Creditor Control Rights and Resource Allocation within Firms*

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Abstract

We examine the within-firm resource allocation and restructuring effects of creditor intervention and their relationship to performance gains at firms violating covenants in private credit agreements. By linking firms to establishment-level data from the U.S. Census Bureau, we demonstrate that covenant violations are followed by large reductions in employment and more frequent establishment sales and closures. These cuts are concentrated in violating firms' noncore business lines and unproductive establishments. We conclude that refocusing operations and improving productive efficiency are important channels through which creditors enhance violating firms' performance.

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1 Introduction

Creditor control rights can alleviate agency problems resulting from the separation of ownership and control (Gale and Hellwig, 1985; Townsend, 1979), as well as conflicts of interest between the suppliers of finance to corporations (Jensen and Meckling, 1976; Smith and Warner, 1979). While the role of creditors in corporate governance has mostly focused on contracting or bankruptcy states, recent research highlights their influence over firms' daily operations, particularly at firms violating financial covenants.[1] Strikingly, the actions creditors take to protect their own claims benefit the shareholders of violator firms through improvements in operating performance (Nini et al., 2009, 2012).[2,3]

The shift of control rights associated with covenant violations put creditors in a strong position to intervene in management. While violations give creditors the right to accelerate repayment and cancel credit lines—potentially forcing the borrower into bankruptcy—they prefer to renegotiate contract terms.[4] This often results in the introduction of additional restrictions on capital budgeting decisions, such as limits on free cash flow and capital expenditures (Beneish and Press, 1993; Chen and Wei, 1993; Nini et al., 2009). Creditors may also pressure violating firms to make operational changes through discussions with management (Nini et al., 2012), influence over the board of directors (Kaplan and Minton, 1994;

[1]Debt contracts frequently separate cash flow rights from control rights through the inclusion of covenants. Covenant violations allow for a shift of control rights to creditors after poor performance in order to correctly incentivize managers or prevent managers from expropriating wealth from creditors on behalf of shareholders. Violations of covenants are ideally suited to study the corporate governance role of creditors outside of bankruptcy, since they occur frequently yet seldom lead to default (e.g., Roberts and Sufi, 2009a).

[2]These authors show a turnaround in cash flow of about 5 percent of lagged assets in the months following the violation. Firms also experience an increase in stock market valuations of roughly 5 percent. See Figures 7, 8, and 9 of Nini et al. (2012), as well as Nini et al. (2009) and Chakraborty et al. (2015).

[3]Transferring control rights to creditors when the firm is performing poorly is optimal because creditors' concave payoff structure gives them sharp incentives to monitor the firm (e.g., Aghion and Bolton, 1992; Dewatripont and Tirole, 1994). This theoretical work provides an explanation of why it may be ex ante optimal to transfer the governance role from shareholders to creditors following covenant violations, and how this can lead to improvements in market valuations.

[4]Maintaining a relationship with the borrower as a going concern may be valuable to the bank due to reputation costs of default (Gopalan et al., 2011) or cross-selling opportunities (Bharath et al., 2007).

Kroszner and Strahan, 2001), and their role in the takeover market (Ivashina et al., 2008). To the extent that managers engage in value-reducing activities such as over-investment, debt covenants and creditor influence can alleviate such behavior and improve performance.[5]

In this paper, we shed light on the precise channels driving the improvements following covenant violations. Our key innovation is to incorporate comprehensive establishment-level data from the U.S. Census Bureau (henceforth, Census). These data provide us with disaggregated information on the internal organization of firms, permitting new analysis of the within-firm reallocation and restructuring activities surrounding covenant violations. Our empirical tests allow us to answer the following questions: What operational changes does creditor interventions bring about in violating firms and establishments? How do these changes impact the operating performance of the firm?

We analyze a sample of covenant violations disclosed to the Securities and Exchange Commission (SEC) covering the universe of publicly-traded U.S. nonfinancial corporations.[6] We adapt the "quasi-discontinuity" research design of Roberts and Sufi (2009a) to the Census data by linking each firm to its constituent establishments over time. To measure resource allocation we focus primarily on employment and establishment sales and closures, given the high quality and coverage of the Census data.[7] We estimate the dynamic impact of covenant violations at both the firm and establishment levels by comparing changes in behavior before and after violations between violators and non-violators. We control flexibly for performance metrics used in financial contracts, thus identifying the impact of a violation

[5]The existing literature emphasizes three classes of managerial preferences as potential causes of shareholder value-reducing behavior. First, managers might prefer the "quiet-life" and exert too little costly effort (Bertrand et al., 2004; Grossman and Hart, 1983). Second, managers might undertake inefficient "empire building" activities yielding private benefits (Baumol, 1959; Marris, 1964; Williamson, 1964). Third, due to career concerns or risk aversion managers may have incentives to "play it safe" (Amihud and Lev, 1981; Gormley and Matsa, 2015; Holmström, 1999; Jensen and Meckling, 1976). See Shleifer and Vishny (1997) for an extensive survey.

[6]We thank Nini et al. (2012) for making these data publicly available.

[7]A growing literature argues that the employment effects of financing frictions are interesting in their own right (Agrawal and Matsa, 2013; Falato and Liang, 2015; Hanka, 1998; Pagano, 2010).

off the discontinuity occurring at the threshold. We complement this approach with a regression discontinuity design (RDD) based on covenant threshold levels from loan contracts at the time of origination, and thus imputed rather than actual violations (Chava and Roberts, 2008).

We first provide evidence of a significant impact of covenant violations on firm-level outcomes, including large reductions in total employment and labor costs, and a greater frequency of establishment sales and closures. The magnitude of these effects are large: for example, we find a typical firm reduces the number of employees by roughly 5 percentage points following a violation (about 12.5 percent of its unconditional standard deviation). We show these results survive numerous robustness tests, including alternative measures of resource allocation and covenant violations, the RDD approach, and placebo tests concerning the timing of violations. We also demonstrate these employment effects are pronounced for firms receiving contractual restrictions in renegotiated contracts (Nini et al., 2009), suggesting these changes are creditor-driven as opposed to voluntary actions on the part of borrowers.

To uncover the channels through which creditor interventions improve operating performance, we turn to the establishment-level data and investigate within-firm resource allocation and restructuring activities. Our analysis focuses on two important establishment attributes motivated by the literature on inefficient resource allocation within conglomerate firms: first, establishment productivity (Rajan et al., 2000; Scharfstein and Stein, 2000); and, second, whether an establishment operates in a core or peripheral industry of a firm (e.g., Lang and Stulz, 1994).

Two important results emerge. First, using several classifications of establishments into core and peripheral industries, we find resources are withdrawn to a greater extent from establishments operating in peripheral industries. In particular, violating firms lay off more employees at continuing peripheral establishments and, along the extensive margin, divest

them more often, as compared to establishments in the core industry focus. This finding indicates that increasing the focus of firms' operations following covenant violations could be an important channel through which creditors improve operating performance (John and Ofek, 1995; Schoar, 2002).

Second, following covenant violations, firms' operations retrench from relatively unproductive establishments. To establish this result, we focus on the set of manufacturing firms for which the Census provides highly-detailed information on factor inputs and output. This richness enables us to construct an array of establishment-level productivity measures both parametrically and non-parametrically. We find evidence that violating firms cut employment and investment and close down more frequently at those establishments characterized by low total factor productivity. This result extends to individual labor and capital factor productivities and violating firms' decisions to withdraw employment and investment, respectively. Thus, the withdrawal of resources from and disposal of relatively unproductive establishments appears to be a plausible second underlying channel through which creditors enhance firms' performance.

Our findings are related to at least two strands of the corporate finance literature. First, we contribute to recent literature on creditor control rights and corporate governance. Building on theoretical work analyzing optimal debt contracting in the presence of agency problems (e.g., Aghion and Bolton, 1992; Dewatripont and Tirole, 1994; Jensen and Meckling, 1976), Nini et al. (2012), among others, argue for a more active role for creditors in corporate governance outside the contracting and bankruptcy states.[8] They argue that, following covenant violations, creditors have the power to influence the daily operations of firms and show that creditor interventions improve operating performance and firm value. Our micro-evidence complements their work by showing improvements in operating performance are driven, at

[8]There are a number of studies that emphasize creditor control in debt restructuring when borrowers are financially distressed (Gilson, 1990; Gilson et al., 1990; James, 1995, 1996; Wruck, 1990), including modern evidence on the role of non-bank lenders (Ivashina et al., 2015; Jiang et al., 2012).

least in part, by a reallocation of resources towards relatively productive establishments, as well as those in core business lines. These sources of efficiency gains are similar in nature to those associated with major equity-centered governance turnarounds including takeovers (Li, 2013; Maksimovic et al., 2011), private equity transactions (Davis et al., 2014), and hedge fund activist interventions (Brav et al., 2015).

Second, we contribute to the applied financial contracting literature on the effects of covenant violations on firm behavior.[9] Violations are followed by significant changes in investment (Chava and Roberts, 2008; Nini et al., 2009), capital structure (Roberts and Sufi, 2009a), payout policy, and CEO turnover (Nini et al., 2012; Ozelge and Saunders, 2012). In contemporaneous work, Falato and Liang (2015) document a similar relation between covenant violations and firm-level employment outcomes based on hand-collected announcements from major news sources and self-reported employment data from Standard & Poor's Compustat (henceforth, Compustat). We complement their findings in at least two ways. First, we consider a comprehensive set of employment variables derived from the Census data. These data are based on administrative data (from the U.S. Internal Revenue Service) and thus highly accurate and cover a larger sample of firms. Second, these data are also reported at the establishment-level, allowing us to conduct the most granular evidence to-date on the within-firm resource allocation and restructuring effects of covenant violations, including the effects on employment, investment, and asset disposals, as well as how these decisions depend on establishment attributes. Most importantly, we are able to relate these within-firm resource allocation outcomes to the efficiency gains at firms violating covenants.

The rest of this paper is organized as follows. Section 2 presents the data and methodology. Section 3 provides our firm and establishment-level results. Section 4 concludes.

[9]For a survey, see Roberts and Sufi (2009b).

2 Data and Empirical Methodology

2.1 Data Sources

In this section, we describe the main sources of data in our analysis and how they are merged. These data provide information on firms' accounting variables, disaggregated establishment-level activities, and financial covenant violations in credit agreements.

Our firm-level data comes from Compustat. This database contains balance sheet and income statement data for publicly-traded U.S. corporations, which are the focus of this study. We gather a large number of standard accounting variables primarily to be used as control variables in our analysis. Our sample covers the period from 1996 to 2009. Following Nini et al. (2012), for a firm-year to be included in the sample, we require non-missing data on total assets, total sales, common shares outstanding, and closing share price. We exclude (financial) firms with Standard Industrial Classification (SIC) codes between 6000 and 6999, as well as firms with book value of assets less than $10 million.

We use three establishment-level datasets provided by the Census. First, the Longitudinal Business Database (LBD), which tracks all business establishments in the United States with at least one paid employee on an annual basis. It provides longitudinal identifiers as well as information on number of employees, payroll, geographical location, and industry for each establishment. The LBD also provides information on corporate affiliation, which allows us to identify establishment ownership changes and closures.

The Census of Manufacturers (CMF) and Annual Survey of Manufacturers (ASM) provide greater detail on activities for the subset of manufacturing establishments (SIC codes between 3000 and 3999). The CMF is a survey conducted every five years (years ending 2 and 7) and consists of all manufacturing establishments in the United States with at least one paid employee. The ASM is another survey conducted in non-census years (i.e., when the CMF is not conducted) for a subset of these manufacturing establishments. This includes

all establishments with greater than 250 employees and some with fewer employees, which are selected with a probability positively correlated with size. Reporting for both of these surveys are mandatory and misreporting is penalized, so the data is of the highest quality. Both the CMF and ASM include information on industry, corporate affiliation, output (total value of shipments), employment, capital expenditures, and on material inputs of each establishment. The level of detail of these manufacturing datasets helps us construct various measures of productivity for each manufacturing establishment.

We use the longitudinal identifiers in LBD to merge the CMF and ASM. We then use the Compustat-SSEL bridge maintained by the Census to match each firm in Compustat to the establishments that comprise its operations. The Compustat-SSEL bridge ends in 2005, so we extend the match to 2009 using employer characteristics including name, address and employer identification number.

Our primary data on financial covenant violations is provided online by Nini et al. (2012).[10] This is a quarterly dataset that contains an indicator variable defining whether each firm-quarter in Compustat has violated a financial covenant. All companies with registered securities are required to disclose loan covenant violations in quarterly filings with the SEC under Regulation S-X (Beneish and Press, 1993; Roberts and Sufi, 2009a). The authors use a combination of textual analysis and hand collection to carefully identify firms reporting a covenant violation.[11] This dataset begins in 1996—the first year in which electronic filing became mandatory with the SEC—and ends in 2009, which explains our choice of sample window for this study.

[10]These authors provide an excellent description of covenants in corporate credit agreements. They argue that covenants, while common in most debt contracts, tend to be most frequently used and most often binding in private bank loan agreements (see also, Taylor and Sansone, 2007). For brevity, we do not repeat many of these details nor provide specific examples of violations from SEC filings in this paper.

[11]After hand-correcting for false positive outcomes of their text search algorithm, Nini et al. (2012) report their approach captures about 90 percent of actual reported violations. Note also that 2 percent of Compustat firm-quarters could not be matched to an SEC filing and are dropped, since it cannot be determined if the firm violated a covenant.

In robustness tests, we use alternative measures of covenant violations based on loan contract terms at-origination from Reuters' Loan Pricing Corporation's Dealscan database (henceforth, Dealscan) following Chava and Roberts (2008). Dealscan provides a large sample of loan contracts, including detailed information on maintenance covenants based on accounting ratios, that we match to Compustat.[12] We assume firms are bound by a given covenant threshold as stated at origination until the loan matures and take the tightest covenant at a given point in time.[13] In these tests, we restrict the sample merged to Compustat to firms having either net worth or current ratio covenants during the time period from 1996 until 2009. We focus on these covenants for two main reasons. First, Roberts and Sufi (2009a) show that more than 95 percent of loan contracts include at least one financial covenant, with the net worth (leverage) and current ratio covenants being among the most common. Second, determining whether a violation has occurred or not for these two covenants is straightforward, since the corresponding accounting variables are standard.

2.2 Variable Construction and Summary Statistics

We use two sets of dependent variables to analyze resource allocation within firms. Broadly speaking, the first set of variables captures the intensive margin of resource allocation (employment and investment at surviving establishments) and the second captures the extensive margin (establishment sales and closures).

Our main dependent variable is a measure of employment, which we use to capture how firms allocate resources. We focus primarily on employment because of the completeness of the data provided in the LBD. In most tests, employment is measured as the annual change

[12]Thanks to Sudheer Chava and Michael Roberts for providing the Dealscan-Compustat link.

[13]Two caveats apply. First, firms may have overlapping deals, i.e., the first deal matures after the start of the second deal. Second, covenant thresholds can change over the tenure of the loan in a predetermined manner or, say, due to a renegotiation or refinancing of the deal. We address these challenges following Chava and Roberts (2008) (see their Appendix B). Essentially, we assume firms are subject to a given covenant threshold for the longest maturity of all loans in each package and take the most restrictive covenant across packages (see also Falato and Liang, 2015).

in the natural logarithm of the number of employees. At the establishment-level, the number of employees comes directly from the LBD. At the firm-level, the number of employees is summed across all of the firm's establishments.

We consider additional employment measures for robustness and also to better understand the channels through which firms adjust resource allocation and potentially achieve cost improvements (i.e., reducing labor costs through the number of employees or wages per employee). We use four such measures based on data from the LBD. First, the annual change in the natural logarithm of payroll. Second, the symmetric growth rate of employment, calculated by dividing the annual change in number of employees by the average of current and lagged number of employees. This measure accommodates both entry and exit as well as limiting the effects of extreme values (Davis et al., 1998). For the third and fourth measures, we use the change in the number of employees and in payroll scaled by the average of current and lagged book value of assets, respectively.

In our subsample analysis of manufacturing firms, we consider investment decisions. We calculate investment as the annual change in establishment-level capital expenditures scaled by the establishment-level capital stock. Establishment-level capital stock is estimated using perpetual inventory method following Brav et al. (2015).

Establishment sale and closure decisions represent an extreme form of withdrawing resources that we investigate throughout the paper. We use longitudinal establishment identifiers from LBD to define, for a given firm-establishment-year, an establishment sale (closure) indicator variable that is set equal to one if the establishment is sold (closed down) in the following year. This is a dependent variable in the establishment-level analysis. For the firm-level analysis, we define dependent variables "Any Establishment Sale" and "Any Establishment Closure," which are indicator variables equal to one if the firm sells or closes any of its establishments, respectively.

Our main independent variable is an indicator set equal to one if a firm violates a covenant

in the current year. These violations are considered material information and must be disclosed in SEC filings, as described in Section 2.1. We aggregate the quarterly violation data to the annual frequency, since this is the frequency of the Census data. In light of this data constraint, we take a conservative approach when we measure the occurrence of a violation. To code a firm-year as a violation, we require a violation in at least one quarter of the current year and non-missing covenant information without any violation in all four quarters of the previous year. Effectively, we focus on new covenant violations—those occurring in the current but not the previous year—which represent a cleaner environment to observe the effects of creditor influence on firm policies (e.g., Nini et al., 2012).

To complement our main approach, we also measure covenant violations based on at-origination loan contract terms (i.e., maintenance covenant thresholds) from the Dealscan dataset. For reasons described above, we focus on the current ratio and net worth covenants. A covenant violation occurs in a given firm-year when the realized current or net worth ratio falls below the threshold specified by the either covenant. As an additional robustness test, we restrict the sample to firm-year observations within ± 20 percent of either covenant threshold and conduct a regression discontinuity analysis in the spirit of Chava and Roberts (2008). We discuss the identification assumptions underlying this test in the next section.

We include in our regressions firm-level accounting ratios on which covenants are written as well as variables to account for observable differences among firms that could affect employment decisions. We consider the following variables: operating cash flow, leverage ratio, interest expense scaled by average assets, net worth over total assets, current ratio, and market-to-book ratio. These variables are winsorized at the 1 percent and 99 percent levels to limit the effects of outliers. In the establishment-level analysis, we further control for establishment age, the number of establishments per firm, and the number of establishments per three-digit industry segment of the parent firm. Precise definitions of all variables can be found in Appendix A.

With our data restrictions in place, particularly the Compustat-SSEL link, we construct a final sample containing 21,000 firm-year observations covering approximately 2,000,000 establishment-years for the period from 1996 until 2009. Table I presents summary statistics for the full sample, as well as the subsamples of covenant violators and non-violators.[14] The firm-level summary statistics are similar to Nini et al. (2012), reassuring us that sample selection resulting from the Compustat-Census match is not a problem. This is not surprising given the administrative nature of the Census data, i.e., it should cover the universe of Compustat firms. New covenant violations occur in 6.3 percent of firm-year observations, which is in line with prior research.

Comparing violators with non-violators motivates our main results and empirical approach. Notably, both at the firm and establishment levels, the change in employment is larger for violators than for the rest of the sample. In addition, establishments belonging to violating firms experience closures with greater frequency. However, there appear to be significant performance differences between violators non-violators: violators have lower net worth, current ratio, market-to-book ratio, hold less cash, and are more levered. To ensure that our results do not simply reflect differences in these characteristics, we control flexibly for them in our regressions and conduct a several falsification and sensitivity tests.

Finally, it is worthwhile noting the differences between the LBD establishments (Panel B) and subsample of manufacturing establishments from the CMF and ASM (Panel C). The rate of covenant violations is about the same for manufacturing (0.048) compared to all other establishments (0.041). Where manufacturing firms differ is that they tend to own fewer and older establishments. We control for these differences throughout our establishment-level analysis, including Section 3.2.2 where we focus on manufacturing firms.

[14]To ensure anonymity, as per Census disclosure requirements, we round off the number of observations in each table and quantile values are not reported for the summary statistics.

2.3 Identification and Empirical Model

Our empirical strategy adapts the "quasi-discontinuity" approach of Roberts and Sufi (2009a) and Nini et al. (2012) to our setting. The establishment-year level of observation of the Census data necessitates certain changes to their approach, which we now describe.

To examine the firm-level implications of covenant violations, we estimate the following equation using OLS where the annual change in employment is given by:

$$\begin{aligned}\Delta y_{i,t+1} \;=\; & \alpha_t \;+\; \alpha_k \;+\; \beta \text{ Covenant Violation}_{it} \\ & + \gamma_1 \text{ Covenant Controls}_{it} + \gamma_2 \text{ Covenant Controls}_{i,t-1} \\ & + \gamma_3 \text{ Higher-Order Covenant Controls}_{it} + \epsilon_{it}, \end{aligned} \tag{1}$$

where i indexes firms, t indexes years, and k indexes industries. The unit of observation is a firm-year. The dependent variable, $\Delta y_{i,t+1}$, is primarily the within-firm annual change in the natural logarithm of the number of employees.[15,16] The main independent variable, Covenant Violation$_{it}$, is an indicator variable equal to one for a new covenant violation. The α_t and α_k denote year and industry (based on three-digit SIC codes) fixed effects, respectively. The industry fixed effects control for time-invariant differences between industries and the year fixed effects control for aggregate economic shocks.[17] ϵ_{it} is the error term, which is assumed to be correlated within firm and potentially heteroskedastic (Petersen, 2009).

The set of variables labeled Covenant Controls$_{it}$ are included to account for variables on which covenants are written as well as those that may have an independent effect on employment and, more broadly, resource allocation decisions. These include operating cash flow,

[15]Census employment variables are measured as of March 12 each year. For this reason, if a violation occurs at first or second (third or fourth) quarters of year t, we measure the annual change in employment from year t to $t+1$ ($t+1$ to $t+2$).

[16]In some tests, we use an indicator variable for whether the firm closes or sells any establishments as a dependent variable and formulate (1) as a probit regression model.

[17]In Table IA.II of the Internet Appendix, we consider a specification that includes industry by year fixed effects.

leverage ratio, interest expense scaled by average assets, net worth over total assets, current ratio, and market-to-book ratio. These variables are the most common ratios included in financial covenants (Roberts and Sufi, 2009a), as well as predictors of firm employment outcomes (Nickell and Wadhwani, 1991). These variables are included linearly, squared, and cubed, as indicated by the higher-order covenant controls term, as well as their one-year lag.

The coefficient of interest, β, measures how a firm's employment responds in percentage point terms to a new covenant violation. If firms reduce employment to improve net cash flows and satisfy creditors worried about the value of their claims, the coefficient β will be strictly negative. The null hypothesis that covenant violations are irrelevant for employment (because firms can find substitute financing or creditors cannot influence operations) corresponds to expecting that β will be zero.

The main identification challenge in the estimation of β is to separate out the effect of violations from expected changes in resource allocation based on differences in fundamentals between violators and non-violators. The quasi-discontinuity approach addresses this challenge through a comparison of firms close to the covenant threshold by controlling flexibly for continuous functions of the underlying variables—on which covenants thresholds are contracted upon—and utilizing the discontinuous change in firm behavior occurring at the time of a violation (Nini et al., 2012; Roberts and Sufi, 2009a). In effect, the outcomes of violations are measured by comparing firms with similar pre-violation performance and thus similar expected time-series path of outcomes. Specifically, we take the within-firm annual difference in dependent variables, which sweeps out fixed differences in outcomes between violators and non-violators. We also flexibly control for contemporaneous and lagged firm-level covenant control variables known to affect outcomes, as described above, and thus control for pre-violation trend differences between violators and non-violators.

We complement our baseline approach with a standard RDD that incorporates the actual

contractual level of covenants (Chava and Roberts, 2008).[18] The RDD essentially compares firms that just violate covenants to those that closely avoid doing so. We focus on the net worth and current ratio thresholds and define a firm-year to be in violation if the observed accounting ratio falls below the threshold specified by the contract. Thus, the covenant violation is a discontinuous function of the distance between the accounting ratio and the threshold, which constitutes the basis of the RDD approach.[19] We use this alternative definition of a violation in two sets of robustness tests. The first simply uses it as a substitute independent variable in equation (1). The second restricts the sample to firm-year observations within ± 20 percent of the covenant threshold. Using a narrow bandwidth around the threshold ensures the covenant violation is close to a random event and thus unlikely to correlate with firm characteristics. Moreover, using observations within close proximity of the threshold addresses identification concerns that our estimates are driven by observations far from the threshold that might differ systematically (Bakke and Whited, 2012).

Analyzing the firm-level response to covenant violations can mask important operational changes within the firm. To better understand the channels through which creditor interventions improve operating performance, we also examine establishment-level data. While firms' establishments differ across several important dimensions, we focus on two characteristics that have been emphasized by the literature on resource allocation within conglomerates:[20] establishment productivity and whether it operates in a core or peripheral industry of a firm.

[18]Note that while our baseline approach does not incorporate explicit covenant thresholds, we proxy for the unobserved thresholds by including lags of the covenant control variables. In support of this approximation, Chava and Roberts (2008) show covenant violations tend to occur about two years after origination (see also Roberts and Sufi, 2009c)

[19]The RDD uses "locally" exogenous variation in violations arising from the distance to the threshold. Validity of this approach hinges on the local continuity assumption, which amounts to continuity of all factors besides the violation through the covenant threshold. This essentially requires that firms cannot perfectly sort themselves on one side of the threshold (Lee and Lemieux, 2010). In our context, this would require that firms manipulate accounting ratios to avoid violations, an outcome mitigated by the institutional features of the U.S. loan market (Chava and Roberts, 2008). Falato and Liang (2015) also show, in our setting, firms are balanced in terms of observables and the net worth and current ratios are smooth through the threshold, inconsistent with manipulation.

[20]See Stein (2003) and Maksimovic and Phillips (2008) for surveys.

This analysis is based on the full sample of establishments covering all industries based on the LBD and the subsample of manufacturing establishments based on the CMF and ASM. In the latter sample, we will additionally be able to see which establishments experience cutbacks on investment and use more detailed productivity measures.

To examine the effect of covenant violations on resource allocation across establishments within the same firm, we estimate a modified version of equation (1) using OLS following Giroud and Mueller (2015):

$$\begin{aligned}\Delta y_{ij,t+1} \;=\; & \alpha_t + \alpha_k + \;\beta_1 \text{ Covenant Violation}_{it} \times \text{Yes}_{jt} \;+\; \beta_2 \text{ Covenant Violation}_{it} \times \text{No}_{jt} \\ & + \gamma_1 \text{ Establishment Controls}_{jt} \;+\; \gamma_2 \text{ Covenant Controls}_{it} \\ & + \gamma_2 \text{ Covenant Controls}_{i,t-1} + \gamma_3 \text{ Higher Order Covenant Controls}_{it} + \epsilon_{ijt}, \quad (2)\end{aligned}$$

where i, j, k, and t index for firms, establishments, industries, and years, respectively. The unit of observation is an establishment-year. The dependent variable, $\Delta y_{ij,t+1}$, is the within-establishment annual change in resource allocation. Depending on the data source, this could be employment, investment, or establishment sales or closures.[21] The main independent variable, Covenant Violation$_{it}$, is an indicator variable equal to one if an establishment's owner firm violates a covenant. The indicator variable Yes$_{jt}$ (No$_{jt}$) are set equal to one (zero) if the attribute under consideration is satisfied (not satisfied) by a given establishment at the beginning of year t. The set of variables labeled Establishment Controls$_{jt}$ include establishment age, the number of establishments per firm, and the number of establishments per segment. We continue to cluster standard errors at the firm level to account for dependence across establishments of the same firm.

The coefficients of interest are β_1, which captures the effect on the establishments with the attribute of interest, and β_2 which captures the effect on other establishments within the

[21] In the case of establishment sales and closures, as before, we formulate (2) as a probit regression model.

same firm. If firms reduce employment uniformly across establishments then the coefficients β_1 and β_2 will both be negative and statistically indistinguishable. On the other hand, if β_2 is smaller than β_1 then the firm cuts employment more at establishments not satisfying the criterion (e.g., non-core or unproductive). The null hypothesis that covenant violations are irrelevant for establishment-level employment decisions, which corresponds to β_1 and β_2 both equal to zero.

3 Empirical Results

In this section, we first document the impact of covenant violations on employment outcomes and establishment sales and closures at the firm-level (Section 3.1). In Section 3.2, we analyze the performance-enhancing steps managers take to reallocate resources across establishments in response to creditor discipline.

3.1 Covenant Violations and Firm-Level Employment

Table II shows the firm-level effect of new covenant violations on the employment outcomes of violators and other firms.

Column [1] presents results from estimation of equation (1) with only industry and year fixed effects. We see that the coefficient of interest on Covenant Violation$_{it}$, β, is -0.063 and it is statistically significant at 1 percent confidence level. The direction of this estimate is consistent with our expectation that following covenant violations firms lay off employees to improve net cash flows and satisfy creditors' concerns. In terms of economic magnitudes, the estimate implies that a typical covenant violation is associated with a 6.3 percentage point decrease in the number of employees, which constitutes about 15.7 percent of its standard deviation (0.401) among the full sample of firms.

Column [2] adds covenant control variables: operating cash flow, leverage, interest ex-

pense, net worth, current ratio, and market-to-book ratio. As expected, their inclusion lowers the estimated coefficient of interest as the comparison group has similar (weak) performance to violating firms. The point estimate drops to -0.042, remains significant at the 1 percent confidence level, and continues to be large in economic terms. Column [3] further includes lagged covenant controls to control for pre-violation trend differences between violators and non-violators. The coefficient of interest remains essentially the same in terms of size and statistical significance.

Column [4] augments the specification with the covenant controls both squared and raised to the third power. The inclusion of these higher-order terms allows us to control more flexibly for the firm fundamentals, on which covenants are written, and exploit the discontinuous change in employment at the time of violation. The inclusion of these controls make little difference to the estimate of β, which is -0.040 and still significant at the 1 percent confidence level.

Next, we consider alternative measures of employment based on data from the LBD. These results serve as both robustness checks and provide further information on the dynamics of employment following covenant violations. Furthermore, this analysis allows us to better understand how firms improve operating performance through cost cutting (i.e., reducing labor costs through the number of employees or wages per employee). Table III shows the results of re-estimating equation (1) with the alternative dependent variables described below.

Column [1] uses the annual change in the natural logarithm of payroll as a dependent variable. Payroll is the total amount of wages and salaries given to employees summed across a firm's establishments. We see that covenant violations result in a 2.7 percentage point reduction in wages and salaries paid to employees.

Columns [2] and [3] verify that our results are not an artifact of log-transforming our dependent variables. We instead scale the annual change in number of employees and payroll

by average assets. Column [4] considers the symmetric growth rate of employment to address outliers and potential extensive margin effects (Davis et al., 1998). Each column gives results consistent with our findings so far: violations result in statistically and economically significant drops in number of employees and the wage bill.

Overall, the micro-estimates provided in this section suggest loan covenant violations have an economically large and statistically robust impact on firm-level employment. Our baseline estimates indicate a cut in the number of employees among violating firms on the order of 4 to 6 percentage points relative to non-violators. Given the frequent occurrence of covenant violations and contract renegotiations (Roberts and Sufi, 2009c), these estimates suggest that creditor interventions might be an important determinant of employment outcomes. Our findings line up quite well with existing estimates from the literature relying on other data sources (e.g., hand-collected layoff announcements, as in Falato and Liang, 2015). Finally, our estimates are quite reasonable in magnitude when compared with less frequent, more severe financial distress events such as bond defaults and bankruptcy filings, which show layoffs of 27 percent and 50 percent, respectively (Agrawal and Matsa, 2013; Hotchkiss, 1995).

3.1.1 Establishment Sales and Closures

We next examine whether covenant violations lead firms to withdraw resources on a larger scale through selling or closing establishments. We initially study this decision at the firm-level and, in Section 3.2, we examine the establishment-level sale and closure decision within the same firm and how it depends on various establishment attributes.

We identify sales and closures through establishment longitudinal identifiers in LBD, which indicate whether an establishment changes ownership or is closed. We define a firm-level variable, Any Establishment $\text{Sale}_{i,t+1}$ to be equal to one if a firm sells any establishment from year t to $t+1$ and zero otherwise. An establishment closure variable is defined anal-

ogously. We then estimate a probit regression model variant of equation (1) with these measures as dependent variables to examine the influence of creditors on firms' establishment and sale decisions. Table IV presents the results.

We start first with establishment sales. Column [1] shows a positive relation between covenant violations and the likelihood of subsequent establishment sales. In columns [2] to [4], we include covenant control variables along the lines of Table II. The point estimate is about 0.100 and significant at at least the 10 percent confidence level. In economic terms, a violation increases the probability of a sale by 32 percent of its standard deviation (0.315).

Columns [5] to [8] examine the firm-level probability of establishment closures. Consistent with the evidence on sales, firms violating covenants experience a positive and economically large increase in the probability of a closure relative to non-violators. The point estimate is statistically significant at at least the 10 percent level, once we include covenant controls.

These results highlight the important role of creditors for establishment sales and closures, complementing recent work examining the effects of shocks to productivity and demand (Maksimovic and Phillips, 2002; Yang, 2008), as well as outcomes following mergers and acquisitions (Maksimovic et al., 2011), and large equity holders (Brav et al., 2015; Davis et al., 2014).

3.1.2 Further Supportive Evidence

In this section, we examine the robustness of these firm-level estimates. We first consider alternative definitions of covenant violations based on the Dealscan database of private credit agreements. This dataset provides actual covenant threshold levels for loan contracts at the time of origination, which allows us to implement a RDD based on imputed rather than actual violations, albeit for a smaller sample (Chava and Roberts, 2008). We code a firm-year as a violation whenever the current value of the accounting variables (net worth or current ratio) is below the threshold specified in the loan contract. We continue to consider only

new covenant violations, meaning both accounting variables must exceed their respective thresholds in every quarter of the prior year and all data required to compute violations must be non-missing.

Panel A of Table V show the results of estimating equation (1) using alternative violation definitions. Column [1] defines a violation based on the net worth and/or current ratio thresholds. The point estimate of β is -0.061 and statistically significant at the 1 percent level. Column [2] combines the definitions based on Dealscan and SEC filings, defining a violation to occur whenever either accounting variable falls below its threshold or a violation is reported to the SEC. We see that the coefficient decreases to -0.040 and remains significant at the 1 percent level.

Columns [3], [4], and [5] revert to the violation definition based on covenant thresholds and restricts the sample to firm-year observations within increasingly narrow intervals around the threshold (from ± 20 to ± 10 percent of the threshold). Implementing the RDD with a narrow bandwidth means the violation is more likely to be random occurrence. This mitigates the concern that information about future investment opportunities (not measured by the control variables) may be captured by distance to the covenant threshold. Each column reports the results of the estimation only including contemporaneous covenant controls, as we implement a conventional RDD here. In each case the coefficient of interest is large and statistically significant at conventional levels. Columns [5] shows that, on average, the number of employees decreases by 4 percentage points post-violation, which is inline with our baseline estimates. This reassures us that we are identifying the effect of covenant violations on employment separately from changes driven by differences in fundamentals between violators and non-violators.

We also investigate the internal validity of our baseline results by checking for pre-existing trends in employment between violators and non-violators. Specifically, we examine the difference in employment outcomes between violators and non-violators in the year prior to

the new covenant violation. In Panel B, we mechanically shift the violation event forward by one year to a time, by construction, that we know there was no covenant violation. The resulting point estimate of the impact of a covenant violation on employment is small in magnitude and statistically indistinguishable from zero. This is true for all of the measures of employment under consideration. This contrasts with our baseline estimate and suggests the negative effect on employment is due to the covenant violation and not some pre-existing trend in firm behavior.

As a final robustness check, we examine a setting where we are confident that interventions by creditor has taken place and therefore the sharp adjustment in employment after the violation is unlikely to simply reflect voluntary action on the part of the borrower. To this end, we follow Nini et al. (2009) and consider covenant violations that lead to the introduction of new capital expenditure restrictions in renegotiated loan contracts. These restrictions usually apply to annual cash capital expenditures plus new capital leases, expressed either in dollar terms or as a percentage of earnings or revenue. While creditors are in a position to adjust other contract terms (maturity, collateral, rates, etc.) after the covenant violation, Nini et al. (2009) show the elasticity of capital expenditure restrictions with respect to violations is largest in magnitude.

Data for this exercise are provided by Nini et al. (2009).[22] These data contain an unbiased sample of 3,720 private credit agreements between banks and 1,931 publicly traded U.S. corporations pulled from SEC filings and identified at the firm-year level. About 30% of these contracts contain capital expenditure restrictions. We focus on the intersection of this dataset and our Compustat-LBD firm-year level sample. To better identify the effect of creditor interventions, we compare employment before and after the signing of a credit agreement for three groups of firms. First, firms with new contracts that do not restrict capital expenditures. Second, firms with new contracts that contains a new restriction

[22]We thank these authors for making these data publicly available online.

and the prior contract does not contain a restriction. Third, firms receiving a contract that contains a restriction and the prior contract already contains a capital expenditure restriction (or we are missing the prior contract). Based on these three groups, we define two indicator variables: New Capital Expenditure Restriction (second group) and Old Capital Expenditure Restriction (third group). The first group of firms without any capital expenditure restriction either before or after the renegotiation will constitute the omitted group in our regression analysis.[23]

Panel C of Table V estimates the employment effects of capital expenditure restrictions across these three groups of firms. Columns [1] controls for industry and year fixed effects and indicates that the introduction of a new capital expenditure restriction leads to a 9 percentage point reduction in employment. This effect is statistically significant at the 1 percent level. There is no such effect for firms signing a new contract without a new restriction. Columns [2] to [4] repeat the estimation including additional sets of controls and the point estimate remains negative—although the magnitude reduces to -0.065 with the full set of controls—and statistically significant at conventional levels for the new capital expenditure restriction group only.

This last piece of evidence supports the idea that the firm employment effects documented in this section are the outcome of creditor intervention (brought about, for example, through contractual restrictions) as opposed to self-correcting behavior on the part of borrowers.

3.2 Internal Resource Allocation: Establishment-Level Analysis

From this point on, we analyze the effects of creditor interventions at the establishment-level. The Census data provide information on operational changes at firms and estab-

[23]Table IA.I of the Internet Appendix shows the summary statistics for the full sample of matched firm-years and conditional on having an old and new capital expenditure restriction. The univariate comparison of employment changes suggests that employment cuts are concentrated among firms receiving new capital expenditure restrictions.

lishments, allowing us to examine important aspects of within-firm restructuring activity following financial covenant violations that have not yet been explored in previous studies. Our primary contribution is to document precisely how creditor discipline leads to well-documented firm-level operational improvements (e.g., Nini et al., 2009, 2012).

In Section 3.2.1, we examine resource allocation at core and non-core business lines using data from the LBD. In Section 3.2.2, using high-quality measures of productivity based on the ASM and CMF data, we examine how the productivity of manufacturing establishments affects resource allocation after covenant violations.

3.2.1 Establishments Operating in Core and Peripheral Business Lines

We first examine the effects of covenant violations on resource allocation among establishments operating in core and peripheral business lines within the same firm. Since peripheral business lines are outside the main scope of the firm, these activities may be less developed, could arise from managers' private incentives, or where management may lack experience relative to core business lines (e.g., Bertrand et al., 2004; Gompers, 1996; Gormley and Matsa, 2015; Scharfstein and Stein, 2000). Thus, withdrawing resources from these establishments and refocusing may improve operating efficiency and decrease the risk of failure, thus improving firm performance and value (Berger and Ofek, 1995; Comment and Jarrell, 1995; John and Ofek, 1995; Lang and Stulz, 1994; Schoar, 2002).

To formally test this idea we turn to the establishment-level data from LBD. We follow Maksimovic and Phillips (2002) and, for each firm, classify a three-digit SIC industry as core (peripheral) if the total value of payroll constitutes more (less) than 25 percent of the firm's total payroll. Each establishment within the firm is characterized as core or peripheral based on its industry classification. We then estimate our establishment-level regression model described in equation (2), which allows for differential sensitivity among establishments operating in the firm's core or peripheral business lines following a new covenant violation.

The estimated coefficients on $\text{Violation}_{it} \times \text{Core}_{jt}$ and $\text{Violation}_{it} \times \text{Peripheral}_{jt}$ measure these heterogeneous responses. Table VI shows the results.

In columns [1] to [4] the dependent variable is the establishment-level change in the natural logarithm of the number of employees. In column [1], we perform the estimation without any covenant controls and find that covenant violations result in a decrease of 10.3 percentage points in core establishments and 13.4 percent in peripheral establishments. Both point estimates are significant at 1 percent confidence level. In column [2], we add covenant controls and the coefficients of interest are estimated to be -0.085 and -0.135, still statistically significant at 1 percent confidence level. Columns [3] and [4] include further controls but the finding does not change: firms decrease employment significantly at both core and peripheral establishments, but the effect is about fifty percent larger at peripheral establishments.[24]

Columns [5] and [6] report results from probit regressions where the dependent variables are indicator variables for establishment sales and closures, respectively. In the former case, the dependent variable is equal to one if the establishment in question is sold in the subsequent year and zero otherwise. Here, a similar pattern emerges: the coefficients of interest are significantly positive for both types of establishment in both regressions, but the point estimate for peripheral establishments is roughly fifty percent larger (for example, 0.157 versus 0.264 in the case of establishment closures). Moreover, these differences are significant at the 1 percent level based on an F-test.

Table VII further examines the robustness of these results to our classifications of core and peripheral industries. We conduct two tests. First, in columns [1] to [3], we use finer information on establishment industry codes to classify industries. In particular, we focus on four-digit SIC codes and maintain the 25 percent threshold (e.g., Giroud and Mueller, 2015). In columns [4] to [6], we maintain the use of three-digit SIC codes but now adopt a

[24]We formally test to see whether these coefficients are statistically distinct from each other using F-tests. In each case, we find the difference between coefficients is significantly different from zero at 1 percent confidence level.

50 percent payroll threshold to classify industries. For both sets of tests, we find very similar results relative to Table VI, indicating that this finding is not an artifact of our industry classification scheme.

Overall, these establishment-level results indicate a large withdrawal of resources from violating firms' operations, particularly, establishments operating in peripheral industries. Specifically, following covenant violations, firms decrease employment more at their continuing peripheral establishments and, along the extensive margin, sell and close them significantly more often. Thus, our findings suggest that increasing the focus of firms' operations following covenant violations is an important channel through which creditor interventions may improve firm performance and valuations.

3.2.2 Establishment Productivity

We next analyze the effects of covenant violations on resource allocation among productive and unproductive establishments within the same firm. If creditor discipline improves firms' operating performance then it is plausible that resources should be withdrawn from less productive establishments.[25]

To test this idea, we use several measures of productivity based on data from both LBD for all firms and the CMF and ASM for the subsample of manufacturers. These unique data allow us to capture labor and capital productivity, as well as total factor productivity. We examine the effects of covenant violations on employment, investment, and establishment sales and closures by estimating regression model (2). Essentially, we interact Covenant Violation$_{it}$ with variables indicating whether establishment j's productivity is above (Productive$_{jt}$) or below (Unproductive$_{jt}$) the median productivity of the establishments belonging to the same three-digit SIC industry in a given year (see also, Brav et al., 2015; Davis et al., 2014). We also

[25]Brav et al. (2015) argue that resource allocation and restructuring based on productivity constitutes an important determinant of the value created by hedge funds. Davis et al. (2014) provide similar evidence in the context of leveraged buyouts by private equity firms.

examine productivity rankings within the same firm (e.g., Giroud and Mueller, 2015). Thus, we consider establishment-level productivity both measured relative to other establishments across firms within the same industry, as well as relative to other establishments within the same firm.[26]

We first examine the importance of labor productivity using LBD data. We proxy for establishment-level labor productivity with its average wage, measured as the ratio of payroll to the number of employees. If labor productivity determines wages then industry-level heterogeneity in wages is consistent with dispersion in labor productivity (see, e.g., Silva, 2013). An establishment is therefore considered productive if its average wage lies above the median among establishments in the same industry. We estimate equation (2) allowing high and low labor productivity establishments to display differential sensitivity of employment to covenant violations. The dependent variable is the annual change in the natural logarithm of an establishment's number of employees. Table VIII shows the results.

Column [1] first shows the results without including any covenant control variables. We find the coefficient on unproductive establishments is negative, large in magnitude, and statistically significant at the 1 percent confidence level. In stark contrast, the estimated effect of violations on employment at productive establishments is small and statistically indistinguishable from zero. In columns [2] to [4] we include progressively more covenant controls and the same pattern emerges. The coefficient on unproductive establishments, β_2, is stable across specifications ranging from -0.201 to -0.212. This indicates that establishments with relatively low labor productivity undergo large employment cutbacks of approximately 20 percentage points relative to non-violators' establishments. No such effect is present at establishments with relatively high labor productivity.

Next, we focus on the subsample of manufacturing firms using data from the CMF and

[26]If industry production is heterogeneous in terms of capital, labor, and total factor productivity then within-firm productivity rankings might be misleading, especially for firms spread across several industries.

ASM. These data provide detailed information on manufacturing establishments, including output and factor inputs, allowing us to construct an array of productivity measures. We can measure total, labor, and capital productivity several ways both parametrically and non-parametrically, which gives us confidence that measurement error is not driving our results.

We first use total factor productivity (TFP), which measures the difference between actual and predicted output for a given level of inputs, to estimate establishment productivity.[27] We rank establishments on the basis of their within-firm productivity ranking—productive (unproductive) establishments fall above (below) the median of TFP of the establishments belonging to the same firm in a given year—and consider the within-industry ranking later in a robustness test. Given the richness of the manufacturing firm data, we examine effects of covenant violations on establishment-level investment, in addition to employment and sales and closures. The results of this analysis are reported in Table IX.

In columns [1] to [4], the dependent variable is the annual change in the natural logarithm of the number of employees. Column [1] indicates that firms cut employment at both productive and unproductive establishments, although the layoffs are significantly higher at unproductive establishments. The estimated coefficients show a decrease in number of employees of 7.7 and 23.5 percentage points for productive and unproductive establishments, respectively. As we introduce covenant controls, the estimated effect on productive establishments diminishes in size and statistical significance. In column [4], with the full set of controls in the regression, layoffs at productive establishments are indistinguishable from zero. In contrast, unproductive establishments experience employment cuts that are large and statistically significant at the 1 percent confidence level throughout. Furthermore, F-tests confirm

[27] We follow a well-established literature to compute TFP using Census data (e.g., Foster et al., 2014, 2008; Giroud, 2013; Schoar, 2002; Syverson, 2004). In particular, TFP is estimated as the difference between actual and predicted output, where the latter is estimated using a log-linear Cobb-Douglas production function with capital, labor, and materials as inputs.

that the difference in the estimates between productive and unproductive establishments is always statistically significant at conventional levels. Finally, notice the similarity of point estimates in column [4] of Tables VIII and IX, which suggests these findings do not appear to be specific to the manufacturing industry.

Columns [5] to [8] display a similar pattern for investment. We consider the investment rate as a dependent variable, which we measure as the annual change in establishment-level capital expenditures scaled by the establishment-level capital stock. Following covenant violations, violating firms cut the investment rate by almost 0.020 at unproductive establishments, relative to the establishments of non-violators. There is virtually zero effect on productive establishments.

In columns [9] and [10], we examine establishment sales and closures, respectively. We find that firms sell and close both productive and unproductive establishments. The increase in the probability of a sale is similar in magnitude across productive and unproductive establishments, which is confirmed by an F-test. However, the probability of being closed is significantly higher for unproductive establishments than for productive ones. Given establishment closures occur far more frequently than sales among violators (see Table I), these findings indicate a significant withdrawal of resources from unproductive establishments along the extensive margin.

Having documented a strong impact of establishment productivity on resource withdrawal following covenant violations, in Table X we examine the robustness to alternative measures of productive efficiency.

We first examine the annual change in employment and investment, respectively, using a within-industry (three-digit SIC code) TFP ranking of establishments. These results are shown in columns [1] and [5]. In both cases we find a similar result as compared to using the within-firm productivity ranking. Indeed, in column [1] we see that following a violation firms decrease the number of employees at unproductive establishments by 17.8 percentage

points (significant at the 1 percent level), whereas the change in employment at productive establishments is statistically insignificant. Column [5] reports the analogous finding for establishment-level investment.

We consider three more refined measures of labor productivity commonly used in the literature (e.g., Brav et al., 2015). First, in column [2], we use value-added per labor hour, which is total value of shipments minus material and energy costs divided by total labor hours. Second, in column [3], we use output divided by total labor hours. Finally, in column [4], we use wage per hour. Each time we use a within-industry productivity ranking to determine which establishments are relatively productive.[28] It can be seen that following covenant violations the withdrawal of labor resources occurs most strongly at establishments with low labor productivity. In contrast to the productive establishment interaction, the unproductive establishment interaction is always negative, larger in magnitude, and statistically significant at the 1 percent confidence level.

Finally, in column [6] we examine how investment following covenant violations depends on capital productivity, proxied for by return on capital (ROC) (e.g., Giroud and Mueller, 2015). We measure ROC as total value of shipments minus labor, material, and energy costs scaled by capital stock. Very similar results emerge: compared to the investment rate of non-violator establishments, the investment rate decreases by 0.014 among violating firms' establishments with below-median ROC (significant at the 1 percent level) and indistinguishable from zero in the case of productive establishments.

In summary, our evidence presented in this section highlights the importance of establishment productivity in firm decision-making following covenant violations. We find consistent evidence that violating firms cut employment and investment at unproductive establishments and close them down more frequently. Overall, the withdrawal of resources from and dis-

[28]Similar results (unreported) emerge when we use a within-firm productivity ranking combined with these alternative measures.

posal of relatively unproductive establishments appear a plausible second underlying channel through which creditors help enhance firm value.

4 Conclusion

Using establishment-level data from the U.S. Census Bureau, we provide detailed evidence on how U.S. publicly-traded corporations adjust their operations in response to violations of financial covenants in private credit agreements. In doing so, we uncover two plausible channels that may explain the well-documented gains in violating firms' operating performance and market valuations following violations (e.g., Nini et al., 2009, 2012).

We first show that covenant violations are followed by significant employment cutbacks. A typical violating firm lays off between 4 and 6 percent of its labor force, as compared to similar non-violating firms. Furthermore, these violating firms are more likely to divest existing establishments both through asset sales and closures. We establish these results using information on covenant violations reported to the SEC (Nini et al., 2012), a RDD that exploits covenant thresholds in loan contracts (Chava and Roberts, 2008), and an analysis of new capital expenditure restrictions in renegotiated contracts (Nini et al., 2009).

Using the granularity of the Census data, we look inside the black box of the firm and document two robust patterns of within-firm resource allocation following covenant violations. First, we show that firms reduce the scope of their operations by withdrawing resources significantly more from peripheral establishments outside of the firm's core business lines. Second, we provide evidence that total and individual factor productivities are important determinants of resource allocation. Specifically, firms violating covenants subsequently reduce employment and capital expenditures almost entirely at unproductive establishments.

Our micro-evidence sheds light on previously unexplored channels through which creditors may have a disciplining influence on firms' day-to-day operations, well outside of

bankruptcy. We find the shift of control rights associated with covenant violations brings about significant operational changes, leading firms to refocus operations in favor of productive establishments within core business lines.

Our results are consistent with a valuable delegated monitoring role of creditors. Regulatory changes in the wake of the the Great Recession and recent financial innovations may impede the ability of lenders to perform this role. Notably, stricter capital regulation and new liquidity requirements levied on banks increase the cost of originating and holding corporate loans, particularly long-term loans to risky borrowers that may benefit most from bank monitoring. In addition, the introduction of "covenant light" corporate loan contracts with weaker covenant protection—namely, loans excluding maintenance covenants (Ivashina and Becker, 2015)—may reduce the occurrence of covenant violations and therefore scope for creditor intervention. Finally, relatively new credit risk transfer mechanisms such as credit default swaps separate control rights from potential losses (Parlour and Winton, 2013), which may weaken incentives to intervene when borrowers violate covenants (Bolton and Oehmke, 2011; Chakraborty et al., 2015).

Investigating the role of banks and other creditors in corporate governance in rapidly evolving, modern credit markets remains an exciting area for future research.

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Table I
Summary Statistics

This table provides sample summary statistics. Panel A provides firm-level statistics. Panels B and C provide establishment-level statistics. The unit of observation in Panels A and B and C, respectively, is a firm-year and establishment-year. All variables are defined in Appendix A.

	Full Sample			Non-Violators			Violators		
	N	Mean	Std.	N	Mean	Std.	N	Mean	Std.
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Panel A: Firm-Level									
ΔLog(Employment)	21,000	-0.061	0.401	19,000	-0.002	0.399	2,000	-0.062	0.424
ΔLog(Payroll)	21,000	0.000	0.410	19,000	0.004	0.408	2,000	-0.047	0.431
Symmetric Employment Growth	21,000	0.018	0.308	19,000	0.018	0.306	2,000	0.029	0.334
ΔEmployees/Average Assets	21,000	9.453	47.376	19,000	9.322	48.448	2,000	11.392	26.895
ΔPayroll/Average Assets	21,000	0.349	2.697	19,000	0.347	2.776	2,000	0.388	0.966
Any Establishment Sale	21,000	0.112	0.315	19,000	0.111	0.314	2,000	0.121	0.327
Any Establishment Closure	21,000	0.472	0.499	19,000	0.471	0.499	2,000	0.486	0.500
Covenant Violation	21,000	0.063	0.244	19,000	0	0	2,000	1	0
Operating Cash Flow	21,000	0.075	0.246	19,000	0.077	0.250	2,000	0.050	0.174
Leverage	21,000	0.256	0.456	19,000	0.252	0.466	2,000	0.315	0.280
Interest Expense	21,000	0.023	0.074	19,000	0.023	0.076	2,000	0.028	0.035
Net Worth	21,000	0.432	0.967	19,000	0.435	0.995	2,000	0.393	0.371
Current Ratio	21,000	2.772	4.615	19,000	2.821	4.744	2,000	2.048	1.724
Market-to-Book	21,000	2.029	3.170	19,000	2.063	3.255	2,000	1.533	1.305
Panel B: Establishment-Level (LBD)									
ΔLog(Employment)	2,000,000	-0.138	0.664	1,900,000	-0.133	0.655	100,000	-0.251	0.832
Establishment Sale	2,000,000	0.000	0.008	1,900,000	0.000	0.008	100,000	0.000	0.009
Establishment Closure	2,000,000	0.054	0.227	1,900,000	0.053	0.224	100,000	0.087	0.282
Covenant Violation	2,000,000	0.041	0.197	1,900,000	0	0	100,000	1	0
Age	2,000,000	13.021	8.811	1,900,000	13.065	8.819	100,000	11.973	8.552
Establishments per Firm	20,000	93.710	356.328	20,000	93.872	357	1,000	90	347
Establishments per Segment	100,000	22.003	154.284	90,000	21.913	154	3,000	24.377	162
Labor Productivity	2,000,000	0.051	6.968	1,900,000	0.052	7.114	100,000	0.029	0.050
Panel C: Establishment-Level (CMF/ASM)									
ΔLog(Employment)	60,000	-0.206	0.827	57,000	-0.198	0.809	3,000	-0.395	1.162
ΔInvestment Rate	60,000	-0.007	0.156	57,000	-0.007	0.155	3,000	-0.021	0.168
Establishment Sale	60,000	0.000	0.012	57,000	0.000	0.011	3,000	0.001	0.029
Establishment Closure	60,000	0.038	0.190	57,000	0.036	0.185	3,000	0.082	0.274
Covenant Violation	60,000	0.048	0.214	57,000	0	0	3,000	1	0
Age	60,000	21.584	8.711	57,000	21.633	8.707	3,000	20.394	8.720
Establishments per Firm	10,000	7.427	14.091	7,000	7.654	14.412	1,000	4.337	8
Establishments per Segment	20,000	2.959	4.675	20,000	2.985	4.700	1,000	2.436	4.105
Total Factor Productivity	60,000	1.841	0.641	57,000	1.844	0.64	3,000	1.761	0.627
Labor Productivity (Alt. 1)	60,000	115.01	284	57,000	116.691	288	3,000	74.630	119
Labor Productivity (Alt. 2)	60,000	219	544	57,000	221	544	3,000	173	542
Labor Productivity (Alt. 3)	60,000	0.019	0.027	57,000	0.019	0.027	3,000	0.017	0.015
Return on Capital	60,000	5.233	545	57,000	5.379	557	3,000	1.706	3.766

Table II
Covenant Violations and Resource Allocation: Firm-Level Analysis

This table presents estimates of the firm-level impact of loan covenant violations on asset allocation. The unit of observation in each regression is a firm-year pair. The dependent variable is the annual change in the natural logarithm of the number of employees aggregated across establishments. A covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Covenant controls include operating cash flow scaled by average assets, the leverage ratio, the interest expense, the net worth, the current ratio, and the market-to-book ratio. Higher-order and lagged covenant controls refer to the second and third power and one-year lag of the covenant controls, respectively. All variables are defined in Appendix A. Industry fixed effects are based on three-digit SIC codes. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable: ΔLog(Employment)				
	[1]	[2]	[3]	[4]
Covenant Violation	-0.063***	-0.042***	-0.042***	-0.040***
	(0.007)	(0.008)	(0.009)	(0.009)
Operating Cash Flow		0.013***	0.061**	0.119***
		(0.013)	(0.028)	(0.036)
Leverage		0.048**	-0.063*	-0.095
		(0.020)	(0.032)	(0.078)
Interest Expense		-0.085	-0.372	0.332
		(0.182)	(0.257)	(0.848)
Net Worth		0.073***	0.032	0.050
		(0.014)	(0.026)	(0.032)
Current Ratio		0.001	-0.007***	0.000
		(0.001)	(0.002)	(0.006)
Market-to-Book		0.019***	0.022***	0.061***
		(0.001)	(0.002)	(0.010)
Lagged Covenant Controls	N	N	Y	Y
Higher Order Covenant Controls	N	N	N	Y
Industry Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Observations	30,000	26,000	21,000	21,000
R^2	0.02	0.12	0.11	0.11

Table III
Covenant Violations and Resource Allocation: Measurement of Employment

This table presents estimates of the firm-level impact of loan covenant violations on resource allocation using alternative measures of employment. The unit of observation in each regression is a firm-year pair. Columns [1] to [4] use the annual change in (log) payroll, the number of employees divided by average assets, payroll divided by average assets, and the symmetric employment growth rate, respectively, as the dependent variable. A covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable:	ΔLog(Payroll)	ΔEmployees / Avg. Assets	ΔPayroll / Avg. Assets	Symmetric Emp. Growth
	[1]	[2]	[3]	[4]
Covenant Violation	-0.027***	-0.222**	-0.011***	-0.026**
	(0.008)	(0.104)	(0.003)	(0.013)
Operating Cash Flow	0.134***	2.158***	0.099***	0.101**
	(0.036)	(0.343)	(0.016)	(0.051)
Leverage	-0.071	0.548	0.016	-0.163
	(0.080)	(0.844)	(0.031)	(0.104)
Interest Expense	-0.178	-19.283**	-1.051***	0.623
	(0.862)	(8.974)	(0.325)	(1.125)
Net Worth	0.085***	-0.074	0.012	0.057
	(0.029)	(0.329)	(0.013)	(0.046)
Current Ratio	-0.005	-0.015	-0.002	0.006
	(0.006)	(0.056)	(0.002)	(0.008)
Market-to-Book	0.093***	0.355***	0.026***	0.031**
	(0.011)	(0.095)	(0.005)	(0.013)
Lagged Covenant Controls	Y	Y	Y	Y
Higher Order Covenant Controls	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Observations	21,000	21,000	21,000	21,000
R^2	0.10	0.07	0.16	0.02

Table IV
Covenant Violations and Resource Allocation: Establishment Sales and Closures

This table shows estimates of the impact of covenant violations on firm-level establishment sales and closures. The unit of observation in each regression is a firm-year pair. The dependent variables indicate whether the firm sold or closed any establishment in a year. A covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable:	Any Establishment Sale				Any Establishment Closure			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Covenant Violation	0.078**	0.123***	0.111**	0.093*	0.009	0.085***	0.076*	0.073*
	(0.038)	(0.045)	(0.052)	(0.052)	(0.031)	(0.036)	(0.042)	(0.042)
Operating Cash Flow		-0.265***	-0.438**	-0.033		0.544***	0.078	0.686***
		(0.092)	(0.200)	(0.248)		(0.067)	(0.132)	(0.177)
Leverage		0.177	0.207	1.113**		0.003	0.120	-0.639
		(0.110)	(0.170)	(0.551)		(0.089)	(0.151)	(0.448)
Interest Expense		1.004	0.455	7.488		-0.061	-0.004	13.517***
		(0.963)	(1.611)	(5.429)		(0.730)	(1.136)	(4.483)
Net Worth		-0.305***	-0.258*	-0.483***		-0.284***	-0.037	-0.055
		(0.083)	(0.139)	(0.179)		(0.067)	(0.127)	(0.166)
Current Ratio		-0.023***	-0.011	-0.180***		-0.063***	-0.021**	-0.036
		(0.008)	(0.015)	(0.047)		(0.006)	(0.011)	(0.041)
Market-to-Book		-0.075***	-0.045**	-0.067		-0.079***	-0.050***	-0.115*
		(0.010)	(0.021)	(0.081)		(0.007)	(0.012)	(0.064)
Lagged Covenant Controls	N	N	Y	Y	N	N	Y	Y
Higher Order Covenant Controls	N	N	N	Y	N	N	N	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	30,000	26,000	21,000	21,000	30,000	26,000	21,000	21,000
R^2	0.02	0.17	0.17	0.17	0.09	0.27	0.28	0.28

Table V
Covenant Violations and Resource Allocation: Robustness Checks

This table presents robustness checks for the estimates of the firm-level impact of loan covenant violations on resource allocation. The unit of observation in each regression is a firm-year pair. Panel A considers a threshold-based definition of covenant violations. The dependent variable is the annual change in natural logarithm of the number of employees aggregated across establishments. Columns [1] and [2] consider alternative covenant violation definitions based on covenants threshold data. Column [1] defines a covenant violation to occur if either the net worth or current ratio falls below their respective thresholds in the current but not previous year. Column [2] requires either a reported covenant violation in a SEC 10-K or 10-Q filing or either net worth or current ratio to fall below a threshold. Columns [3] to [5] use the covenant violation definition from [1], but restrict the sample to firm-year observations where relevant accounting variables are within ±20, 15, and 10 percent of the covenant threshold. Panel B repeats the baseline estimation using a one-year lagged (placebo) covenant violation. A placebo covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the next year but not the current nor previous years. Panel C considers the subsample of borrowers with credit agreements that contain covenants with a direct restrictions on capital expenditure. The New Capital Expenditure Restriction indicator variable equals one when the new contract contains a capital expenditure restriction and the previous contract for the same borrower did not. The Old Capital Expenditure Restriction indicator variable equals one when the new contract contains a capital expenditure restriction and New Capital Expenditure Restriction is equal to zero. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Panel A: Threshold-Based Violations					
Dependent Variable: ΔLog(Employment)			RDD Bandwidth (Percent)		
			±20	±15	±10
	[1]	[2]	[3]	[4]	[5]
Covenant Violation	-0.061***	-0.040***	-0.047**	-0.038*	-0.040*
	(0.020)	(0.008)	(0.024)	(0.021)	(0.024)
Operating Cash Flow	0.317***	0.128***	0.237***	0.317**	0.262**
	(0.090)	(0.026)	(0.103)	(0.113)	(0.123)
Leverage	0.071	-0.118*	-0.115	-0.186	-0.204
	(0.224)	(0.071)	(0.109)	(0.114)	(0.128)
Interest Expense	-3.439	0.509	0.751	0.759	1.171
	(2.411)	(0.717)	(1.001)	(1.100)	(1.189)
Net Worth	0.012	0.049	-0.003	-0.034	(0.039)
	(0.104)	(0.027)	(0.098)	(0.100)	(0.108)
Current Ratio	-0.020	-0.002	-0.006	-0.010	-0.007
	(0.026)	(0.006)	(0.011)	(0.010)	(0.010)
Market-to-Book	0.033	0.063***	0.039***	0.033**	0.013
	(0.040)	(0.009)	(0.013)	(0.016)	(0.018)
Lagged Covenant Controls	Y	Y	N	N	N
Higher Order Covenant Controls	Y	Y	N	N	N
Industry Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Observations	4,000	22,000	2,000	2,000	1,000
R^2	0.13	0.12	0.17	0.17	0.18

Panel B: Placebo Violations (One-Year Lag)

Dependent Variable:	ΔLog(Emp.)	ΔLog(Payroll)	ΔEmployees / Avg. Assets	ΔPayroll / Avg. Assets	Symmetric Emp. Growth
	[1]	[2]	[3]	[4]	[5]
Covenant Violation	0.009	-0.013	-0.019	0.030	0.013
	(0.013)	(0.013)	(0.014)	(0.552)	(0.034)
Covenant Controls	Y	Y	Y	Y	Y
Lagged Covenant Controls	Y	Y	Y	Y	Y
Higher Order Covenant Controls	Y	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y
Observations	21,000	21,000	21,000	21,000	21,000
R^2	0.10	0.10	0.02	0.07	0.16

Panel C: Capital Expenditure Restrictions

Dependent Variable: ΔLog(Employment)

	[1]	[2]	[3]	[4]
Old Capital Expenditure Restriction	0.012	0.018	0.022	0.022
	(0.015)	(0.017)	(0.018)	(0.018)
New Capital Expenditure Restriction	-0.090***	-0.070*	-0.067*	-0.065*
	(0.036)	(0.036)	(0.036)	(0.036)
Operating Cash Flow		-0.041	0.143	0.405*
		(0.113)	(0.181)	(0.232)
Leverage		0.094	-0.015	-0.067
		(0.077)	(0.114)	(0.263)
Interest Expense		0.683	1.110	2.457
		(0.758)	(1.032)	(2.544)
Net Worth		0.120**	0.127	0.108
		(0.061)	(0.092)	(0.124)
Current Ratio		0.012	0.011	-0.009
		(0.011)	(0.011)	(0.031)
Market-to-Book		0.040***	0.050***	-0.031
		(0.010)	(0.015)	(0.045)
Lagged Covenant Controls	N	N	Y	Y
Higher Order Covenant Controls	N	N	N	Y
Industry Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Observations	3,000	2,000	2,000	2,000
R^2	0.04	0.13	0.13	0.13

Table VI
Covenant Violations and Resource Allocation: Core & Peripheral Establishments

This table presents estimates of the firm-level impact of loan covenant violations on resource allocation among core and peripheral establishments. The unit of observation in each regression is a establishment-year pair. Core (peripheral) establishments are establishments operating in three-digit SIC industries that account for more than (less than) 25% of the firm's total employment expenditures. The dependent variables in columns [1] to [4], [5], and [6] are the annual change in the (log) number of employees, a dummy variable indicating whether an establishment is sold or not, and a dummy variable indicating whether an establishment is closed or not, respectively. A covenant violation occurs when a firms reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Establishment controls include age, the number of establishments, and the number of establishments per segment. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable:	ΔLog(Employment)				Est. Sale	Est. Closure
	[1]	[2]	[3]	[4]	[5]	[6]
Covenant Violation × Core	-0.103***	-0.085***	-0.093***	-0.090***	0.206***	0.157***
	(0.023)	(0.026)	(0.030)	(0.029)	(0.009)	(0.007)
Covenant Violation × Peripheral	-0.134***	-0.135***	-0.145***	-0.146***	0.283***	0.264***
	(0.045)	(0.046)	(0.052)	(0.050)	(0.014)	(0.010)
Operating Cash Flow		0.383***	0.463***	1.374***	0.831***	-1.984***
		(0.074)	(0.113)	(0.275)	(0.083)	(0.052)
Leverage		-0.042	0.002	-0.069	-1.612***	1.181***
		(0.055)	(0.080)	(0.193)	(0.103)	(0.073)
Interest Expense		0.142	-0.873	2.150	44.787***	-8.469***
		(0.543)	(0.835)	(2.168)	(1.219)	(0.862)
Net Worth		0.028	0.008	0.025	-0.131***	0.178***
		(0.038)	(0.066)	(0.073)	(0.031)	(0.024)
Current Ratio		0.009	0.007	-0.032	0.063***	-0.077***
		(0.005)	(0.012)	(0.030)	(0.017)	(0.013)
Market-to-Book		0.004	-0.004	0.101**	0.189***	-0.343***
		(0.005)	(0.009)	(0.044)	(0.023)	(0.016)
Establishment Controls	Y	Y	Y	Y	Y	Y
Lagged Covenant Controls	N	N	Y	Y	Y	Y
Higher Order Covenant Controls	N	N	N	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	3,000,000	2,500,000	2,000,000	2,000,000	2,000,000	2,000,000
R^2	0.02	0.03	0.03	0.03	0.11	0.06

Table VII
Covenant Violations and Resource Allocation: Core & Peripheral Robustness

This table presents robustness checks for the estimates of the firm-level impact of loan covenant violations on resource allocation across core and peripheral establishments using alternative measures of core and peripheral. The unit of observation in each regression is a establishment-year pair. Columns [1] to [3] define peripheral establishments as establishments operating in 4-digit SIC industries accounting for less than 25% of the firm's total employment expenditures. In columns [4] to [6], they are establishments operating in 3-digit SIC industries that account for less than 50% of these expenditures. The dependent variables in columns [1] to [3] and [4] to [6] are annual change in the (log) number of employees, a dummy variable indicating whether the establishment is sold, and a dummy variable indicating whether the establishment is closed, respectively. A covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Establishment controls include age, the number of establishments, and the number of establishments per segment. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable:	4-Digit SIC			50 Percent Cutoff		
		Establishment			Establishment	
	ΔLog(Emp.)	Sales	Closures	ΔLog(Emp.)	Sales	Closures
	[1]	[2]	[3]	[4]	[5]	[6]
Covenant Violation × Core	-0.091***	0.209***	0.157***	-0.091***	0.236***	0.170***
	(0.030)	(0.009)	(0.007)	(0.030)	(0.009)	(0.007)
Covenant Violation × Peripheral	-0.136***	0.262***	0.246***	-0.131***	0.254***	0.357***
	(0.044)	(0.014)	(0.010)	(0.044)	(0.016)	(0.011)
Operating Cash Flow	1.374***	0.952***	-1.984***	1.376***	0.779	-2.241***
	(0.275)	(0.083)	(0.052)	(0.274)	(0.086)	(0.053)
Leverage	-0.068	-1.564***	1.135***	-0.070	-1.842	1.006
	(0.193)	(0.103)	(0.073)	(0.193)	(0.105)	(0.074)
Interest Expense	2.165	48.851***	-8.606***	2.145	52.596***	-6.381***
	(2.168)	(1.219)	(0.862)	(2.168)	(1.258)	(0.879)
Net Worth	0.023	-0.235***	0.166***	0.025	-0.156***	0.121***
	(0.073)	(0.031)	(0.024)	(0.073)	(0.032)	(0.024)
Current Ratio	-0.033	0.172***	-0.079***	-0.032	0.030*	-0.078
	(0.030)	(0.017)	(0.013)	(0.030)	(0.018)	(0.013)
Market-to-Book	0.100**	0.032	-0.337***	0.0101**	0.203**	-0.339***
	(0.044)	(0.022)	(0.016)	(0.044)	(0.023)	(0.016)
Establishment Controls	Y	Y	Y	Y	Y	Y
Lagged Covenant Controls	Y	Y	Y	Y	Y	Y
Higher Order Covenant Controls	Y	Y	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
R^2	0.03	0.11	0.06	0.03	0.12	0.06

Table VIII
Covenant Violations and Resource Allocation: Labor Productivity Split

This table presents estimates of the firm-level impact of loan covenant violations on asset allocation across productive and unproductive establishments based on data from the LBD. The unit of observation in each regression is an establishment-year pair. The dependent variable is the annual change in the (log) number of employees. Establishment productivity is estimated using the average wage at the establishment-level relative to other establishments in the same 3-digit SIC industry. A covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Establishment controls include age, the number of establishments, and the number of establishments per segment. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable: ΔLog(Employment)				
	[1]	[2]	[3]	[4]
Covenant Violation × Productive	-0.009	0.013	0.009	0.009
	(0.020)	(0.023)	(0.027)	(0.028)
Covenant Violation × Unproductive	-0.212***	-0.201***	-0.212***	-0.207***
	(0.034)	(0.037)	(0.041)	(0.040)
Operating Cash Flow		0.393***	0.478***	1.372***
		(0.072)	(0.110)	(0.268)
Leverage		-0.037	0.007	-0.076
		(0.053)	(0.078)	(0.193)
Interest Expense		0.113	-0.832	2.196
		(0.533)	(0.827)	(2.179)
Net Worth		0.030	0.009	0.030
		(0.037)	(0.064)	(0.072)
Current Ratio		0.009	0.007	-0.034
		(0.005)	(0.012)	(0.030)
Market-to-Book		0.003	-0.004	0.099**
		(0.005)	(0.009)	(0.043)
Establishment Controls	Y	Y	Y	Y
Lagged Covenant Controls	N	N	Y	Y
Higher Order Covenant Controls	N	N	N	Y
Industry Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Observations	3,000,000	2,500,000	2,000,000	2,000,000
R^2	0.02	0.03	0.03	0.03

Table IX
Covenant Violations and Resource Allocation: Productivity Split for Manufacturing Establishments

This table presents estimates of the firm-level impact of loan covenant violations on resource allocation across productive and unproductive manufacturing establishments. The unit of observation in each regression is an establishment-year pair. Each establishment is classified as productive or unproductive depending on its within-firm total factor productivity (TFP) ranking. An establishment is considered productive (unproductive) if its corresponding TFP rank is above (below) the median TFP of the establishments belonging to the firm in a given year. The dependent variables in columns [1] to [4] and [5] to [8] are the annual change in the (log) number of employees and the annual change in investment given by establishment-level capital expenditures over capital stock, respectively. In columns [9] and [10] the dependent variables are dummy variables indicating whether the establishment is sold and closed. A covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Establishment controls include age, the number of establishments, and the number of establishments per segment. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable:	ΔLog(Employment)				ΔInvestment Rate				Est. Sale	Est. Closure
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Covenant Violation × Productive	-0.077***	-0.067**	-0.069**	-0.053	-0.007	-0.006	-0.007	-0.007	0.128**	0.193***
	(0.026)	(0.029)	(0.032)	(0.033)	(0.006)	(0.006)	(0.005)	(0.005)	(0.052)	(0.058)
Covenant Violation × Unproductive	-0.235***	-0.230***	-0.214***	-0.198***	-0.019***	-0.019***	-0.021***	-0.021***	0.116**	0.326***
	(0.039)	(0.042)	(0.047)	(0.047)	(0.005)	(0.006)	(0.006)	(0.006)	(0.056)	(0.056)
Operating Cash Flow		0.628**	0.587***	0.999		0.033***	0.104***	0.121***	-0.725**	-1.500***
		(0.111)	(0.135)	(0.211)		(0.013)	(0.027)	(0.033)	(0.339)	(0.355)
Leverage		0.058	-0.062	0.184		-0.028***	-0.024	-0.025	-0.258	-0.639
		(0.074)	(0.095)	(0.342)		(0.009)	(0.015)	(0.045)	(0.593)	(0.677)
Interest Expense		0.017	-0.464	-2.100		0.295***	-0.015	-0.205	18.992***	3.778
		(0.750)	(1.034)	(3.510)		(0.096)	(0.143)	(0.477)	(6.644)	(7.329)
Net Worth		0.095**	0.094	0.112		-0.003	-0.003	0.001	-0.020	-0.322
		(0.045)	(0.072)	(0.101)		(0.005)	(0.013)	(0.014)	(0.169)	(0.182)
Current Ratio		0.002	0.005	-0.028		-0.000	0.001	0.002	0.137	-0.053
		(0.007)	(0.010)	(0.046)		(0.001)	(0.002)	(0.007)	(0.082)	(0.091)
Market-to-Book		-0.023	0.012	0.185**		0.001	0.010***	0.001	-0.502***	0.231
		(0.009)	(0.014)	(0.080)		(0.001)	(0.003)	(0.012)	(0.167)	(0.145)
Establishment Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Lagged Covenant Controls	N	N	Y	Y	N	N	Y	Y	Y	Y
Higher Order Covenant Controls	N	N	N	Y	N	N	N	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	100,000	80,000	60,000	60,000	80,000	70,000	60,000	60,000	70,000	70,000
R^2	0.05	0.06	0.07	0.07	0.01	0.01	0.01	0.01	0.08	0.17

Table X
Covenant Violations and Resource Allocation: Robustness of Productivity Split for Manufacturers to Alternative Measurement

This table presents estimates of the firm-level impact of loan covenant violations on resource allocation across productive and unproductive manufacturing establishments using alternative measuremes of productivity. The unit of observation in each regression is an establishment-year pair. Each establishment is classified as productive or unproductive depending on its within-industry ranking each year. Productive (unproductive) establishments fall above (below) the median of the productivity measure of the establishments belonging to the same three-digit SIC code in a given year. Columns [1] and [5] uses total factor productivity to rank establishments. Columns [2] to [4] use three measures of labor productivity: value-added per labor hour, output divided by total labor hours, and wage per hour. Column [6] uses return on capital to measure capital productivity. A covenant violation occurs when a firm reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Establishment controls include age, the number of establishments, and the number of establishments per segment. Covenant controls and fixed effects are described in Table II. All variables are defined in Appendix A. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes statistical significance at the 1, 5, and 10 percent level.

Dependent Variable:	ΔLog(Employment)				ΔInvestment Rate	
	[1]	[2]	[3]	[4]	[5]	[6]
Covenant Violation × Productive	-0.050	-0.066*	-0.075**	0.036	-0.002	-0.004
	(0.036)	(0.035)	(0.034)	(0.037)	(0.005)	(0.006)
Covenant Violation × Unproductive	-0.178***	-0.165***	-0.158***	-0.251***	-0.016***	-0.014**
	(0.043)	(0.044)	(0.042)	(0.045)	(0.006)	(0.006)
Operating Cash Flow	0.776***	0.785***	0.786***	0.777***	0.130***	0.130***
	(0.307)	(0.306)	(0.305)	(0.304)	(0.038)	(0.038)
Leverage	0.070	0.057	-0.056	0.047	-0.035	-0.035
	(0.355)	(0.354)	(0.355)	(0.351)	(0.047)	(0.047)
Interest Expense	-2.424	-2.463	-2.455	-2.656	-0.255	-0.262
	(3.857)	(3.860)	(3.861)	(3.823)	(0.501)	(0.501)
Net Worth	0.082	0.081	0.081	0.086	0.011	0.011
	(0.102)	(0.102)	(0.102)	(0.103)	(0.014)	(0.014)
Current Ratio	-0.009	-0.010	-0.009	-0.014	0.004	0.004
	(0.062)	(0.102)	(0.102)	(0.103)	(0.014)	(0.014)
Market-to-Book	0.203**	0.202	0.202	0.195**	0.009	0.008
	(0.093)	(0.092)	(0.092)	(0.092)	(0.013)	(0.013)
Establishment Controls	Y	Y	Y	Y	Y	Y
Lagged Covenant Controls	Y	Y	Y	Y	Y	Y
Higher Order Covenant Controls	Y	Y	Y	Y	Y	Y
Industry Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y
Observations	60,000	60,000	60,000	60,000	60,000	60,000
R^2	0.08	0.08	0.08	0.08	0.01	0.01

Appendix A: Variable Definitions

This appendix presents the definitions for the variables used throughout the paper.

Variable	Definition	Source
Panel A: Firm-Level Variables		
ΔLog(Employment)	Annual change in the natural logarithm of number of employees summed across establishments	LBD
ΔLog(Payroll)	Annual change in the natural logarithm of payroll summed across establishments	LBD
Symmetric Employment Growth	Twice the annual change in total employees over the sum of current and lagged employment	LBD
ΔEmployees/Average Assets	Annual change in the number of employees divided by the average of current and lagged book assets	LBD, Compustat
ΔPayroll/Average Assets	Annual change in payroll divided by the average of current and lagged book assets	LBD, Compustat
Any Establishment Sale	Indicator variable equal to one if the firm sold any establishment in the current year	LBD
Any Establishment Closure	Indicator variable equal to one if the firm closed any establishment in the current year	LBD
Covenant Violation	Indicator variable equal to one if the firm violates a covenant in the current but not previous year	Nini et al. (2012)
New Capital Expenditure Restriction	Indicator variable equal to one if the new contract contains a capital expenditure restriction and the previous contract for the same borrower does not	Nini et al. (2009)
Old Capital Expenditure Restriction	Indicator variable equal to one if the new contract contains a capital expenditure restriction and New Capital Expenditure Restriction is equal to zero	Nini et al. (2009)
Operating Cash Flow	Operating income before depreciation divided by average assets	Compustat
Leverage	Sum of debt in current liabilities and long-term debt divided by total assets	Compustat
Interest Expense	Interest expense divided by average assets	Compustat
Net Worth	Stockholders equity divided by total assets	Compustat
Current Ratio	Current assets divided by current liabilities	Compustat
Market-to-Book	Market value of equity minus book equity (adjusted for deferred taxes) divided by total asets	Compustat
Panel B: Establishment-Level Variables		
ΔLog(Employment)	Annual change in the establishment-level natural logarithm of number of employees	LBD
ΔInvestment Rate	Annual change in establishment-level capital expenditures divided by capital stock	CMF/ASM
Establishment Sale	Indicator variable equal to one if the establishment is sold	LBD
Establishment Closure	Indicator variable equal to one if the establishment is closed	LBD
Covenant Violation	Indicator variable equal to one if the parent firm had a covenant violation in the current but not previous year	Nini et al. (2012)
Age	Number of years since the first year the establishment first appears in the LBD	LBD
Establishments per Firm	The total number of establishments of the parent firm	LBD
Establishments per Segment	The average number of establishments per three-digit industry segment of the parent firm	LBD
Total Factor Productivity	Establishment-level log total factor productivity computed following Foster et al. (2013)	CMF/ASM
Labor Productivity	Average wage defined as payroll divided by number of employees	LBD
Labor Productivity (Alt. 1)	Value added per labor hour defined as sales minus materials and energy costs divided labor hours	CMF/ASM
Labor Productivity (Alt. 2)	Output divided by total labor hours	CMF/ASM
Labor Productivity (Alt. 3)	Wage per hour defined as payroll divided by total labor hours	CMF/ASM
Return on Capital	Sales minus material and energy costs and payroll divided by establishment-level capital stock	CMF/ASM

Internet Appendix for "Creditor Control Rights and Resource Allocation Within Firms"

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Appendix IA.I: Summary Statistics for Capital Expenditures Restriction Sample

This table provides firm-level sample summary statistics for the set of firms with capital expenditure restrictions. The New Capital Expenditure Restriction indicator variable equals one when the new contract contains a capital expenditure restriction and the previous contract for the same borrower did not. The Old Capital Expenditure Restriction indicator variable equals one when the new contract contains a capital expenditure restriction and New Capital Expenditure Restriction is equal to zero. The unit of observation is a firm-year. All variables are defined in Appendix A.

	Full Sample			Old Restriction			New Restriction		
	N	Mean	Std.	N	Mean	Std.	N	Mean	Std.
	[1]	[2]	[3]	[4]	[5]	[6]	[4]	[5]	[6]
ΔLog(Employment)	2,000	0.020	0.392	1,000	0.004	0.382	500	-0.069	0.594
Operating Cash Flow	2,000	0.136	0.103	1,000	0.124	0.096	500	0.095	0.074
Leverage	2,000	0.312	0.199	1,000	0.348	0.228	500	0.353	0.177
Interest Expense	2,000	0.024	0.019	1,000	0.030	0.024	500	0.030	0.023
Net Worth	2,000	0.397	0.214	1,000	0.373	0.274	500	0.353	0.219
Current Ratio	2,000	1.864	0.192	1,000	1.940	1.070	500	1.823	0.959
Market-to-Book	2,000	1.634	1.098	1,000	1.376	0.810	500	1.146	0.534

Appendix IA.II: Covenant Violations and Resource Allocation: Firm-Level Analysis with Industry-Year Fixed Effects

This table presents estimates of the firm-level impact of loan covenant violations on asset allocation controlling for industry-year fixed effects. The unit of observation in each regression is a firm-year pair. The dependent variable is the annual change in natural logarithm of the number of employees aggregated across establishments. A covenant violation occurs when a firms reports a covenant violation in a SEC 10-K or 10-Q filing in the current but not previous year. Covenant controls include operating cash flow scaled by average assets, the leverage ratio, the interest expense, the net worth, the current ratio, and the market-to-book ratio. Higher-order and lagged covenant controls refer to the second and third power and one-year lag of the covenant controls, respectively. All variables are defined in Appendix A. Industry fixed effects are based on three-digit SIC codes. Standard errors (in parentheses) are clustered at the firm level. ***, **, * denotes 1%, 5%, and 10% statistical significance.

Dependent Variable: ΔLog(Employment)				
	[1]	[2]	[3]	[4]
Covenant Violation	-0.060***	-0.041***	-0.042***	-0.040***
	(0.007)	(0.008)	(0.009)	(0.009)
Operating Cash Flow		0.096***	0.057**	0.114***
		(0.013)	(0.029)	(0.036)
Leverage		0.048**	-0.064**	-0.093
		(0.020)	(0.033)	(0.078)
Interest Expense		-0.084	-0.345	0.381
		(0.184)	(0.259)	(0.849)
Net Worth		0.072***	0.032	0.048
		(0.015)	(0.026)	(0.033)
Current Ratio		0.001	-0.006	0.001
		(0.001)	(0.002)	(0.006)
Market-to-Book		0.019***	0.022***	0.061
		(0.001)	(0.002)	(0.010)
Lagged Covenant Controls	N	N	Y	Y
Higher Order Covenant Controls	N	N	N	Y
Industry × Year Fixed Effects	Y	Y	Y	Y
Observations	30,000	26,000	21,000	21,000
R^2	0.04	0.12	0.13	0.13