

# **Creditor Control Rights and Firm Investment Policy\***

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# **Creditor Control Rights and Firm Investment Policy**

## **Abstract**

We present novel empirical evidence that conflicts of interest between creditors and their borrowers have a significant impact on firm investment policy. We examine a large sample of private credit agreements between banks and public firms and find that 32% of the agreements contain an explicit restriction on the firm's capital expenditures. Creditors are more likely to impose a capital expenditure restriction as a borrower's credit quality deteriorates, and the use of a restriction appears at least as sensitive to borrower credit quality as other contractual terms, such as interest rates, collateral requirements, or the use of financial covenants. We find that capital expenditure restrictions cause a reduction in firm investment and that firms obtaining contracts with a new restriction experience subsequent increases in their market value and operating performance.

## 1. Introduction

How does a reliance on external finance affect firm investment? This question has been the focus of research across many economic disciplines, including corporate finance, banking, macroeconomics, and development. In their seminal article, Jensen and Meckling (1976) suggest that risk shifting tendencies of equity-holders may lead creditors to directly restrict investment in debt contracts. However, in their classic study of corporate bond covenants, Smith and Warner (1979) conclude that “extensive direct restrictions on production/investment policy would be expensive to employ and are not observed” (p. 117). Consistent with the findings in Smith and Warner (1979), recent evidence on bond covenants reported by Billett, King, and Mauer (2007) suggests that fewer than 5% of public bond indentures contain an explicit restriction on firm investments.

In contrast to these previous studies, this paper provides evidence of widespread use of direct contractual restrictions on firm investment in the debt agreements of publicly traded companies. We show that lenders regularly impose explicit limits on capital expenditures, particularly after a borrower’s credit quality deteriorates, and that the capital expenditure restrictions constrain firm investment. We also demonstrate that firms obtaining a capital expenditure restriction experience subsequent increases in operating and market performance.

What distinguishes our study from earlier research is our emphasis on private credit agreements rather than bond indentures. Private credit agreements govern the terms of sole-lender and syndicated bank loans to companies, and they contain covenants that are more detailed, comprehensive, and tightly set than public bonds.<sup>1</sup> We examine 3,720 private credit agreements between banks and publicly traded U.S. corporations and show that 32% of the contracts contain an explicit restriction on capital expenditures. The importance of this finding for the investment literature is underscored by the fact that

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<sup>1</sup> Kahan and Tuckman (1993) find that relative to bond indentures, loan agreements “more aggressively control the actions of shareholders by setting various covenants more tightly.” Verde (1999) compares bonds and loans for the same firms and argues that “... the scope of [bond] restrictions ... is generally loose and adds little value in protecting bondholders.” In addition, “... explicit protections afforded high-yield bondholders are weak in comparison to those provided to leveraged loan creditors.”

roughly 80% of all public firms maintain private credit agreements, compared with only 15% to 20% that have public debt (Faulkender and Petersen, 2006; Sufi, 2007).

We find that creditors are more likely to limit firm investment in response to increases in the borrower's credit risk, as measured by the firm's ratio of debt to cash flow and credit rating. This result suggests that restricting potential risk-shifting investments by equity-holders becomes more relevant as the riskiness of the debt increases. It is also consistent with the model of Aghion and Bolton (1992), in which creditors alleviate incentive conflicts with equity-holders by limiting investment after negative firm performance but before payment default.

The effect of credit quality on the likelihood of having a capital expenditure restriction is both statistically robust and economically meaningful. For example, a firm that is downgraded from the lowest investment-grade S&P rating (BBB) to the highest speculative-grade rating (BB) experiences a 21 percentage point increase in the likelihood of facing a capital expenditure restriction, which is almost a doubling of the likelihood that the contract contains a restriction. Moreover, compared with other contractual features common to loan contracts, capital expenditure restrictions are one of the most sensitive to changes in borrower credit quality. For instance, whether a loan includes an investment restriction appears more sensitive to changes in credit quality than amendments to interest rates, collateral requirements, or financial covenants.

Although credit agreements do not make capital expenditure restrictions explicitly contingent on borrower performance, we find that renegotiation in response to a financial covenant violation serves to make the restrictions effectively contingent on borrower performance. A financial covenant violation represents a technical default that gives creditors the right to accelerate the loan, which could force the firm into bankruptcy. These acceleration rights permit creditors to introduce capital expenditure restrictions into subsequently renegotiated agreements. In fact, relative to the original agreement, capital expenditure restrictions are 20 percentage points more likely to be observed in a renegotiated agreement following a covenant violation. While creditors also increase interest rates and demand collateral in

response to covenant violations, the elasticity of the capital expenditure restriction with respect to a covenant violation is significantly larger than the elasticity of other loan terms.<sup>2</sup>

Challenges arise when attempting to determine the causal effect of capital expenditure restrictions on actual firm investment policy, primarily because the restrictions often follow negative performance, which by itself could induce borrowers to voluntarily cut back on capital expenditures. We conduct several tests to overcome this identification problem, and we find that the restrictions in fact constrain firm investment. First, we demonstrate that firms obtaining a credit agreement with an investment restriction experience a 15% decline in capital expenditures relative to firms that obtain a credit agreement without a restriction, even after controlling for observed changes in investment opportunities and prior performance. Second, using a sub-sample of agreements for which we collect the exact dollar value of the restriction, we show that actual borrower expenditures tend to cluster tightly below the contractual limit. Lastly, we examine the capital expenditure patterns of firms that go from having a credit agreement with no capital expenditure restriction to having a new contract with a restriction. Immediately prior to the new agreement, almost half of the borrowers invest more than the yet-to-be imposed restriction amount. Once the restriction is imposed, less than 10% of firms exceed the restricted amount, and over 60% of the borrowers lie in the expenditure area within one-quarter of a standard deviation directly below the restriction. Such a dramatic shift in expenditures to a level just below the restriction is difficult to reconcile with the hypothesis that the restrictions do not affect investment policy.

In our last set of results, we explore the impact of capital expenditure restrictions on subsequent firm performance. We show that firms obtaining an agreement with a new capital expenditure restriction experience increases in both market value and return on assets relative to firms that obtain agreements without a restriction. This result is robust to the inclusion of control variables for other loan terms, firm investment opportunities, and mean reversion in accounting variables. The positive effect of capital

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<sup>2</sup> This pattern is consistent with the “dynamic lending strategy” discussed by Smith (1993). Lenders use covenants as tripwires to flexibly monitor borrower performance. A covenant violation leads to a re-evaluation by the lender of borrower payment ability and the setting of new restrictions on borrower behavior conditional on the evaluation. Berlin and Mester (1992) examine a framework in which covenants lead to optimal contract renegotiations, while Rajan and Winton (1995) build a model in which covenants improve the lenders’ incentives to monitor.

expenditure restrictions on performance suggests that the restrictions not only protect the creditors of borrowing firms from potential risk-shifting behavior but also yield positive externalities that benefit borrowing-firm equity-holders.

Our study contributes to the investment-financing literature by being the first to demonstrate widespread use of capital expenditure restrictions and their effect on corporate investment and firm performance. Our results complement the findings of several related papers. Beniesh and Press (1993) study 44 financial covenant violations and report that 27 of the post-violation contracts contain a capital expenditure restriction. However, they do not investigate the causal impact of the restrictions on firm investment or future performance. Chava and Roberts (2007) also study financial covenant violations and focus on the decline in firm investment following the violations, but provide no evidence on capital expenditure restrictions. In contrast, we show that contractual restrictions are common and impede investment even when no financial covenant violation has occurred. Our performance results echo the results of Demiroglu and James (2007), who find that firms facing tighter financial covenants experience higher operating and stock price performance than firms with less stringent covenants.

Our study also contributes to the emerging area of applied financial contracting (Kaplan and Strömberg, 2003; Kaplan and Strömberg, 2004; Lerner, Shane, and Tsai, 2004; Benmelech, Garmaise, and Moskowitz, 2005). Our analysis is unique in this area because we focus on private bank credit agreements obtained by public firms, which are arguably the largest source of financing for corporations (Houston and James, 1996; Gomes and Phillips, 2005; Sufi, 2007).

The rest of the paper proceeds as follows. The next section discusses the data and summary statistics. Section 3 presents the theoretical framework with which we motivate the empirical analysis. Sections 4 through 7 present the results, and Section 8 concludes.

## **2. Data and summary statistics**

Our analysis centers on a novel set of private credit agreements collected directly from Security and Exchange Commission (SEC) filings of public firms. SEC rules and precedent have established a requirement that public companies include copies of all “material” contracts, including bank loan

agreements. The reporting requirements for loan contracts fall within item 601(b) of regulation S-K, which is the general provision that requires exhibits to be filed. Item 4 and item 10 under this regulation require disclosure of securities and the disclosure of all material contracts, respectively. Most loan contracts fall within one of these two categories.

The contracts typically appear as exhibits at the end of a 10-K or 10-Q report, or as an attachment to an 8-K filing. The SEC's *Edgar* electronic filing system makes it possible to search, extract, and download these credit agreements. Below, we detail the data-collection process.

### *2.1. Loan agreements from Edgar*

We begin with a sample of loan deals from Reuters LPC's *DealScan* database that are matched with firm financial characteristics from Standard & Poor's *Compustat* database. Our sample includes deals made to non-financial firms, and we require that each deal have information on the loan amount and the interest spread of all tranches in the deal. The sample is restricted to deals initiated during the years 1996 through 2005. Our starting year corresponds to when the SEC began requiring firms to file electronically; electronic filings are only sparsely available on Edgar prior to 1996. Once these restrictions are in place, we are left with 9,580 deals (representing 13,715 loan tranches).

From Compustat, we construct financial statistics as the average of the four quarters prior to the loan agreement being signed. Cash flow is constructed using item 21, scaled by the book value of total assets (item 44). The book leverage ratio is long term debt (item 51) plus short term debt (item 45), scaled by book assets. The market to book ratio is total assets less the book value of equity plus the market value of equity, all scaled by total assets. The book value of equity is the book value of assets less the book value of liabilities (item 54) and preferred stock (annual item 10) plus deferred taxes (item 52). The market value of equity is common shares outstanding (item 14) multiplied by the share price (item 61). We include only deals for which these borrower-level variables are non-missing.

Although DealScan strives to provide some information on capital expenditure restrictions, the reporting is sparse, and we find the relevant data to be missing for many of our contracts. To obtain a more comprehensive measure of restrictions, we use text-search programs to scan every 10-Q, 10-K, and

8-K filing in Edgar for loan contracts. More specifically, we match every firm in Compustat to its respective set of SEC filings based on the firm's tax identification number and then scan these filings for the following 10 terms in capital letters: "credit agreement," "loan agreement," "credit facility," "loan and security agreement," "loan & security agreement," "revolving credit," "financing and security agreement," "financing & security agreement," "credit and guarantee agreement," and "credit & guarantee agreement." If we find one of these 10 terms, we also require the document to contain the capitalized search term "table of contents" within 60 lines after the initial search term. This process allows us to extract most original credit agreements and many of the major amendments and restatements of credit agreements that are contained in Edgar. We match the credit agreement to DealScan based on the date of the loan agreement and the name of the company.

Of the 9,580 deals in DealScan, we are able to successfully locate almost 40% of the actual credit agreements in Edgar, which yields a final sample of 3,720 loan contracts to 1,931 borrowers. The appendix discusses the reasons why our search program misses a substantial number of observations available in DealScan. It also discusses the potential biases that might arise in our analysis due to the exclusion of these contracts. Our conclusion is that the use of the Edgar sub-sample of DealScan contracts does not lead to any meaningful bias in our results.

We also use a text-search program to collect data from 10-Q and 10-K filings on whether firms violate a financial covenant in the year prior to the loan agreement. Roberts and Sufi (2007) provide a detailed description of the text-search algorithm. Financial covenants are accounting-based risk and performance hurdles that the borrower must meet to be in compliance with the credit agreement. The breach of a financial covenant means that the borrower is in technical default on the loan, and that the lender has the right to demand immediate repayment of the entire loan. Banks typically utilize this right to initiate a renegotiation of the credit agreement which can lead to significant changes in interest spreads and loan amounts (Beneish and Press, 1993; Beneish and Press, 1995; Chen and Wei, 1993; Smith, 1993; Sweeney, 1994; Dichev and Skinner, 2002; Sufi, 2007). For example, the L.A. Gear case study by

DeAngelo, DeAngelo, and Wruck (2002) shows that creditors used covenant violations to reduce credit availability from \$360 million to \$75 million in just two years.

## 2.2. Capital expenditure restrictions

From our sample of loan contracts, we collect information on capital expenditure restrictions contained in each agreement. There are a number of interesting control-oriented covenants in private credit agreements, including restrictions on acquisitions, expenditures on non-capital items, and changes in company ownership (Beneish and Press, 1993; Baird and Rasmussen, 2006). However, we restrict our analysis to capital expenditure restrictions for three reasons. First, covenants restricting capital expenditures are relatively easy to identify using our search methods. Second, unlike more “boiler-plate” covenants that are in almost all loan agreements, capital expenditure restrictions are deal-specific, and their incidence varies across our sample of contracts. Third, capital expenditure restrictions refer primarily to “cash” capital expenditures, (Item 128 in Compustat), and thus pertain specifically to what is usually termed “investment” in the corporate finance literature. Capital expenditure restrictions typically cover cash capital expenditures as reported in a company’s statement of cash flows plus the capitalized value of new capital leases.

Capital expenditure restrictions are usually documented in the covenants section near the end of the credit agreement and are commonly set as a nominal dollar amount for a given fiscal year. The capital expenditure restriction contained in the June 29<sup>th</sup>, 2001 loan agreement for Airborne Express, Inc is a typical example:

Limitation on Capital Expenditures. Capital Expenditures for each Fiscal Year shall not exceed the maximum levels as set forth below opposite such Fiscal Year:

Fiscal Year Ended:	Maximum Level
December 31, 2001	\$205,000,000
December 31, 2002	\$255,000,000
December 31, 2003	\$305,000,000

Alternatively, capital expenditure restrictions are sometimes enforced as percentages of revenue or earnings variables. For example, the loan agreement between American Precision Industries, Inc. and Marine Midland Bank, dated August 31<sup>st</sup>, 1998 contains the following restriction:

**CAPITAL EXPENDITURES.** For any one fiscal year, [the borrower shall not] make or incur aggregate Capital Expenditures in excess of seven and one-half percent (7-1/2%) of the Company's Consolidated net sales as shown on the Company's audited financial statements for such fiscal year.

For our full sample of loans, we code as a restriction any limit on the capital expenditure activities of the firm or its subsidiaries. To find such restrictions, we use a text search algorithm to scan all contracts for the term “capital expenditure.” The search program tells us if the term is in the agreement, which we then further examine to confirm whether the agreement actually has a capital expenditure restriction. For firms that have a capital expenditure restriction, a fiscal year ending in December, and a specific dollar restriction on aggregate capital expenditures defined over the fiscal year, we also collect the actual capital expenditure restriction amount for the first year reported in the loan agreement. We isolate this subset of firms in order to accurately measure the timing and amount of the restriction.<sup>3</sup> This subset includes 486 deals.

We also collect information on the presence of various financial covenants in the credit agreements. We group financial covenants into six mutually exclusive groups: coverage ratio covenants (including interest coverage, fixed charge coverage, and debt service coverage covenants), debt to cash flow ratio covenants, net worth covenants, debt to balance sheet covenants (including debt to total capitalization and debt to net worth covenants), liquidity covenants (including current ratio, quick ratio, and working capital covenants), and minimum cash flow covenants. Financial covenant data are missing for 3% of our sample (117 observations) because some contracts detail financial covenants in an attached exhibit that is not included in the SEC filing.

### *2.3. Summary statistics*

Table 1 contains the summary statistics for the sample of 3,720 private credit agreements signed by 1,931 borrowers. The first statistic is also one of our main results: 32% of the agreements contain an

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<sup>3</sup> Actual restrictions often have rollover provisions that permit some portion of unused annual limits to be carried over to the following fiscal year. To avoid the effect of accumulating limits, we focus on the first year. We use only firms with fiscal year end in December for two reasons. First, the restrictions are sometimes given in terms of calendar years, which would make calculation difficult for firms with alternative fiscal year ends. Second, if a firm has a non-December fiscal year end, it is difficult to ascertain to which fiscal year the restriction applies.

explicit restriction on capital expenditures. Across the agreements for which we gather the restricted amount, the average level of the restriction, measured relative to lagged assets, is 8.5%. The average capital expenditures in the year of the agreement for these firms, also measured relative to lagged assets, is 6.4%. The average loan deal amount is \$450 million, which represents 34% of book assets. While the loan size may appear large, it is important to understand that over 94% of the deals contain revolving credit facilities, many of which remain unused (Sufi, 2007). Almost half of the credit agreements are obtained by firms with a Standard & Poor's issuer credit rating. Conditional on having a credit rating, only 2% of firms in our sample have a rating of CCC or below, meaning very few of the borrowers in our sample are in, or even near, bankruptcy.

### **3. Theoretical background**

The summary statistics presented in Table 1 suggest that capital expenditure restrictions are relatively common in private credit agreements. Theoretical research suggests that the use of such restrictions is motivated by conflicts of interest between equity-holders and creditors. In Jensen and Meckling (1976), equity-holders in a levered firm can engage in risky investments that increase the value of their convex payoff claim at the expense of creditors. One way that creditors can mitigate the chance of such wealth transfers is through covenants that restrict the borrower from making risky investments. The restrictions are efficient when the costs of abiding by the covenants are smaller than the savings from lowered interest payments—for instance, in cases in which expected returns are low and the potential for asset substitution is high.

Aghion and Bolton (1992) generalize the intuition of Jensen and Meckling (1976) in a formal incomplete contracting model. They assume the existence of private benefits to equity-holders that cannot be transferred to creditors, and add a contractible signal that is correlated with the negative externality created by these private benefits. In this setting, contracts are written so that decision rights optimally shift from equity-holders to creditors when private benefits are most likely to distort equity-holders into inefficient decisions; for example, when potential cash flow benefits from a project are low, but private benefits from the project are high. The decision right in Aghion and Bolton (1992) is quite general and is

not limited to asset liquidation. As they note, it includes “decisions such as mergers, takeovers, [or] spinoffs” (p. 477) and could be interpreted as a right to limit investment.<sup>4</sup>

Jensen and Meckling (1976) and Aghion and Bolton (1992) share two hypotheses that we use to motivate our empirical analysis. First, in the presence of conflicts of interest between creditors and equity-holders, debt agreements may limit investment policy even outside of payment default states. Second, given that conflicts of interest are exacerbated when firms perform poorly, creditors are more likely to limit investment in response to deterioration in firm credit quality.

#### **4. Use of capital expenditure restrictions**

In this section, we examine whether creditors contractually restrict the investment policy of public firms outside of payment default. Table 2 shows that 32% of the credit agreements in our sample contain an explicit restriction on capital expenditures. In fact, 42% of the firms in our sample have a capital expenditure restriction at some point between 1996 and 2005. Over roughly the same period, Sufi (2007) shows that over 80% of public firms in the Compustat universe utilize private credit agreements in the form of bank lines of credit. These two statistics imply that 34% of Compustat firms faced a capital expenditure restriction in a debt contract at some point between 1996 and 2005.

Capital expenditure restrictions are common across industries, outside of agriculture. In particular, about 40% of credit agreements obtained by borrowers operating in the retail trade, wholesale trade, and services industries contain a restriction, while roughly one-third of credit agreements to manufacturing borrowers have the restriction. Across size categories, restrictions are more common for small firms, but a substantial fraction of firms with over \$1 billion in book assets also have agreements containing capital expenditure restrictions.

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<sup>4</sup> In their framework, the equity-holders continue to receive monetary payments even when the creditor obtains decision rights, which makes it difficult to interpret such an outcome as “bankruptcy.” Hart (1995) criticizes this aspect of Aghion and Bolton (1992): “One of the most basic features of a debt contract is that what triggers a shift in control is the non-payment of debt ... the Aghion-Bolton contract does not have this property” (p. 101). Garleanu and Zwiebel (2007) and DeMarzo and Fishman (2007) also consider contracts that explicitly restrict borrower investment behavior. Garleanu and Zwiebel (2007) study how debt contracts with exogenously imposed investment restrictions influence the efficiency of renegotiation (see also Berlin and Mester, 1992). DeMarzo and Fishman (2007) derive an optimal compensation contract that rewards good-performing managers by allowing them to grow the firm through new investment, and penalizes bad performers by restricting investment growth.

Table 2 also shows how the likelihood of capital expenditure restrictions varies across two measures of borrower credit quality: the ratio of debt to cash flow and S&P credit ratings. The average likelihood of a restriction goes from 26% in the lowest debt to cash flow ratio quartile to 40% in the highest quartile. Among firms with negative cash flow (for whom the ratio of debt to cash flow is not well-defined), the likelihood increases to almost 50%. Conditional on having an S&P issuer credit rating, only 6% of agreements obtained by investment grade borrowers have a capital expenditure restriction. Among speculative grade borrowers, the fraction of agreements with a restriction is 44%. These statistics suggest that creditors are more likely to restrict investment policy for low credit quality borrowers, something we explore further in Section 5.

Although capital expenditure restrictions are more common on loans to borrowers of lower credit quality, Table 2 shows that restrictions are not exclusively associated with firms near bankruptcy. For example, 39% of credit agreements obtained by firms with a BB rating have a restriction, and on average, only 1.4% of similarly-rated borrowers defaulted over a one year horizon between 1920 and 2005, according to Moody's Investors Service (2006) historical default rates. Capital expenditure restrictions are correlated with borrower credit quality, but they are not a restriction used exclusively on loans to borrowers that are in or near bankruptcy.

## **5. Restrictions and credit quality**

In this section, we examine the impact of declines in borrower credit quality on the incidence of capital expenditure restrictions, and measure how these estimates compare with changes in other loan terms following a credit quality decline. We also examine the extent to which contracts employ explicit contingencies that impose capital expenditure restrictions following measurable changes in borrower performance.

### *5.1. The effect of credit quality on the likelihood of restrictions*

We use three measures of credit quality to estimate the impact of a credit quality decline on the likelihood of observing a capital expenditure restriction in a loan agreement. First, for the full sample, we use the borrower's ratio of debt to cash flow. The motivation for the use of the debt to cash flow ratio is

that it is easy to measure, available for almost all borrowers, and is the basis for the most common financial covenants – so called “leverage ratios” – utilized by banks (see Table 1). This latter fact suggests that banks view the debt to cash flow ratio as a particularly valuable signal of credit quality. The debt to cash flow ratio is measured as debt in the quarter before the loan origination scaled by the sum of cash flows for the 4 quarters prior to the loan origination. Given that the debt to cash flow ratio typically has large outliers and is not well defined if a borrower has negative cash flow, we use debt to cash flow quartile indicator variables along with an independent category for borrowers with negative cash flow. The second measure of credit quality is whether the firm has violated a financial covenant in a pre-existing agreement in the previous four quarters. Finally, we use the borrower’s S&P issuer credit rating in the quarter before origination as a measure of credit quality. The drawback of the credit rating measure is that it is only available for rated firms, which comprise 49% of our sample.

### 5.1.1. Empirical strategy

Our goal is to estimate the average partial effect of credit quality on the likelihood of a capital expenditure restriction in a given borrower’s loan agreement. Our main dataset is a panel of credit agreements to firms indexed by  $i$  at dates indexed by  $t$ . The advantage of a panel over a cross-section is the ability to mitigate biases in coefficient estimates caused by an unobserved effect of a given firm, which we denote,  $c_i$ . In a standard linear framework with a continuous left hand side variable, fixed effects estimation explicitly estimates  $c_i$ , which allows for arbitrary correlation between the unobserved effect and the observed explanatory variables (Wooldrige, 2002). By allowing for this arbitrary correlation, fixed effects estimation produces consistent estimates of the average partial effects of covariates under the relatively weak assumption that the mean of the error term, conditional on the covariates and the unobserved effect, is zero.

Our outcome of interest is the likelihood of a capital expenditure restriction, which is a discrete  $\{0,1\}$  variable. We want to estimate coefficients from the general specification:

$$\Pr(\text{restriction}_{it} = 1 | X_{it}\beta, c_i) = G(X_{it}\beta, c_i) \quad (1)$$

Obtaining consistent estimates of the parameter vector  $\beta$  in a panel setting is the subject of a large body of econometric research (Arellano and Honore, 2001; Chamberlain, 1984; Fernandez-Val, 2005; Bester and Hansen, 2006). While there has been progress, there is still no generally agreed upon consistent panel estimator that allows for arbitrary correlation between the unobserved effect and the covariates. One possibility is to assume  $G(\cdot)$  is a linear function and to estimate (1) using a fixed effects linear probability specification. However, such an estimation has several undesirable properties, including the fact that predicted values may lie outside the  $[0, 1]$  interval and that it imposes the restriction  $X_{it}\beta < c_i < 1 - X_{it}\beta$ .

In addition to the fixed effects linear probability model, we estimate a probit model in which the function  $G(\cdot)$  in Eq. (1) takes the following form:

$$G(z) \equiv \Phi(z) \equiv \int_{-\infty}^z \phi(v)dv \quad (2)$$

where  $\phi(v)$  is the standard normal density. The probit model has several desirable properties; most important for us is the ability to easily compute average partial effects from coefficient estimates.<sup>5</sup> However, it has the undesirable property that firm unobserved effects cannot be explicitly estimated given the incidental parameters problem. In other words, unlike the linear case, we cannot allow for arbitrary correlation between the unobserved effect and the covariates.

To obtain average partial effects, we use both a pooled probit estimation and a random effects probit estimation. The former takes on the following form:

$$\Pr(\text{restriction}_{it} = 1 | X_{it}\beta) = \Phi(X_{it}\beta). \quad (3)$$

The random effects probit model makes an explicit assumption about the correlation structure between the unobserved firm effects  $c_i$  and covariates  $X_{it}$ ,

$$\Pr(\text{restriction}_{it} = 1 | X_{it}\beta, c_i) = \Phi(X_{it}\beta + c_i), \quad (4)$$

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<sup>5</sup> An alternative model is conditional logit, in which the conditional distribution of *restriction* does not depend on  $c_i$  given the logit functional form. The main disadvantage of conditional logit is the difficulty in obtaining partial effects from the index parameter estimates—the distribution of  $c_i$  is unrestricted, and it is therefore a non-trivial exercise to decide on what value of  $c_i$  should be used to calculate partial effects. See Wooldridge (2002), page 492.

together with the assumption that

$$c_i | x_i : \text{Normal}(0, \sigma_c^2). \quad (5)$$

While assumption (5) is quite strict, the random effects probit model has the nice property of specifying a conditional distribution of the random effect while allowing for straight-forward estimation of average partial effects.

The estimates of average partial effects we choose to report in the next sub-section are from a pooled probit model, a random effects probit model, and a linear probability fixed effects model. As we show below, our coefficient estimates of interest are stable across these different specifications.

### *5.1.2. Results*

Table 3 presents the estimates. For each of the four estimation models, we present two specifications. The first uses the full sample and examines how debt to cash flow ratio quartiles and financial covenant violations affect the likelihood of a capital expenditure restriction in the credit agreement. The second specification adds credit rating indicator variables as covariates and isolates the sample to firms that have a credit rating. The linear probability fixed effects models further restrict the sample to firms with at least two loans.

In all specifications including firms without a credit rating (Columns 1, 3, 5, and 7), there is a statistically significant increase in the likelihood of capital expenditure restrictions when moving from the lowest debt to cash flow ratio quartile (the omitted group) to the highest quartile. The pattern is monotonic and the magnitudes are quite large: moving from the lowest to highest debt to cash flow quartile leads to an increase in the likelihood of a restriction between 11 and 22 percentage points, depending on the specification. Given the mean likelihood of 0.32, these effects represent a 30 to 60% increase in the likelihood evaluated relative to the mean. In addition, a borrower with negative cash flow in the previous four quarters has a likelihood of a capital expenditure restriction that is between 10 and 17 percentage points more than firms in the lowest debt to cash flow ratio quartile, depending on the specification. The debt to cash flow quartiles are weaker in specifications using the rated sample (columns

2, 4, 6, and 8), but this is a result of the inclusion of the credit rating indicator variables. Credit ratings and the debt to cash flow ratio quartiles are highly correlated, and excluding the credit rating indicator variables leads to similar estimates on the debt to cash flow quartiles in the rated sample (not reported).

In column 1, the coefficient estimate on the covenant violation indicator variable implies that a firm that violates a financial covenant is 13 percentage points more likely to have a capital expenditure restriction, which is 40% at the mean. The coefficient estimate on the violation indicator variable is stable across all estimation strategies for the full sample. However, the coefficient estimate is smaller in magnitude and not statistically distinct from 0 for the sample of rated firms. This latter result suggests that a narrow focus on the effect of financial covenant violations misses the important effect of credit quality on the likelihood of capital expenditure restrictions. Our findings show that ratings are a more powerful predictor of the likelihood of an investment restriction, yet extant research has focused almost exclusively on financial covenant violations when examining the impact of creditor intervention on investment.

In all estimations, there is a sharp increase in the likelihood of a firm having a capital expenditure restriction as it moves from BBB rated to BB rated—that is, as the firm moves from an investment-grade rating to a speculative grade rating. The estimates in column 2 suggest that a firm downgraded from BBB to BB faces an increase in the likelihood of having a capital expenditure restriction by 21 percentage points, which is 95% of the mean in the rated sample.

There is a negative relation between the incidence of capital expenditure restrictions and both total assets and the market to book ratio in most specifications. These patterns suggest that capital expenditure restrictions are less likely in the credit agreements of large borrowers and those with better investment opportunities.

In unreported results, we find that the core results are robust to alternative measures of credit quality, including the use of cash flow scaled by assets and the leverage ratio as independent control variables, the use of a debt to cash flow ratio that excludes negative cash flow observations, an interest coverage ratio that excludes negative cash flow observations and firms with zero interest expense, and interest coverage ratio quartiles, formed by excluding firms with zero interest expense.

## 5.2. Restrictions versus other loan terms

In this section, we explore how other contract terms respond to credit quality deterioration in order to understand the relative importance of shifts in control over investment. We focus on capital expenditure restrictions versus interest spreads, whether a loan is secured, whether a loan contains a restriction on dividend payments, and whether a loan contains financial covenants.

Table 4 reports the unconditional correlations of the various contract terms. Capital expenditure restrictions are most strongly positively correlated with interest spreads and whether the loan is secured. Restrictions are also positively correlated with dividend restrictions and cash flow only financial covenants. Restrictions are less strongly positively correlated with financial covenants on net worth, the ratio of debt to cash flow, and the interest coverage ratio. The results in Table 4 suggest that restrictions are often bundled with collateral requirements and higher interest spreads but less likely to be bundled with a specific set of financial covenants.

In order to document the relative importance of credit quality deterioration on the likelihood of capital expenditure restrictions, Panel A of Table 5 presents the contract term averages across the credit rating distribution, and Panel B presents the percentage change relative to the mean when moving from A or better to a lower credit rating. The top lines of Panels A and B show that the likelihood of a capital expenditure restriction increases by only 5 percentage points (15% at the mean) from A to BBB, but increases by over 30 percentage points (100% at the mean) from BBB to BB. In comparison, the likelihood of dividend restrictions, collateral requirements, coverage ratio covenants, debt to cash flow ratio covenants, and net worth covenants all increase sharply from A or better to BBB. This result suggests that banks and borrowers agree to restrictions on financial outcomes while leaving investment policy unrestricted when credit quality deteriorates slightly but firms remain investment grade. In contrast, a more significant deterioration leads to creditor intervention with investment policy.

Firms experience a large increase in the likelihood of capital expenditure restrictions when moving from BBB to B, a range that includes over 80% of the loans in the distribution. Panel B shows that moving from the BBB to the B category leads to a 130% (145%-15%) increase in the likelihood of a

capital expenditure restriction when evaluated at the mean. Only the likelihood of collateral (115%) and cash flow only financial covenants (147%) experience an increase as large over this range when evaluated at their respective means. This evidence suggests that capital expenditure restrictions are among the most sensitive contractual features with respect to credit quality deterioration, especially in the middle of the credit quality distribution.

Because the results in Table 5 rely on the sub-sample of firms that have a credit rating from S&P, we also examine in unreported results the full sample with imputed credit ratings using cash flow, cash flow variance, the leverage ratio, and the market-to-book ratio as credit-rating prediction variables. We obtain similar results.

### *5.3. Contingency*

In this section, we examine how creditors make future contract terms contingent on the borrower's credit quality. The results in Table 3 suggest that capital expenditure restrictions in loan agreements are implicitly contingent on the borrower's credit quality—credit agreements are more likely to contain a restriction when the borrower has a higher debt to cash flow ratio, has violated a financial covenant, or has lower credit quality. However, these results do not necessarily imply that ex ante contracts are explicitly contingent on future credit quality. Indeed, we rarely find contract provisions that specify that a restriction will be imposed if the borrower's credit quality deteriorates. Instead, observed agreements tend to either restrict or not restrict capital expenditures from the outset of the contract.

Although written contingencies are uncommon, lenders can use financial covenants and the maturity of the loan to create an implicit contingency in the lending arrangement. Financial covenants are performance-based limits contained in almost all private credit agreements. A borrower that violates a financial covenant is in “technical default” of the agreement, which gives the lender the right to accelerate the outstanding loan. Technical defaults typically lead to renegotiation of the agreement in which creditors use their acceleration right to extract amendment fees and impose new restrictions in the new renegotiated agreement (Smith, 1993). Similarly, agreements that reach maturity are typically renegotiated at terms that reflect the recent performance of the borrower.

In Table 6, we present descriptive statistics that show how creditors use financial covenant violations to change terms in renegotiated agreements. We isolate the sample to “contingent-contract” loan pairs, where: (a) each pair represents two credit agreements between the same borrower and the same lender, (b) the borrower has violated a financial covenant before the new credit agreement, and (c) the origination date of the new agreement is before the maturity date of the old agreement. Among these pairs, the new credit agreement most likely represents a renegotiated loan following a technical default.

Column 1 of Table 6 reports the fraction of original and renegotiated agreements that contain capital expenditure restrictions. While 40% of credit agreements obtained before the financial covenant violation include a restriction, over 60% of the renegotiated agreements following the violation contain a restriction. That is, the renegotiated agreement after the violation is 51% more likely to contain a restriction on capital expenditures. The remaining columns of Table 6 show that the renegotiated loan agreement has an interest spread that is 30% higher than the original loan agreement, that the likelihood of requiring collateral increases by 20%, and that presence of a dividend restriction is 9% more likely. The results in Table 6 show that the likelihood of capital expenditures is more sensitive to financial covenant violations than other contract terms such as the interest spread or collateral requirements.

## **6. The Impact of restrictions on investment**

In this section, we examine how capital expenditure restrictions affect investment. As Section 5 demonstrates, restrictions on investment are not randomly imposed. Instead, creditors introduce restrictions into credit agreements, and borrowers agree to the loans, in response to deterioration in credit quality. The non-randomness introduces a significant identification problem when attempting to measure the impact of the restriction on actual investment, as investment levels for firms with deteriorating credit quality are likely to fall even in the absence of a new capital expenditure restriction.

Before addressing this identification problem more formally, we emphasize two facts suggesting that the restrictions are relevant for firm investment policy. First, it is difficult to construct a reasonable economic framework in which creditors would introduce non-binding investment restrictions into a borrower credit agreement following a decline in credit quality. This is especially true given that creditors

charge lower interest rates in exchange for including more covenants (Bradley and Roberts, 2003). If the restrictions provided no benefit to the creditor, then this latter fact suggests that no contract should contain a restriction. Simply stated, economic theory strongly suggests that restrictions introduced in response to declining in credit quality are introduced with the intent of limiting investment (Jensen and Meckling, 1976; Aghion and Bolton, 1992).

Second, we can infer the relevance of the restrictions by simply noting their level of detail. As an example, the March 27, 1997 revolving loan agreement for casino operator Hollywood Park, Inc. contains the following restrictions:

Capital Expenditures. [Borrower shall not] Make, or become legally obligated to make, any Capital Expenditure except:

(a) Maintenance Capital Expenditures not in excess of (i) \$15,000,000 for the Fiscal Year ending December 31, 1997, (ii) \$15,000,000 for the Fiscal Year ending December 31, 1998 and (iii) \$20,000,000 for any subsequent Fiscal Year;

(b) Capital Expenditures to the extent financed by Indebtedness permitted under Section 6.9(h);

(c) Capital Expenditures for the construction of approximately 200 additional hotel rooms, a restaurant, an entertainment lounge, meeting rooms, retail space and parking facilities at the Reno Property not in excess of \$25,000,000;

(d) Capital Expenditures for the construction of buffet and restaurant facilities at the New Orleans Property not in excess of \$10,000,000;

(e) Capital Expenditures for the purchase of capital assets which, as of the Closing Date, are leased by Borrower or any Restricted Subsidiary from other Persons pursuant to operating leases not in excess of \$8,000,000; and

(f) Capital Expenditures not otherwise permitted above which, when added to all other Basket Expenditures theretofore made, do not exceed \$40,000,000.

Imposing such meticulous restrictions requires time and expense, which makes it difficult to see why contracts would include such a covenant unless it provides a real constraint that adds value to the contracting parties.

The Hollywood Park agreement also demonstrates the two important mechanisms through which creditors restrict the investment choices of their borrowers. Ex ante, lenders can directly restrict the

business plans of their borrowers when setting contract terms. Ex post, lenders retain the right to approve or disapprove investment above the restriction amount.

We begin our formal analysis of the effect of restrictions on investment by examining firm-level mean investment levels, conditioned only on whether a firm has a restriction in its loan agreement. More specifically, in Fig. 1, we present mean capital expenditures, scaled by lagged assets, plotted in the years before and following the signing of a loan contract for three groups of firms: (a) firms for which the contract does not restrict capital expenditure restriction (no capital expenditure restriction), (b) firms for which the contract contains a restriction and the prior sample agreement does not contain a restriction (new capital expenditure restriction), and (c) firms for which the contract contains a restriction and either we do not have a prior agreement, or the prior agreement already contains a capital expenditure restriction (capital expenditure restriction).

Fig. 1 indicates that capital expenditures decline through our sample period for all firms. However, the fall in capital expenditures is larger when a firm's contract contains a new capital expenditure restriction. By the end of the year after the agreement is signed, firms with a new capital expenditure restriction experience a decline in capital expenditures (scaled by lagged assets) that is 1.5 percentage points larger than firms without a capital expenditure restriction, translating to nearly a 20% larger decline in investment, measured at the mean.

Table 7 extends the preceding analysis to a regression framework in which we include year indicator variables and changes in firm cash flow and investment opportunities. Columns (1) and (2) report specifications in which the left hand side variable is the difference in capital expenditures from the year before to the year of the loan agreement, and columns (3) and (4) report specifications in which the change in capital expenditures is measured as the difference between the average over the two years prior to the restriction and the average over the two years beginning in the year of the loan agreement. In all specifications, firms that face a new restriction show a statistically significantly larger decrease in capital expenditures than the other contract categories, even after controlling for changes in cash flow and investment opportunities. The fact that the estimate remains statistically robust to the inclusion of control

variables suggests that the decline in investment is not uniquely caused by reduced investment opportunities. The estimates in Table 7 imply that firms facing a new restriction experience a decline in investment that is 15% to 20% larger than firms that do not face a restriction. These results also explain why prior empirical studies do not find widespread evidence of risk-shifting (e.g., Andrade and Kaplan, 1998). In equilibrium, gross attempts at asset substitution are likely to be precluded by contractual restrictions on investment.

The regression results in Table 7 could still be influenced by an unobservable variable that jointly determines the likelihood of getting a new restriction and the level of capital expenditures. In order to buttress our argument that restrictions cause a reduction in investment, we examine the degree of clustering of investment just below the capital expenditure limit. As stated in Section 2, we collect the exact capital expenditure limit in the loan agreement for a sub-sample of 486 loans in our sample. We use these data to compute the difference between actual capital expenditures and the contractual limit, and scale the difference by lagged total assets. Values below zero indicate actual expenditures below the limit, and values above zero indicate expenditures that exceed the limit.

Fig. 2 plots a histogram of the distribution of actual capital expenditures relative to the amount restricted by the contract. While 27% of observations are within 1% of lagged assets below the restriction, only 9% are within 1% above the restriction.<sup>6</sup> Similarly, 50% of observations are within 2% below the restriction, and only 11% are within 2% above the restriction. The noticeable kink in the empirical distribution from just below to just above zero provides evidence that exceeding the limit is costly. In other words, the distribution presented in Fig. 2 is consistent with the hypothesis that restrictions constrain borrower investment below the contractual limit.

One concern with Fig. 2 is that restrictions are set at the borrowers' planned level of capital expenditures. Then, the distribution of capital expenditures relative to the restriction simply reflects

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<sup>6</sup> A firm may exceed its limit by obtaining a waiver to the restriction. However, there is also a measurement issue. Most contracts contain rollover provisions that permit some portion of 'unused' expenditures to be spent the following year. While we attempt to identify the initial year to which the restriction applies, we likely include restrictions where the firm has some rollover capacity from a previous contract.

deviations from planned expenditures and would look the same without the restriction. There are several counterarguments to this concern. First, even if the agreement specifies a limit at planned capital expenditures, it may be the case that, ex ante, the creditor forces planned capital expenditures downward when negotiating the new loan agreement. Second, there is no reason to believe that deviations from planned capital expenditures in the absence of a restriction should show a strong asymmetry between above and below the planned amount. Fig. 2 suggests a strong asymmetry: the fraction of observations that are -2% to -1% below the limit is more than twice the fraction that are 0% to 1% above the limit, and the difference between the two is statistically distinct from zero at the one percent level.

Third, in Table 8, we find that the size of the kink and shape of the distribution does not vary with the time from the contract origination until the end of the fiscal year. For example, consider two borrowers that have capital expenditure limits applying to the calendar year 2003. The loan is originated for one borrower in January of 2003 and the loan for the other borrower is originated in November of 2003. If the restriction is non-binding and simply represents planned capital expenditures, we would expect more deviations from planned expenditures and thus less clustering below the limit for the January 2003 borrower given the longer time period between the loan origination and the end of the calendar year. As Table 8 shows, we find no evidence to support the alternative planned capital expenditure hypothesis. The degree of clustering just below the limit is almost identical for firms that sign contracts early or late in the calendar year.

In Fig. 3, we limit the sample to the subset of 81 loans in which the current agreement contains a capital expenditure restriction but the prior agreement for the same borrower does not contain a restriction. For this sample, realized capital expenditures from the year prior to the loan agreement are unrestricted by a contractual limit, and therefore serve as a plausible counterfactual for the distribution of expenditures in the absence of a restriction. The figure demonstrates that, in the year of the agreement in which the restriction applies, the clustering of observations just below the limit is more pronounced than for the broader sample underlying Fig. 2. Here, over 60% of the observations are within 2% of assets just below the threshold, suggesting that the limit is most binding immediately after it is first introduced. In

addition, actual expenditures in the prior year appear to have little relation with the contractual limit imposed subsequently. Most striking is that 41% of the firms exceeded the yet-to-be-imposed limit in the year prior to the loan origination, while only 7% exceeded the limit after the restriction is imposed. Finally, in the year prior to the agreement, deviations from the region just below the yet-to-be-imposed limit are not asymmetrically skewed downward. To the contrary, there appear to be more deviations above the yet-to-be-imposed limit. This evidence supports the idea that we see fewer deviations above the limit in the year after it is imposed because the restriction is binding, and not because deviations from planned expenditures tend to be negative.

## **7. Impact of restrictions on firm performance**

In this section, we explore the value and performance implications of restrictions on capital expenditures in private credit agreements. Theoretical research does not provide a clear hypothesis on whether creditor-imposed restrictions promote or distort efficient investment. For example, in Jensen and Meckling (1976), investment restrictions might reduce value-improving investments by preventing risky but positive NPV projects. However, they may also prevent risky negative NPV projects that would otherwise benefit equity-holders, given their convex payoff function. Alternatively, by restricting the potential investment set of managers, restrictions in debt agreements on investment may provide positive externalities to external equity-holders by limiting value-reducing managerial over-investment.<sup>7</sup>

To provide some evidence on the valuation consequences of imposing capital expenditure restrictions, we examine how measures of market value and operating performance change after a firm obtains a loan agreement with a new restriction. As a measure of market value, we use the market-to-book ratio (MTB). As a measure of operating performance, we use return on assets (ROA), defined as EBITDA divided by lagged assets.

The two panels of Fig. 4 graph MTB and ROA before and after firms obtain a new credit agreement by whether the agreement contains a capital expenditure restriction. Reflecting the results in

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<sup>7</sup> Several models hypothesize that debt restricts managerial over-investment and value-reducing behavior (e.g., Jensen, 1986; Harris and Raviv, 1990; Zwiebel, 1996), although bank debt may be less likely to enforce managerial discipline given the ease of ex post renegotiation.

Section 5, both MTB and ROA for firms obtaining loans with new limits fall from the year before the contract through the year in which the contract is signed, as capital expenditure restrictions respond to poor performance. However, in the year after the contract, both MTB and ROA increase uniquely for the sample of firms receiving a new restriction. In fact, by two years after the contract, both measures return to their level from one year before the loan origination. The fraction of firms leaving the sample over the event period is similar for all three groups of firms, which suggests that survivorship bias is not the source of difference in ex post performance.

Table 9 presents regression results for the one year change in MTB and ROA from the year the loan is originated to the year after the loan is originated. In the specifications reported in columns (2) and (4), we include controls for the lagged change in the dependent variables. We include these variables to control for possible mean reversion in performance, given that MTB and ROA are falling in the years preceding the loan origination for firms that obtain new restrictions. The difference-in-difference estimates suggest that firms with a new restriction experience a large and statistically significant increase in market valuation and operating performance relative to firms that obtain loans without a restriction. The estimate in column 2 implies that firms obtaining loans with a new restriction experience an increase in MTB by 0.17 more than firms obtaining loans without a restriction, which is a 10% increase at the mean MTB. The column 4 estimate implies a relative increase in ROA of 0.012, which is over a 10% effect at the mean.

A potential concern with the results in Table 9 is that the introduction of other loan agreement terms, as opposed to capital expenditure restrictions, is responsible for the improvement in value and performance. In Columns 3 and 6, we include additional indicators for whether the agreement contains a dividend restriction, a collateral requirement, or financial covenants. As the results in Column 3 demonstrate, a new capital expenditure restriction is correlated with an increase in MTB, even after controlling for all other contract terms. In fact, the inclusion of a capital expenditure restriction is the only contractual term that has a positive effect on MTB. Column 6 shows that the positive effect of a new capital expenditure restriction on ROA is robust to inclusion of control variables for other contract terms.

The results in Columns 3 and 6 also mitigate the selection bias concern that capital expenditure restrictions are positively correlated with MTB and ROA because banks only lend to troubled firms for which they have private information on future improvements in performance. This selection bias concern would imply that all harsher contract terms would be positively correlated with future performance, yet the results show that a capital expenditure restriction is the only contract term that is correlated with future increases in both MTB and ROA.

## **8. Conclusion**

We provide evidence of widespread use of explicit restrictions on investment in the private credit agreements of a large fraction of publicly traded companies. These restrictions are more likely to be put in place after credit quality deterioration. In fact, the elasticity of a capital expenditure restriction with respect to borrower credit quality is often larger than the elasticities of other contract terms, such as the interest spread or a dividend restriction. We describe how creditors use financial covenants and associated acceleration rights to make investment restrictions effectively conditional on the borrower's credit quality, and we provide compelling evidence that restrictions on capital expenditures contained in private credit agreements constrain firm investment. These results are consistent with the hypothesis that conflicts of interest between creditors and their borrowers have a significant impact on firm investment policy.

We also show that investment restrictions can create positive externalities for equity-holders by reducing managerial value-reducing overinvestment. However, we view these results as suggestive, and we believe that more conclusive evidence is needed. One obvious angle is to isolate exogenous variation in the imposition of the restrictions documented here, and we hope that future research is able to utilize our data to answer the efficiency question more definitively.

## Appendix

### Contracts Unmatched and Matched to *DealScan*

As stated in Section 2, of the 9,581 credit agreement observations in *DealScan*, we are able to successfully match 40% to the actual loan contract from *Edgar* to yield the final sample of 3,720 private credit agreements. In order to understand why the match rate is only 40%, it is instructive to describe how Reuters LPC constructs its *DealScan* data set. *DealScan* obtains its most detailed observations from SEC filings. Reuters LPC follows the filing of SEC documents and continually extracts information from those filings that contain credit agreements. But Reuters LPC also creates additional *DealScan* observations through information collected from financial institutions that report “deal flow” directly to the company. Reuters-LPC uses this information to construct league tables of bank loan deals. Although LPC requires that the financial institutions provide enough information on the loans to verify the accuracy of the information, they do not typically obtain a copy of the credit agreement, and thus forego the level of detail available from a copy of the agreement. Thus, the completeness of a *DealScan* record will tend to depend on whether LPC could find the original credit agreement in an SEC filing.

To check the effectiveness of our text-search algorithms, we randomly sample 200 observations from *DealScan* that we could not match electronically to a loan contract on *Edgar*, and conduct a detailed search of *Edgar* by hand to understand why the *DealScan* deals did not match to a contract. Panel A of the Appendix Table presents our findings. For 40% of unmatched observations, we are able to find a full loan contract in *Edgar*. Typically, our search algorithm misses these contracts because they do not contain a full Table of Contents, which is a requirement of our search program. Despite its shortcoming, we find including the “TABLE OF CONTENTS” search requirement is the best method for reducing credit agreement-like references that are not loan contracts (false positives). Another 22% of the unmatched loans are minor amendments tracked by *DealScan* as new loans, but which actually do not involve the initiation of a new or renegotiated credit agreement. Rather, the amendments detail small sets of changes to the existing agreement. For the remaining 38% of unmatched *DealScan* observations, we are unable to locate any partial or full loan contract in *Edgar*, indicating that LPC likely obtained the information directly from the financial institution arranging the loan deal.

In Panel B of the Appendix Table, we present loan and borrower characteristics for observations that are matched and unmatched to a loan contract from *Edgar* in order to assess any potential biases associated with the sub-sample of contracts we examine. The first line examines the incidence of capital expenditure restrictions, where the data are only available for the matched sample of contracts (Column 1) and for the full contracts that are in *Edgar* but missed by our search program (Column 3). Minor amendments missed by our program (Column 4) rarely contain a capital expenditure restriction change, and, of course, we cannot observe whether a capital expenditure restriction is present among the contracts not in *Edgar* (Column 5).

There are some important differences in loan characteristics between the matched and unmatched samples. Loans that contain full contracts in *Edgar* but are missed by our search algorithm tend to be smaller than our matched sample (mean loan amount = \$145 million compared with \$450 million), and are much more likely to be initiated by a sole lender (67 % vs. 18%). These loans are also made to smaller firms (mean assets \$631 million compared with \$1,623 million), and lower credit quality firms (mean cash flow/assets = 1.9% compared with 3.4%) than in the matched sample.<sup>8</sup> In any case, the incidence of capital restrictions in the unmatched sample of full contracts (37%) is not statistically different from the matched sample (33%), and the fact that the point estimate appears higher is consistent with the patterns documented in our paper – smaller and riskier firms are more likely to face a restriction. In sum, the

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<sup>8</sup> We likely miss these loans because the contracts to smaller firms are more likely to be shorter and less-complicated, obviating the need for a Table of Contents.

missing firms with full contracts in *Edgar* are unlikely to affect our overall results, although our estimates of the incidence of capital expenditure restrictions could be biased *downward* because we miss some of the smaller, riskier loans. Among those observations in *Edgar* that we miss because they are only minor amendments, but are tracked by *DealScan* (Column 4), borrower and loan characteristics appear to be similar to our matched sample in Column 1. However, consistent with the contract being incomplete, much of the contract information is missing from *DealScan*. Since these observations are only minor amendments to existing contracts, we do not believe that they should be included as part of our sample (nor should they be counted as completed deals in *DealScan*).

For those observations that we miss because the agreement is not in *Edgar*, the table indicates that the *DealScan* data quality is much poorer than for the matched loans. These are the cases in which Reuters-LPC is relying on information reported by the financial institution, which is less complete than observing the credit agreement. In particular, data describing collateral, whether a loan has financial covenant data, whether a loan has a dividend restriction, and the percentage held by each lender is more likely to be missing in *DealScan* for loans that we are unable to match to a contract.

According to *DealScan*, loans without a contract in *Edgar* (Column 4) are also much more likely to be revolving loans with maturities less than one year, compared with the matched sample (44% with less than one year of maturity, compare with 10%), and to be smaller relative to the size of the borrower (loan amount-to-assets = 20% versus 28%) than matched loans. Revolving loans with maturities of less than one year are often backup lines for commercial paper issuances, so it is likely that a substantial proportion of the missing *Edgar* observations are these sorts of credits. It is possible that companies deem such loans to be not “material”, and therefore do not file the credit agreements. Our results could be biased by selection if the incidence of capital expenditure restrictions among contracts excluded from *Edgar* are different from the matched sample. In particular, our results would tend to overstate the importance of capital expenditure restrictions if the presence of the restriction determines whether or not the contract is “material” according to SEC standards.

Based on our reading of the definition of “materiality” by the SEC, we believe that this is unlikely to be the case. Although the SEC purposely keeps the definition of “materiality” open-ended, it offers guidelines to determine the materiality of information, and in particular, financial contracts. In particular, the SEC relies on accounting and court rulings, as well as internal guidance procedures, to determine the materiality of information that should be disclosed. The U.S. Supreme Court has defined a fact to be material when, “the fact would have been viewed by the reasonable investor as having significantly altered the “total mix” of information made available” (SEC, 1999). Though the capital expenditure restriction itself could be deemed material under these guidelines, what is likely to make the contract material is the loan itself, independent of the contents of the contract. Put differently, firms are likely to identify a loan as material because the *magnitude* of the financing arrangement is material, not because of the covenants per se. Consistent with this view, the SEC requires under Regulation S-K that firms file as exhibits those contracts deemed to be “material” and “definitive. The SEC defines a *Material Definitive Agreement* to be the “entry into any material contract not made in the ordinary course of business... as well as any material amendment to a material contract.” (SEC, 2007). Further, the SEC requires a company to disclose all large financial obligations, be they on- or off-balance sheet items: “A company must report when it becomes a party to a material, direct financial obligation enforceable against it. Reporting is also required upon creation of a direct or contingent obligation arising out of an off-balance sheet arrangement.” (SEC, 2007). The definitions make no reference to particular covenants in the agreements, but to the agreements themselves. Thus, the contracts missing from *Edgar* are likely to be loans that are deemed by the borrower to be not material. Such loans could include loans that are relatively small, short-term, or agreements that are reported to *DealScan* as a commitment by the financial institution, but are later canceled prior to initiation. None of these explanations should bias the findings of our paper.

## Appendix Table Addressing Sample Selection Concerns

Panel A presents the fraction of *DealScan* observations for which our search program is unable to find a contract in *Edgar*. To determine whether a contract that is not in our sample is in *Edgar*, we randomly sample 200 observations and search manually through the SEC filings of the borrower for the contract. Panel B presents the summary statistics for observations based on whether or not we are able to find the contract in *Edgar*.

### Panel A: Why are *DealScan* observations not in sample?

	N	Fraction
In sample (Search program finds a contract)	3,720	0.39
Not in sample (Search program does not find a contract)	5,861	0.61
<i>Random sample of 200 observations not in sample</i>		
Full contract in <i>Edgar</i> but search program misses it	81	0.41
Minor amendment in <i>Edgar</i>	45	0.23
Not in <i>Edgar</i>	74	0.37

### Panel B: Comparison of characteristics

	(1)	(2)	(3)	(4)	(5)
	In sample (N = 3,720)	Not in sample (N = 200)	Not in sample, full contract in <i>Edgar</i> (N = 81)	Not in sample, minor amendment in <i>Edgar</i> (N = 45)	Not in sample, contract not in <i>Edgar</i> (N = 74)
Capital expenditure restriction	0.329		0.370		
<i>Dealscan data quality</i>					
Secured not available	0.162	0.394**	0.147	0.409**	0.652**
Financial covenant not available	0.069	0.383**	0.147	0.341**	0.667**
% held by lenders not available	0.568	0.702**	0.613	0.682**	0.812**
Div restriction not available	0.074	0.473**	0.293**	0.386**	0.725**
<i>Type of loan</i>					
Sole-lender loan	0.182	0.394**	0.667**	0.227	0.203
Revolver w/ maturity of < 1 year	0.096	0.250**	0.093	0.227*	0.435**
<i>Borrower characteristics</i>					
Total assets (\$M)	1623	1589	631**	1544	2658**
Book debt/total assets	0.300	0.291	0.282	0.327	0.278
Cash flow/total assets	0.034	0.026**	0.019**	0.030	0.032
<i>Loan characteristics</i>					
Loan amount (\$M)	450	340*	145**	358	541
Interest rate spread (basis points)	170	198*	261**	190	134*

\*,\*\* statistically distinct from *In sample* category at 5% and 1% level, respectively.

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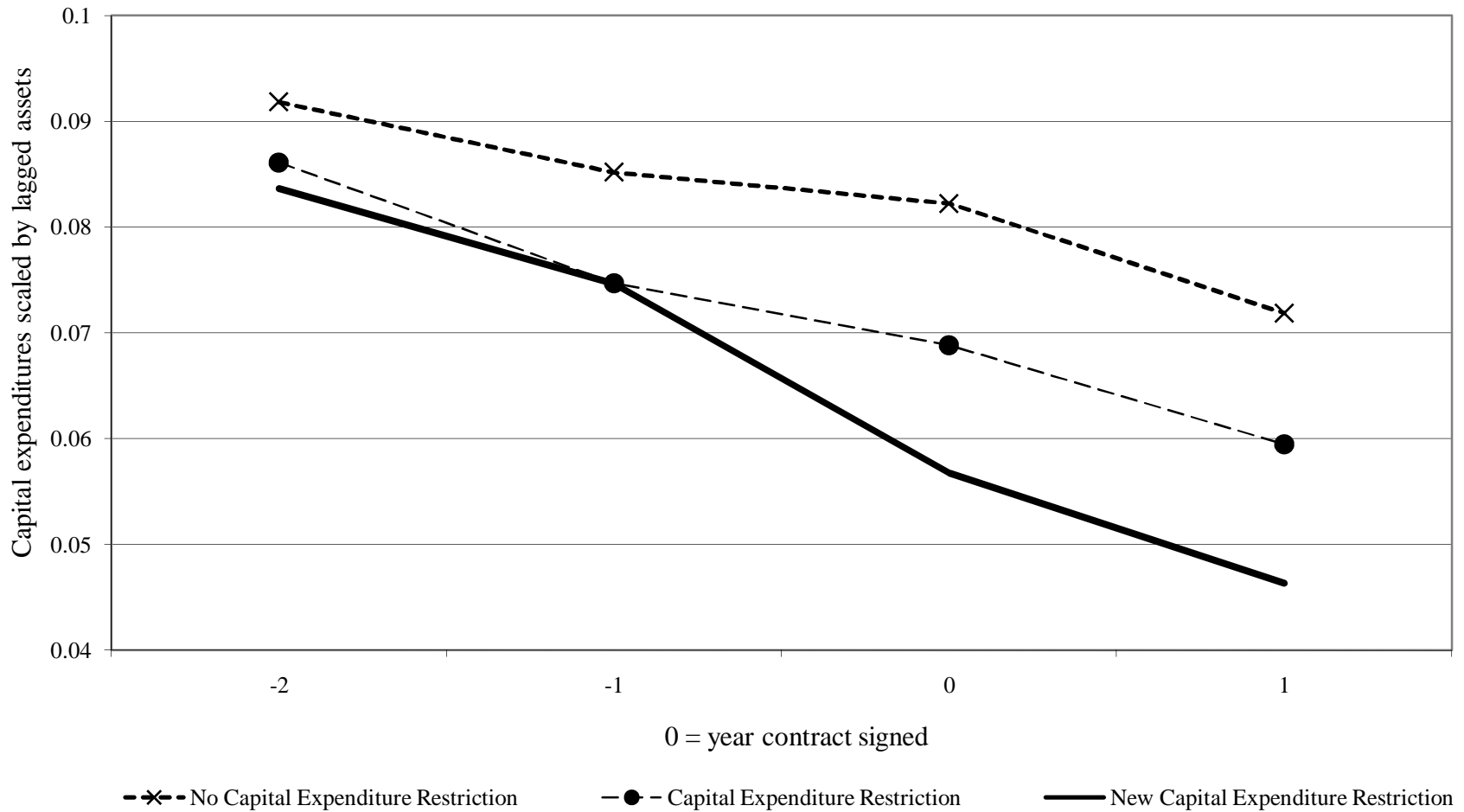
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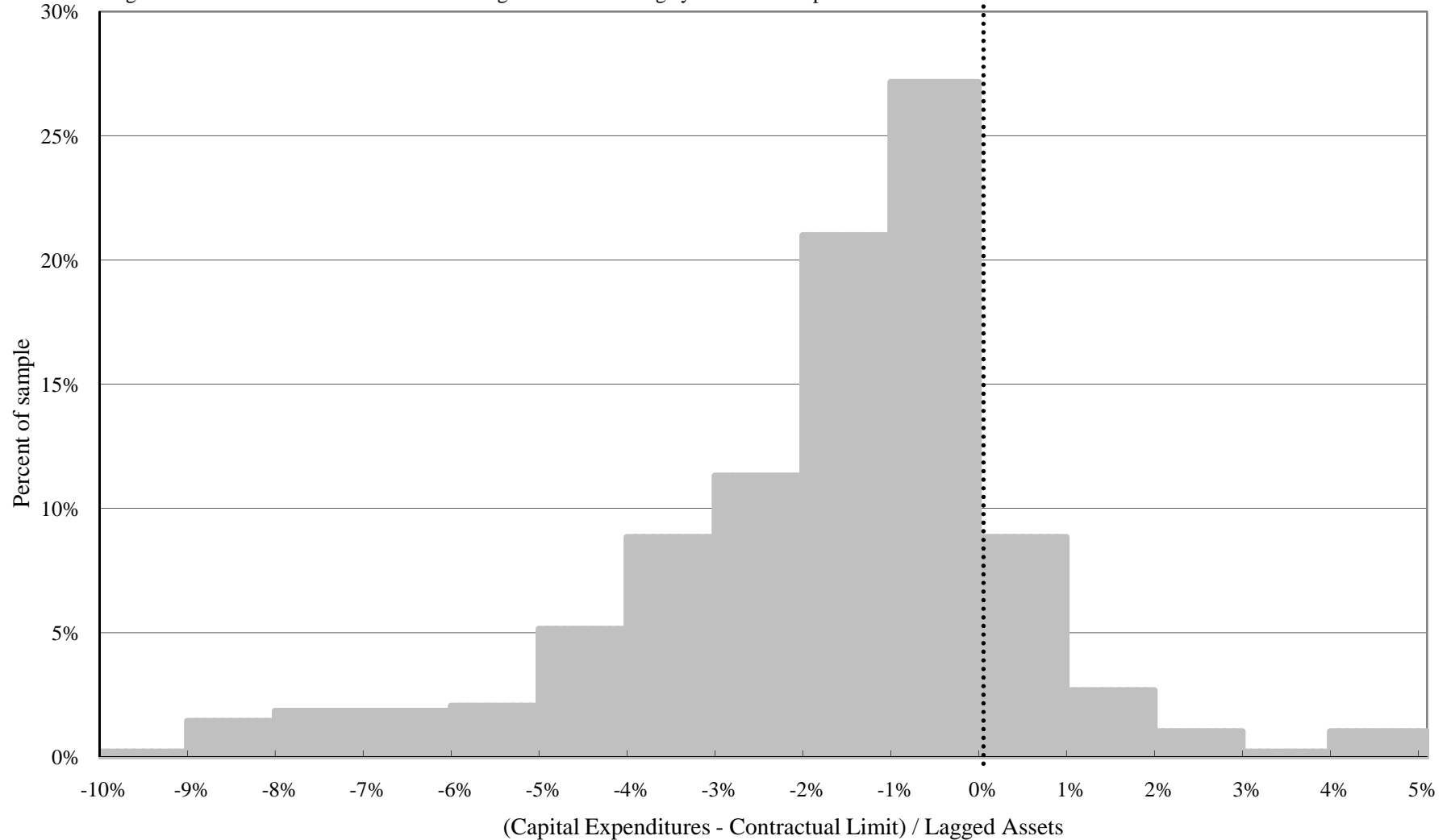
**Figure 1: Capital Expenditures, by Whether Contract Contains Capital Expenditure Restriction**

This figure presents average capital expenditures before and after a loan contract is signed, by whether the credit agreement contains a covenant with a direct restriction on capital expenditures. The figure is based on a sample of 3,720 private credit agreements to 1,931 borrowers collected from the SEC's Edgar electronic filing system over the period 1996-2005. A New Capital Expenditure Restriction is a restriction in the contract of a borrower whose last loan contract did not contain a restriction.



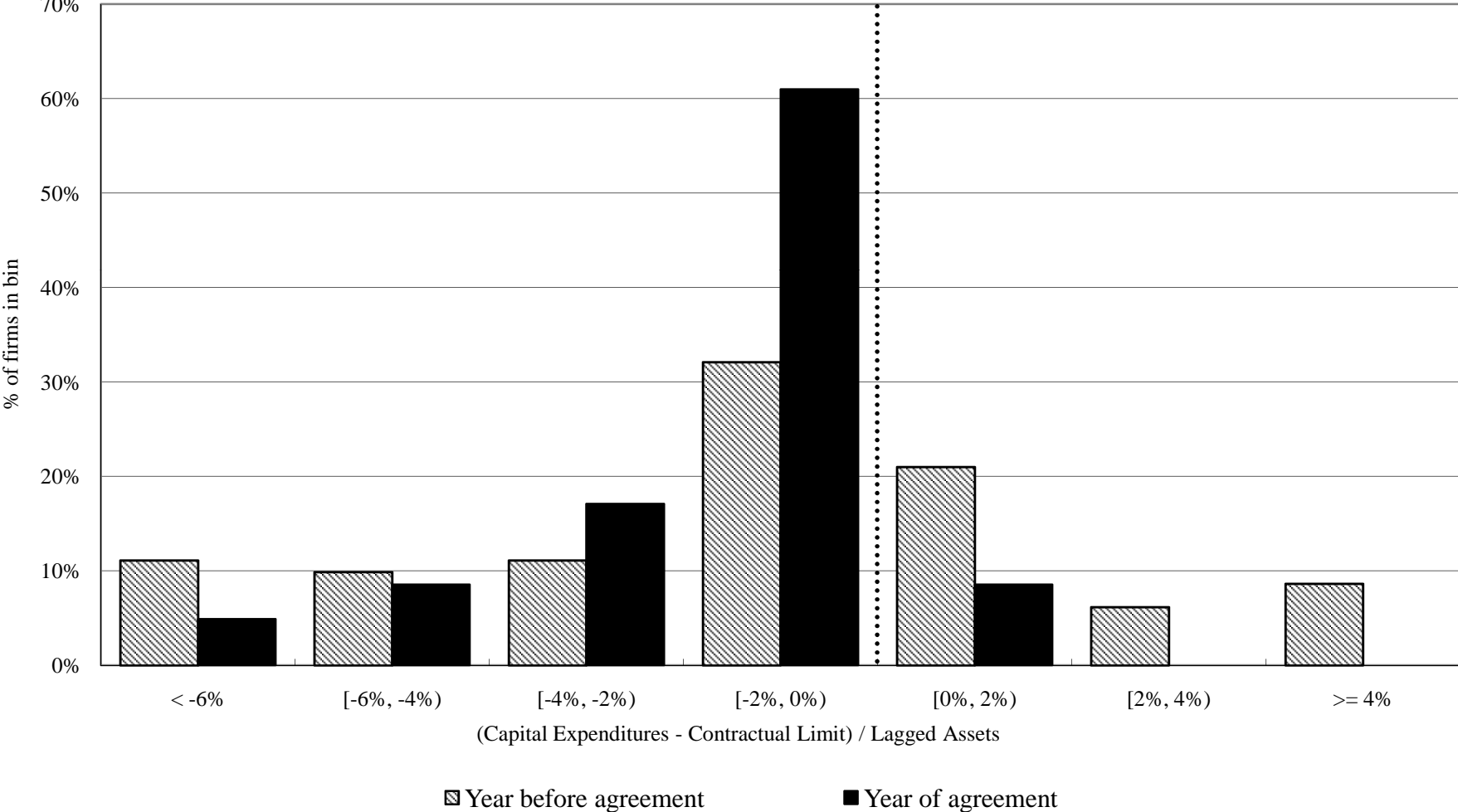
### Figure 2: Capital Expenditures - Contractual Limit

This figure presents a histogram of the difference between actual capital expenditures and the contractual limit imposed by the capital expenditure restriction in the loan agreement, expressed as a ratio to lagged assets. Actual capital expenditures are for the first fiscal year after the loan contract is signed. The sample includes the 486 contracts for which we collect the contractual limit from the private credit agreement. The private credit agreements are collected from the SEC's Edgar electronic filing system over the period 1996-2005



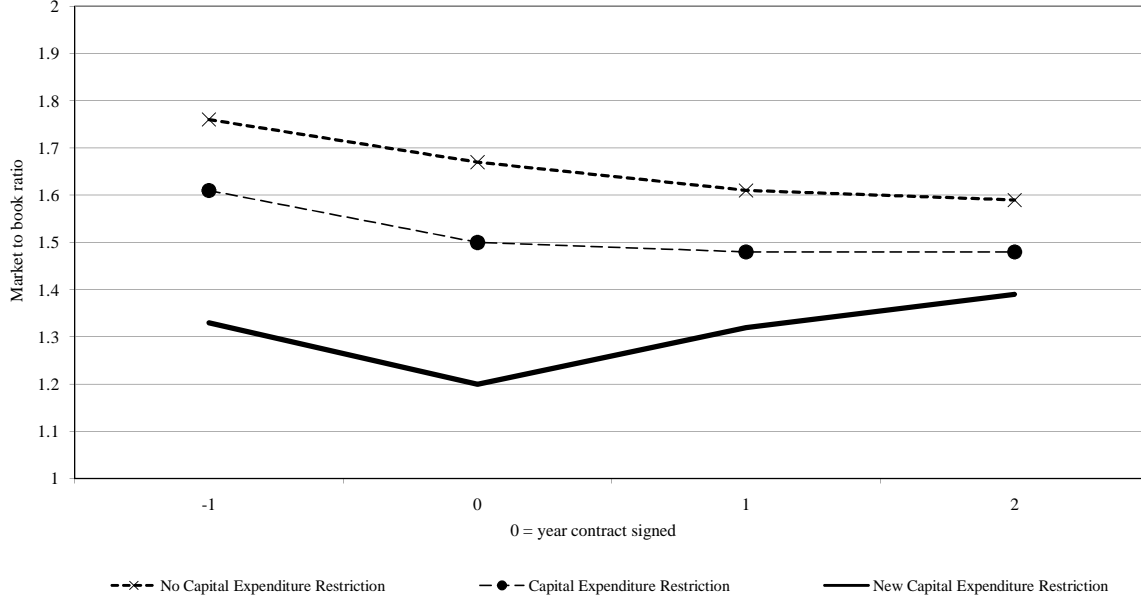
**Figure 3: Capital Expenditures - Contractual Limit, Year Before and Year of Contract**

This figure presents a histogram of the difference between actual capital expenditures and the contractual limit imposed by the capital expenditure restriction in the loan agreement, where actual capital expenditures are for the first fiscal year of the loan contract (solid black) and for the fiscal year immediately preceding the year in which the contract is signed (striped). For the year before the contract, the figure presents the difference between actual capital expenditures and the yet to be imposed restriction. Differences are scaled by lagged assets. The sample includes the 81 loans in which the prior sample loan did not include a capital expenditure restriction.



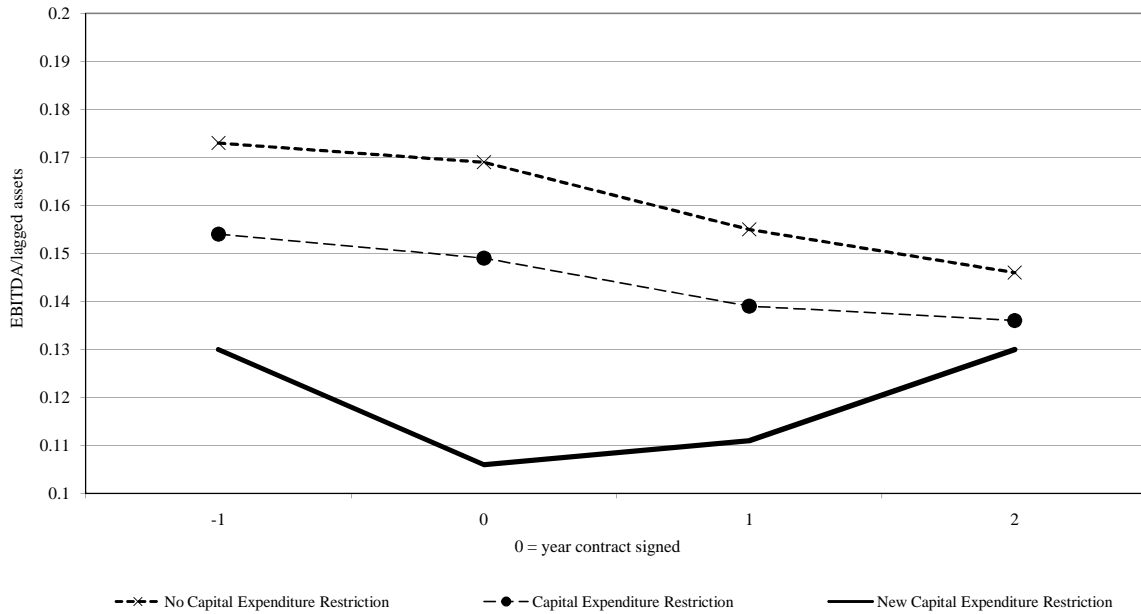
**Figure 4: Firm Performance, by Whether Contract Contains Restriction**  
 Panel A: Market to book

This panel presents the average market value of assets (measured as the book value of debt plus market value of equity) to book value of assets before and after a loan contract is signed, by whether the loan contract contains a capital expenditure restriction. The figure is based on a sample of 3,720 private credit agreements to 1,931 borrowers collected from the SEC's Edgar electronic filing system over the period 1996-2005. A New Capital Expenditure Restriction is a restriction in the contract of a borrower whose last loan contract did not contain a restriction.



Panel B: Cash flow to lagged assets

This figure presents the average cash flow (earnings before interest and taxes, plus depreciation and amortization) to lagged booked value of assets before and after a loan contract is signed, by whether the loan contract contains a capital expenditure restriction. The figure is based on a sample of 3,720 private credit agreements to 1,931 borrowers collected from the SEC's Edgar electronic filing system over the period 1996-2005. A New Capital Expenditure Restriction is a restriction in the contract of a borrower whose last loan contract did not contain a restriction.



**Table 1**  
**Summary Statistics**

This table presents summary statistics for the sample of 3,720 private credit agreements to 1,931 borrowers collected from the SEC's Edgar electronic filing system over the period 1996-2005. A capital expenditure restriction refers a covenant in the credit agreement that directly restricts borrower capital expenditures. Restriction Amount is the contractually specified limit on capital expenditures from the sub-sample of 486 agreements where we collect the restriction amount. Agreement amount includes total dollar proceeds available to the borrower. LIBOR is the London Interbank Offer Rate. Coverage ratio covenants include interest coverage, fixed charge coverage, and debt service coverage covenants. Debt to balance sheet covenants include debt to total capitalization and debt to net worth covenants. Liquidity covenants include current ratio, quick ratio, and working capital covenants. All borrower characteristics are measured as the average over four quarter prior to the credit agreement. Cash flow is earnings before interest and taxes, plus depreciation and amortization. Negative cash flow is an indicator variable that takes the value of one when cash flow is less than zero. Financial covenant violation is an indicator variable equal to one when the borrower reports a covenant violation in an SEC Form 10-K or 10-Q in at least one of the four quarters prior to the signing of the credit agreement. Credit ratings are from Standard & Poor's, and a rating lower than BBB is considered to be junk rated.

	Mean	Median	St. Dev.	N
<i>Capital expenditure restrictions</i>				
Capital expenditure restriction {0,1}	0.319	0.000	0.466	3,720
Restriction Amount / lagged assets	0.085	0.056	0.102	486
Actual capital expenditures / lagged assets	0.064	0.039	0.089	486
<i>Other loan characteristics</i>				
Agreement amount (\$ in millions)	450	200	985	3,720
Agreement amount / assets	0.338	0.245	0.308	3,720
Agreement contains a line of credit/revolver {0,1}	0.938	1.000	0.241	3,720
Agreement is secured {0,1}	0.647	1.000	0.478	3,117
Agreement contains dividend restriction {0,1}	0.813	1.000	0.390	3,446
Interest rate spread <sub>t</sub> (basis points above LIBOR)	170	150	119	3,720
Coverage ratio covenant {0,1}	0.743	1.000	0.437	3,603
Debt to cash flow covenant {0,1}	0.575	1.000	0.494	3,603
Net worth covenant {0,1}	0.452	0.000	0.498	3,603
Debt to balance sheet covenant {0,1}	0.292	0.000	0.455	3,603
Liquidity covenant {0,1}	0.147	0.000	0.354	3,603
Minimum cash flow covenant {0,1}	0.127	0.000	0.333	3,603
<i>Borrower characteristics</i>				
Cash flow / assets	0.034	0.034	0.026	3,720
Book leverage ratio	0.301	0.288	0.193	3,720
Debt to cash flow	3.052	2.260	2.888	3,526
Negative cash flow {0,1}	0.052	0.000	0.222	3,720
Financial covenant violation within past year {0,1}	0.063	0.000	0.242	3,720
Total assets (\$M)	1,622	674	1,974	3,720
Market to book ratio	1.768	1.426	1.136	3,720
Firm has a corporate credit rating {0,1}	0.490	0.000	0.500	3,720
<i>Conditional on borrower having credit rating</i>				
Credit rating (1 = AAA or AA, 2 = A, 3 = BBB ...)	3.502	3.000	1.066	1,822
Junk rated {0,1}	0.482	0.000	0.500	1,822
CCC rated or worse {0,1}	0.020	0.000	0.141	1,822

**Table 2**  
**Capital Expenditure Restrictions, Across Types of Firms**

This table presents the fraction of 3,720 private credit agreements to 1,931 borrowers collected from the SEC's Edgar electronic filing system over the period 1996-2005 that have a capital expenditure restriction, sorted by industry, size, and credit quality. A capital expenditure restriction refers to a covenant in the credit agreement that directly restricts borrower capital expenditures. Book assets is the book value of assets of the borrower. Debt to cash flow is the book value of borrower short and long term debt, scaled by the earnings before interest and taxes, plus depreciation and amortization. Book values are measured in annual terms over the four quarters prior to the signing of the credit agreement.

	Fraction with capital expenditure restriction
<i>Totals</i>	
Fraction of credit agreements with restriction	0.319
Fraction of firms that ever have credit agreement with restriction	0.424
Estimated fraction of all Compustat firms with restriction, using Sufi (2007)	0.336
<i>Fraction of credit agreements with restriction:</i>	
<i>By industry</i>	
Agriculture, minerals, construction	0.154
Manufacturing	0.324
Transportation, communication, and utilities	0.230
Trade—wholesale	0.360
Trade—retail	0.433
Services	0.399
<i>By size (book assets)</i>	
Less than \$100M	0.468
\$100M to \$250M	0.469
\$250M to \$500M	0.443
\$500M to \$1,000M	0.381
\$1,000M to \$2,500M	0.243
\$2,500M to \$5,000M	0.133
Greater than \$5,000M	0.086
<i>By debt to cash flow quartile</i>	
Debt to cash flow quartile 1	0.263
Debt to cash flow quartile 2	0.243
Debt to cash flow quartile 3	0.333
Debt to cash flow quartile 4	0.398
Cash flow negative	0.485
<i>Conditional on firm having credit rating</i>	
Investment grade	0.060
Junk rated {0,1}	0.437
AAA, AA rated {0,1}	0.000
A rated {0,1}	0.031
BBB rated {0,1}	0.077
BB rated {0,1}	0.393
B rated {0,1}	0.490
CCC rated or worse {0,1}	0.622
<i>Borrower does not have credit rating</i>	0.392
<i>Borrower has credit rating</i>	0.242

**Table 3**  
**Credit Quality and Capital Expenditure Restrictions**

This table presents estimated coefficients from cross-sectional regressions that relate the probability of having a capital expenditure restriction in a credit agreement to measures of borrower credit quality calculated over the four quarters preceding the signing of the credit agreement. We collect the sample of 3,720 private credit agreements from the SEC's Edgar electronic filing system over the period 1996-2005. The dependent variable in all regressions is an indicator variable that equals one if the credit agreement contains a capital expenditure restriction, i.e. when a covenant in the agreement directly restricts borrower capital expenditures. All regressions include year indicator variables, loan purpose indicator variables, and loan type indicator variables. Credit ratings are from Standard & Poor's. Negative cash flow is an indicator variable that takes the value of one when cash flow is less than zero. Financial covenant violation is an indicator variable equal to one when the borrower reports a covenant violation in an SEC Form 10-K or 10-Q in at least one of the four quarters prior to the signing of the credit agreement. In all specifications except for the random effects probit, standard errors are clustered for each borrower. The full sample contains all credit agreement observations; the rated sample contains only those credit agreements to borrowers with credit ratings; the sample " $\geq 2$  loans" includes only those borrowers for which we can observe at least two credit agreements over the sample period.

**Table 3**  
**Credit Quality and Capital Expenditure Restrictions**  
**(Continued)**

Specification Type	Probit		Random effects probit		Probit		FE linear probability	
	Full	Rated	Full	Rated	≥ 2 loans	Rated and ≥ 2 loans	≥ 2 loans	Rated and ≥ 2 loans
Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BBB rated <sub>t-1</sub> {0,1}		0.026 (0.052)		0.034 (0.038)		0.030 (0.053)		0.052 (0.030)
BB rated <sub>t-1</sub> {0,1}		0.237** (0.068)		0.280** (0.084)		0.215** (0.075)		0.229** (0.061)
B rated <sub>t-1</sub> {0,1}		0.270** (0.083)		0.340** (0.113)		0.258** (0.095)		0.261** (0.095)
CCC rated or worse <sub>t-1</sub> {0,1}		0.383** (0.143)		0.676** (0.168)		0.372** (0.172)		0.562** (0.149)
Debt to cash flow quartile 2 {0,1}	0.011 (0.026)	0.006 (0.039)	0.022 (0.030)	0.001 (0.025)	0.013 (0.031)	0.005 (0.041)	0.018 (0.027)	-0.022 (0.030)
Debt to cash flow quartile 3 {0,1}	0.088** (0.029)	0.065 (0.042)	0.126** (0.037)	0.041 (0.033)	0.085* (0.035)	0.066 (0.045)	0.055 (0.033)	-0.019 (0.039)
Debt to cash flow quartile 4 {0,1}	0.151** (0.031)	0.078 (0.044)	0.215** (0.041)	0.055 (0.034)	0.158** (0.039)	0.074 (0.047)	0.106** (0.038)	-0.007 (0.045)
Negative cash flow {0,1}	0.099* (0.045)	0.144 (0.092)	0.159** (0.061)	0.131 (0.103)	0.158** (0.066)	0.167 (0.118)	0.170* (0.074)	0.223 (0.125)
Financial covenant violation <sub>t-1</sub> {0,1}	0.126** (0.040)	0.069 (0.060)	0.171** (0.052)	0.056 (0.047)	0.130** (0.050)	0.074 (0.074)	0.147** (0.047)	0.133* (0.067)
Ln(total assets <sub>t-1</sub> (\$M))	-0.071** (0.007)	-0.046** (0.012)	-0.085** (0.008)	-0.032** (0.009)	-0.083** (0.009)	-0.042** (0.013)	-0.053 (0.027)	0.025 (0.043)
Market to book ratio <sub>t-1</sub>	-0.024** (0.009)	-0.030 (0.016)	-0.029** (0.010)	-0.026* (0.010)	-0.028* (0.012)	-0.028 (0.020)	-0.018 (0.012)	-0.042** (0.020)
Number of credit agreements	3,720	1,822	3,720	1,822	2,742	1,453	2,742	1,453
Number of firms	1,939	844	1,939	844	961	475	961	475
R <sup>2</sup>	0.17	0.30	0.13	0.26	0.20	0.30	0.19	0.21

\*,\*\* statistically distinct from zero at the 5% and 1% level, respectively.

**Table 4****Correlations between Capital Expenditure Restrictions and Other Loan Contract Terms**

This table presents unconditional correlations between the probability of a credit agreement containing a capital expenditure restriction and other contract terms in the credit agreement. We collect the sample of 3,720 private credit agreements from the SEC's Edgar electronic filing system over the period 1996-2005. Capital expenditure restriction equals one when the credit agreement contains a covenant that directly restricts borrower capital expenditures. Dividend restriction equals one when a covenant in the credit agreement directly restricts dividend payments. Secured equals one when the agreement is secured with collateral. Interest spread is the contracted interest rate, stated in basis points above the London Interbank Offer Rate (LIBOR). Coverage ratio covenants include interest coverage, fixed charge coverage, and debt service coverage covenants. Debt to balance sheet covenants include debt to total capitalization and debt to net worth covenants. Liquidity covenants include current ratio, quick ratio, and working capital covenants.

	Dividend restriction	Secured	Interest spread	Coverage covenant	Debt to cash flow covenant	Net worth covenant	Debt to balance sheet	Liquidity covenant	Cash flow only covenant
Capital expenditure restriction	0.26**	0.42**	0.41**	0.15**	0.19**	0.08**	-0.18**	0.00	0.25**
Dividend restriction		0.38**	0.33**	0.19**	0.20**	0.13**	-0.14**	0.10**	0.12**
Secured			0.59**	0.14**	0.14**	0.09**	-0.24**	0.17**	0.21**
Interest spread				0.06**	0.07**	0.00	-0.22**	0.14**	0.29**
Coverage covenant					0.38**	0.03	-0.10**	-0.07**	-0.08**
Debt to cash flow covenant						0.05*	-0.41**	-0.10**	-0.01
Net worth covenant							-0.03	0.10**	-0.02
Debt to balance sheet covenant								0.03	-0.13**
Liquidity covenant									0.09**

\*,\*\* statistically distinct from zero at the 5% and 1% level, respectively.

**Table 5**  
**Capital Expenditure Restrictions and Other Loan Contract Terms,**  
**Across Credit Rating Distribution**

This table examines how capital expenditure restrictions and other contract terms of a credit agreement vary across the credit ratings distribution. We collect the sample of 3,720 private credit agreements from the SEC's Edgar electronic filing system over the period 1996-2005. Credit ratings are from Standard and Poor's. Panel A presents averages of each contract term across the credit rating distribution. Panel B presents the percentage change relative to the mean value of each contract term when moving from A or better to a lower credit rating. Capital expenditure restriction equals one when the credit agreement contains a covenant that directly restricts borrower capital expenditures. Dividend restriction equals one when a covenant in the credit agreement directly restricts dividend payments. Secured equals one when the agreement is secured with collateral. Interest spread is the contracted interest rate, stated in basis points above the London Interbank Offer Rate (LIBOR). Coverage ratio covenants include interest coverage, fixed charge coverage, and debt service coverage covenants. Debt to balance sheet covenants include debt to total capitalization and debt to net worth covenants. Liquidity covenants include current ratio, quick ratio, and working capital covenants.

<b>Panel A: Means by credit rating</b>					
	A or better	BBB	BB	B	CCC or worse
N	322	622	527	314	37
Capital expenditure restriction	0.028	0.077*	0.393*	0.490*	0.622*
Interest spread	48	98*	195*	258*	362*
Dividend restriction	0.390	0.602*	0.940*	0.936*	0.875*
Secured	0.065	0.218*	0.808*	0.961*	1.000*
Coverage covenant	0.387	0.695*	0.859*	0.764*	0.528
Debt to cash flow covenant	0.201	0.440*	0.686*	0.623*	0.361
Net worth covenant	0.217	0.325*	0.397*	0.306	0.167
Debt to balance sheet covenant	0.481	0.454	0.211*	0.094*	0.056*
Liquidity covenant	0.022	0.018	0.138*	0.148*	0.222*
Cash flow only covenant	0.013	0.023	0.107*	0.209*	0.472*
<b>Panel B: Percentage change relative to the mean from A or better</b>					
	BBB	BB	B	CCC or worse	
Capital expenditure restriction	15%	115%	145%	186%	
Interest spread	29%	86%	123%	185%	
Dividend restriction	26%	68%	67%	60%	
Secured	24%	115%	139%	145%	
Coverage covenant	42%	64%	51%	19%	
Debt to cash flow covenant	42%	84%	73%	28%	
Net worth covenant	24%	40%	20%	-11%	
Debt to balance sheet covenant	-9%	-93%	-132%	-146%	
Liquidity covenant	-3%	79%	86%	136%	
Cash flow only covenant	8%	74%	155%	362%	

\* Statistically distinct from an A-rated firm, or better, at a 5% level.

**Table 6**  
**Contingent Contract Analysis**

This table presents mean differences in credit agreement contract terms for contingent contract pairs. A contingent contract pair of agreements meets the following conditions: (a) each pair consists of two credit agreements between the same borrower and the same set of lenders, (b) the borrower has violated a financial covenant before the new credit agreement, and (c) the origination date of the new agreement is before the maturity date of the old agreement. Among these pairs, the new credit agreement most likely represents a renegotiated loan following a technical default. The contingent contract pairs are drawn from a sample of 3,720 private credit agreements from the SEC's Edgar electronic filing system over the period 1996-2005. We deem a financial covenant violation to have occurred when the borrower reports a covenant violation in an SEC Form 10-K or 10-Q in at least one of the four quarters prior to the signing of the credit agreement. Banks are matched across agreements according to the institutions in the lead lending role. Capital expenditure restriction equals one when the credit agreement contains a covenant that directly restricts borrower capital expenditures. Interest spread is the contracted interest rate, stated in basis points above the London Interbank Offer Rate (LIBOR). Secured equals one when the agreement is secured with collateral. Dividend restriction equals one when a covenant in the credit agreement directly restricts dividend payments. Tests for differences in the means cluster standard errors for each borrower.

	Contract Term			
	(1) Capital expenditure restriction	(2) Interest spread	(3) Secured	(4) Dividend restriction
Original agreement	0.400	196	0.795	0.864
Renegotiated agreement that follows financial covenant violation	0.604*	255**	0.957**	0.940
% increase	51%	30%	20%	9%
Number of credit agreements	103	103	90	95
Number of firms	48	48	46	48

\*,\*\* statistically distinct from zero at the 5% and 1% level, respectively.

**Table 7**  
**Capital Expenditures Before and After a Capital Expenditure Restriction**

This table presents annual differences-in-differences estimates relating capital expenditures to whether a firm obtains a credit agreement with a capital expenditure restriction. Observations are for firms utilizing private credit agreements that we collect from the SEC's Edgar electronic filing system over the period 1996-2005. The dependent variable in the regressions is the annual change in the ratio of capital expenditures to one-year lagged book value of assets. The New capital expenditure restriction indicator variable equals one when the credit agreement contains a capital expenditure restriction and the previous credit agreement for the same borrower did not contain a restriction. The Old capital expenditure restriction indicator variable takes the value of one when the credit agreement contains a capital expenditure restriction and New capital expenditure restriction is equal to 0. A capital expenditure restriction refers to a covenant in the credit agreement that directly restricts borrower capital expenditures. Difference Cash flow to lagged assets is the annual change in the ratio of earnings before interest and taxes, plus depreciation and amortization, to the one-year lagged book value of assets. Difference market to book is the annual change in the ratio of the market value of assets (measured as the book value of debt plus the market value of equity) to the book value of assets. The omitted group is firms that obtain credit agreements without a restriction. All regressions include year indicator variables.

	Level of Differencing			
	(1)	(2)	(3)	(4)
	Year before contract – year of contract		Average 2 years before contract – average year of and year after contract	
Old capital expenditure restriction	-0.003 (0.002)	-0.003 (0.002)	-0.004 (0.003)	-0.004 (0.002)
New capital expenditure restriction	-0.014** (0.005)	-0.009* (0.004)	-0.014** (0.005)	-0.010* (0.005)
Difference cash flow to lagged assets		0.126** (0.016)		0.211** (0.021)
Difference market to book		0.016** (0.002)		0.005* (0.003)
N	2,812	2,812	2,812	2,812
R <sup>2</sup>	0.01	0.16	0.03	0.14

\*,\*\* statistically distinct from zero at the 5% and 1% level, respectively.

**Table 8**  
**Capital Expenditures – Contractual Limit**  
**By Time from Contract Origination to End of Year**

This table pertains to a sample of 486 firms for which we record the contractual limit on capital expenditures specified by the credit agreement. The firms are a subset of our sample of 3,720 private credit agreements collected from the SEC's Edgar electronic filing system over the period 1996-2005. This table presents the distribution of sample borrowers' actual capital expenditures centered on the capital expenditure restriction in the loan agreement and scaled by the one-year lagged book value of assets. The distribution is split by whether the contract originated at least 6 months prior to the end of the first year in which the limit applies (column 1) or the contract originated less than 6 months prior the end of the first year in which the limit applies (column 2).

<u>(Capital Expenditure – contractual limit)</u> lagged assets	(1) Contract signed $\geq$ 6 months prior to first year that limit applies	(2) Contract signed < 6 months prior to first year that limit applies
Below -10%	0.030	0.050
(-10%, -9%]	0.000	0.000
(-9%, -8%]	0.010	0.020
(-8%, -7%]	0.030	0.010
(-7%, -6%]	0.020	0.020
(-6%, -5%]	0.020	0.020
(-5%, -4%]	0.060	0.050
(-4%, -3%]	0.070	0.110
(-3%, -2%]	0.120	0.100
(-2%, -1%]	0.210	0.210
(-1%, 0%]	0.260	0.290
(0%, 1%]	0.090	0.080
(1%, 2%]	0.030	0.030
(2%, 3%]	0.010	0.010
(3%, 4%]	0.000	0.000
(4%, 5%]	0.010	0.010
Above 5%	0.020	0.010

\*,\*\* statistically distinct from column (1) at the 5% and 1% percent level, respectively.

## Table 9

### **Value and Operating Performance Before and After a Capital Expenditure Restriction**

This table presents annual differences-in-differences estimates relating the difference in market to book ratios (columns 1 through 3) and operating performance, as measured by cash flow to lagged assets (columns 4 through 6), to whether a firm obtains a credit agreement with a capital expenditure restriction. Observations are for firms utilizing private credit agreements that we collect from the SEC's Edgar electronic filing system over the period 1996-2005. The New capital expenditure restriction indicator variable takes on the value of one if the credit agreement contains a capital expenditure restriction and the previous credit agreement for the same firm did not contain a restriction. The Old capital expenditure restriction indicator variable takes on the value of one if the credit agreement contains a capital expenditure restriction and New capital expenditure restriction equals zero. The other contract terms in columns 3 and 6 are defined similarly. Difference cash flow to lagged assets is the annual change in the ratio of earnings before interest and taxes, plus depreciation and amortization, to the one-year lagged book value of assets. Difference market to book is the annual change in the ratio of the market value of assets (measured as the book value of debt plus the market value of equity) to the book value of assets. Coverage ratio covenants include interest coverage, fixed charge coverage, and debt service coverage covenants. Liquidity covenants include current ratio, quick ratio, and working capital covenants. All regressions include year indicator variables.

**Table 9**  
**Value and Operating Performance Before and After a Capital Expenditure Restriction**  
**(Continued)**

	(1)	(2)	(3)	(4)	(5)	(6)
	Difference market to book ratio			Difference cash flow to lagged assets		
Old capital expenditure restriction	0.053 (0.030)	0.048 (0.030)	0.051 (0.033)	0.002 (0.003)	0.004 (0.004)	0.005 (0.005)
New capital expenditure restriction	0.171** (0.042)	0.167** (0.039)	0.170** (0.049)	0.016** (0.006)	0.012* (0.006)	0.014* (0.006)
Difference cash flow to lagged assets		-0.138 (0.181)	-0.138 (0.184)		-0.249** (0.033)	-0.249** (0.033)
Difference market to book ratio		-0.185** (0.036)	-0.187** (0.036)		0.032** (0.004)	0.032** (0.004)
Old dividend restriction			0.013 (0.031)			0.002 (0.004)
New dividend restriction			-0.011 (0.045)			0.004 (0.005)
Old secured			0.023 (0.032)			0.000 (0.004)
New secured			0.008 (0.058)			-0.011 (0.006)
Old coverage covenant			-0.029 (0.033)			-0.007 (0.004)
New coverage covenant			0.004 (0.056)			0.001 (0.008)
Old debt to cash flow covenant			-0.085** (0.027)			-0.014** (0.004)
New debt to cash flow covenant			-0.019 (0.049)			-0.019** (0.007)
Old net worth covenant			0.013 (0.027)			-0.002 (0.004)
New net worth covenant			-0.124 (0.086)			-0.011 (0.009)
Old liquidity covenant			-0.009 (0.051)			0.003 (0.007)
New liquidity covenant			0.144 (0.105)			0.004 (0.015)
Old cash flow covenant			0.013 (0.055)			0.011* (0.007)
New cash flow covenant			0.008 (0.069)			0.020** (0.008)
N	3,033	3,033	3,033	3,033	3,033	3,033
R <sup>2</sup>	0.03	0.08	0.08	0.03	0.14	0.15

\*,\*\* statistically distinct from zero at the 5% and 1% level, respectively.