-group of firms that are in a state with right-to-work legislation. A t-test shows a significant difference (p = 0.01) in these coefficients between the two sub-groups separated by status of right-to-work legislation. We find a similar pattern in the regressions for Total Line/(Total Line + Cash). Therefore, we find similar results after we use the Heckman two-stage estimation to control for the self-selection problem.<sup>14</sup>

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<sup>14</sup> These results are not tabulated but are available on request.

### (c) Labor Costs and Operating Profitability

In this section, we examine whether there is a difference in the impact of the forms of corporate liquidity on labor costs and operating profitability between the states with or without right-to-work legislation. This can provide further evidence on the consequence of the bargaining effect associated with bank lines of credit.

We first examine labor costs. If a firm holds a higher fraction of corporate liquidity in the form of bank lines of credit (i.e., a lower fraction of corporate liquidity in the form of corporate cash holdings), then the firm's labor costs will be lower because of the bargaining benefits associated with bank lines of credit. We expect that the negative relation between the fraction of corporate liquidity held in the form of bank lines of credit and labor costs is stronger (weaker) for firms that are not in (are in) a state with right-to-work legislation.

We obtain a sub-sample of firms whose data on labor costs are available in Compustat. This sub-sample includes 133 firm-year observations.<sup>15</sup> We follow Chemmanur, Cheng and Zhang (2013) and define labor costs as average employee pay, which is calculated as staff expenses divided by the number of employees. In the regressions, the dependent variable is the logarithm of average employee pay. The independent variables include the fraction of corporate liquidity held in the form of bank lines of credit and other control variables. The control variables are motivated by Chemmanur, Cheng and Zhang (2013) and include size, leverage, average sales per employee, market-to-book ratio, and tangibility.

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<sup>15</sup> The size of this sub-sample is much smaller because in the US the disclosure of labor costs is voluntary (e.g., Lajili and Zeghal, 2005), and the data are only available for a small fraction of firms. For example, Chemmanur, Cheng and Zhang (2013) state that "Compustat provides "labor and related expenses" (data item 42) ..... About 10% of firms recorded in Compustat have valid information on data item 42". See Chemmanur, Cheng and Zhang (2013), p482.



In the regressions for the logarithm of average employee pay, the coefficient of Unused Line/(Unused Line + Cash) is -0.510 ( $p = 0.04$ ) for the sub-group of firms that are not in a state with right-to-work legislation, and this coefficient is 0.006 ( $p = 0.97$ ) for the sub-group of firms that are in a state with right-to-work legislation. A t-test shows a significant difference ( $p = 0.03$ ) in these coefficients between the two sub-groups separated by status of right-to-work legislation. We find a similar pattern when we use Total Line/(Total Line + Cash) as the measure of the fraction of corporate liquidity held in the form of bank lines of credit. Therefore, the results are consistent with the interpretation that there is a negative relation (no relation) between the fraction of corporate liquidity held in the form of bank lines of credit and labor costs for firms that are not in (are in) a state with right-to-work legislation.<sup>16</sup>

Next, we examine operating profitability. If a firm holds a higher fraction of corporate liquidity in the form of bank lines of credit (i.e., a lower fraction of corporate liquidity in the form of corporate cash holdings), then the firm's operating profitability will be higher because of the bargaining benefits associated with bank lines of credit. We expect that the positive relation between the fraction of corporate liquidity held in the form of bank lines of credit and operating profitability is stronger (weaker) for firms that are not in (are in) a state with right-to-work legislation.

We use ROA as the measure of operating profitability. We define ROA as the ratio of EBIT to non-cash assets.<sup>17</sup> The independent variables include the fraction of corporate liquidity held in the form of bank lines of credit and other control variables. The control variables include size, market-to-book ratio, leverage, capital expenditures, tangibility, and lagged ROA in year  $t-1$ . These variables are commonly used in the literature as determinants of ROA.

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<sup>16</sup> These results are not tabulated but are available on request.

<sup>17</sup> We obtain similar results when we define ROA as the ratio of EBIT to assets. We also obtain similar results when we use the ratio of EBIT to sales as the measure of operating profitability.

In the regressions for ROA, the coefficient of Unused Line/(Unused Line + Cash) is 0.055 ( $p = 0.01$ ) for the sub-group of firms that are not in a state with right-to-work legislation, and this coefficient is 0.016 ( $p = 0.39$ ) for the sub-group of firms that are in a state with right-to-work legislation. A t-test shows a significant difference ( $p = 0.03$ ) in these coefficients between the two sub-groups separated by status of right-to-work legislation. We find a similar pattern when we use Total Line/(Total Line + Cash) as the measure of the fraction of corporate liquidity held in the form of bank lines of credit. Therefore, the results are consistent with the interpretation that there is a positive relation (no relation) between the fraction of corporate liquidity held in the form of bank lines of credit and operating profitability for firms that are not in (are in) a state with right-to-work legislation.<sup>18</sup>

*(vii) Financial Constraints*

We investigate how financial constraints affect the relation between the unionization rate and the fraction of corporate liquidity held in the form of bank lines of credit. We follow the literature and use two measures of financial constraints. First, we use payout defined as the ratio of the sum of dividends and stock repurchases to total assets. We divide the sample into two sub-groups depending on the level of payout. A firm is financially constrained (unconstrained) if lagged payout is below (above) the median. Second, we divide the sample into two sub-groups depending on whether a firm has credit ratings. We obtain credit ratings data from Compustat. A firm is financially unconstrained (constrained) if the firm has either (neither) a bond rating or (nor) a commercial paper rating. We estimate the regressions separately for the financially unconstrained and constrained sub-groups.

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<sup>18</sup> These results are not tabulated but are available on request.

Table 8 shows the results. Panel A shows the regressions when we separate the sample by payout. We report the second stage of the 2SLS estimation. Columns 1 and 2 show the regressions for Unused Line/(Unused Line + Cash). Column 1 shows that the coefficient of Union Coverage<sub>t-1</sub> is 1.763 (p = 0.04) for the sub-group of financially constrained firms. Column 2 shows that this coefficient is 0.430 (p = 0.20) for the sub-group of financially unconstrained firms. A t-test reported in Panel B shows a significant difference (p = 0.05) in these coefficients between the two sub-groups separated by payout. We find a similar pattern in Columns 3 and 4 for the regressions for Total Line/(Total Line + Cash).

Panel C shows the regressions when we separate the sample by whether a firm has credit ratings. We report the second stage of the 2SLS estimation. Columns 1 and 2 show the regressions for Unused Line/(Unused Line + Cash). Column 1 shows that the coefficient of Union Coverage<sub>t-1</sub> is 2.082 (p = 0.01) for the sub-group of financially constrained firms. Column 2 shows that this coefficient is -0.077 (p = 0.78) for the sub-group of financially unconstrained firms. A t-test reported in Panel D shows a significant difference (p = 0.01) in these coefficients between the two sub-groups separated by the availability of credit rating. We find a similar pattern in Columns 3 and 4 for the regressions for Total Line/(Total Line + Cash).

Therefore, the results in Table 8 imply that there is a positive relation (no relation) between the unionization rate and the fraction of corporate liquidity held in the form of bank lines of credit for financially constrained (unconstrained) firms. These results are consistent with Hypothesis 3.

*(viii) Robustness Checks*

We conduct robustness checks in this section. We examine an alternative explanation related to labor intensity. Then, we conduct the analysis using union membership as an alternative measure of the bargaining power of labor unions.

*(a) Labor Intensity*

Klasa et al. (2009) argue that a lower union coverage can indicate lower labor intensity instead of less union bargaining power in some industries. A firm with lower labor intensity may have higher asset tangibility because the firm can be in a capital-intensive rather than a labor-intensive industry. This can facilitate the firm in obtaining more bank lines of credit. Therefore, an alternative explanation is that because unionization rate may proxy for labor intensity, the observed effect of the unionization rate on the forms of corporate liquidity can stem from the impact of labor intensity instead of collective bargaining.

We examine this alternative explanation by dividing the sample into two sub-groups based on the level of a firm's labor intensity, and we investigate whether there is a difference in the impact of unionization rate on the forms of corporate liquidity between these two sub-groups. We use the ratio of a firm's number of employees to assets as the measure of labor intensity. We divide the sample into two sub-groups depending on whether labor intensity in year  $t-1$  is below or above the median. We estimate the regressions separately for these two sub-groups. If the observed impact of unionization rate on the forms of corporate liquidity is (is not) solely due to the impact of labor intensity, we should not (should) find a significant impact of union coverage on the forms of corporate liquidity after controlling for the labor intensity.

Table 9 shows the results. We report the second stage of the 2SLS estimation in Panel A. Column 1 shows that the coefficient of  $\text{Union Coverage}_{t-1}$  is 1.147 ( $p = 0.01$ ) for the sub-group of firms with lower labor intensity, and Column 2 shows that this coefficient is 1.043 ( $p = 0.04$ ) for the sub-group of firms with higher labor intensity. A t-test reported in Panel B shows an insignificant difference ( $p = 0.78$ ) in the coefficients of  $\text{Union Coverage}_{t-1}$  between the two sub-groups separated by the labor intensity. We find a similar pattern in Columns 3 and 4 for the regressions for  $\text{Total Line}/(\text{Total Line} + \text{Cash})$ .

Therefore, after controlling for the labor intensity, we still find a significant impact of unionization rate on a firm's choice of the forms of corporate liquidity, which implies that our findings are not driven by labor intensity.

#### (b) Union Membership

We repeat the analysis, using union membership as an alternative measure of the bargaining power of labor unions. Union membership is the fraction of total workers in an industry who are members of labor unions. Table 1 shows that union coverage is higher than union membership, indicating that collective bargaining covers some workers who are not members of labor unions. We use the same specification as in Table 4 and replace the union coverage with the union membership. The results are consistent with the interpretation that firms hold more corporate liquidity in the form of bank lines of credit in the presence of stronger labor unions. Therefore, we find similar results when we use union membership as an alternative measure of the bargaining power of labor unions.

## 6. CONCLUSION

We examine how the presence of labor unions affects a firm's choice of the forms of corporate liquidity between bank lines of credit and corporate cash holdings. We use the unionization rate to measure the bargaining power of labor unions, and we use the ratio of bank lines of credit to the sum of bank lines of credit and corporate cash holdings as a measure of a firm's choice of the forms of corporate liquidity. We use instrumental variables with two-stage least squares estimation.

We find that firms in industries with higher unionization rates hold a higher fraction of corporate liquidity in the form of bank lines of credit. We divide the firms into sub-groups and find that this positive relationship holds for firms that are not in a state with right-to-work legislation and for firms that are financially constrained. We conduct robustness checks and find similar results when we control for labor intensity and when we use the union membership as an alternative measure of the bargaining power of labor unions.

Therefore, our findings are consistent with the hypothesis that a firm chooses the forms of corporate liquidity to take advantage of the bargaining benefits associated with bank lines of credit.

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**Table 1**  
Univariate Statistics

Variable	Mean	Median	25th Percentile	75th Percentile	Std. Dev.
Unused Line/(Unused Line + Cash)	0.4559	0.4665	0.0000	0.8297	0.3750
Total Line/(Total Line + Cash)	0.5170	0.5886	0.0000	0.9033	0.3894
Unused Lines of Credit	0.1030	0.0697	0.0000	0.1515	0.1253
Total Lines of Credit	0.1577	0.1138	0.0000	0.2453	0.1581
Corporate Cash Holdings	0.1894	0.0803	0.0208	0.2822	0.2314
Union Coverage $t-1$	0.1167	0.0800	0.0330	0.1500	0.1196
Union Membership $t-1$	0.1077	0.0740	0.0280	0.1380	0.1163
Size $t-1$	18.7380	18.7468	17.1287	20.2452	2.3309
M/B $t-1$	3.6161	1.5033	1.0700	2.7319	7.1529
Net Worth $t-1$	0.4361	0.4544	0.2868	0.6365	0.2856
Tangibility $t-1$	0.6310	0.5357	0.2963	0.8450	0.4864
Cash Flow $t-1$	0.0618	0.1261	0.0420	0.1951	0.2886
Leverage $t-1$	0.1677	0.1067	0.0006	0.2925	0.1827
Cash Flow Volatility $t-1$	0.2624	0.0859	0.0424	0.2143	0.4753
Industry Cash Flow Volatility $t-1$	0.0490	0.0446	0.0297	0.0576	0.0260
Over the Counter Dummy $t-1$	0.1562	0.0000	0.0000	0.0000	0.3632
Not in an S&P Index Dummy $t-1$	0.6887	1.0000	0.0000	1.0000	0.4632
Firm Age $t-1$	15.5742	10.0000	5.0000	24.0000	13.6507
Fraction of Female Workers $t-1$	0.3595	0.3420	0.2410	0.4470	0.1582
Average Age of the Workers $t-1$	39.5563	40.0924	39.8021	40.3123	1.5047

Notes:

This table shows the univariate statistics. We use a sample of 1773 firm-year observations from 1996 to 2003. *Unused Line/(Unused Line + Cash)* is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings are the sum of cash and marketable securities. *Total Line/(Total Line + Cash)* is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings. *Unused Lines of Credit* is the ratio of unused lines of credit to assets. *Total Lines of Credit* is the ratio of total lines of credit to assets. *Corporate Cash Holdings* is defined as the ratio of the sum of cash and marketable securities to assets. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Union Membership* is the fraction of total workers in an industry who are members of labor unions. *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Industry Cash Flow Volatility* is the standard deviation of the median of *Cash Flow* in an industry classified by 2-digit SIC codes in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years a firm is available on Compustat. *Fraction of Female Workers* is the fraction of female workers in the industry a firm belongs to. *Average Age of the Workers* is the average age of the workers in the industry a firm belongs to.

**Table 2**  
Univariate Analysis of Union Coverage and the Forms of Corporate Liquidity

	Union Coverage $t-1$				Difference between the 1st Quartile and the 4th Quartile (p-value of the mean test)
	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile	
Unused Line/(Unused Line + Cash)	0.5673	0.4850	0.4151	0.3585	0.2088*** (0.01)
Total Line/(Total Line + Cash)	0.6218	0.5452	0.4729	0.4299	0.1919*** (0.01)

Notes:

This table shows the univariate analysis of union coverage and the forms of corporate liquidity. We use a sample of 1773 firm-year observations from 1996 to 2003. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). We divide the observations into quartiles based on the level of union coverage in year  $t-1$ . *1st Quartile* includes the observations with the highest union coverage. *4th Quartile* includes the observations with the lowest union coverage. *Unused Line/(Unused Line + Cash)* is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings is the sum of cash and marketable securities. *Total Line/(Total Line + Cash)* is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings. We report the mean of the variables and the p-value of the mean test in the table. \*\*\*, \*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.

**Table 3**  
First-stage Regression

Model:  $Union\ Coverage_{i,t-1} = a + b_1 * Fraction\ of\ Female\ Workers_{i,t-1} + b_2 * Average\ Age\ of\ the\ Workers_{i,t-1} + b_3 * Size_{i,t-1} + b_4 * M/B_{i,t-1} + b_5 * Net\ Worth_{i,t-1} + b_6 * Tangibility_{i,t-1} + b_7 * Cash\ Flow_{i,t-1} + b_8 * Leverage_{i,t-1} + b_9 * Cash\ Flow\ Volatility_{i,t-1} + b_{10} * Industry\ Cash\ Flow\ Volatility_{i,t-1} + b_{11} * Over\ the\ Counter\ Dummy_{i,t-1} + b_{12} * Not\ in\ an\ S\&P\ Index\ Dummy_{i,t-1} + b_{13} * Firm\ Age_{i,t-1} + Industry\ Dummy\ Variables + Year\ Dummy\ Variables + \epsilon_{i,t-1}$

	Union Coverage <sub>t-1</sub>
Intercept	-0.592*** (0.01)
Fraction of Female Workers <sub>t-1</sub>	-0.159*** (0.01)
Average Age of the Workers <sub>t-1</sub>	0.018*** (0.01)
Size <sub>t-1</sub>	0.003** (0.04)
M/B <sub>t-1</sub>	-0.001*** (0.01)
Net Worth <sub>t-1</sub>	-0.034*** (0.01)
Tangibility <sub>t-1</sub>	-0.001 (0.90)
Cash Flow <sub>t-1</sub>	-0.012 (0.17)
Leverage <sub>t-1</sub>	0.004 (0.75)
Cash Flow Volatility <sub>t-1</sub>	0.001 (0.95)
Industry Cash Flow Volatility <sub>t-1</sub>	-1.070*** (0.01)
Over the Counter Dummy <sub>t-1</sub>	0.033*** (0.01)
Not in an S&P Index Dummy <sub>t-1</sub>	-0.012** (0.02)
Firm Age <sub>t-1</sub>	0.001*** (0.01)
Industry Dummy Variables	Yes
Year Dummy Variables	Yes
Observations	1773
Adjusted R <sup>2</sup>	0.56
Partial F-statistic	F = 65.79 (p = 0.01)
Partial R <sup>2</sup>	0.15

Notes:

This table shows the first-stage regression of the 2SLS estimation. We use a sample of 1773 firm-year observations from 1996 to 2003. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Fraction of Female Workers* is the fraction of female workers in the industry a firm belongs to, where the industry is classified by the 3-digit Census Industry Classification (CIC) codes. *Average Age of the Workers* is the average age of the workers in the industry a firm belongs to, where the industry is classified by the 3-digit Census Industry Classification (CIC) codes. *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Industry Cash Flow Volatility* is the standard deviation of the median of *Cash Flow* in an industry classified by 2-digit SIC codes in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years that a firm is available on Compustat. *Industry Dummy Variables* are the dummy variables for industries defined by 1-digit SIC codes and are not reported in the table. *Year Dummy Variables* are the dummy variables for the years in the sample and are not reported in the table. The p-value is in parentheses. \*\*\*, \*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.

**Table 4**  
Second-stage Regressions: Union Coverage and the Forms of Corporate Liquidity

$$\begin{aligned} \text{Model 1: } \text{Unused Line}/(\text{Unused Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

$$\begin{aligned} \text{Model 2: } \text{Total Line}/(\text{Total Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

	Unused Line/(Unused Line + Cash)		Total Line/(Total Line + Cash)	
	Model 1:	Model 1:	Model 2:	Model 2:
	OLS	Second Stage of the 2SLS	OLS	Second Stage of the 2SLS
Intercept	-0.533*** (0.01)	-0.457*** (0.01)	-0.447*** (0.01)	-0.488*** (0.01)
Union Coverage <sub>t-1</sub>	0.167** (0.05)	1.208*** (0.01)	0.169* (0.08)	1.407*** (0.01)
Size <sub>t-1</sub>	0.043*** (0.01)	0.040*** (0.01)	0.040*** (0.01)	0.037*** (0.01)
M/B <sub>t-1</sub>	-0.005*** (0.01)	-0.004*** (0.01)	-0.007*** (0.01)	-0.005*** (0.01)
Net Worth <sub>t-1</sub>	0.043 (0.16)	0.087*** (0.01)	0.028 (0.37)	0.078** (0.03)
Tangibility <sub>t-1</sub>	0.044*** (0.01)	0.048*** (0.01)	0.037** (0.03)	0.041** (0.02)
Cash Flow <sub>t-1</sub>	0.037 (0.25)	0.052 (0.12)	0.045 (0.17)	0.061* (0.08)
Leverage <sub>t-1</sub>	0.319*** (0.01)	0.333*** (0.01)	0.429*** (0.01)	0.445*** (0.01)
Cash Flow Volatility <sub>t-1</sub>	-0.108*** (0.01)	-0.108*** (0.01)	-0.122*** (0.01)	-0.120*** (0.01)
Industry Cash Flow Volatility <sub>t-1</sub>	-1.986*** (0.01)	-0.785 (0.16)	-2.369*** (0.01)	-0.906 (0.11)
Over the Counter Dummy <sub>t-1</sub>	-0.028 (0.20)	-0.067*** (0.01)	0.003 (0.89)	-0.040 (0.13)
Not in an S&P Index Dummy <sub>t-1</sub>	0.030 (0.12)	0.043** (0.03)	0.053*** (0.01)	0.068*** (0.01)
Firm Age <sub>t-1</sub>	0.001 (0.56)	-0.001 (0.42)	-0.001 (0.61)	-0.001** (0.05)
Industry Dummy Variables	Yes	Yes	Yes	Yes
Year Dummy Variables	Yes	Yes	Yes	Yes
Observations	1773	1773	1773	1773
Adjusted R <sup>2</sup>	0.38	0.36	0.42	0.39
Over-identifying Restrictions Test		F = 0.49 (p = 0.48)		F = 0.37 (p = 0.54)
Hausman Test		F = 10.73 (p = 0.01)		F = 15.57 (p = 0.01)

**Table 4 (Continued)**

Notes:

This table shows the OLS estimation and the second stage of the 2SLS estimation of the relation between the unionization rate and the forms of corporate liquidity. We use a sample of 1773 firm-year observations from 1996 to 2003. *Unused Line/(Unused Line + Cash)* is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings are the sum of cash and marketable securities. *Total Line/(Total Line + Cash)* is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Industry Cash Flow Volatility* is the standard deviation of the median of *Cash Flow* in an industry classified by 2-digit SIC codes in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years that a firm is available on Compustat. *Industry Dummy Variables* are the dummy variables for industries defined by 1-digit SIC codes and are not reported in the table. *Year Dummy Variables* are the dummy variables for the years in the sample and are not reported in the table. The p-value is in parentheses. \*\*\*,\*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.

**Table 5**  
Union Coverage and the Level of Bank Lines of Credit

$$\begin{aligned} \text{Model 1: Unused Lines of Credit}_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

$$\begin{aligned} \text{Model 2: Total Lines of Credit}_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

	Unused Lines of Credit		Total Lines of Credit	
	Model 1	Model 2	Model 1	Model 2
	Second Stage of the 2SLS		Second Stage of the 2SLS	
Intercept	0.096**	0.141***	(0.02)	(0.01)
Union Coverage <sub>t-1</sub>	0.170*	0.283*	(0.07)	(0.06)
Size <sub>t-1</sub>	0.001	0.001	(0.62)	(0.58)
M/B <sub>t-1</sub>	-0.001***	-0.002***	(0.01)	(0.01)
Net Worth <sub>t-1</sub>	0.008	-0.004	(0.52)	(0.77)
Tangibility <sub>t-1</sub>	-0.007	0.003	(0.27)	(0.76)
Cash Flow <sub>t-1</sub>	0.030**	0.047***	(0.02)	(0.01)
Leverage <sub>t-1</sub>	0.030	0.140***	(0.14)	(0.01)
Cash Flow Volatility <sub>t-1</sub>	-0.037***	-0.054***	(0.01)	(0.01)
Industry Cash Flow Volatility <sub>t-1</sub>	-0.161	-0.574***	(0.34)	(0.01)
Over the Counter Dummy <sub>t-1</sub>	-0.042***	-0.029***	(0.01)	(0.01)
Not in an S&P Index Dummy <sub>t-1</sub>	0.009	0.028***	(0.23)	(0.01)
Firm Age <sub>t-1</sub>	-0.001***	-0.002***	(0.01)	(0.01)
Industry Dummy Variables	Yes	Yes		
Year Dummy Variables	Yes	Yes		
Observations	1773	1773		
Adjusted R <sup>2</sup>	0.12	0.20		
Over-identifying Restrictions Test	F = 1.72 (p = 0.19)	F = 0.24 (p = 0.62)		
Hausman Test	F = 3.57 (p = 0.05)	F = 4.21 (p = 0.04)		

**Table 5 (Continued)**

Notes:

This table shows the second-stage regressions of the 2SLS estimation of the relation between the unionization rate and the level of bank lines of credit. We use a sample of 1773 firm-year observations from 1996 to 2003. *Unused Lines of Credit* is the ratio of unused lines of credit to assets. *Total Lines of Credit* is the ratio of total lines of credit to assets. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Industry Cash Flow Volatility* is the standard deviation of the median of *Cash Flow* in an industry classified by 2-digit SIC codes in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years that a firm is available on Compustat. *Industry Dummy Variables* are the dummy variables for industries defined by 1-digit SIC codes and are not reported in the table. *Year Dummy Variables* are the dummy variables for the years in the sample and are not reported in the table. The p-value is in parentheses. \*\*\*, \*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.



**Table 6**  
**Union Coverage and the Forms of Corporate Liquidity: Industry-Level Analysis**

Model 1:  $\text{Industry Unused Line}/(\text{Unused Line} + \text{Cash})_{i,t} = a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Industry Size}_{i,t-1} + b_3 * \text{Industry M/B}_{i,t-1}$   
 $+ b_4 * \text{Industry Net Worth}_{i,t-1} + b_5 * \text{Industry Tangibility}_{i,t-1}$   
 $+ b_6 * \text{Industry Cash Flow}_{i,t-1} + b_7 * \text{Industry Leverage}_{i,t-1}$   
 $+ b_8 * \text{Industry Cash Flow Volatility}_{i,t-1}$   
 $+ b_9 * \text{Industry Over the Counter Dummy}_{i,t-1}$   
 $+ b_{10} * \text{Industry Not in an S\&P Index Dummy}_{i,t-1} + b_{11} * \text{Industry Firm Age}_{i,t-1}$   
 $+ \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t}$

Model 2:  $\text{Industry Total Line}/(\text{Total Line} + \text{Cash})_{i,t} = a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Industry Size}_{i,t-1} + b_3 * \text{Industry M/B}_{i,t-1}$   
 $+ b_4 * \text{Industry Net Worth}_{i,t-1} + b_5 * \text{Industry Tangibility}_{i,t-1}$   
 $+ b_6 * \text{Industry Cash Flow}_{i,t-1} + b_7 * \text{Industry Leverage}_{i,t-1}$   
 $+ b_8 * \text{Industry Cash Flow Volatility}_{i,t-1}$   
 $+ b_9 * \text{Industry Over the Counter Dummy}_{i,t-1}$   
 $+ b_{10} * \text{Industry Not in an S\&P Index Dummy}_{i,t-1} + b_{11} * \text{Industry Firm Age}_{i,t-1}$   
 $+ \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t}$

	Industry Unused Line/(Unused Line + Cash) Model 1 Second Stage of the 2SLS	Industry Total Line/(Total Line + Cash) Model 2 Second Stage of the 2SLS
Intercept	-1.276*** (0.01)	-1.030*** (0.01)
Union Coverage <sub>t-1</sub>	1.012*** (0.01)	1.441*** (0.01)
Industry Size <sub>t-1</sub>	0.081*** (0.01)	0.076*** (0.01)
Industry M/B <sub>t-1</sub>	-0.006 (0.19)	-0.004 (0.45)
Industry Net Worth <sub>t-1</sub>	0.345*** (0.01)	0.417*** (0.01)
Industry Tangibility <sub>t-1</sub>	0.066 (0.14)	0.083* (0.08)
Industry Cash Flow <sub>t-1</sub>	0.167** (0.03)	0.254*** (0.01)
Industry Leverage <sub>t-1</sub>	0.386*** (0.01)	0.646*** (0.01)
Industry Cash Flow Volatility <sub>t-1</sub>	-2.149*** (0.01)	-1.759** (0.02)
Industry Over the Counter Dummy <sub>t-1</sub>	0.054 (0.35)	0.075 (0.24)
Industry Not in an S&P Index Dummy <sub>t-1</sub>	0.001 (0.99)	0.082 (0.13)
Industry Firm Age <sub>t-1</sub>	-0.004*** (0.01)	-0.006*** (0.01)
Industry Dummy Variables	Yes	Yes
Year Dummy Variables	Yes	Yes
Observations	360	360
Adjusted R <sup>2</sup>	0.46	0.46
Over-identifying Restrictions Test	F = 1.48 (p = 0.23)	F = 0.13 (p = 0.72)
Hausman Test	F = 26.07 (p = 0.01)	F = 33.73 (p = 0.01)

**Table 6 (Continued)**

Notes:

This table shows the second-stage regressions of the 2SLS estimation on the industry-level analysis. We convert all firm-level variables into industry-level variables by taking the average of the variables across the industries classified by the 3-digit Census Industry Classification (CIC) codes. The sample includes 360 industry-year observations from 1996 to 2003. *Unused Line/(Unused Line + Cash)* is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings are the sum of cash and marketable securities. *Total Line/(Total Line + Cash)* is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years that a firm is available on Compustat. *Industry Dummy Variables* are the dummy variables for industries defined by 1-digit SIC codes and are not reported in the table. *Year Dummy Variables* are the dummy variables for the years in the sample and are not reported in the table. The p-value is in parentheses. \*\*\*, \*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.

**Table 7**  
Sub-groups Separated by Right-to-Work Legislation

$$\begin{aligned} \text{Model 1: } \text{Unused Line}/(\text{Unused Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \epsilon_{i,t} \end{aligned}$$

$$\begin{aligned} \text{Model 2: } \text{Total Line}/(\text{Total Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \epsilon_{i,t} \end{aligned}$$

**Panel A. Regressions**

	Unused Line/(Unused Line + Cash)		Total Line/(Total Line + Cash)	
	Model 1: Second Stage of the 2SLS		Model 2: Second Stage of the 2SLS	
	No RTW	RTW	No RTW	RTW
Intercept	-0.392** (0.03)	-0.776*** (0.01)	-0.322* (0.06)	-0.856*** (0.01)
Union Coverage <sub>t-1</sub>	1.170*** (0.01)	0.203 (0.78)	1.284*** (0.01)	-0.068 (0.90)
Size <sub>t-1</sub>	0.039*** (0.01)	0.056*** (0.01)	0.032*** (0.01)	0.063*** (0.01)
M/B <sub>t-1</sub>	-0.006*** (0.01)	-0.001 (0.90)	-0.006*** (0.01)	-0.004 (0.12)
Net Worth <sub>t-1</sub>	0.001 (0.99)	0.206*** (0.01)	0.028 (0.44)	0.152** (0.04)
Tangibility <sub>t-1</sub>	0.030 (0.24)	0.001 (0.97)	0.004 (0.87)	-0.007 (0.82)
Cash Flow <sub>t-1</sub>	0.026 (0.50)	0.087 (0.25)	0.032 (0.40)	0.096 (0.21)
Leverage <sub>t-1</sub>	0.242*** (0.01)	0.387*** (0.01)	0.411*** (0.01)	0.465*** (0.01)
Cash Flow Volatility <sub>t-1</sub>	-0.116*** (0.01)	-0.040 (0.37)	-0.120*** (0.01)	-0.083* (0.06)
Industry Cash Flow Volatility <sub>t-1</sub>	-1.196** (0.05)	-1.495 (0.15)	-1.233** (0.05)	-2.804*** (0.01)
Over the Counter Dummy <sub>t-1</sub>	-0.058** (0.04)	-0.019 (0.69)	-0.068** (0.02)	0.115** (0.02)
Not in an S&P Index Dummy <sub>t-1</sub>	0.023 (0.31)	0.088** (0.05)	0.043* (0.06)	0.083** (0.05)
Firm Age <sub>t-1</sub>	-0.001 (0.25)	0.001 (0.71)	-0.001 (0.18)	-0.002 (0.35)
Industry Dummy Variables	Yes	Yes	Yes	Yes
Year Dummy Variables	Yes	Yes	Yes	Yes
Observations	1252	521	1252	521
Adjusted R <sup>2</sup>	0.40	0.30	0.43	0.35
Over-identifying Restrictions Test	F = 0.09 (p = 0.77)	F = 0.99 (p = 0.32)	F = 0.26 (p = 0.61)	F = 0.67 (p = 0.41)
Hausman Test	F = 13.13 (p = 0.01)	F = 0.01 (p = 0.97)	F = 15.99 (p = 0.01)	F = 0.06 (p = 0.80)

**Panel B. Difference in the Coefficients of Union Coverage<sub>t-1</sub>**

	Unused Line/(Unused Line + Cash)	Total Line/(Total Line + Cash)
Difference	0.967***	1.352***
(p-value)	(0.01)	(0.01)

**Table 7 (Continued)**

Notes:

This table shows the second-stage regressions of the 2SLS estimation for the sub-groups separated by the status of right-to-work legislation. We use a sample of 1773 firm-year observations from 1996 to 2003. Panel A shows the regressions. *Unused Line/(Unused Line + Cash)* is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings are the sum of cash and marketable securities. *Total Line/(Total Line + Cash)* is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings. *No RTW (RTW)* indicates that a firm is not in (is in) a state with right-to-work legislation. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Industry Cash Flow Volatility* is the standard deviation of the median of *Cash Flow* in an industry classified by 2-digit SIC codes in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years that a firm is available on Compustat. *Industry Dummy Variables* are the dummy variables for industries defined by 1-digit SIC codes and are not reported in the table. *Year Dummy Variables* are the dummy variables for the years in the sample and are not reported in the table. The p-value is in parentheses. Panel B shows the difference in the coefficients of  $Union\ Coverage_{t-1}$  between the two sub-groups separated by the status of right-to-work legislation and reports the p-value of the t-test in the parentheses. \*\*\*,\*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.

**Table 8**  
Sub-groups Separated by Financial Constraints

$$\begin{aligned} \text{Model 1: } \text{Unused Line}/(\text{Unused Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

$$\begin{aligned} \text{Model 2: } \text{Total Line}/(\text{Total Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

**Panel A. Sub-groups Separated by Payout**

	Unused Line/(Unused Line + Cash)		Total Line/(Total Line + Cash)	
	Model 1: Second Stage of the 2SLS		Model 2: Second Stage of the 2SLS	
	Payout <sub>t-1</sub> < Median	Payout <sub>t-1</sub> > Median	Payout <sub>t-1</sub> < Median	Payout <sub>t-1</sub> > Median
Intercept	-0.616** (0.02)	-0.152 (0.32)	-0.506*** (0.01)	0.053 (0.72)
Union Coverage <sub>t-1</sub>	1.763** (0.04)	0.430 (0.20)	1.637** (0.03)	0.446 (0.21)
Size <sub>t-1</sub>	0.044*** (0.01)	0.030*** (0.01)	0.046*** (0.01)	0.025*** (0.01)
M/B <sub>t-1</sub>	-0.003* (0.06)	-0.007* (0.06)	-0.004*** (0.01)	-0.009*** (0.01)
Net Worth <sub>t-1</sub>	0.047 (0.29)	0.117** (0.04)	0.039 (0.38)	0.076 (0.16)
Tangibility <sub>t-1</sub>	0.047* (0.07)	0.029 (0.26)	0.048* (0.07)	0.010 (0.68)
Cash Flow <sub>t-1</sub>	0.133*** (0.01)	-0.095 (0.12)	0.154*** (0.01)	-0.115** (0.05)
Leverage <sub>t-1</sub>	0.143* (0.06)	0.592*** (0.01)	0.252*** (0.01)	0.660*** (0.01)
Cash Flow Volatility <sub>t-1</sub>	-0.055** (0.04)	-0.183*** (0.01)	-0.070*** (0.01)	-0.200*** (0.01)
Industry Cash Flow Volatility <sub>t-1</sub>	0.008 (0.99)	-1.603** (0.02)	-0.602 (0.54)	-2.044*** (0.01)
Over the Counter Dummy <sub>t-1</sub>	-0.087** (0.02)	0.001 (0.98)	-0.035 (0.34)	-0.001 (0.99)
Not in an S&P Index Dummy <sub>t-1</sub>	0.101*** (0.01)	-0.014 (0.57)	0.124*** (0.01)	0.002 (0.94)
Firm Age <sub>t-1</sub>	-0.003** (0.04)	0.001 (0.90)	-0.003** (0.02)	-0.001 (0.59)
Industry Dummy Variables	Yes	Yes	Yes	Yes
Year Dummy Variables	Yes	Yes	Yes	Yes
Observations	887	886	887	886
Adjusted R <sup>2</sup>	0.29	0.36	0.34	0.42
Over-identifying Restrictions Test	F = 0.57 (p = 0.45)	F = 0.26 (p = 0.61)	F = 0.94 (p = 0.42)	F = 1.13 (p = 0.32)
Hausman Test	F = 4.89 (p = 0.03)	F = 1.38 (p = 0.24)	F = 5.54 (p = 0.02)	F = 1.02 (p = 0.38)

**Panel B. Difference in the Coefficients of Union Coverage<sub>t-1</sub>**

	Unused Line/(Unused Line + Cash)	Total Line/(Total Line + Cash)
Difference	1.333**	1.191*
(p-value)	(0.05)	(0.06)

**Table 8 (Continued)**

<b>Panel C. Sub-groups Separated by the Availability of Credit Ratings</b>				
	Unused Line/(Unused Line + Cash)		Total Line/(Total Line + Cash)	
	Model 1:		Model 2:	
	Second Stage of the 2SLS		Second Stage of the 2SLS	
	No Credit Ratings	With Credit Ratings	No Credit Ratings	With Credit Ratings
Intercept	-0.356 (0.11)	-0.381*** (0.01)	-0.489** (0.03)	-0.153 (0.26)
Union Coverage $t_{-1}$	2.082*** (0.01)	-0.077 (0.78)	1.902*** (0.01)	0.038 (0.88)
Size $t_{-1}$	0.041*** (0.01)	0.039*** (0.01)	0.048*** (0.01)	0.031*** (0.01)
M/B $t_{-1}$	-0.002* (0.10)	-0.015*** (0.01)	-0.003* (0.09)	-0.018*** (0.01)
Net Worth $t_{-1}$	0.057 (0.19)	0.119* (0.06)	0.030 (0.49)	0.105* (0.08)
Tangibility $t_{-1}$	0.042* (0.10)	0.057** (0.04)	0.036 (0.18)	0.044* (0.10)
Cash Flow $t_{-1}$	0.144*** (0.01)	-0.021 (0.72)	0.115** (0.02)	-0.054 (0.34)
Leverage $t_{-1}$	0.204** (0.02)	0.431*** (0.01)	0.357*** (0.01)	0.501*** (0.01)
Cash Flow Volatility $t_{-1}$	-0.063* (0.07)	0.066* (0.07)	-0.050 (0.22)	0.061* (0.08)
Industry Cash Flow Volatility $t_{-1}$	-0.057** (0.04)	-0.168*** (0.01)	-0.070*** (0.01)	-0.165*** (0.01)
Over the Counter Dummy $t_{-1}$	1.034 (0.33)	-2.619*** (0.01)	-1.293** (0.05)	-3.073*** (0.01)
Not in an S&P Index Dummy $t_{-1}$	0.022 (0.54)	0.004 (0.86)	0.090*** (0.01)	0.003 (0.90)
Firm Age $t_{-1}$	-0.016*** (0.01)	0.002** (0.04)	-0.008*** (0.01)	0.001* (0.09)
Industry Dummy Variables	Yes	Yes	Yes	Yes
Year Dummy Variables	Yes	Yes	Yes	Yes
Observations	814	959	814	959
Adjusted R <sup>2</sup>	0.30	0.38	0.35	0.42
Over-identifying Restrictions Test	F = 0.67 (p = 0.57)	F = 1.44 (p = 0.22)	F = 1.52 (p = 0.21)	F = 0.28 (p = 0.84)
Hausman Test	F = 13.29 (p = 0.01)	F = 0.66 (p = 0.42)	F = 10.72 (p = 0.01)	F = 0.01 (p = 0.98)

**Panel D. Difference in the Coefficients of Union Coverage $t_{-1}$**

	Unused Line/(Unused Line + Cash)	Total Line/(Total Line + Cash)
Difference	2.159***	1.864***
(p-value)	(0.01)	(0.01)

**Table 8 (Continued)**

Notes:

This table shows the second-stage regressions of the 2SLS estimation for the sub-groups separated by financial constraints. We use a sample of 1773 firm-year observations from 1996 to 2003. Panel A reports the regressions for the sub-groups separated by payout. *Unused Line/(Unused Line + Cash)* is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings are the sum of cash and marketable securities. *Total Line/(Total Line + Cash)* is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings. *Payout* is the ratio of the sum of dividends and stock repurchases to assets. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Industry Cash Flow Volatility* is the standard deviation of the median of *Cash Flow* in an industry classified by 2-digit SIC codes in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years that a firm is available on Compustat. *Industry Dummy Variables* are the dummy variables for industries defined by 1-digit SIC codes and are not reported in the table. *Year Dummy Variables* are the dummy variables for the years in the sample and are not reported in the table. The p-value is in parentheses. Panel B shows the difference in the coefficients of  $Union\ Coverage_{t-1}$  between the two sub-groups separated by payout and reports the p-value of the t-test in the parentheses. Panel C reports the regressions for the sub-groups separated by the availability of credit ratings. The p-value is in parentheses. Panel D shows the difference in the coefficients of  $Union\ Coverage_{t-1}$  between the two sub-groups separated by the availability of credit rating and reports the p-value of the t-test in the parentheses. \*\*\*, \*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.

**Table 9**  
**Union Coverage and the Forms of Corporate Liquidity: Labor Intensity**

$$\begin{aligned} \text{Model 1: } \text{Unused Line}/(\text{Unused Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

$$\begin{aligned} \text{Model 2: } \text{Total Line}/(\text{Total Line} + \text{Cash})_{i,t} = & a + b_1 * \text{Union Coverage}_{i,t-1} + b_2 * \text{Size}_{i,t-1} + b_3 * \text{M/B}_{i,t-1} + b_4 * \text{Net Worth}_{i,t-1} \\ & + b_5 * \text{Tangibility}_{i,t-1} + b_6 * \text{Cash Flow}_{i,t-1} + b_7 * \text{Leverage}_{i,t-1} \\ & + b_8 * \text{Cash Flow Volatility}_{i,t-1} + b_9 * \text{Industry Cash Flow Volatility}_{i,t-1} \\ & + b_{10} * \text{Over the Counter Dummy}_{i,t-1} + b_{11} * \text{Not in an S\&P Index Dummy}_{i,t-1} \\ & + b_{12} * \text{Firm Age}_{i,t-1} + \text{Industry Dummy Variables} + \text{Year Dummy Variables} + \varepsilon_{i,t} \end{aligned}$$

**Panel A. Regressions**

	Unused Line/(Unused Line + Cash)		Total Line/(Total Line + Cash)	
	Model 1: Second Stage of the 2SLS		Model 2: Second Stage of the 2SLS	
	Labor Intensity <sub>t-1</sub> < Median	Labor Intensity <sub>t-1</sub> > Median	Labor Intensity <sub>t-1</sub> < Median	Labor Intensity <sub>t-1</sub> > Median
Intercept	-0.676*** (0.01)	-0.226 (0.19)	-0.686*** (0.01)	-0.066 (0.82)
Union Coverage <sub>t-1</sub>	1.147*** (0.01)	1.043** (0.04)	1.390*** (0.01)	1.261* (0.06)
Size <sub>t-1</sub>	0.040*** (0.01)	0.038*** (0.01)	0.042*** (0.01)	0.031*** (0.01)
M/B <sub>t-1</sub>	-0.002* (0.07)	-0.010*** (0.01)	-0.003** (0.03)	-0.013*** (0.01)
Net Worth <sub>t-1</sub>	0.069* (0.08)	0.120** (0.02)	0.064 (0.12)	0.138*** (0.01)
Tangibility <sub>t-1</sub>	0.102*** (0.01)	-0.130*** (0.01)	0.105*** (0.01)	-0.152*** (0.01)
Cash Flow <sub>t-1</sub>	0.005 (0.91)	0.143*** (0.01)	0.022 (0.62)	0.157*** (0.01)
Leverage <sub>t-1</sub>	0.416*** (0.01)	0.340*** (0.01)	0.462*** (0.01)	0.588*** (0.01)
Cash Flow Volatility <sub>t-1</sub>	-0.086*** (0.01)	-0.011 (0.84)	-0.086*** (0.01)	-0.048 (0.39)
Industry Cash Flow Volatility <sub>t-1</sub>	0.114 (0.88)	-1.119* (0.10)	0.256 (0.75)	-0.594 (0.53)
Over the Counter Dummy <sub>t-1</sub>	-0.082** (0.02)	-0.023 (0.52)	-0.057 (0.12)	-0.001 (0.99)
Not in an S&P Index Dummy <sub>t-1</sub>	0.058** (0.04)	-0.020 (0.45)	0.077*** (0.01)	0.020 (0.45)
Firm Age <sub>t-1</sub>	-0.002** (0.04)	0.001 (0.95)	-0.002** (0.03)	-0.001* (0.10)
Industry Dummy Variables	Yes	Yes	Yes	Yes
Year Dummy Variables	Yes	Yes	Yes	Yes
Observations	886	887	886	887
Adjusted R <sup>2</sup>	0.42	0.36	0.44	0.39
Over-identifying Restrictions Test	F = 0.29 (p = 0.59)	F = 0.49 (p = 0.48)	F = 0.86 (p = 0.35)	F = 0.45 (p = 0.71)
Hausman Test	F = 10.56 (p = 0.01)	F = 3.41 (p = 0.06)	F = 17.69 (p = 0.01)	F = 5.50 (p = 0.02)

**Panel B. Difference in the Coefficients of Union Coverage<sub>t-1</sub>**

	Unused Line/(Unused Line + Cash)	Total Line/(Total Line + Cash)
Difference	0.104	0.129
(p-value)	(0.78)	(0.74)



**Table 9 (Continued)**

Notes:

This table shows the second-stage regressions of the 2SLS estimation for the sub-groups separated by the labor intensity. We use a sample of 1773 firm-year observations from 1996 to 2003. Panel A reports the regressions. *Unused Line/(Unused Line + Cash)* is the ratio of unused lines of credit to the sum of unused lines of credit and corporate cash holdings, where corporate cash holdings are the sum of cash and marketable securities. *Total Line/(Total Line + Cash)* is the ratio of total lines of credit to the sum of total lines of credit and corporate cash holdings. *Labor Intensity* is the ratio of the number of employees to assets. *Union Coverage* is the fraction of total workers in an industry who are covered by labor unions in the collective bargaining, where the industries are based on the 3-digit Census Industry Classification (CIC). *Size* is the logarithm of non-cash assets, where non-cash assets are total assets less corporate cash holdings. *M/B* is defined as the book value of non-cash assets minus the book value of equity plus the market value of equity divided by the book value of non-cash assets. *Net Worth* is defined as assets minus total liabilities divided by non-cash assets. *Tangibility* is the ratio of plant, property and equipment to non-cash assets. *Cash Flow* is the ratio of income before extraordinary items to non-cash assets. *Leverage* is the ratio of long-term debts to non-cash assets. *Cash Flow Volatility* is the standard deviation of *Cash Flow* in the prior 20 years. *Industry Cash Flow Volatility* is the standard deviation of the median of *Cash Flow* in an industry classified by 2-digit SIC codes in the prior 20 years. *Over the Counter Dummy* is a dummy variable that equals one if a firm's equity trades only over the counter and equals zero otherwise. *Not in an S&P Index Dummy* is a dummy variable that equals one if a firm is not included in one of the main S&P indices and equals zero otherwise. *Firm Age* is approximated by the number of years that a firm is available on Compustat. *Industry Dummy Variables* are the dummy variables for industries defined by 1-digit SIC codes and are not reported in the table. *Year Dummy Variables* are the dummy variables for the years in the sample and are not reported in the table. The p-value is in parentheses. Panel B shows the difference in the coefficients of  $Union\ Coverage_{t-1}$  between the two sub-groups separated by the labor intensity and reports the p-value of the t-test in the parentheses. \*\*\*, \*\*, and \* denote significance at the 0.01, 0.05, and 0.10 level, respectively.