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ARE DIRECT LENDERS MORE LIKE BANKS OR ARM'S-LENGTH INVESTORS?

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ABSTRACT

I study whether direct lenders, which have been displacing banks in private equity (PE) buyouts, lend more like banks or arm's-length investors. Using a novel database for direct lender-held loans to PE buyouts, I find that nearly all senior loans originated by direct lenders include financial covenants. Upon covenant violation, direct lenders frequently impose additional restrictions on firms' activities during renegotiation, resulting in more conservative investment and financial policies. During the COVID-19 pandemic, direct lenders exhibited greater flexibility than banks in resolving distress through out-of-court renegotiation, in part facilitated by more equity injection from the firms' PE sponsors. Furthermore, direct lenders' prior relationships with PE sponsors were associated with more favorable continuation lending during the pandemic. Overall, similar to banks, direct lenders appear to actively monitor and engage in relationship lending.

CHAPTER 1

INTRODUCTION

> "*Would nonbank credit-providing institutions be able to provide credit when their clients need them the most? I personally doubt that.*" (Jamie Dimon, JP Morgan CEO, 2022)

Since the Great Financial Crisis, corporate lending has increasingly shifted away from the banking system. Banks have played a critical role in the economy as relationship lenders, collecting soft information on their borrowers through close monitoring and adapting lending terms accordingly (Diamond, 1991; Rajan, 1992). Hence, experts have warned that regulatory effort to limit bank lending may harm firms that benefit from bank monitoring (Smith, 2016). Additionally, as reflected in the opening quote, Jamie Dimon described many nonbank lenders as "fair-weather" friends who do not maintain relationships through challenging times.[1]

Among a wide array of nonbanks that emerged to fill the void left by banks, "direct lenders" – institutions that raise capital through private debt funds and business development companies (BDCs) and directly originate loans without bank syndication – have grown substantially. As of March 2023, direct lenders had deployed at least $919.3 billion of capital in loan investments in the US, suggesting that they have become a meaningful player when compared to the $1.4 trillion leveraged loan and $1.6 trillion high-yield bond markets.[2] Importantly, direct lenders primarily lend to private equity (PE) buyouts, where a PE sponsor acquires a firm using large amounts of debt and plays an active role in firm operations.[3] A survey by Block, Jang, Kaplan, and Schulze (2022) shows that 78% of loans made by US private debt funds are for PE buyouts.

1. https://www.nytimes.com/2023/05/06/business/dealbook/bank-crisis-shadow-banks.html

2. Sources: LSTA US Leveraged Loan Index and S&P US High Yield Corporate Bond Index (as of December 2023)

3. PE sponsor refers to the majority-owning PE investor of the firm.

Are direct lenders more like banks or arm's-length investors? After all, are they just fair-weather friends? The current literature does not provide a definitive answer. On one hand, several studies suggest that nonbanks tend to adopt a more arm's-length approach and contribute to financial fragility.[4] However, these papers consider a broader range of nonbanks beyond direct lenders and do not focus on PE-backed firms, while direct lending is primarily used by PE-backed firms. On the other hand, direct lenders surveyed by Block et al. (2022) indicate that they actively monitor and build close relationships with both borrowers and PE sponsors. Direct lenders' high-powered incentives and closely held organizational structure could imply that they have high monitoring and relationship lending incentives (Winton and Yerramilli, 2008; Berger and Udell, 2002).

In this paper, I empirically examine the direct lending market and find evidence that direct lenders, like banks, engage in active monitoring and relationship lending. I access a novel database of loans held by direct lenders through a valuation advisory firm that direct lenders rely on for third-party valuations. This database, referred to as the "Database" hereafter, contains confidential data on financial statements, loan agreements, covenant compliance, and restructuring history for direct lender-reliant PE-backed firms not available in standard data sources, providing a suitable setting to study direct lenders' lending decisions. The Database covers more than 3,000 PE-backed firms between 2013 and 2021, including nearly half of all BDC-reliant PE-backed firms, and is representative of the BDC universe as confirmed with a balance test on key loan metrics.

In the first half of the paper, I study whether direct lenders use covenants to monitor and intervene over borrower activities. I motivate the analysis with Aghion and Bolton (1992) model of state-contingent control, where creditors can detect deterioration in firm performance with financial covenants such that, upon violation, they exert control to limit

4. See, among others, Chernenko, Erel, and Prilmeier (2022); Loumioti (2022); Gopal and Schnabl (2022); Irani, Iyer, Meisenzahl, and Peydro (2021); Aldasoro, Doerr, and Zhou (2023). I discuss each of these papers in detail in the literature review as well as Section 2.1.

moral hazard. To examine the prevalence of covenants, I randomly select 400 senior loan agreements from the Database and read through each to collect data on covenant terms. Among those, 72% are loans originated by direct lenders ("Direct"), and the rest are bank-originated loans syndicated to direct lenders ("Bank").

I find that 99% of the sample "Direct" loans contain financial covenants. "Direct" loans also have more financial covenants based on EBITDA and capital expenditures and stricter negative covenant limits on debt issuance and investments relative to "Bank" loans to observably similar firms.[5] These findings align with Block et al. (2022), where surveyed direct lenders stated that they proactively use financial and negative covenants for monitoring. In contrast to prior studies that find that nonbank loans carry fewer covenants than bank loans (Chernenko et al., 2022; Loumioti, 2022), I do not find evidence that direct lenders use covenants any less than banks do.

Then, I investigate whether direct lenders exert control over covenant-violating borrowers. I identify firms that violated a covenant between January 2016 and March 2021, and then read through their renegotiated loan agreements to look for evidence of whether lenders contractually place restrictions upon violation. I find that 77% (67%) of "Direct" ("Bank") violations resulted in a loan amendment that required tighter financial covenants, negative covenants, and noncovenant monitoring-related terms (e.g. cash flow reporting frequency, board observation rights, appointment of a lender-approved financial advisor, scheduled lender meeting), as well as equity injection from the PE sponsors. Relative to "Bank" violations, "Direct" violations resulted in higher likelihoods of tighter liquidity and minimum EBITDA covenants, scheduled lender meetings, and sponsor equity injection. These results suggest that direct lenders contractually attempt to impose restrictions on firm activities and align PE sponsors' skin-in-the-game at least as frequently as banks do.

5. Unlike financial covenants, where the borrower's performances are checked on a periodic basis for ex-post monitoring, negative covenants ex-ante specify a set of actions that the borrower is prohibited from undertaking.

Further, examining post-violation changes in firm outcomes, I document that "Direct" violations are subsequently associated with divestitures, reduced investments and debt issuance, and increased cash holdings. The results on divestitures, reduced investments, and debt issuance remain robust to regression analyses that attempt to isolate violation effects from confounding effects arising from firm fundamentals that led to violations by flexibly controlling for pre-violation performance-related variables on which covenants are written. Hence, consistent with prior work on bank loan covenant violations (Nini, Smith, and Sufi, 2012), direct lenders appear to exert control over their covenant violators, pushing them towards more conservative investment and financial policies.

The second half of the paper studies whether direct lenders exhibit flexibility in resolving distress, in particular for borrowers with close relationships. Prior research has shown that, as banks form close relationships, they continue to supply credit to their borrowers during a period of distress (Bolton, Freixas, Gambacorta, and Mistrulli, 2016). To examine whether direct lenders behave similarly, I collect detailed information on distress resolution outcomes for all firms in the Database with either a covenant or payment default during the COVID pandemic. The COVID period provides a useful quasi-natural experiment setting to study lenders' ability to support their distressed borrowers because it not only was less predictable than other crises but also largely affected the liquidity conditions of the borrowers rather than the lenders (Berger, Bouwman, Norden, Roman, Udell, and Wang, 2021).

Distressed "Direct" borrowers renegotiated more flexibly relative to distressed "Bank" borrowers during the pandemic despite having similar levels of distress severity as measured by revenue contraction between Q4 2019 and Q4 2020. For example, the probability of payment deferral for "Direct" ("Bank") loans was 25% (9%), while that of bankruptcy proceeding was 3% (14%). This is consistent with Block et al. (2022), where 65% of the survey respondents indicate that they believe firms choose direct lenders over banks due to their ability to maintain stable relationships.

At the same time, "Direct" loans were associated with a higher likelihood of equity injection (40% vs 23%) from and a lower likelihood of subsequent exit (11% vs 23%) by the PE sponsors. These results imply that direct lenders do not renegotiate for free – they do so as long as the PE sponsors increase skin-in-the-game. These findings raise two interesting points. First, given the high reliance of direct lenders on PE sponsors for deal sourcing, one could expect the opposite, i.e., that direct lenders have low bargaining power over PE sponsors in renegotiation (Block et al., 2022). However, that does not appear to be the case.

Second, as also observed in the bank-syndicated loan market (Haque and Kleymenova, 2023), PE sponsors and direct lenders appear to share their relationship surplus in distress situations. It has been long understood that PE sponsors and lenders build relationships through repeated deals (Demiroglu and James, 2010; Ivashina and Kovner, 2011). To preserve relationship with lenders, PE sponsors may inject equity, providing lenders with downside protection (Bernstein, Lerner, and Mezzanotti, 2019; Hotchkiss, Smith, and Strömberg, 2021; Haque, Jang, and Mayer, 2023). To preserve relationship with PE sponsors, lenders may try to renegotiate out of court, giving a second chance to PE sponsors as bankruptcy would otherwise entirely wipe out PE sponsors' claims given the absolute priority rule (Buccola, 2022). Consistent with this relationship surplus-sharing hypothesis, I find that direct lenders provide more loans in the future to PE sponsors that injected equity. Hence, such mutual efforts by PE sponsors and direct lenders to preserve relationships and share relationship surplus appear to help firms navigate through distress.

As the final exercise, I test whether such relationships that direct lenders build with PE sponsors through repeated interactions explain variation in credit supply upon distress. First, I access all BDCs' quarterly loan holdings data from Refinitiv and identify the PE sponsors of those BDC-reliant borrowers from Pitchbook. Then, I use two different variables to proxy for the relationship between each PE-BDC pair: 1) an indicator for whether the pair had done a deal in the past five years, and 2) log number of their prior deals (plus 1).

Using these variables, I examine whether BDC lenders' prior relationships with PE sponsors ("PE-BDC" relationship) are associated with more favorable credit access to firms backed by those PE sponsors during the COVID pandemic.

One endogeneity concern is that PE sponsors bring firms with lower credit risk to BDCs with stronger relationships. If so, then a simple correlation may overstate the true effect of PE-BDC relationship on credit supply in distress times. To overcome this issue, as in Khwaja and Mian (2008) and Banerjee, Gambacorta, and Sette (2021), I focus on firms with multiple lenders and use an empirical strategy that controls for firm-time fixed effects. By doing so, I effectively hold credit demand fixed and compare changes in credit supply to the same firm by different BDC lenders that have varying relationships with the firm's PE sponsor.

I find that prior PE-BDC relationships were associated with more favorable continuation lending during COVID, in the form of higher credit growth and lower interest rates, with the former being more pronounced among firms in industries more heavily disrupted by the pandemic. The results are similar on both relationship measures (i.e. indicator for and log number of prior deals within each PE-BDC pair). Moreover, the inclusion of firm-time fixed effects leads to higher estimates, suggesting that the estimates generated without the fixed effects likely underestimate the true effects. This partially distills the aforementioned endogeneity concern. Furthermore, estimations without the fixed effects on the full sample of firms yield similar estimates, implying that the documented relationship effects may even apply to single BDC-reliant firms. Overall, these findings support the hypothesis that direct lenders' stable relationships with PE sponsors help them lean against the wind and continue supplying credit during challenging times.

Taken together, direct lenders appear to actively monitor and exert control using covenants and exhibit flexibility in resolving distress. These results are consistent with an interpretation that the relationships that direct lenders cultivate with PE sponsors through repeated

deals allow them to effectively monitor and adapt lending terms in times of stress (Block et al., 2022). Hence, unlike arm's-length investors, but more like traditional banks, direct lenders behave as relationship lenders. This view raises two important questions.

First, what explains direct lenders' active monitoring? A theory by Winton and Yerramilli (2008) provides one explanation. In their theory, private equity and venture capital funds have greater monitoring incentives than banks because the former face higher funding costs and have a compensation structure marked by high-powered incentives. Direct lenders not only have a similar funding structure and sources (i.e. mostly locked-up equity financing from institutional investors) but also a similar compensation structure (i.e. management fees and carried interests) as private equity and venture capital funds. Furthermore, because the loans that direct lenders originate are not readily traded in secondary markets, they likely have a greater incentive to enhance returns through close monitoring rather than active trading.

Second, given that direct lenders provide relationship lending as bank do, does that mean that banks should no longer be viewed as special? Not necessarily. Another critical function of banks is liquidity creation, accommodating liquidity demands of depositors and borrowers on both sides of their balance sheet (Kashyap, Rajan, and Stein, 2002). Several facts that I present in this paper corroborate that banks are still more uniquely positioned than direct lenders to meet corporate liquidity demands. For example, banks provide more revolver financing than direct lenders to observably similar firms, and direct lenders also frequently rely on lines of credit at the fund level. Hence, even if direct lenders may be better than banks in assuming credit risk, we cannot rule out the possibility that they could not have achieved the same outcomes in a counterfactual world where they do not rely on bank lines of credit. If the answer is yes, then banks could be viewed as even more special for their ability to assume liquidity risk, thereby supporting nonbank intermediation.

Literature. This paper contributes to three different strands of literature.

First, it adds to the growing literature on direct lending by private debt funds and BDCs,

a type of nonbank lending that has grown substantially since the Great Financial Crisis ("GFC"). Munday, Hu, and Zhang (2018) study the performance of private debt funds, and Block et al. (2022) survey a meaningful group of US and European private debt funds. Fritsch, Lim, Montag, and Schmalz (2022) study various factors that contributed to the growth of direct lending, and Erel and Inozemtsev (2022) focus on regulation as a major driver of direct lending growth. Davydiuk, Marchuk, and Rosen (2022) find that direct lending by BDCs has spurred middle-market growth. Buchner, Lopez-de Silanes, and Schwienbacher (2022) study conflicts of interest in buyouts where both equity and debt are financed by the same entity's private equity and debt funds.

More specifically, this paper contributes to the understanding of the effects of nonbanks on credit supply and financial stability in the face of increased post-GFC banking regulation. Irani et al. (2021) find that greater nonbank participation in syndicated loans was associated with greater fragility during the 2008 crisis. Aldasoro et al. (2023) document that lending relationships with nonbanks do not improve borrowers' access to credit during crises in a global setting. Gopal and Schnabl (2022) find that compared to traditional banks, nonbanks that lend to small businesses focus more on collateral and less on monitoring cash flow risk. This paper is most closely related to Chernenko et al. (2022) and Loumioti (2022), who document that a wide variety of nonbanks that lend to public middle-market firms use fewer covenants than banks do. Contrary to previous studies that portray nonbanks as more arm's-length, I find that direct lenders closely monitor borrowers and PE sponsors and practice relationship lending.

Second, this paper adds to the literature that studies the role of PE sponsors in debt financing. Consistent with theory (Malenko and Malenko, 2015; Gryglewicz and Mayer, 2022), Demiroglu and James (2010) and Ivashina and Kovner (2011) document that PE sponsors help borrowers obtain cheaper financing by pledging reputational capital built through repeated interactions with banks. Bernstein et al. (2019), Hotchkiss et al. (2021), Gompers,

Kaplan, and Mukharlyamov (2022), Haque et al. (2023), and Haque, Mayer, and Wang (2023) document that PE sponsors offer financial and operational help to portfolio companies in times of stress. Haque (2022) and Haque et al. (2023) find that, due to the reduction in distress costs from PE sponsors' active engagement, PE ownership ex-ante raises optimal leverage as well as access to cash flow-based debt. This paper is most closely related to Haque and Kleymenova (2023), who find that covenant violations lead to lower credit contraction for PE-backed firms relative to non PE-backed firms, and that the effects are greater for firms backed by more reputable PE sponsors. This paper adds to this literature by being the first to both document the importance of PE-lender repeated interactions in a nonbank setting and identify their credit supply effects in times of stress.

Lastly, it contributes to empirical work on financial contracts. Since the work of Kaplan and Stromberg (2003) that studies venture capital contracts to draw important connections to existing financial contracting theories, various studies have tested such theories on debt contracts using text-analysis based methods. Roberts and Sufi (2009a,b), Nini, Smith, and Sufi (2009); Nini et al. (2012), and Roberts (2015) examine creditor influence over borrowers by analyzing loan agreements and conducting event studies around covenant violations identified from firms' SEC filings. More recently, Becher, Griffin, and Nini (2022), Ivashina and Vallee (2022), Brauning, Ivashina, and Ozdagli (2022), and Buccola and Nini (2022) study the complexities of loan contracts embedded in negative covenants. This paper adds to the literature by being the first to apply similar text-based approaches to loan agreements negotiated among PE sponsors and direct lenders.

CHAPTER 2

INSTITUTIONAL BACKGROUND

In this section, I review existing studies on post-GFC growth of nonbank corporate lending. Then, I provide a detailed summary of key institutional facts about direct lenders.

2.1 Post-GFC rise of nonbank lenders

The Great Financial Crisis ("GFC") of 2008 gave rise to a series of regulation that impeded credit supply from the banking sector (Erel and Inozemtsev, 2022).[1] As a result, a wide variety of nonbank lenders have emerged to filled the gap. In the bank-syndicated loan market, institutional investors such as hedge funds, mutual funds, and, in particular, collateralized loan obligations (CLOs), have become major buyers of term loans (Irani et al., 2021).[2] Post-GFC bank disintermediation has been more conspicuous among smaller firms (Ares, 2020). In the context of middle-market firms[3], Chernenko et al. (2022), Loumioti (2022), and Davydiuk et al. (2022) find that a wide variety of nonbank lenders, such as finance companies, insurance companies, hedge funds, and direct lenders, have increasingly been originating loans without going through bank syndication. In the context of small businesses, Gopal and Schnabl (2022) document that finance companies and fintech lenders have markedly increased lending.

1. For example, globally, "Basel III" was implemented by the Bank for International Settlements in 2013 to increase bank capital and liquidity requirements. In the US, stress tests required by the Dodd-Frank Act additionally increased capital requirements for large bank-holding companies. Furthermore, the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, and the Federal Deposit Insurance Corporation collectively updated the Interagency Guidance on Leveraged Financing in 2013 to tighten banks' underwriting standards and limit their exposure in leveraged lending.

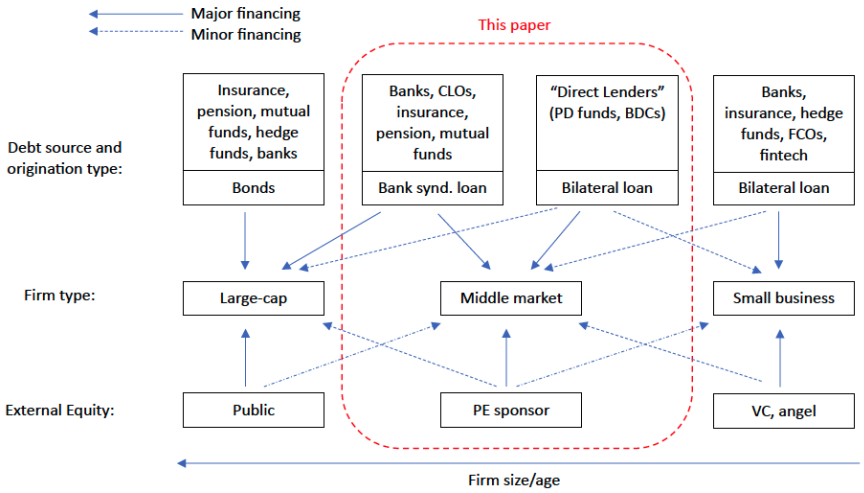
2. The increase in their presence has also coincided with the rise of covenant-light term loans, i.e. those without a financial covenant (Becker and Ivashina, 2016). Despite the arm's-length nature of these nonbank lenders, Berlin, Nini, and Yu (2020) show that the lead banks still retain their monitoring capacity through a split control right, where the revolving lines of credit that they fund almost always contain a financial covenant.

3. According to the National Center for the Middle Market, middle-market firms are defined as firms with annual revenue between $10 million and $1 billion.

Many of these papers suggest that these nonbanks in general are more arm's-length than banks, e.g. using less covenants (Chernenko et al., 2022; Loumioti, 2022) and not engaging in relationship lending (Aldasoro et al., 2023), and adding financial fragility risk (Irani et al., 2021). In fact, in a recent poll conducted by Kent Clark Center of 41 renowned scholars in finance and economics, 68% of the respondents responded with either "Strongly Agree" or "Agree" to the statement, "Non-bank financial intermediaries pose a substantial threat to financial stability."[4]

Figure 2.1 illustrates the typical firm financing landscape today. This paper focuses on direct lenders, which have become major debt providers for middle-market PE buyouts.

Figure 2.1: Firm financing landscape



Note: This figure illustrates the typical financing (both debt and equity) landscape by firm type (large-cap, middle-market, and small business). Blue solid lines signify major forms of financing and blue dashed lines signify minor forms of financing. CLOs refer to collateralized loan obligations, PD funds refer to private debt funds, BDCs refer to business development companies, and FCOs refer to finance companies. The debt types considered are bonds, bank-syndicated loans, and bilateral loans, and the equity types considered are public equity, private equity (i.e. buyout), and others (e.g. venture capital/angel/family-owned).

4. https://www.kentclarkcenter.org/surveys/non-bank-financial-intermediaries-2/

2.2 Basics of direct lenders

I highlight some key facts about direct lenders' financing, founding history, and investment features.

2.2.1 Financing structure

Direct lenders raise two types of closed-end funds: private debt funds and business development companies (BDCs) (Ares, 2020).

Private Debt Fund. Private debt funds – also known as private credit funds – refer to closed-end funds that make loans to corporations. Similar to private equity and venture capital funds, they raise capital through a limited partnership with a fixed life, usually from long-term investors such as insurance companies, pension funds, and endowments (Block et al., 2022). While private debt funds employ different strategies, most private debt funds specialize in "direct lending," i.e. direct loan origination without bank syndication (Munday et al., 2018; Block et al., 2022).

Business Development Company. Another major financing structure that supports direct lending is the business development company (BDC). BDCs, which only exist in the US, were created in 1980 under the Small Business Investment Incentive Act of 1980 to spur investments in small enterprises. Similar to private debt funds, BDCs are structured as closed-end funds. However, unlike private debt funds, BDCs are subject to certain SEC regulatory requirements and special tax treatments, and can be listed on public equity exchanges.[5]

5. For example, BDCs are required to invest at least 70% of their assets in domestic operating companies not publicly listed, or exchange-listed companies with less than $250 million in market capitalization. The SEC also requires BDCs to disclose the fair values of their investments on a quarterly basis. Furthermore, BDCs are subject to leverage limits, up to 2-to-1 in debt to equity (Gonzales-Uribe and Balloch, 2021). Lastly, most BDCs can elect to be treated as regulated investment companies (RIC) for tax purposes (similar to REITs), whereby they can bypass corporate income taxes if they distribute at least 90% of their taxable

GP Compensation. Similar to private equity and venture capital funds, the investment professionals (also called the general partners or GPs) in private debt funds and BDCs are compensated in management fees and carried interest, the latter of which generate high-powered incentives to maximize returns. Unlike private equity and venture capital funds, management fees in private debt funds and BDCs are typically charged on invested capital, not committed capital, to mitigate the effects of the J-curve return structure common in most private capital investments (Ares, 2018).[6]

Leverage. While direct lenders rely mostly on equity financing from institutional investors through private debt funds and BDCs, they also raise debt financing on these funds. The mean (median) leverage used by US private debt funds surveyed in Block et al. (2022) is 42% (25%) of total capital. BDCs tend to use more leverage. As shown in Figure B.3 Panel A, the mean (median) debt/assets leverage across 128 BDCs – 50 public and 78 private – as of 2022 was 44% (51%). Based on my hand-collected data from BDCs' loan agreements available through the SEC filings, 78% (83%) and 26% (34%) of public (private) BDCs had a revolver and a term loan from a bank, respectively. According to Capital IQ, the mean fractions of outstanding bonds, term loans, and revolvers to total debt for public BDCs were 62%, 13%, and 31%, respectively (Figure B.3 Panel B).[7]

Market Size. As shown in Figure B.1 in the Appendix, total private debt fund assets under management globally and in the US amounted to $1.478 trillion and $914 billion as of December 2022, respectively. Excluding dry powder, total capital deployed by US private

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investment income as dividends.

6. According to Cambridge Associates, BDCs typically charge a 1.25% management fee and a 20% incentive fee, and private debt funds tend to charge an 0.8% management fee and a 10% incentive fee. See more detail in: https://www.cambridgeassociates.com/insight/private-direct-lending-or-public-bdcs-guidance-for-pension-plan-sponsors/

7. Capital IQ does not track debt composition for private BDCs nor private debt funds, but given their relative opacity compared to public BDCs, it is likely that they rely more on bank loans than bonds.

debt funds was $695.5 billion as of March 2023. The growth of BDCs materially took off post-GFC (Davydiuk et al., 2022), but also post-pandemic. As shown in Figure B.2, total BDC assets as of September 2022 amounted to $268 billion. Of these, $223.8 billion has been deployed for loan investments.

Hence, combined, direct lenders deployed at least $919.3 billion of capital towards loan investments in the US. This is an underestimate because it excludes leverage used by private debt funds. According to the US financial accounts, total outstanding corporate bonds, bank corporate loans, and nonbank corporate loans to US nonfinancial firms were $6.88 trillion, $2.59 trillion, and $3.29 trillion as of March 2023, respectively. This means that the loans held by US direct lenders make up at least 7% of US corporate debt and 28% of US nonbank corporate loans today.

2.2.2 Founding and fundraising history

For 67 direct lenders studied in this paper as well as in Block et al. (2022), I present novel facts about their founding and fundraising background from Pitchbook, Preqin, and Google searches.

Direct lenders' human capital largely originate from PE and Banking industries. As displayed in Table A.2 Panel A, 51% of the direct lenders were founded post-GFC. 48% of the direct lenders were founded either through a spin-off from a bank (10%) or by a founder who has held at least a managing director role at a bank right before founding (46%).[8] 54% of the direct lenders were either affiliated under a PE buyout firm (33%) or founded by a person who has held at least a managing director role at a PE buyout firm right before founding (27%). Finally, around 9% of the direct lenders were affiliated either under an

8. According to JP Morgan, "chief executives at nine of the 10 largest direct lenders all at one point worked in traditional bank lending." Source: https://privatebank.jpmorgan.com/nam/en/insights/markets-and-investing/ideas-and-insights/can-private-credit-continue-to-perform

insurance or a pension fund company.

Most direct lenders rely on private debt funds, and more experienced rely on BDCs. As displayed in Table A.2 Panel A, an average direct lender has raised 6.3 direct lending-focused private debt funds and 1.2 BDCs as of 2022. 42% have only raised a direct lending-focused private debt fund, and 13% have raised only a BDC. Among the 45% that have raised both, the mean (median) fraction of capital committed towards BDCs was 25% (15%), suggesting that direct lenders raise more capital through private debt funds. Table A.2 Panel B presents the results by age – "Old" (founded before 2008) and "Young" (founded in or after 2008). Younger direct lenders are less likely to have a BDC. Indeed, as shown in Panel C, both the presence and log number of BDCs (plus 1) in direct lenders are significantly and positively associated with their log age (plus 1). Hence, it appears that direct lenders tend to rely more on BDCs as they build a track record.

2.2.3 Investment characteristics

Direct lenders specialize in "direct lending," i.e. directly originate loans without bank syndication. The negotiation is usually done by a single lender or a small syndicate of lenders who intend to hold to maturity (Ares, 2018). Below, I document several novel facts about direct lending.

Unlike bank-syndicated loans, direct loans are not frequently traded. Blickle, Fleckenstein, Hillenbrand, and Saunders (2022) find that, in more than 50% of bank-syndicated deals, even the lead banks sell the entire term loan stake within days of origination. On the contrary, as shown in Figure B.5, BDCs trade out within a year of origination in less than 20% of the deals, with the median BDC selling off its entire position after 10 quarters. However, it is important to note that, as I later show in Section 3, some direct lenders do participate in bank-syndicated loans.

Direct lenders primarily lend to PE buyout deals. As described before, direct lenders mostly lend to PE buyouts. According to Block et al. (2022), 78% of loans made by the surveyed US private debt funds were used for buyouts. The picture is similar for BDCs. As shown in Figure B.4, the fraction of senior loans held by BDCs used for buyouts was 63% as of September 2022.[9]

PE-affiliated direct lenders rarely lend to their parent PE firm's buyout deals. Given direct lenders' strong focus on PE buyouts and high prevalence of PE-affiliation, PE firms may often use their own direct lending arm to finance the debt of their buyout deals. If true, then, as Buchner et al. (2022) note, there may be agency conflicts between the equity fund and debt fund within the PE firm. I examine the prevalence of such deals using Pitchbook deal data.

Among the buyout deals (tracked by Pitchbook) lent to by the 22 PE-affiliated direct lenders in Table A.2 between 2011 and 2022, I compute the fraction of those that were sponsored by their own PE parent firm, termed as "sponsor-levered" deals. As displayed in Figure B.6 Panel A, while sponsor-levered deals were more common in the early 2010s, they are less common today, averaging less than 10% a year between 2015 and 2022. Subsetting to senior debt deals (Figure B.6 Panel B), a more common form of direct lending, the frequencies drop by nearly half. Hence, PE investors do not appear to primarily use their credit arms to finance their own buyout deals.

Loan investments are often made at the firm level (not fund). To investigate whether private debt funds and BDCs within the same direct lender firm share loans or operate separately, among 30 direct lenders in Table A.2 with both a private debt fund and a BDC, I randomly select 300 of their private debt fund deals from Pitchbook. Then, I cross-check them with BDCs' loan holdings data from Refinitiv to determine the fraction

9. I describe the data construction in Section 3.2 in detail).

of those jointly held in their BDCs. By count, 43% of the loans held by their private debt funds also appeared in their BDCs, implying a significant overlap in deal activities within these direct lender firms. This suggests that not only are loans often made at the parent firm level, but the BDC's publicly available loan portfolio through the SEC can partially reflect the entire loan portfolio across funds.

2.3 Takeaways

I conclude this section highlighting the following facts. First, direct lenders raise financing through both private debt funds and BDCs, and there is a significant overlap in loans held by both as investments are typically made at the firm level. Second, direct lenders primarily lend to PE buyouts, but PE-affiliated direct lenders rarely lend to their PE parent buyout deals. Third, direct lenders do not often trade in secondary markets and intend to hold to maturity. Finally, direct lenders' human capital appears to have largely originated from the private equity and banking industries, both of which have been traditionally associated with monitoring-intensive investment approach (Kaplan and Stromberg, 2009; Nini et al., 2012). The last two points, combined with high-powered incentives in their compensation structure, may imply that direct lenders employ a monitoring-intensive lending approach to maximize returns (Winton and Yerramilli, 2008).

CHAPTER 3

DATA

In this section, I describe the main data source that I use to study direct lenders' lending approach.

3.1 Description

Loan-level data on private companies, particularly those borrowing from nonbank lenders, are limited in standard data sources due to the absence of regulatory reporting requirements. Instead, I obtain access to a novel database for loans held by direct lenders, provided by an anonymous US valuation-advisory firm that mainly serves direct lenders for third-party valuation.[1] The database includes confidential data on financial statements, loan agreements (including subsequent amendments), covenant compliance, and restructuring history of primarily PE-backed middle-market borrowers. I will provide a detailed explanation of each of these data sets later as I utilize them in my analyses. Henceforth, I refer to this data source as the "Database."

Nearly all the loans present in the Database are loans held by direct lenders with a private fund or BDC. These include loans that these direct lenders originated directly as well as bank-syndicated loans in which they have invested, and the vast majority are used to finance PE buyouts within the US. Among 55 direct lenders that appear in the Database, 21 of them appear in the top 25 direct lenders in terms of private debt fund assets under management according to Preqin, suggesting that the Database covers most of the bigger and experienced direct lenders. Before delving into sample construction, I conduct further investigations to determine the reliability of the Database.

1. Many private capital fund managers, especially BDCs, use third-party valuation firms to arrive at fair values of their investments. See, for example,
https://www.mayerbrown.com/-/media/files/perspectives-events/publications/2022/05/business-development-company-guide-for-capital-markets.pdf?rev=cb0498be4e604c49a86d837c1e30cc34.

3.2 Representativeness

To assess the representativeness of the direct lending deals in the Database, I first compare them with BDCs' quarterly investments, publicly available through the SEC. Then, I cross-check with key statistics from white papers published by one of the most reputable direct lenders in the US.

Cross-checking with BDC Loan Holdings. I obtain access to the quarterly investment holdings of all BDCs from Q1 2012 to Q3 2022 from Refinitiv's BDC Collateral. This product compiles all BDCs' investments from their SEC filings into a quarterly panel dataset. The dataset includes information such as firm name, industry, and key loan metrics, such as maturity, seniority, par amount, fair value, interest rate, and non-accrual status (i.e. non-performing loans).

This BDC dataset does not provide information on PE-backing status. Hence, I acquire the list of PE buyouts from Pitchbook and manually hand-match them with the BDC dataset on investee names. Through this process, I identify a total of 4,729 PE-backed firms that borrowed from BDCs between Q1 2012 and Q3 2022. Among these, I find that 2,272 (48%) appear in the Database, suggesting that the Database covers a significant fraction of BDC-reliant PE-backed firms.

I also test the representativeness of the Database by performing a balance test over the following variables: interest rates, nonperforming status, and number of BDCs. I collapse two interest rate variables, Spread over LIBOR (Cash) and Spread over LIBOR (Cash + PIK), by taking the average at the firm level. For the other two variables, I take the maximum at the firm level.

Table 3.1 reports the balance test results. The BDC-reliant PE-backed firms that appear in the Database do not display statistically significant differences in terms of cash spread over LIBOR, total spread over LIBOR, and the likelihood of reporting a nonperforming loan

Table 3.1: Balance test results

	In Database		Not in Database		
	Mean	SD	Mean	SD	Mean Difference
Spread over LIBOR (Cash, bps)	695.479	253.423	707.366	266.830	-11.887
Spread over LIBOR (Cash + PIK, bps)	741.689	285.739	748.277	290.920	-6.588
Non-accrual	0.028	0.120	0.031	0.139	-0.003
Number of BDCs	2.098	1.554	1.605	1.215	0.493***
Observations	2272		2457		

* $p < .10$, ** $p < .05$, *** $p < .01$

*Note: This table reports the balance test results for BDC-funded PE buyout firms that appear in the Database and those that do not appear in the Database. The list of BDC-funded PE buyout firms was constructed by merging the quarterly BDC asset-level holdings data from Refinitiv BDC Collateral and the list of PE buyouts from Pitchbook. The interest rate variables (Spread over LIBOR, Cash and Cash + PIK) were computed as the average at firm level, and non-accrual and number of BDCs, the maximum at firm level. *, **, and *** indicate the statistical significance for mean differences at 10%, 5%, and 1%, assuming unequal variances.*

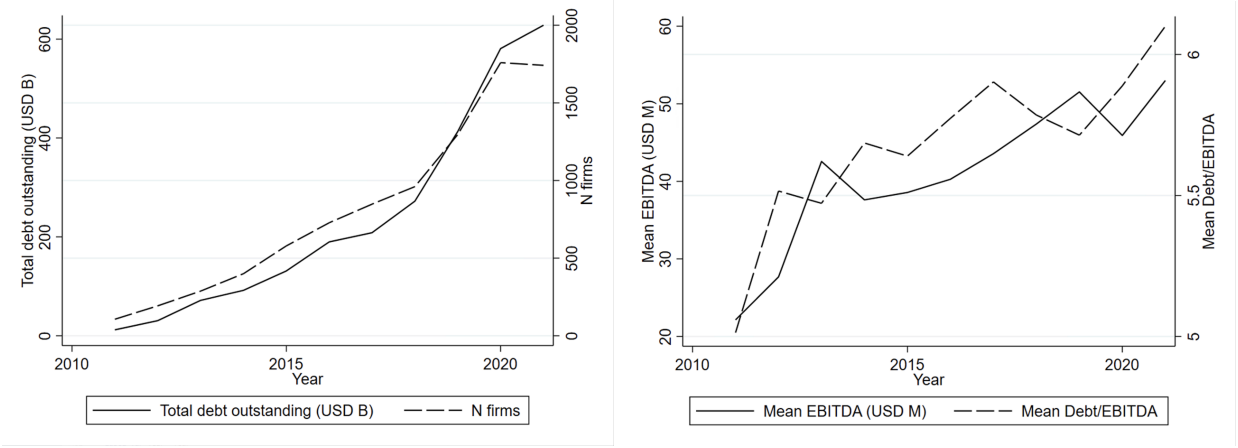
when compared to those that do not appear in the Database. Consequently, those that show up in the Database likely have a similar distribution of riskiness with those not in the Database.

However, I observe that the firms appearing in the Database tend to borrow from a greater number of BDCs. This is not surprising as the data in the Database were sourced from the lenders, not the firms. That is, the more lenders a firm borrows from, the more likely one of those lenders provide data, therefore the more likely that firm appears in the Database. Hence, it is important to note that the firms analyzed in this paper may be larger and more likely to have loans syndicated among multiple direct lenders compared to average direct lending-reliant firms.

Cross-checking with Industry White Papers. Ares Management, which has one of the largest active BDCs in the US, Ares Capital Corporation, has published two white papers on direct lending that have been widely cited among industry practitioners and academics (Ares, 2018, 2020; Loumioti, 2022). Therefore, I compare key statistics on direct lending-reliant borrowers presented in these white papers with those observed in the Database.

According to these white papers, the average EBITDA and debt-to-EBITDA leverage, and the estimated total size for US middle-market direct lending deals are reported as $40 million, 5.0, and $412 billion, respectively, as of 2018 (Ares, 2018, 2020). Using the financial data of firms that appear in the Database between 2011 and 2021, I plot the number of borrowers and total debt on their balance sheet in Figure 3.1 Panel A, and mean EBITDA and Debt/EBITDA multiple in Panel B.

Figure 3.1: Key statistics of the Database (2011-2021)



Panel A: Number of firms and total debt outstanding

Panel B: Mean EBITDA and Debt/EBITDA

Note: This figure shows some of the key statistics of the Database. Panel A plots the number of firms and the sum of their total debt outstanding as of each fiscal year from 2011 to 2021. Panel B plots the mean EBITDA and Debt/EBITDA of these firms as of each fiscal year from 2011 to 2021. Debt/EBITDA is winsorized at 5% to minimize the influence of outliers.

As depicted in Panel A, the total debt outstanding for all direct-lending reliant borrowers in the Database amounts to approximately $628 billion as of 2021. As I later show using randomly selected PE-backed deals in Section 5, this is roughly equally split between direct lending deals (53%) and bank-syndicated deals (47%).[2] Considering that banks hold a very small share of the loan in direct lending deals (as I later show in Table 3.3), it can be inferred

2. Table 3.3 reports the summary statistics of 400 randomly selected loans in the Database. Among these, 288 are PE-backed direct lending deals with mean loan commitment of $123M and 112 PE-backed bank-syndicated deals with mean loan commitment of $278M. This means that roughly $(288 \times 123)/(288 \times 123 + 112 \times 278) \approx 53\%$ of debt held by firms in the Database are from direct lending deals.

that at least $300 billion of these firms' debt was provided by direct lenders, encompassing nearly one-third of the $919.3 billion US direct lending market (estimated earlier in Section 2.2).

According to Figure 3.1 Panel B, the average EBITDA and Debt/EBITDA between 2014 through 2019 fall within the of range $38 to $52 million and 5.6 to 5.9, respectively. Compared to the numbers in Ares (2018) ($40 million and 5.0), the average EBITDA is slightly higher and Debt/EBITDA is also slightly higher. However, this is consistent with PE-backed firms typically being larger and more levered than typical private firms in the US (Haque et al., 2023).

In sum, the Database covers a substantial number of PE-backed firms with total debt representing a meaningful portion of the direct lending market. Their firm- and loan-level estimates also align closely with industry estimates, reinforcing the Database's reliability to study direct lending.

3.3 Key firm and loan characteristics of direct loan borrowers

Who borrows from direct lenders, and what are key direct loan contractual terms? To investigate these questions, I utilize the data from financial statements and loan agreements in the Database.

Sample Construction. I begin with all senior, first-lien loans in the Database originated between 2013 and 2019[3], and subset to all nonfinancial, PE-backed, middle-market firms (i.e. max annual sales between $10 million and $1 billion). Using the firms' financial statement data, I further restrict the sample to those with nonmissing data on total assets. Then, I randomly select 400 loans for which the original loan agreements were available. As explained

3. I focus on the pre-COVID period and exclude loans originated before 2013 because, as shown in Figure 3.1, not only is the coverage low, but also the statistics on EBITDA and Debt/EBITDA are noticeably different from those in the later years.

before, these could either be direct lender-originated or bank-syndicated. Following Ivashina and Kovner (2011), I use the information on lead lender identity (i.e. "administrative agent") from the loan agreements to classify the loans into a direct loan if the lead lender is a direct lender and a bank-syndicated loan if the lead lender is a bank. The final sample contains 288 direct and 112 bank-syndicated loans to PE-backed middle-market firms, abbreviated as "PE-Direct" and "PE-Bank," respectively.

I also collect a sample of bank-syndicated loans to public middle-market firms ("Public-Bank") because comparing this sample with the "PE-Bank" sample would help us understand how PE-backed firms differ from public firms in loan demand. To this end, I merge Dealscan with Compustat to construct a sample of bank-syndicated loans to public, nonfinancial, middle-market firms, and then randomly select 400 for which loan agreements were available through the SEC EDGAR database.

Table 3.2: Sample of loan agreements for manual reading

	PE-Direct	PE-Bank	Public-Bank	Total
2013	17	10	84	111
2014	24	11	77	112
2015	36	9	76	121
2016	37	14	42	93
2017	66	22	43	131
2018	63	23	39	125
2019	45	23	39	107
Total	288	112	400	800

Note: This table reports the number of loan agreements by origination year and financing type for middle-market firms, randomly sampled for manual reading. The sample period is from 2013 to 2019, and three financing types that are considered are PE-Direct, PE-Bank, and Public-Bank.

Table 3.2 reports the number of loan agreements by origination year and financing type. Not surprisingly, the number of "Public-Bank" loans decreased over the period, especially after 2015. During the same time, the number of loans to PE-backed firms, both "PE-Direct" and "PE-Bank," increased, with the former at a slightly faster pace.[4] It is important to note

4. The overall contrasting trend between public and PE-backed firm deals among the bank-originated deals

that the increases in "PE-Direct" and "PE-Bank" loans are also driven in part by the fact that the data provider has continuously expanded its valuation business to direct lenders in recent years.

Data collection from loan agreements. I now manually read through the loan agreements and collect the following set of data. First, loan agreements typically include a revolving credit facility and a term loan.[5] For each facility, I record basic loan terms such as the total commitment amount, interest rate spread over LIBOR (and indicator for pricing grid), and maturity date. I also record an indicator for a borrowing base – typically used in asset-based lending – where the firm's debt capacity is limited by the value of the specific assets pledged as collateral (Lian and Ma, 2021). Furthermore, for "PE-Direct" loans, I also record whether there is a bank syndicate.

Then, I collect loan terms that are related to monitoring. These include seven common types of financial covenants (debt to cash flow, coverage ratios, minimum cash flow, net worth, debt to balance sheet, liquidity, and capital expenditures) studied in prior literature (Nini et al., 2009, 2012). For the debt to cash flow and capital expenditure covenants, I also record their relevant thresholds. I also record an indicator for an equity cure right, which allows the borrower to inject equity to "cure" a financial covenant breach arising from a cash flow shortfall.

Furthermore, I collect data on negative covenants. Unlike financial covenants, where the

is interesting because it seems to imply that the effect of post-crisis regulation that curbed bank lending could have been concentrated among public firm deals. This may be due to the fact that the "PE-Bank" deals in my sample are those that direct lenders invested in; hence, while the banks may have originated the loans, they could have sold the majority of the loans to unregulated entities such as direct lenders and other nonbanks (Haque et al., 2023). While this is possible, as I later show in Section 6 using data collected from loan amendments during COVID, the lead banks rarely relinquishes their role as the lead agent over time. Hence, the lead banks in "PE-Bank" deals likely maintain considerable exposure in the loans throughout the loan life.

5. Sometimes there is also a delayed draw term loan, which allows the borrower to withdraw predefined amounts of loan with an expiration date for withdrawal. I separately record whether this facility exists but not its specific terms.

borrower's performances are checked on a periodic basis for ex-post monitoring, negative covenants ex-ante specify a set of actions that the borrower is prohibited from undertaking. Recent work has suggested that negative covenants can be as important as financial covenants for contractual allocation of control rights (Ivashina and Vallee, 2022; Brauning et al., 2022; Buccola and Nini, 2022). For select types of negative covenants (debt issuance, investment, acquisitions, and asset sales), I collect the dollar amount of activity permitted under each. Also commonly referred to as "baskets" or "deductibles" by industry practitioners (Ivashina and Vallee, 2022), these limits capture the degree of flexibility. Appendix A describes these more in detail.

Firm characteristics. Before comparing loan terms, I first compare key firm characteristics by financing type ("PE-Direct," "PE-Bank," and "Public-Bank"), displayed in Table 3.3 Panel A.

Among firms with bank-syndicated loans, "PE-Bank" firms are smaller, more profitable, more levered, and have less tangible fixed assets (Net PP&E) than "Public-Bank" firms. These are consistent with PE investors targeting small, financially constrained private firms with competitive business models that produce stable cash flow (Gompers, Kaplan, and Mukharlyamov, 2016).

Table 3.3: Key characteristics by financing type

Panel A: Firm characteristics

	PE-Direct				PE-Bank				Public-Bank			
	N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD
I(Upper Middle-Market)	288	0.059	0.000	0.236	112	0.152**	0.000	0.360	400	0.365***	0.000	0.482
Assets (USD M)	288	173.685	107.211	223.315	112	363.469***	252.044	377.708	400	849.819***	538.916	964.071
EBITDA/Assets	288	0.187	0.131	0.231	112	0.177	0.148	0.107	400	0.104***	0.106	0.122
I(EBITDA<0)	288	0.063	0.000	0.242	112	0.000***	0.000	0.000	400	0.065***	0.000	0.247
Cash/Assets	288	0.074	0.031	0.115	112	0.061	0.024	0.098	400	0.104***	0.060	0.118
Net PP&E/Assets	288	0.158	0.098	0.172	112	0.151	0.091	0.168	400	0.365***	0.236	0.315
Inventory/Assets	288	0.135	0.071	0.151	112	0.114	0.081	0.123	400	0.090*	0.017	0.133
Receivable/Assets	288	0.171	0.129	0.148	112	0.124***	0.106	0.090	400	0.120	0.104	0.099
Debt/Assets (pre-deal)	288	0.514	0.489	0.296	112	0.587**	0.578	0.254	400	0.322***	0.272	0.236
FF 5 Industry: Consumer	288	0.358	0.000	0.480	112	0.196***	0.000	0.399	400	0.122*	0.000	0.328
FF 5 Industry: Healthcare	288	0.087	0.000	0.282	112	0.134	0.000	0.342	400	0.085	0.000	0.279
FF 5 Industry: High Tech	288	0.243	0.000	0.430	112	0.205	0.000	0.406	400	0.302**	0.000	0.460
FF 5 Industry: Manufacturing	288	0.104	0.000	0.306	112	0.170	0.000	0.377	400	0.235	0.000	0.425
FF 5 Industry: Other	288	0.208	0.000	0.407	112	0.295*	0.000	0.458	400	0.255	0.000	0.436

Table 3.3: Key characteristics by financing type (continued)

Panel B: Loan characteristics

	PE-Direct				PE-Bank				Public-Bank			
	N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD
Total commitment (USD M)	288	122.639	81.100	119.412	112	277.605***	189.000	318.511	400	286.894	200.000	274.335
Debt/Assets (at issuance)	288	0.644	0.527	0.474	112	0.770**	0.608	0.544	400	0.336***	0.306	0.220
Spread over LIBOR (bps)	288	676.819	650.000	188.903	112	488.290***	475.000	138.628	400	284.438***	250.000	158.193
Days to maturity	288	1893.694	1826.000	308.765	112	2121.679***	2191.000	407.514	400	1761.205***	1826.000	491.751
I(Revolver)	288	0.691	1.000	0.463	112	0.875***	1.000	0.332	400	0.900	1.000	0.300
I(Term loan)	288	0.997	1.000	0.059	112	0.946***	1.000	0.226	400	0.445***	0.000	0.498
Revolver commitment ratio	288	0.101	0.089	0.117	112	0.194***	0.132	0.237	400	0.692***	1.000	0.389
I(Borrowing base)	288	0.090	0.000	0.287	112	0.170**	0.000	0.377	400	0.263**	0.000	0.441
I(Bank syndicate)	288	0.153	0.000	0.360	112	1.000***	1.000	0.000	400	1.000	1.000	0.000
I(Financial covenant)	288	0.986	1.000	0.117	112	0.964	1.000	0.186	400	0.915*	1.000	0.279
N(Financial covenant)	288	2.087	2.000	1.037	112	1.500***	1.000	0.838	400	1.837***	2.000	0.896
I(Debt to CF covenant)	288	0.917	1.000	0.277	112	0.920	1.000	0.273	400	0.698***	1.000	0.460
I(CF coverage ratio covenant)	288	0.528	1.000	0.500	112	0.330***	0.000	0.472	400	0.700***	1.000	0.459
I(Minimum CF covenant)	288	0.149	0.000	0.357	112	0.009***	0.000	0.094	400	0.048***	0.000	0.213
I(CapEx covenant)	288	0.378	0.000	0.486	112	0.143***	0.000	0.351	400	0.107	0.000	0.310
I(Equity cure)	288	0.698	1.000	0.460	112	0.670	1.000	0.472	400	0.048***	0.000	0.213
Investment limit/Assets	288	0.021	0.009	0.033	112	0.040***	0.020	0.066	400	0.023**	0.002	0.119
Debt issuance limit/Assets	288	0.017	0.000	0.033	112	0.040***	0.023	0.059	400	0.018***	0.000	0.039

*Note: This table reports the summary statistics of key firm and loan characteristics by financing type ("PE-Direct", "PE-Bank", and "Public-Bank"). All firm characteristics are winsorized at 1% and 99%. Variable descriptions can be found in Table A.1 in the Appendix section. The sample period is from 2013 to 2019. *, **, and *** indicate the statistical significance for mean differences between the financing types in the adjacent columns at 10%, 5%, and 1%, assuming unequal variances. The full tables with more loan characteristics are presented in Tables A.3 and A.4.*

Among PE-backed firms in the Database, "PE-Direct" firms are, on average, half the size of "PE-Bank" firms. Accordingly, "PE-Direct" firms are less likely to be in the "upper middle-market" sector (i.e. revenues greater than $500 million) that tend to have greater access to bank-syndicated loans and high-yield bonds.[6] The former also are less levered in terms of Debt/Assets and are more likely to have a negative EBITDA than the latter (6.3% vs 0.0%). Furthermore, despite having similar mean levels, "PE-Direct" firms have twice as wide a dispersion of EBITDA/Assets (0.231% vs 0.107%). On the other hand, I do not find significant differences in cash holdings (Cash/Assets) and tangibility (Net PP&E/Assets). Interestingly, the former have higher Receivable/Assets, likely due to the fact that they are more concentrated in the consumer industries.

Taken together, among PE-backed deals, direct lenders appear to invest in smaller firms with wider dispersion of cash flow in consumer industries compared to banks. These results are largely consistent with survey responses in Block et al. (2022) that direct lenders alleviate financing frictions for firms that are too small or have too risky cash flow to qualify for bank syndication.

Loan characteristics. Now, I compare key loan characteristics by each financing type. Panel B of Table 3.3 reports the summary statistics for key loan characteristics, separately for each of the three financing types ("PE-Direct," "PE-Bank," and "Public-Bank"). The full tables with more loan characteristics are displayed in Tables A.3 and A.4 in the Appendix.

Not surprisingly, relative to "Public-Bank" loans, "PE-Bank" loans tend to result in higher leverage, interest rate spread over LIBOR, and likelihood of having an equity cure right. Relative to "PE-Bank" loans, "PE-Direct" loans have shorter maturity (median of 5 vs 6 years), higher interest rate spread over LIBOR by 189 basis points (mean of 677 vs 488 bps), lower probability of having a revolver (69.1% vs 87.5%) and a borrowing base (9.0% vs

6. See, for example, https://saratogainvestmentcorp.com/articles/middle-market-lending-the-complete-guide/ and https://www.stelluscapital.com/stellus-capital-why-private-credit/

17.0%), and lower fraction of revolver to total commitment (10.1% vs 19.4%). Furthermore, 15% of "PE-Direct" loans have a bank syndicate, suggesting that bank involvement in direct lending deals is quite minimal.

In terms of covenants, "PE-direct" loans almost always have a financial covenant (98.6%), mostly tied to firm's cash flow (CF). Furthermore, relative to "PE-Bank" loans, "PE-direct" loans are likely to involve more financial covenants (1.50 vs 2.09, especially with CF coverage ratio and minimum CF), a capital expenditure covenant (37.8% vs 14.3%), and tighter negative covenant limits on investment and debt issuance.

3.4 Differences in loan characteristics controlling for firm characteristics

Any inferences one can make about differences in lending approach by comparing loan terms are likely to be biased given differences in borrower-level risk. To mitigate such bias, I employ a regression framework that controls for observable firm characteristics, as well as industry and year fixed effects and test whether observably similar firms obtain different loan terms by financing type. To this end, I loosely follow Chernenko et al. (2022) and estimate the following specification:

$$Y_{i,j,t} = \alpha_j + \alpha_t + \beta_1 \cdot Direct_{i,j,t} \times PE_{i,j,t} + \beta_2 \cdot PE_{i,j,t} + \Gamma \cdot X_{i,j,t-1} + \Phi \cdot Z_{i,j,t} + \epsilon_{i,j,t} \quad (3.1)$$

where, for firm i in industry j with a loan originated in year t, α_j is Fama-French 12 industry j fixed effect, and α_t is year t fixed effect. As borrower-level controls $X_{i,j,t-1}$, I include EBITDA/Assets, Cash/Assets, Inventory/Assets, Receivable/Assets, Net PP&E/Assets, and Debt/Assets, all measured prior to loan origination. Moreover, given the observed differences in firm sizes and dispersions in profitability between "PE-Direct" and "PE-Bank," I also in-

clude categorical dummies I(EBTIDA<0), which equals 1 if a firm had negative EBITDA, and I(Upper Middle-Market), which equals 1 if a firm had revenue greater than $500 million prior to loan origination. The standard errors are clustered at the industry level.

I estimate the regression for eight key loan terms ($Y_{i,j,t}$: post-issuance Debt/Assets leverage, interest rate spread over LIBOR, indicators for revolver, borrowing base, and CapEx covenant, number of cash flow-based financial covenants and negative covenant limits on debt issuance and investments). For the interest rate variable, I additionally control for post-issuance Debt/Assets because leverage has a direct effect on credit risk. β_2 picks up the differences between "PE-Bank" and "Public-Bank," and the main coefficient of interest, β_1, captures the differences between "PE-Direct" and "PE-Bank." Table 3.4 reports the estimation results for β_1 and β_2, and the full results with estimated coefficients on all variables are displayed in Tables A.5 and A.6 in the Appendix.

Even after controlling for the borrower characteristics, the observed differences between "PE-Direct" and "PE-Bank" loans in Table 3.3 remain significant at 5% or 1% level with noticeable increases in R^2 in most cases. In terms of basic loan terms (Table 3.4 Panel A), relative to observably similar "PE-Bank" borrowers, "PE-Direct" borrowers obtain lower leverage, pay higher interest rates, and are less likely to obtain a revolver or borrowing base. The interest rates result is consistent with prior studies showing that nonbank lenders tend to charge a premium to riskier, bank-shunned firms (Chernenko et al., 2022; Loumioti, 2022; Davydiuk et al., 2022; Gopal and Schnabl, 2022). The revolver result is also not surprising given the synergies embedded in banks' joint liquidity provision to depositors and borrowing firms (Kashyap et al., 2002). That is, banks may be at advantage in meeting firm liquidity needs than direct lenders relying on closed-end funds.

Table 3.4: Regressions of key loan terms on financing type

Panel A: Basic loan terms

	Debt/Assets (at issuance)		Spread over LIBOR (bps)		I(Revolver)		I(Borrowing base)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Direct X PE	-0.122***	-0.112**	189.493***	161.014***	-0.181***	-0.176***	-0.079	-0.145***
	(0.033)	(0.049)	(13.646)	(14.762)	(0.038)	(0.046)	(0.050)	(0.041)
PE	0.421***	0.240***	214.420***	175.405***	-0.024	-0.118*	-0.081	-0.056
	(0.034)	(0.052)	(20.404)	(19.947)	(0.045)	(0.063)	(0.088)	(0.048)
Firm controls	No	Yes	No	Yes	No	Yes	No	Yes
Industry Effects	No	Yes	No	Yes	No	Yes	No	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	800	800	800	800	800	800	800	800
R-squared	0.19	0.35	0.54	0.62	0.08	0.16	0.05	0.30

Panel B: Covenants

	Financial covenants				Negative Covenants			
	N(CF-based covenant)		I(CapEx covenant)		Debt issuance limit		Investment limit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Direct X PE	0.338***	0.200***	0.236***	0.149***	-0.023***	-0.020***	-0.020***	-0.018**
	(0.052)	(0.059)	(0.038)	(0.035)	(0.005)	(0.004)	(0.006)	(0.007)
PE	-0.128	-0.299**	0.086**	0.042	0.017***	0.013*	0.012	0.000
	(0.112)	(0.109)	(0.032)	(0.048)	(0.004)	(0.006)	(0.014)	(0.019)
Firm controls	No	Yes	No	Yes	No	Yes	No	Yes
Industry Effects	No	Yes	Yes	Yes	No	Yes	No	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	800	800	800	800	800	800	800	800
R-squared	0.05	0.22	0.16	0.22	0.06	0.11	0.01	0.09

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression coefficients for monitoring-related loan terms by "PE-Direct", "PE-Bank", and "Public-Bank" loans following regression specification 3.1. Fama-French 12 industry fixed effects and origination year fixed effects were included. Firm controls include EBITDA/Assets, Cash/Assets, Inventory/Assets, Receivable/Assets, Net PP&E/Assets, Debt/Assets, Ln(Assets), I(EBTIDA<0), and I(Upper Middle-Market) right before origination. Debt issuance limit and Investment limit refers to the debt issuance and investment basket amount permitted under negative covenants scaled by total assets, respectively. The standard errors are clustered at the industry level. The full results with estimated coefficients on all variables are displayed in Tables A.5 and A.6 in the Appendix.

The covenants results (Table 3.4 Panel B) are rather more surprising. As noted earlier, previous studies have found that nonbanks tend to use fewer covenants (Chernenko et al., 2022; Loumioti, 2022). Contrary to those findings, but consistent with survey evidence (Block et al., 2022), direct lenders in my sample appear to put more emphasis on monitoring firms' cash flows using financial covenants and restricting firms' investments and borrowing ex-ante using negative covenants.

There are limitations to drawing any causal inference from these regression results. First, while the borrowers in my sample appear to be representative of the direct lending universe (as assessed in Section 3.2), "PE-Bank" borrowers are, by construction, those that borrow from direct lenders at the same time. This could mean that they may not even be able to get bank financing absent a direct lender. However, this seems unlikely because, as shown in Table 3.3, "PE-Bank" borrowers are not observably riskier, and are even larger, than "PE-Direct" borrowers. This suggests, if any thing, that they should have greater access to bank syndication (Block et al., 2022).

Second, even after controlling for observable characteristics, "PE-Direct" borrowers may be riskier in unobservable dimensions. In theory, these are the type of firms that would benefit more from monitoring (Diamond, 1991). Hence, while establishing whether direct lenders have stronger monitoring incentives than banks is difficult, my results, at the very least, do not indicate that direct lenders monitor any less than banks do. This stands in contrast to other nonbanks that were found to use fewer covenants than banks do (Chernenko et al., 2022; Loumioti, 2022).

CHAPTER 4

CONCEPTUAL FRAMEWORK FOR EMPIRICAL IMPLEMENTATION

In this section, I review prior research on bank monitoring and relationship lending to establish the conceptual framework for understanding the nature of direct lending.

The literature has long recognized banks as a special type of creditor that establishes close relationships with borrowers through repeated interactions (Boot, 2000). This proximity facilitates active monitoring by banks to collect private information about the borrowers (Diamond, 1984). Such "soft" information acquired through monitoring is thought to enable banks to overcome problems of asymmetric information that typical arm's-length investors cannot easily overcome.

First, it enables banks to alleviate problems of moral hazard. In models such as Diamond (1991) and Holmstrom and Tirole (1997), the firm in need of external financing is subject to a moral hazard problem where it can undertake a riskier project or a less profitable project with private benefit. In these models, banks can incur costly monitoring effort to detect and limit selection of such projects. In practice, banks often implement this through the use of financial covenants. Consistent with a theory of state-contingent control (Aghion and Bolton, 1992), banks detect deterioration in firm performance with financial covenants that are checked on a periodic basis such that, upon violation, they increase monitoring and exert control over firm activities (Chava and Roberts, 2008; Roberts and Sufi, 2009a; Nini et al., 2009, 2012). While these studies were conducted in the context of public firms, other work have also shown that PE-backed firms are frequently monitored with financial covenants (Demiroglu and James, 2010; Ivashina and Vallee, 2022; Haque et al., 2023).

Second, it enables banks to flexibly renegotiate and adapt lending terms to evolving circumstances (Rajan, 1992). When adverse selection prevents certain risky borrowers from being able to access credit (Stiglitz and Weiss, 1981), borrowers that have established a stable

bank relationship can overcome such problems as repeated borrowing allows the banks to learn about their creditworthiness (Diamond, 1991). Hence, lending relationships facilitate credit provision at more favorable terms not only upon a rise in investment opportunities (Petersen and Rajan, 1994; Roberts and Sufi, 2009b), but also when firms are in financial distress (Hoshi, Kashyap, and Scharfstein, 1990).

In particular, many empirical papers have shown that banks play a critical role of maintaining credit to their borrowers with a pre-existing relationship in times of financial stress (Chodorow-Reich, 2014; Sette and Gobbi, 2015; Bolton et al., 2016; Schwert, 2018; Banerjee et al., 2021). In the context of PE-backed firms, prior work has shown an interesting relationship dynamic between PE sponsors and banks. PE sponsors, through repeated deal issuance in the syndicated loan market, build close relationships with banks such that PE sponsors' portfolio firms are able to access credit from their relationship banks at more favorable terms (Ivashina and Kovner, 2011). Given that PE sponsors are actively involved in their portfolio firms' operations (Kaplan and Stromberg, 2009; Gompers et al., 2016), lenders often expect the PE sponsors to inject equity during distressed renegotiations to signal their skin-in-the game and preserve the relationship (Bernstein et al., 2019; Hotchkiss et al., 2021; Gompers et al., 2022; Haque et al., 2023). Hence, banks also likely consider their relationships with PE sponsors for their credit supply decisions in times of distress.

Taken together, in their capacity as relationship lenders, banks acquire soft information about their borrowers through close monitoring and employ such information to provide at least two types of valuable services. One is to limit moral hazard through state-contingent control, and another is to make flexible financial decisions in times of financial distress. Although we observed in Section 3.3 that direct loans almost always have financial covenants, it is an empirical question whether direct lenders use these covenants in a manner similar to traditional banks. Therefore, in Section 5, I examine whether direct lenders exert control over borrower activities upon covenant violation. In Section 6, I investigate whether direct lenders

exhibited flexibility in resolving distress during the COVID pandemic, and in particular, for borrowers with close relationships.

CHAPTER 5

MONITORING AND GOVERNANCE

Covenant violation constitutes an event of default that grants lenders the right to terminate the loan and accelerate payments. In practice, lenders rarely exercise these rights. Instead, consistent with a theory of state-contingent control, they influence firm activities through renegotiation (Aghion and Bolton, 1992; Chava and Roberts, 2008; Roberts and Sufi, 2009a; Nini et al., 2009, 2012).

While we observed in Section 3.3 that direct lenders often negotiate for financial covenants, whether they actually exert control upon violation remains uncertain. If they consistently grant waivers without intervention, then they may not differ from typical arm's-length investors. Hence, in this section, I examine whether direct lenders exert control upon violation in two approaches. In the first approach, I read through the renegotiated loan agreements and look for evidence of whether direct lenders contractually place restrictions upon violation. In the second, I use firm financial panel data and study post-violation changes in firm policies.

5.1 Covenant violation and renegotiation

As described before, the Database has tracked firms' covenant compliance since 2016. I hand-collect loan amendments in the Database that occurred as a result of covenant violation.[1] Then, similarly as before, I inspect the amended loan documents in detail to study whether and how direct lenders contractually influence firm activities. Most amended agreements track changes from the prior draft, making data collection relatively straightforward. For documents that do not track changes, I cross-reference with previously executed loan

1. These also include simple waivers of covenant violation that did not result in material renegotiation because, according to the Database provider, the client lenders customarily ask them to perform liquidation analysis whenever their portfolio companies breach a covenant.

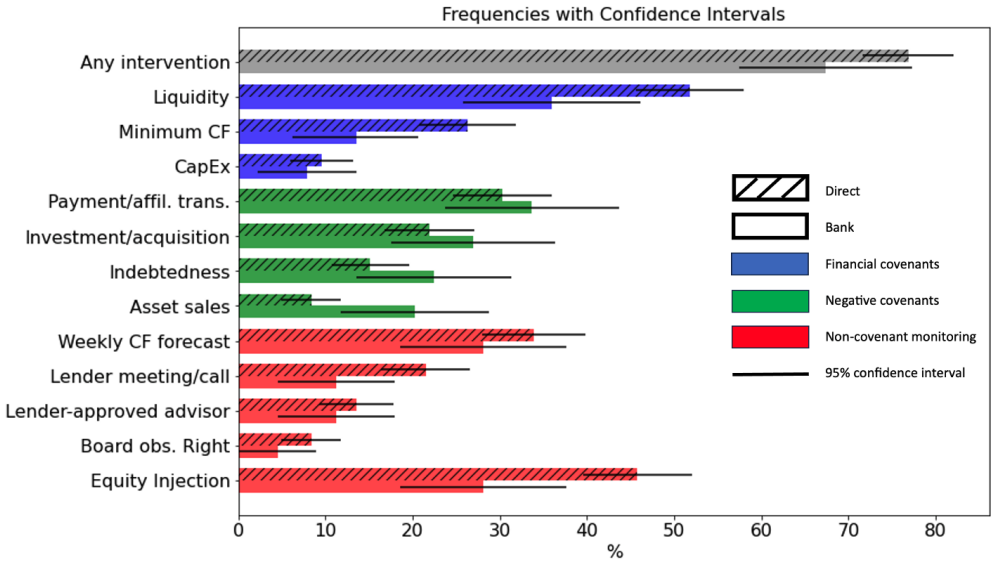
agreements to identify modifications.

Reading through these documents, I record renegotiated loan terms that likely signify an additional restriction on borrower activity.[2] These include changes in not only financial covenants (Debt to CF, CF coverage, liquidity, minimum CF, and capital expenditures) and negative covenants (liens, debt issuance, investments/acquisition, restricted payments/affiliate transactions, and asset sales), but also other requirements that provide lenders access to borrowers' proprietary information, such as weekly cash flow reporting, lender board observation rights, scheduled meetings with the lenders, and the engagement of a lender-approved financial advisor. Furthermore, I record whether the renegotiated contracts required an equity injection from the borrowers' PE sponsors, a tactic frequently employed by PE sponsors to resolve financial distress and signal skin-in-the-game (Bernstein et al., 2019; Hotchkiss et al., 2021). Figure B.8 in the Appendix illustrates how some of these renegotiated terms are presented in loan amendment documents.

For 251 "PE-Direct" and 89 "PE-Bank" deals that violated a covenant sometime between January 2016 and March 2021, Figure 5.1 presents the average frequencies of tightening of financial covenants, tightening of negative covenants, intervention through non-covenant monitoring-related terms (cash flow reporting, lender board observation rights, scheduled meetings with the lenders, the engagement of a lender-approved financial advisor, and equity injection). I(Any intervention) equals 1 if any one of the above interventions has occurred.

2. I define amendments resulting from the anticipation of covenant violation as those that relaxed an existing financial covenant.

Figure 5.1: Renegotiated terms upon covenant violation



Note: This table reports the mean frequencies and 95% confidence intervals of select renegotiated items in Table A.7 by "PE-Direct" and "PE-Bank" covenant violations between January 2016 and March 2021.

As illustrated in Figure 5.1, direct lenders appear to place restrictions on firm activities during renegotiation upon covenant violation (77%) at least as frequently as banks do (67%). Focusing on statistically significant differences, "PE-Direct" violations were more likely to result in additional restrictions through a liquidity covenant, minimum CF covenant, and scheduled lender meetings as well as sponsor equity injection relative to "PE-Bank." Furthermore, except for asset sales, I do not find statistically significant differences in negative covenant tightening.

Because violations during the COVID pandemic may be different in nature than those in normal times, Table A.7 Panel B in the Appendix separately reports the results for pre-COVID violations. Furthermore, to mitigate concerns that bank syndicates in direct lending deals may influence the renegotiation process, Table A.7 Panel B also displays the results after reclassifying "PE-Direct" loans with a bank syndicate as "PE-Bank" loans. The results remain similar in both cases.

The fact that nearly half of the "PE-Direct" violations required equity injection from

PE sponsors is particularly striking. This suggests that direct lenders monitor not only firm activity, but also PE sponsors' skin-in-the-game. In line with this, 30% of the "PE-Direct" violations involved the tightening of negative covenants on payments and affiliate transactions to limit cash distribution or value leakage to the PE sponsors. These findings align with the survey results in Block et al. (2022) that direct lenders possess significant bargaining power over PE sponsors during renegotiation.

It is also worth noting that, as displayed in Table A.7 Panel A in the Appendix, "PE-Direct" and "PE-Bank" covenant-violating firms had similar pre-violation distributions of the five financial covenants (Debt to CF, CF coverage, liquidity, minimum CF, and capital expenditures). This suggests that the observed differences in post-violation intervention between the two samples are likely more driven by differences in incentives to intervene rather than in firm-level risk.[3]

5.2 Post-violation changes in firm outcomes

Given that direct lenders appear to contractually intervene over firm activities through renegotiation, I further examine whether violation results in subsequent changes in firm policies.

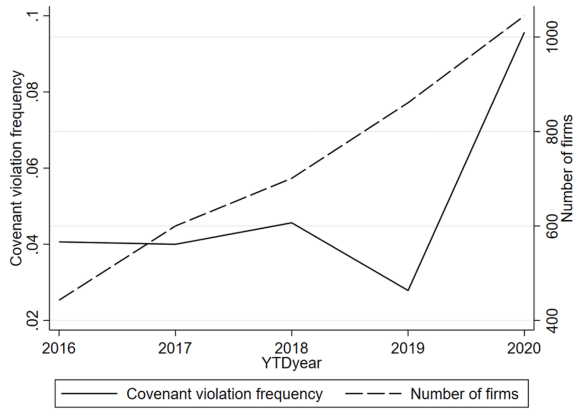
To this end, I utilize the financial accounting panel data set for "PE-Direct" borrowers available in the Database. One important caveat to note in advance on this exercise is that, because the data provider materially expanded its valuation business in recent years, restricting the sample to firms with longer years of data availability can lead to significant reduction in the sample size. To illustrate this point, Figure 5.2 Panels A and B plot, for each year between 2016 and 2020, the number of "PE-Direct" and "PE-Bank" borrowers

3. Furthermore, their frequencies among "PE-Direct" pre-COVID violations (96%, 64%, 16%, 34%, and 12%) are quite similar to those among the sample of "PE-Direct" deals studied in the Section 3.3 (92%, 53%, 10%, 38%, and 15% in Table A.4 in the Appendix). On the other hand, those among "PE-Bank" pre-COVID violations (89%, 70%, 13%, 28%, and 7%) are noticeably higher than those among the previously analysed counterparts (92%, 33%, 7%, 14%, 1% in Table A.4 in the Appendix). These differences reinforce the earlier findings in Section 3.3 that the covenants in direct lending are generally more tightly set than in bank lending.

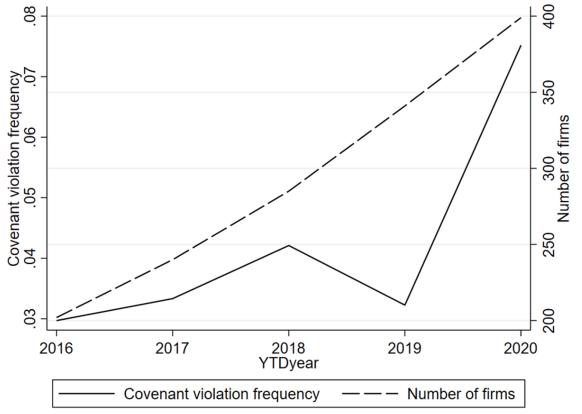
reporting one-year financial data, as well as the fraction of those reporting covenant violation, respectively. In Panels C and D, the same are shown among "PE-Direct" and "PE-Bank" borrowers with financial data also available in the preceding and following year, respectively. As displayed, restricting the sample to firms with data of at least three consecutive years results in a reduction in the sample sizes by around half. This restriction does not, however, significantly impact the overall trends; in fact, it leads to higher fractions of firms reporting covenant violation, indicating a lesser impact on distressed firms of our interest.

To understand whether covenant violation results in changes in firm policies among "PE-Direct" borrowers, Figure 5.3 plots their mean year-over-year changes and their 95% confidence intervals for natural logarithm of total assets, total debt, and net PP&E as well as capital expenditures, cash, and total debt scaled by total assets as of one year before, the year of, and one year after covenant violation. In terms of investment policies, mean Ln(Assets) and Ln(PP&E), which were rising 8% and 9% annually in the previous year, experience a sharp and continued decline since the year of violation, a total of 20% and 14% in two years, respectively. Mean capital expenditures scaled by assets, which was barely changing, decreases by 0.8 percentage points in the year of violation, and reverts to near zero in the year after violation. The drop of 0.8 percentage points is meaningful given that the mean level was 3.2% in the year before violation.

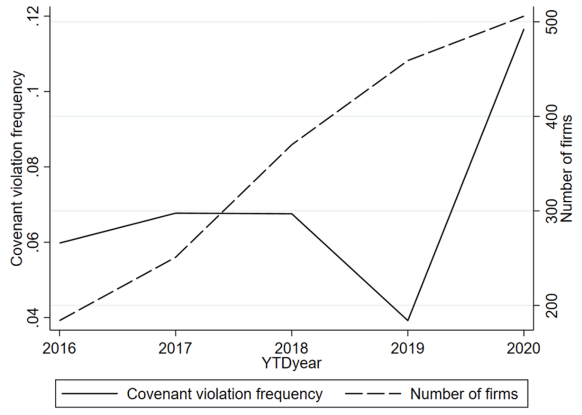
Figure 5.2: Covenant violation frequency



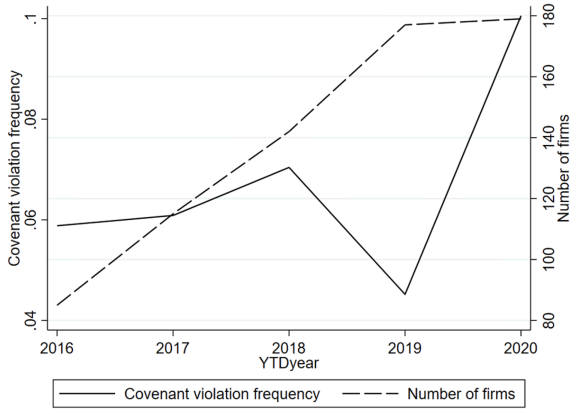
Panel A: "Direct" with yearly financials



Panel B: "Bank" with yearly financials



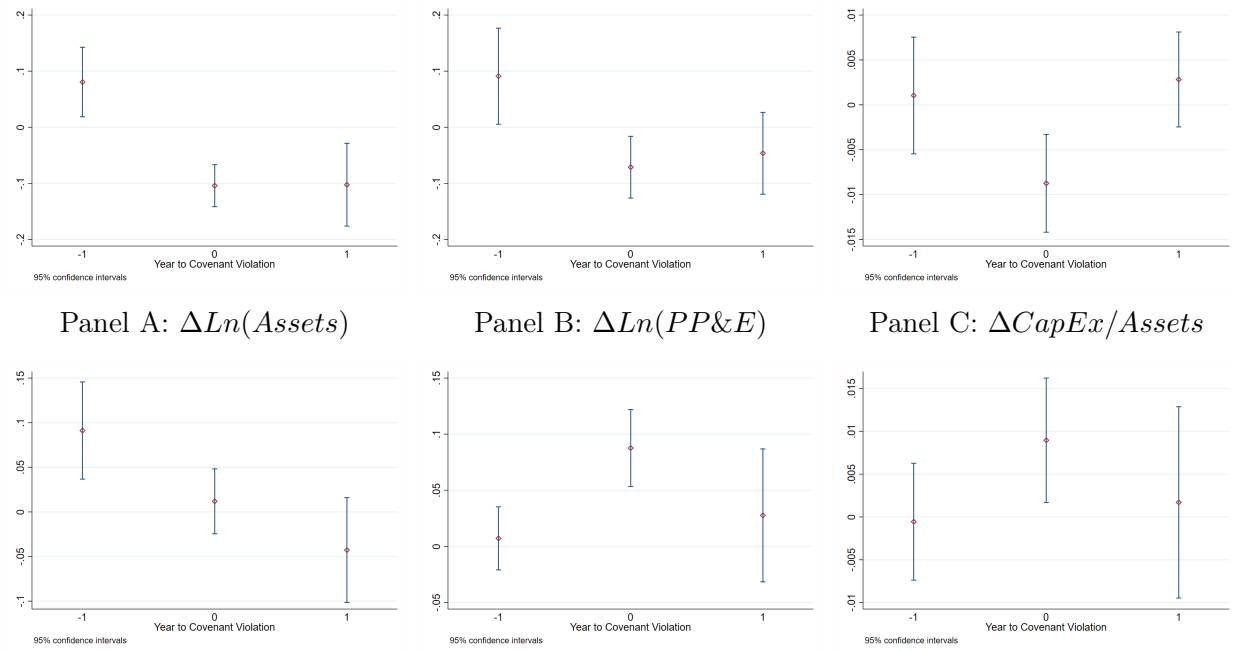
Panel C: "Direct" with lead and lag yearly financials



Panel D: "Bank" with lead and lag yearly financials

Note: Panels A and B plot, for each year between 2016 and 2020, the number of "PE-Direct" and "PE-Bank" borrowers reporting one-year financial data, as well as the fraction among those reporting covenant renegotiation, respectively. In Panels C and D, the same are shown among "PE-Direct" and "PE-Bank" borrowers with financial data available in the preceding and following year, respectively.

Figure 5.3: "Direct" borrower outcomes around covenant violation



Panel A: $\Delta Ln(Assets)$ Panel B: $\Delta Ln(PP\&E)$ Panel C: $\Delta CapEx/Assets$

Panel E: $\Delta Ln(Debt)$ Panel D: $\Delta Debt/Assets$ Panel F: $\Delta Cash/Assets$

Note: This figure plots "PE-Direct" covenant violators' mean year-over-year changes and their 95% confidence intervals for natural logarithm of total assets, total debt, and net PP&E as well as capital expenditures, cash, and total debt scaled by total assets as of one year before, the year of, and one year after covenant violation. The number of firms used in Panels A through F are 86, 83, 53, 84, 84, and 82, respectively.

In terms of financial policies, mean Ln(Debt), although rising before the year of violation, stops rising in the year of and starts declining in the year after violation. Mean Debt/Assets leverage increases by 8 percentage points in the year of violation (given the concurrent decrease in total assets) but increases only by 3 percentage points in the year after violation (given the concurrent decrease in total debt as well). Finally, mean Cash/Assets, which were barely changing, increases by 0.9 percentage points in the year of violation, and reverts to near zero in the year after violation. The rise of 0.9 percentage points is meaningful given that the mean level was 3.6% in the year before violation. These results suggest that, similar to what was observed among covenant-violating public firms with mostly bank-syndicated loans (Nini et al., 2012), covenant violations may result in investment and financial conservatism in

the form of divestitures, reduced investments and debt issuance, and increased cash holdings.

While these time-series patterns are informative, the interpretations mentioned above remain suggestive at best, as we cannot observe the counterfactual of what would have happened to these firms in the absence of lender intervention upon covenant violation. To refine identification, I follow a regression framework similar to the one in Nini et al. (2012). Specifically, for the "PE-Direct" sample, I estimate regressions of the following specification:

$$\Delta Y_{i,t+1} = \beta_1 Violate_{i,t+1} + \beta_2 Violate_{i,t} + \theta_1 \cdot X_{i,t} + \theta_2 \cdot X_{i,t-1} + FEs + \epsilon_{i,t+1}, \quad (5.1)$$

where, for firm i, $\Delta Y_{i,t+1}$ measures the year-over-year change in a host of outcome variables (Y) between years t and $t+1$, and $Violate_{i,t+1}$ ($Violate_{i,t}$) equals 1 if there was a covenant violation between years t and $t+1$ (between years $t-1$ and t). Hence, β_1 and β_2, our main coefficients of interest, capture an immediate and more persistent effect of covenant violation, respectively. Crucially, as control variables ($X_{i,t}$ and $X_{i,t-1}$), I include $Debt/Asset_{i,t}$, $EBITDA/Asset_{i,t}$, $Ln(Asset)_{i,t}$, and their lagged counterparts as performance-related measures that likely affect both the firm outcomes as well as compliance with financial covenants. Recall in Section 3.3 that the most common financial covenants were those based on firm's cash flows ($Debt/EBITDA$, $EBITDA$ coverage ratio, minimum $EBITDA$), so arguably the movements in $Debt$ and $EBITDA$ are likely to be most important.[4] I also control for industry, fiscal reporting quarter (to account for seasonal patterns related to fiscal quarters), and lead lender fixed effects. The standard errors are clustered by firm.

As in Nini et al. (2012), the main objective of these regressions is to disentangle the effects of covenant violations from confounding effects arising from changes in the underlying firm fundamentals that led to the violations. By estimating the outcomes as a smooth function of the underlying control variables that directly affect firms' covenant compliance

4. Unfortunately, the Database's coverage of interest expense is low, so I do not include it the analysis.

and then comparing firms with relevant financial covenant ratios just above and just below the violation threshold, the regressions attempt to isolate the discontinuous jumps in the outcome variables introduced by covenant violation. The first-differences in the outcomes control for time-invariant firm-level heterogeneity between violators and nonviolators, and the included set of lagged control variables attempt to account for the expected time-series trajectory of outcomes following deteriorating firm performance. In sum, these regressions identify the effect of a covenant violation based on differences in outcomes for violators relative to those for nonviolators who share a similar pre-violation performance trend, belong to the same industry, and have obtained a loan arranged by the same lead lender.

Table 5.2 report the estimation results for six outcome variables: $\Delta Ln(Assets)$, $\Delta Ln(PP\&E)$, $\Delta CapEx/Assets$, $\Delta Ln(Debt)$, $\Delta Debt/Assets$, and $\Delta Cash/Assets$. For each outcome variable, three separate results are presented: the first column displays the results using one-year lagged control variables; the second, adding two-year lagged control variables; and the third, using data only in the pre-COVID period (i.e. fiscal year $t+1$ below or equal to 2019) given that violations that occurred during the COVID period may be of an extraordinary nature. Table 5.1 report the summary statistics for the variables used in these analyses.[5]

5. As illustrated in these tables, data coverage for Capital Expenditures is noticeably lower than other variables because cash flow statements are less frequently reported in the Database.

Table 5.1: Summary Statistics

	N	Mean	P10	Median	P90	SD
$\Delta Ln(Assets)_{i,t+1}$	1701	0.017	-0.244	-0.025	0.354	0.371
$\Delta Ln(PP\&E)_{i,t+1}$	1629	0.065	-0.300	0.000	0.500	0.389
$\Delta CapEx/Assets_{i,t+1}$	1066	-0.001	-0.022	0.000	0.018	0.021
$\Delta Ln(Debt)_{i,t+1}$	1691	0.103	-0.164	0.036	0.501	0.297
$\Delta Debt/Assets_{i,t+1}$	1691	0.087	-0.133	0.039	0.310	0.358
$\Delta Cash/Assets_{i,t+1}$	1645	0.005	-0.041	0.001	0.054	0.052
$Ln(Assets)_{i,t}$	1701	19.072	17.560	19.194	20.363	1.066
$Ln(PP\&E)_{i,t}$	1675	16.037	13.785	16.195	18.247	1.665
$CapEx/Assets_{i,t}$	1340	0.026	0.002	0.014	0.061	0.033
$Ln(Debt)_{i,t}$	1701	18.613	17.077	18.698	19.921	1.048
$Debt/Assets_{i,t}$	1701	0.705	0.360	0.600	1.131	0.421
$Cash/Assets_{i,t}$	1671	0.049	0.007	0.030	0.112	0.059
$EBITDA/Assets_{i,t}$	1701	0.128	0.042	0.108	0.225	0.105
$Violate_{i,t}$	1701	0.077	0.000	0.000	0.000	0.267

Note: This table reports the summary statistics of the variables used in the estimation in Table 5.2 for "Direct" borrowers with lead and lagged financial data available as of fiscal reporting years t between 2016 and 2020.

As shown in Panel A of Table 5.2, all of $\Delta Ln(Assets)$, $\Delta Ln(PP\&E)$, and $\Delta CapEx/Assets$, on average, experience a statistically significant and economically important decline in the year of covenant violation. $Ln(Assets)$ also experiences a statistically significant and economically important decline in the year following covenant violation, indicating a potential longer-run effect. Taken together, these results are consistent with the observed time-series patterns in Figure 5.3, suggesting that direct lenders likely push covenant-violating firms to become more conservative in their investment policies.

Table 5.2: Regressions of firm outcomes on covenant violation

Panel A: Investment policies

	$\Delta Ln(Assets)_{i,t+1}$			$\Delta Ln(PP\&E)_{i,t+1}$			$\Delta CapEx/Assets_{i,t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Violate_{i,t+1}$	-0.127***	-0.107***	-0.077**	-0.135***	-0.144***	-0.136***	-0.006**	-0.005**	-0.010**
	(0.022)	(0.024)	(0.031)	(0.031)	(0.035)	(0.038)	(0.002)	(0.002)	(0.004)
$Violate_{i,t}$	-0.094***	-0.091***	-0.162***	-0.052	-0.025	-0.036	0.002	0.005*	0.006
	(0.026)	(0.029)	(0.039)	(0.034)	(0.039)	(0.062)	(0.003)	(0.003)	(0.004)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lag Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	PreCOVID	All	All	PreCOVID	All	All	PreCOVID
N	2724	1701	760	2594	1629	755	1611	1061	574
R-squared	0.24	0.24	0.25	0.10	0.13	0.20	0.09	0.11	0.16

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Panel B: Financial policies

	$\Delta Ln(Debt)_{i,t+1}$			$\Delta Debt/Assets_{i,t+1}$			$\Delta Cash/Assets_{i,t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Violate_{i,t+1}$	-0.111***	-0.096***	-0.093***	0.001	0.010	-0.003	0.011**	0.006	0.001
	(0.022)	(0.023)	(0.030)	(0.023)	(0.030)	(0.045)	(0.004)	(0.005)	(0.006)
$Violate_{i,t}$	-0.133***	-0.111***	-0.176***	-0.053**	-0.060**	-0.053	-0.002	-0.004	0.003
	(0.022)	(0.025)	(0.037)	(0.027)	(0.025)	(0.045)	(0.004)	(0.005)	(0.006)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lag Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	PreCOVID	All	All	PreCOVID	All	All	PreCOVID
N	2706	1691	755	2708	1691	755	2647	1645	738
R-squared	0.17	0.17	0.23	0.09	0.11	0.17	0.08	0.11	0.17

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for the regression specification 5.1 on six outcome variables: $\Delta Ln(Assets)$, $\Delta Ln(PP\&E)$, $\Delta CapEx/Assets$, $\Delta Ln(Debt)$, $\Delta Debt/Assets$, and $\Delta Cash/Assets$. For each outcome variable, three separate results are presented: the first column displays the results using one-year lagged control variables, the second, adding two-year lagged control variables, and the third, using only pre-COVID data. Standard errors are clustered by firm. The full results showing the estimated coefficients for all control variables are displayed in Tables A.8 and A.9.

Panel B of Table 5.2 presents the estimated effects of covenant violation on firms' financial policies. $Ln(Debt)$, on average, experiences a statistically significant and economically important decline in both the year of and year after covenant violation. $Debt/Assets$, on average, experiences a statistically significant and economically important decline in the year following covenant violation, but restricting the sample to the pre-COVID sample, the estimated coefficient, while remaining similar in terms of the magnitude, loses significance. $\Delta Cash/Assets$ only exhibits a statistically significant relationship with covenant violation in the first column that only includes year t controls. One potential reason for the subdued

effects on $\Delta Cash/Assets$ could be that PE-backed firms in general have access to their PE sponsors' dry powder for unforeseen liquidity needs, as also illustrated earlier by the high frequency of equity injection post-covenant violation. In sum, except for cash holdings, the results are broadly consistent with the observed patterns in Figure 5.3.

5.3 Takeaways

I conclude this section with the following takeaways. Direct lenders resemble traditional banks in proactively monitoring using covenants and placing additional restrictions on borrower activity through renegotiation of covenant violations. Furthermore, they appear to also monitor PE sponsors' skin-in-the-game by requiring equity injection, suggesting an interesting relationship dynamic with PE sponsors (discussed more in the next section). Observed time-series patterns in covenant violators' various outcomes around covenant violations suggest that covenant violation leads to divestitures, reduced investments and debt issuance, and increased cash holdings. The results on divestitures, reduced investments, and debt issuance remain robust to regression analyses that exploit discontinuity in the outcomes introduced by covenant violations by comparing violators and nonviolators with similar pre-violation performance trend. Hence, similar to how banks treat covenant-violating public firms (Nini et al., 2012), direct lenders appear to push covenant violators towards a more conservative investment and financial policy.

CHAPTER 6

DISTRESS RESOLUTION AND LENDING RELATIONSHIP

Given the monitoring-intensive nature of direct lending, it is conceivable that direct lenders, like banks, develop close relationships with their borrowers (Gârleanu and Zwiebel, 2009; Prilmeier, 2017). Prior studies have shown that bank relationships are valuable, as the reduced information asymmetry from such relationships facilitates flexible lending during challenging periods (Bolton et al., 2016). Therefore, in this section, I examine whether direct lenders engage in such forms of relationship lending. First, I compare how flexibly direct lenders renegotiated with their borrowers that experienced distress during the COVID pandemic with banks in the Database. Then, I examine the effects of prior relationships on direct lenders' credit supply during the pandemic period.

6.1 Evidence from COVID renegotiation

As argued by Berger et al. (2021), COVID provides a unique quasi-natural experiment for studying lenders' ability to support relationship borrowers during crises. This is because the COVID crisis was both less predictable than other crises and predominantly impacted the liquidity conditions of borrowers rather than lenders. To the extent that bank loans are very frequently renegotiated upon changes in macroeconomic conditions (Roberts and Sufi, 2009b), examining how borrowers and direct lenders renegotiated in response to the COVID shock may offer insights into the distress resolution capacity of direct lenders.

Sample Construction. The Database also tracks firms' default and restructuring history. Using this information, I identify distressed firms as those that experienced a payment or covenant default between March 2020 and March 2021. Additionally, to control for differences in COVID distress severity and pre-COVID borrower characteristics, I restrict the sample to firms with available information on revenue growth between Q4 2019 and Q4 2020 as well as

Ln(Assets), Debt/Assets, EBITDA/Assets, Cash/Assets, Non-Cash Current Assets/Assets, and Net PP&E/Assets as of 2019Q4. This resulted in a sample of 168 "PE-Direct" and 56 "PE-Bank" distressed firms.

Then, I gather information on how firms resolved distress. First, examining amended loan documents, I record whether the firm renegotiated with an amendment that deferred payment and interest obligations ("I(P&I deferral)"). Second, using the restructuring data, I record whether the firm underwent restructuring, i.e. resulting in a new capital structure with changes in ownership ("I(Restructuring)"). Third, if a restructuring occurred, I record whether it took place in court through a bankruptcy filing ("I(Bankruptcy)"). Furthermore, I collect information on PE sponsor involvement during distress resolution: whether the sponsor injected equity ("I(Sponsor injection)") and whether the sponsor exited as a result of the restructuring transaction ("I(Sponsor exit)").

Analysis. Table 6.1 presents summary statistics and statistical significance for the mean differences between the two financing types on pre-COVID firm characteristics, variables related to the nature of COVID distress, and COVID distress resolution outcomes.

Table 6.1: COVID distress resolution by financing type

	PE-Direct			PE-Bank			
	N	Mean	SD	N	Mean	SD	Mean Difference
A: Pre-COVID Charateristics							
Total Assets	168	254.515	276.386	56	339.139	282.953	-84.624*
Debt/Assets	168	0.631	0.396	56	0.869	0.479	-0.238***
EBITDA/Assets	168	0.120	0.112	56	0.143	0.102	-0.023
Cash/Assets	168	0.045	0.057	56	0.045	0.051	-0.000
Non-Cash Current Assets/Assets	168	0.214	0.186	56	0.215	0.155	-0.001
Net PP&E/Assets	168	0.147	0.191	56	0.150	0.162	-0.004
B: COVID Distress Severity							
COVID revenue growth	168	-0.153	0.212	56	-0.176	0.190	0.023
I(Payment default)	168	0.363	0.482	56	0.375	0.489	-0.012
I(Covenant default)	168	0.768	0.423	56	0.696	0.464	0.071
C: Resolution Outcomes							
I(P&I deferral)	168	0.250	0.434	56	0.089	0.288	0.161***
I(Restructuring)	168	0.125	0.332	56	0.304	0.464	-0.179***
I(Bankruptcy)	168	0.030	0.170	56	0.143	0.353	-0.113**
I(Sponsor injection)	168	0.399	0.491	56	0.232	0.426	0.167**
I(Sponsor exit)	168	0.113	0.318	56	0.232	0.426	-0.119*
I(Bankruptcy, Post-COVID)	168	0.012	0.109	56	0.054	0.227	-0.042
I(M&A)	168	0.060	0.237	56	0.143	0.353	-0.083
I(OOB)	168	0.012	0.109	56	0.018	0.134	-0.006
I(Failure)	168	0.083	0.277	56	0.196	0.401	-0.113*

*Note: This table reports the summary statistics of COVID distress resolution outcomes by the two financing types: PE-Direct and PE-Bank. Variable descriptions can be found in Table A.1 in the Appendix section. All distress events occurred between March 2020 and March 2021. *, **, and *** indicate the statistical significance for mean differences between the two financing types at 10%, 5%, and 1%, assuming unequal variances.*

Similar to what we observed in the pre-loan issuance data in Section 3.3, "PE-Direct" and "PE-Bank" distressed firms display similar patterns in their firm characteristics. Both have comparable distributions of profitability, liquidity, non-cash liquidity, and tangibility, with the latter generally having more assets and leverage. Importantly, both "PE-Direct" and "PE-Bank" firms in this sample appear to have experienced a similar nature of distress shock during the COVID pandemic. They not only had similar likelihoods of payment and covenant default but also shared similar distributions of revenue contraction between Q4

2019 and Q4 2020.

Despite their similarity in the nature of distress, both groups exhibited significant differences in how they resolved distress. Based on statistically significant differences in Table 6.1, compared to "PE-Bank" firms, "PE-Direct" firms were associated with a higher likelihood of P&I deferral (25.0% vs 8.9%), and lower likelihoods of restructuring (12.5% vs 30.4%) and bankruptcy (3.0% vs 14.3%). Furthermore, they were also associated with a higher likelihood of sponsor equity injection (39.9% and 23.2%) and a lower likelihood of sponsor exit (11.3% vs 23.2%).

To mitigate bias arising from heterogeneity in firm characteristics and distress severity as well as across industries, I run regressions controlling for the pre-COVID firm characteristics, COVID revenue growth, and industry and fiscal-quarter fixed effects, where standard errors are clustered at industry. Table 6.2 reports the results.

As reported in Table 6.2, all results remain robust to the inclusion of controls (revenue growth between Q4 2019 and Q4 2020 and firm characteristics as of Q4 2019), as well as industry and fiscal-quarter fixed effects at least at 10% significance level, with the results on bankruptcy and sponsor injection exhibiting significance at 1% level.

Table 6.2: Regressions of distress-related outcomes on financing type

Panel A: Distress resolution types

	I(P&I deferral)		I(Restructuring)		I(Bankruptcy)	
	(1)	(2)	(3)	(4)	(5)	(6)
Direct	0.150**	0.128*	-0.195**	-0.123*	-0.121***	-0.096***
	(0.060)	(0.073)	(0.078)	(0.064)	(0.042)	(0.032)
Borrower Controls	No	Yes	No	Yes	No	Yes
COVID Sales Growth	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
N	224	224	224	224	224	224
R-squared	0.19	0.20	0.18	0.29	0.28	0.32

Panel B: Sponsor actions and ex-post performances

	I(Injection)		I(Exit)		I(M&A)		I(Failure)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Direct	0.213***	0.222***	-0.137**	-0.109*	-0.080	-0.095*	-0.112**	-0.124**
	(0.067)	(0.075)	(0.065)	(0.055)	(0.053)	(0.051)	(0.051)	(0.047)
Borrower Controls	No	Yes	No	Yes	No	Yes	No	Yes
COVID Sales Growth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	224	224	224	224	224	224	224	224
R-squared	0.20	0.24	0.17	0.22	0.13	0.13	0.13	0.13

Note: This table reports the regression results of distress-related outcomes in Table 6.1, controlling for revenue growth between 2019Q4 and 2020Q4, firm characteristics as of 2019Q4, industry and fiscal quarter fixed effects. The standard errors are clustered at industry. The full tables with estimated coefficients on all included variables are reported in Tables A.10, A.11, and A.12.

Direct lenders' renegotiation flexibility and relationship dynamics with PE sponsors. Two notable themes emerge from these results. First, direct lenders appear to demonstrate greater flexibility than banks in resolving distress, in the form of more P&I deferrals and less restructuring and bankruptcy. These findings align with the results in Block et al. (2022), where 65% of survey respondents indicated that firms choose direct lenders over banks due to their ability to maintain stable relationships.

Second, direct lenders do not renegotiate for free – they do so as long as the PE sponsors pledge more skin-in-the-game. In fact, PE sponsors were nearly twice as likely to inject equity in direct lending deals than in bank deals. This raises two important points. First,

considering the significant reliance of direct lenders on PE sponsorship for deal origination, one might have expected the opposite, where direct lenders possess less bargaining power over PE sponsors during renegotiation (Block et al., 2022). However, this does not appear to be the case.

Moreover, as also observed in the bank-syndicated loan market (Haque and Kleymenova, 2023), PE sponsors and direct lenders appear to have mutual incentives to share relationship surplus in distress situations. It has been long known that PE sponsors and lenders develop relationships through repeated interaction (Demiroglu and James, 2010; Ivashina and Kovner, 2011; Malenko and Malenko, 2015). To preserve the relationship with the lenders, PE sponsors may inject equity, providing lenders with immediate downside protection (Bernstein et al., 2019; Hotchkiss et al., 2021) and potentially higher claims on the firm's continuation value due to enhanced operational support from PE sponsors (Gompers et al., 2022; Mayer and Gryglewicz, 2022). To preserve the relationship with the PE sponsors, lenders may try to renegotiate out-of-court, giving a second chance to PE sponsors as bankruptcy would otherwise entirely wipe out PE sponsors' claims due to the absolute priority rule (Buccola, 2022).

In fact, direct lenders appear to provide more loans in the future to PE sponsors that injected equity. In Table A.13 in the Appendix, I report the estimation results from regressing measures of deal activity (i.e. log number of deals + 1 and an indicator of a deal) of each direct lender-PE sponsor pair between March 2021 and September 2023 on I(Sponsor injection). Controlling for their past deal activity and the same set of controls and fixed effects used in Table 6.2, PE sponsors' equity injection in these distressed deals is positively related to their subsequent deal activity with their lead direct lender. While there can be other interpretations, this result is consistent with a hypothesis that the mutual efforts by PE sponsors and direct lenders to preserve relationship and share relationship surplus facilitate distress resolution.

What could explain the higher propensity of direct lenders to renegotiate with sponsor equity injection compared to banks? One possibility is as follows: as explained in Section 2.2, direct loans are not broadly syndicated, and the lender group rarely changes over time as lenders intend to hold to maturity. As a result, PE sponsors can build stable relationships with lenders and leverage these relationships to renegotiate favorably during times of stress. Such dynamics may not be feasible in bank-syndicated lending, where lenders frequently sell claims in secondary markets, resulting in a fragmented and constantly changing lender group (Blickle et al., 2022).

Are direct lenders' continuation strategies necessarily efficient? Given that the pandemic introduced a largely unanticipated financial distress shock, the observed direct lenders' continuation strategies can be reasonably viewed as optimal for most firms. However, for firms that had been experiencing economic distress prior to the pandemic, continuation may be inefficient as it can result in "zombie" lending (Caballero, Hoshi, and Kashyap, 2009; Altman, Dai, and Wang, 2021).

Although assessing the efficiency of such strategies is inherently difficult, I attempt do so by tracking these firms' longer-run outcomes in Pitchbook. I record whether the firm filed for bankruptcy since March 2021 ("I(Bankruptcy, Post)"), went out of business ("I(OOB)"), or was sold through an M&A transaction ("I(M&A)"). To the extent that recent research has shown that distressed sales can be inefficient (Antill, 2022), I also create an indicator variable "I(Failure)" that equals 1 if any of I(Bankruptcy, Post), I(OOB), or I(M&A) equals 1. As done for other variables, Table 6.1 reports their frequencies by "PE-Direct" and "PE-Bank" distressed firms, and Table 6.2 Panel B reports their regression results with the same set of controls and fixed effects as before.

As displayed in Table 6.2 Panel B, the estimated relationships of I(M&A) and I(Failure) on "Direct" are negative and significant at 10% and 5%, respectively. These findings offer suggestive evidence that direct lenders' continuation strategies during the COVID pandemic

may not necessarily be deemed inefficient, at least within the two-year period following the pandemic.

6.2 Identifying relationship effects on credit supply during COVID

Taken together, direct lenders not only proactively monitor using covenants but also demonstrate flexibility in renegotiating upon distress shock. These results align with the interpretation that the relationships cultivated by direct lenders with PE sponsors through repeated deals enable them to effectively monitor and flexibly adapt lending terms when necessary (Block et al., 2022). However, due to the descriptive nature of the results, such interpretations can only be considered suggestive at best. Therefore, as the final exercise of this paper, I delve further into this claim by empirically testing whether the repeated interaction of direct lenders with PE sponsors helped mitigate credit supply distortions during the pandemic.

Alternative Data and Methodology. Identifying the effects of relationships between PE sponsors and direct lenders on credit supply during COVID presents at least two empirical challenges. First, it is necessary to have data on the full deal history between a lender and a PE sponsor to measure the strength of their relationship. While the Database provides valuable insights into how direct lenders monitor and renegotiate, it is not suitable for tracking the full deal history as its data is self-reported by the lenders, omitting interactions that occurred outside the deals covered in the Database. This limitation prevents an accurate measurement of relationship strength. Second, and more importantly, endogeneity poses a significant challenge in cleanly identifying the effects of sponsor-lender relationships on credit supply. For instance, if PE sponsors bring firms with lower credit risk to lenders with whom they have stronger relationships, the estimated effects of sponsor-lender relationships on credit supply during COVID may be biased upward.

I address the first, data challenge by utilizing the full quarterly BDC loan holdings data between Q1 2012 and Q3 2022 that I already constructed in Section 3.2. As described before, this dataset has been merged with the list of PE buyouts from Pitchbook. According to Gornall, Gredil, Howell, Liu, and Sockin (2021) and Haque et al. (2023), Pitchbook is widely regarded as one of the most comprehensive databases for PE buyout deals, particularly in the US. Therefore, this dataset enables me to measure the relationship between a PE sponsor and a BDC lender (referred to as "PE-BDC" relationship going forward) at a given point in time based on their past deal activity.

I keep only firms with either one PE sponsor or an identifiable lead PE sponsor for buyouts involving multiple PE sponsors. Moreover, because a direct lender can have multiple BDCs (as described in Section 2.2.2), I aggregate the loan holdings data at the parent direct lender level. I then construct two measures of the "PE-BDC" relationship: I(Recent deal), which takes a value of 1 if the BDC lender has previously lent to the PE sponsor's deals in the past five years, and Log(N(prior deal)+1), where N(prior deal) represents the total number of the PE sponsor's deals that the BDC lender has previously lent to. The former captures variation in relationship strength across PE-BDC pairs based on recent deal activity and more at the extensive margin, while the latter captures differences based on all deal history and more at the intensive margin. It is important to note that these relationship measures, by construction, are subject to measurement error in the earlier years of the sample. Therefore, I subset the analysis samples to start from 2017, 2018, and 2019, providing enough time to ensure more precise measurement of the relationship measures.

To overcome the second, identification challenge, I focus on PE-backed firms that borrow from multiple BDC lenders and exploit firm-time fixed effects, as in Khwaja and Mian (2008) and Banerjee et al. (2021). Doing so, I effectively compare changes in credit supply to the same firm by BDCs that differ in their relationship with its PE sponsor. Specifically, I

estimate the following regression specification:

$$Y_{i,j,k,t} = \beta_1 Relationship_{i,j,t-1} + \beta_2 Relationship_{i,j,t-1} \times COVID_t + \gamma X_{i,k,t-1} + \alpha_{k,t} + \delta_{i,t} + \epsilon_{i,j,k,t} \tag{6.1}$$

where, for a firm k that is owned by PE sponsor j and borrows from multiple BDC lender i's in year-quarter t, the outcome variable, $Y_{i,j,k,t}$, either takes the changes in the log volume of total credit or the interest rates charged on the first lien debt provided by a BDC lender to the firm.[1] $Relationship_{i,j,t-1}$ takes one of the two aforementioned PE-BDC relationship variables, and $COVID_t$ is an indicator variable that equals 1 if t is within Q1 2020 and Q4 2020.

The main coefficient of interest, β_2, captures the incremental credit supply effects of a prior relationship between PE sponsor j and BDC lender i during the COVID period. Crucially for identifying such credit supply effects, $\alpha_{k,t}$ is included to isolate time-varying credit demand effects. Furthermore, I include lender-time fixed effects, $\delta_{i,t}$, to control for the time-varying lender-level conditions as lenders may have had differential exposure to the COVID shock. Finally, this empirical strategy relies on the identifying assumption that firms do not have lender-specific credit demand correlated with their PE sponsors' prior relationship with lenders. In order to mitigate omitted variable bias arising from violation of this assumption, I additionally include time-varying BDC-firm level control variables, $X_{i,k,t-1}$, such as $Log(\text{Total Credit})_{i,j,k,t-1}$, and the share of first-lien and second-lien debt to total debt provided.

Analysis. For the main analysis, I use the subsample of 903 firms that were backed by 265 PE sponsors and borrowed from 71 BDC lenders between Q1 2019 and Q3 2022. The summary statistics of key variables for this sample are reported in Table 6.3, and those for the subsamples with sample period Q1 2018-Q3 2022 and Q1 2017-Q3 2022 are reported in

1. As I show in Table 6.3, among the three types of debt provided by the BDCs (first-lien, second-lien, and subordinated debt), first-lien debt is the majority (78%).

Tables A.15 and A.17, respectively.

Table 6.3: Summary Statistics (Q1 2019-Q3 2022)

	N	mean	p10	p25	median	p75	p90	sd
Total credit (M)	19123	22.205	0.992	2.909	7.851	20.190	47.860	59.065
Log(Total credit)	19123	15.799	13.807	14.883	15.876	16.821	17.684	1.581
1L share$_{t-1}$	19123	0.782	0.000	0.663	1.000	1.000	1.000	0.374
2L share$_{t-1}$	19123	0.165	0.000	0.000	0.000	0.000	1.000	0.351
Δ Log(Total credit)	19123	-0.005	-0.591	-0.003	-0.001	0.000	0.586	0.706
Δ Log(1L+2L)	19123	-0.007	-0.584	-0.003	-0.001	0.000	0.541	0.681
Δ Log(1L)	19123	-0.004	-0.585	-0.003	-0.002	0.000	0.579	0.730
1L all in yield rate (%)	16317	7.033	4.670	5.810	6.940	8.040	9.310	1.976
I(PE-BDC recent deal)$_{t-1}$	19123	0.396	0.000	0.000	0.000	1.000	1.000	0.489
N(PE-BDC prior deal)$_{t-1}$	19123	2.095	0.000	0.000	1.000	3.000	6.000	3.226
Log(N(PE-BDC prior deal)+1)$_{t-1}$	19123	0.776	0.000	0.000	0.693	1.386	1.946	0.783
Firm-BDC duration (qtrs)$_{t-1}$	19123	7.105	1.000	3.000	6.000	10.000	15.000	5.054
Log(Firm-BDC duration)$_{t-1}$	19123	1.879	0.693	1.386	1.946	2.398	2.773	0.682
Disrupted Industry$_{t-1}$	19123	0.174	0.000	0.000	0.000	0.000	1.000	0.379

Note: This table reports the summary statistics for the estimation sample in Table 6.4 columns 1 and 2 where Δ Log(Total credit) was used as the dependent variable. The sample includes 903 firms that were backed by 265 PE sponsors and borrowed from 71 BDCs between 2019Q1 and 2022Q3.

In terms of the debt-related variables, the mean (median) total credit provided by a BDC lender to a firm was \$22.21 million (\$7.85 milion). BDCs primarily provide first-lien debt; the share of first-lien, second-lien, and subordinated debt provided by BDCs in the sample were 78.2%, 16.5%, and 5.3%, respectively. Although the raw data includes a more detailed classification of first-lien debt into revolving credit facilities and term loans, the coverage is limited, so I do not further differentiate the loan types for the analyses. The mean (median) quarterly growth in total credit (i.e. the sum of first-lien, second-lien, and subordinated debt), total senior debt (i.e. the sum of first-lien and second-lien debt), and total first-lien debt were -0.5% (-0.1%), -0.7% (-0.1%), and 0.4% (-0.2%), respectively. While not reported in the table, the mean quarterly growth in total credit during the COVID and non-COVID periods were -1.53% and -0.17%, respectively. There is a wide dispersion at the tails of the distributions; for example, the standard deviation, 10th percentile, and 90th percentile of quarterly growth in total credit were 70.6%, -59.1%, and 58.6%, respectively.[2] The mean

2. Because all credit growth variables are computed as log differences, I winsorize them at 5% for sensible

(median) interest rate charged on the first-lien debt was 7.03% (6.94%).

In terms of the relationship measures, 39.6% of the observations had a PE-BDC pair with a prior deal in the past five years, and the mean (median) number of prior deals between a PE-BDC pair was 2.095 (1). This indicates a significant amount of variation in the relationship measures for analysis. In addition to the PE-BDC relationship measures, I also construct a firm-BDC relationship measure by taking the logarithm of the number of quarters of their relationship duration. The mean (median) duration of the firm-BDC relationship was 7.105 (6) quarters. These low numbers are consistent with loan agreements typically requiring loan repayment upon a change of control of the borrower. In this case, as the new majority owner of the firm upon buyout, the PE sponsor likely has a full discretion over the choice of new creditors after fully repaying existing creditors. Hence, with the existing firm-lender relationships having been likely extinguished, PE-lender relationships may play as a more critical role in lending decisions, as suggested in Ivashina and Kovner (2011) and Haque and Kleymenova (2023). I directly test this idea in the analyses by comparing the estimated coefficients on the PE-BDC and firm-BDC relationship measures.

I now estimate Specification 6.1, separately using the two lagged PE-BDC relationship measures (I(PE-BDC recent deal) and Log(N(PE-BDC prior deal)+1)). Table 6.4 reports the results separately using I(PE-BDC recent deal) and Log(N(PE-BDC prior deal)+1) as relationship measures. The main outcome variables used are the quarterly growth in total credit and the interest rate charged on the first-lien debt. All standard errors are double-clustered at the firm and BDC lender level. The full results with estimated coefficients on all included variables are shown in Table A.14. The results for the other two subsamples (2017Q1-2022Q3 and 2018Q1-2022Q3) are reported in Tables A.16 and A.18, respectively.

Compared to normal times, BDC lenders with closer relationship with the PE sponsors appear to have provided more continuation lending during the pandemic, both in the form of

interpretation of the magnitudes in the regressions. As I show in Figure B.9 of Appendix, the main results are not sensitive to winsorization at different levels.

higher credit growth and lower interest rates. Having a prior deal with the PE sponsor was associated with 8.3% higher quarterly growth in total credit and a 12.5 bps lower interest rate charged on the first-lien debt, respectively. Moreover, one standard deviation increase in Log(N(PE-BDC prior deal)+1) is associated with 4.2% and -8.7 bps for the same outcome variables, respectively. These estimates are statistically significant at either the 5% or 1% level, and economically meaningful as the mean quarterly credit growth during COVID was -3.1% among PE-BDC pairs with no prior deal.

Table 6.4: PE-BDC relationship and credit supply during COVID

	ΔLog(Total credit)	1L rate (%)	ΔLog(Total credit)	1L rate (%)
I(Recent deal)	0.012	-0.009		
	(0.019)	(0.035)		
I(Recent deal) × COVID	0.083***	-0.125**		
	(0.028)	(0.061)		
Log(N(Prior deal)+1)			0.003	-0.004
			(0.015)	(0.028)
Log(N(Prior deal)+1) × COVID			0.053**	-0.111**
			(0.021)	(0.048)
Firm x YearQtr FE	Yes	Yes	Yes	Yes
BDC x YearQtr FE	Yes	Yes	Yes	Yes
BDC x Firm loan controls	Yes	Yes	Yes	Yes
Sample	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3
N	19123	15529	19123	15529
R-squared	0.51	0.90	0.51	0.90

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for regression specification 6.1. Panel A reports the results using I(PE-BDC recent deal) as the relationship measure, and Panel B, Log(N(PE-BDC Prior deal)+1). Firm-year-quarter and BDC-year-quarter fixed effects were included. BDC-Firm time-varying controls include lagged total credit, and the share of 1L and 2L debt to total credit. Standard errors are double-clustered by BDC and borrowing firm.

On the other hand, as shown in Table A.14, the interaction between Log(Firm-BDC duration) and COVID does not exhibit a significant relationship with any of the outcome variables. As conjectured before, this suggests that lenders' relationships with PE sponsors were more important than their relationship with the firms for their lending decisions during the COVID period.

Furthermore, as demonstrated in Tables A.16 and A.18, the results remain qualitatively similar for the Q1 2018-Q3 2022 and Q1 2017-Q3 2022 subsamples, albeit with slightly smaller magnitudes for some of the outcome variables. This is consistent with the influence of attenuation bias stemming from the measurement error in relationship measures.

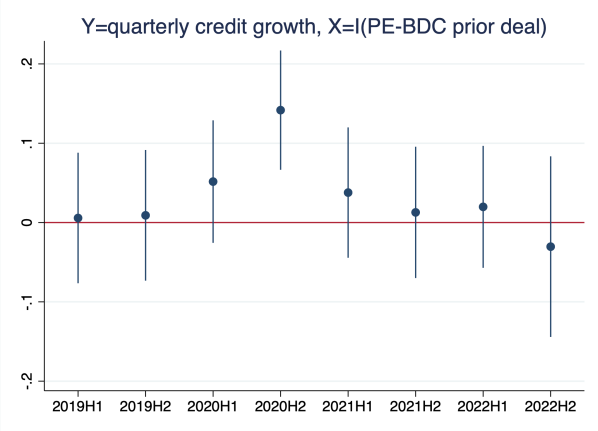
In sum, among PE-backed firms that borrow from multiple BDC lenders, the relationships that direct lenders have cultivated with PE sponsors through repeated deals seem to have mitigated credit supply distortions during the pandemic. These PE-lender relationships appear to be more influential in shaping credit supply decisions during challenging times than firm-lender relationships. This finding aligns with the majority of surveyed US direct lenders in Block et al. (2022) who chose the lending relationship with PE sponsors as the primary advantage of lending to PE buyout deals.

Robustness tests. While the aforementioned results support the hypothesis that repeated interactions between PE sponsors and direct lenders help protect firms from credit supply distortions during times of stress, there are remaining concerns. First, we want to ensure that the relationship effects do not occur randomly in normal times and only occur during a period of distress. Second, although COVID served as a suitable quasi-natural experiment to examine lenders' ability to support relationship borrowers in a crisis due to its low predictability and its isolated impact on borrowers' liquidity without significantly affecting lenders' (Berger et al., 2021), it remains uncertain whether the observed credit supply effects of PE-BDC relationships during COVID were entirely due to distress reasons given its differential impact across industries. Third, the results, by design, only apply to firms that borrow from multiple BDC lenders, raising the question of whether the same conclusions can be drawn for single-BDC borrowers.

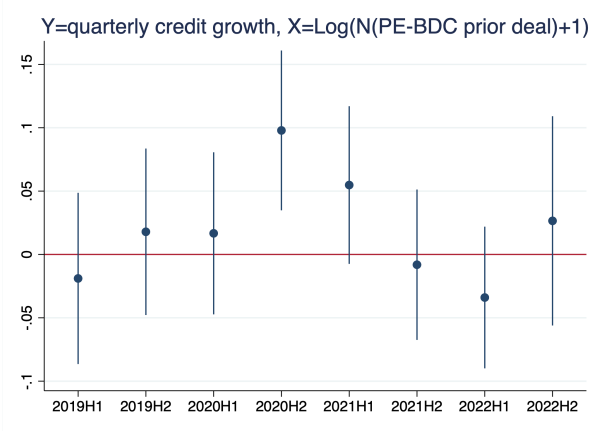
I perform a series of robustness tests to address these concerns. To assuage the first concern, I reestimate the regressions in 6.1 by interacting the relationship measures with every half-year indicator instead of just the COVID period. To mitigate the second concern,

I reestimate the regressions by adding an interaction term, an indicator for COVID-disrupted industries. To address the third concern on external validity, I rerun the analyses without the firm-time fixed effects and compare the estimates to assess the direction of omitted variable bias.

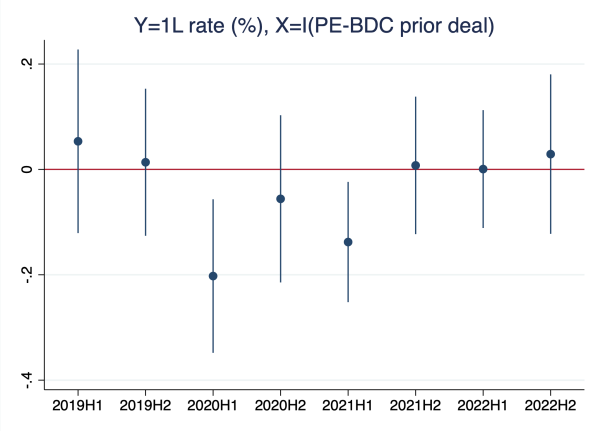
Figure 6.1: Relationship effects across time



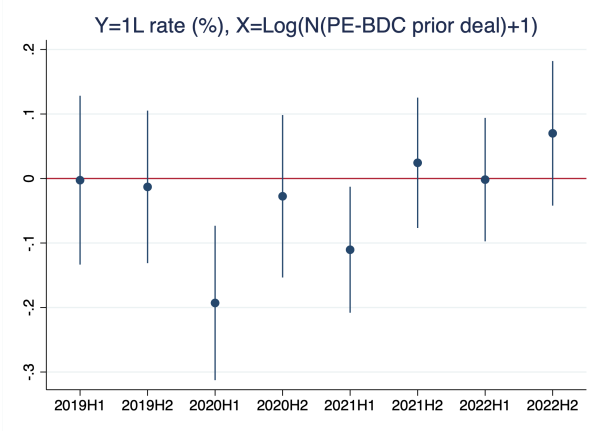
Panel A: ΔLog(Credit) on I(Recent deal)



Panel B: ΔLog(Credit) on Log(N(Prior deal)+1)



Panel C: 1L rate (%) on I(Recent deal)



Panel D: 1L rate (%) on Log(N(Prior deal)+1)

Note: This figure plots the estimated coefficients on all interaction terms where the regressions in specification 6.1 were reestimated by interacting the relationship measures (ΔLog(Credit) or 1L rate (%)) with every half-year indicator instead of just the COVID period.

Robustness test A: Relationship effects across time. Figure 6.1 plots the estimated coefficients on all interaction terms where the regressions in specification 6.1 were reestimated

by interacting the relationship measures (ΔLog(Credit) or 1L rate) with every half-year indicator instead of just the COVID period. As displayed, both relationship measures exhibit a significant relationship with ΔLog(Credit) only when interacted with the second half of 2020, and with 1L rate only when interacted with the first half of 2020 and 2021. These results reinforce the earlier interpretation that the effects of prior relationship on credit supply are more pronounced in periods of distress.

Robustness test B: Interaction with COVID Disrupted Industries. To examine whether the observed credit supply effects of relationships during COVID were driven by distress-related factors, I classify firms into industries with high versus low exposure to COVID disruption. To this end, I refer to Chodorow-Reich, Darmouni, Luck, and Plosser (2022) who analyzed industry-level COVID exposures as well as an S&P article that categorized industries into high and low COVID impact sectors.[3] In the former, the NAICS industries with the largest employment and liquidity impact include "Clothing and clothing accessories stores", "Accommodation," "Amusements, gambling, and recreation," "Apparel," "Furniture and home furnishings stores," "Food services and drinking places," "Sporting goods, hobby, book, and music stores," "Performing arts and spectator sports, and related industries," "Motion picture and sound recording" and "Miscellaneous store retailers." The latter classifies five most impacted industries as "Airlines," "Automobiles," "Energy Equipment & Services," "Hotels, Restaurants & Leisure," and "Specialty Retail."

Accordingly, I use the two broad industry categories from Refinitiv and Pitchbook to categorize firms into high versus low COVID impact industries. Refinitiv and Pitchbook follow their own industry classification, which do not directly align with standard industry codes such as SIC or NAICS. Therefore, I manually inspect the industry names and create an indicator variable, "Disrupted Industry," which takes the value of 1 if a firm falls under

3. The link to the latter is: https://www.spglobal.com/marketintelligence/en/news-insights/blog/industries-most-and-least-impacted-by-covid-19-from-a-probability-of-default-perspective-january-2022-updat

as one of the following set of categories in Refinitiv ("Aerospace and Defense", "Automotive", "Beverage Food and Tobacco Processing", "Hotel & Gaming", "Leisure and Entertainment", "Media", "Restaurants", "Retail & Supermarkets", and "Textiles & Apparel"), or Pitchbook ("Apparel and Accessories", "Energy Equipment", "Energy Services", "Media", "Restaurants, Hotels and Leisure", and "Retail"). As reported in Table 6.3, 17.4% of the sample observations are classified under "Disrupted Industry".

To investigate whether the observed credit supply effects of PE-BDC relationships during COVID were concentrated among firms that operate in industries with high exposure to the COVID distress shock, I additionally interact "Disrupted Industry" in the regressions as the following:

$$\begin{aligned} Y_{i,j,k,t} = {} & \beta_1 Relationship_{i,j,t-1} + \beta_2 Relationship_{i,j,t-1} \times COVID_t \\ & + \beta_3 Relationship_{i,j,t-1} \times Disrupted + \beta_4 Relationship_{i,j,t-1} \times COVID_t \times Disrupted \\ & + \gamma X_{i,j,k,t-1} + \alpha_{k,t} + \delta_{i,t} + \epsilon_{i,j,k,t}, \end{aligned} \tag{6.2}$$

where the main coefficient of interest now becomes β_4.

Table 6.5 reports the estimation results for two main outcome variables, total credit growth and interest rate on the first-lien debt, using the main sample with sample period Q1 2019-Q3 2022. As shown for both relationship measures, their positive effects on total credit growth during COVID are concentrated among firms in industries with high distress exposure to COVID. On the other hand, those firms do not appear to exhibit stronger interest rate effects.

Table 6.5: Incremental relationship effects on firms in COVID disrupted industries

Panel A: Sponsor-BDC relationship measure = I(PE-BDC recent deal)

	Δ Log(Total credit)		1L rate (%)	
	(1)	(2)	(3)	(4)
Relationship	0.012	0.012	-0.009	-0.029
	(0.019)	(0.020)	(0.035)	(0.036)
Relationship × COVID	0.083***	0.053*	-0.125**	-0.106*
	(0.028)	(0.031)	(0.061)	(0.060)
Relationship × Disrupted Industry		-0.004		0.109
		(0.053)		(0.097)
Relationship × COVID × Disrupted Industry		0.142**		-0.114
		(0.072)		(0.178)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
BDC x Firm controls	Yes	Yes	Yes	Yes
Sample	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3
N	19123	19123	15529	15529
R-squared	0.51	0.51	0.90	0.91

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Panel B: Sponsor-BDC relationship measure = Log(N(PE-BDC Prior deal)+1)

	Δ Log(Total credit)		1L rate (%)	
	(1)	(2)	(3)	(4)
Relationship	0.003	-0.001	-0.004	-0.014
	(0.015)	(0.015)	(0.028)	(0.029)
Relationship × COVID	0.053**	0.032	-0.111**	-0.113**
	(0.021)	(0.023)	(0.048)	(0.050)
Relationship × Disrupted Industry		0.029		0.063
		(0.041)		(0.095)
Relationship × COVID × Disrupted Industry		0.110**		0.037
		(0.052)		(0.144)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
BDC x Firm controls	Yes	Yes	Yes	Yes
Sample	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3
N	19123	19123	15529	15529
R-squared	0.51	0.51	0.90	0.91

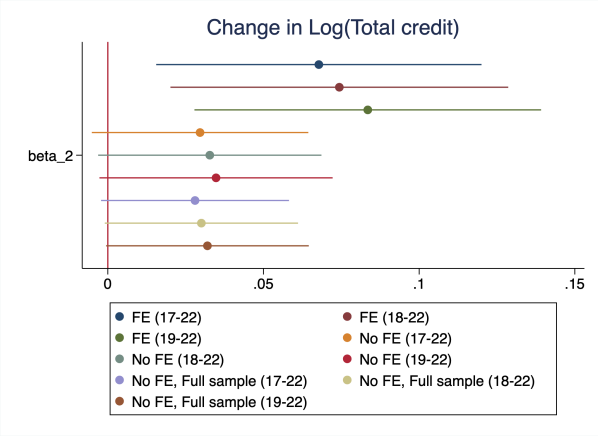
Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for Specification 6.2. Panel A reports the results using I(PE-BDC recent deal) as the relationship measure, and Panel B, Log(N(PE-BDC Prior deal)+1). Firm-year-quarter and BDC-year-quarter fixed effects were included. BDC-Firm time-varying controls include lagged total credit, the share of 1L and 2L debt to total credit, Log(Firm-BDC duration), Log(Firm-BDC duration) × COVID, Log(Firm-BDC duration)× Disrupted Industry, and Log(Firm-BDC duration) × COVID × Disrupted Industry. Standard errors are double-clustered by BDC and borrowing firm.

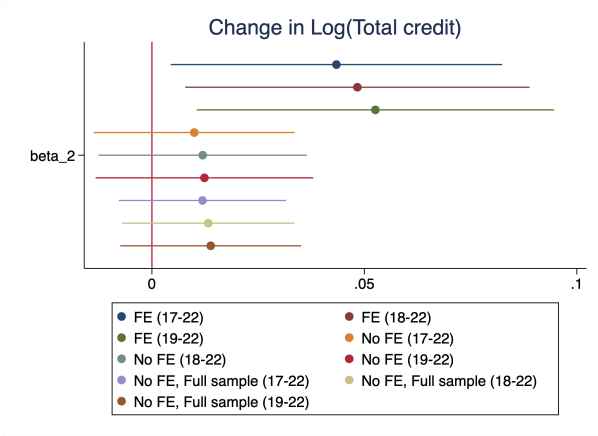
Robustness test C: External Validity. To examine external validity for single-BDC borrowers, in Figure 6.2, I plot the main coefficients of interest in specifications 6.1 (β_2) and 6.2 (β_4) using credit growth as the outcome variable, separately 1) with firm-time fixed effects for multiple-BDC borrowers, 2) without firm-time fixed effects for multiple-BDC borrowers, and 3) without firm-time fixed effects for all borrowers including single-BDC borrowers. I also plot them separately for the main sample (2019Q1-2022Q3) as well as the supplementary samples (2018Q1-2022Q3 and 2017Q1-2022Q3).

On both relationship measures, the inclusion of firm-time fixed effects lead to higher estimates. This distills the endogeneity concern that PE sponsors bring firms with lower credit risk to BDCs with a stronger relationship, and therefore suggests that the estimations without the fixed effects are likely biased downward (not upward). Importantly, the results without the fixed effects also remain unchanged for the full sample of firms. Although the estimates without firm-time fixed effects are weakly significant in only some cases, such stability in the estimates across the samples, coupled with the aforementioned downward bias, raises the possibility that the relationship effects may even hold for single-BDC borrowers.

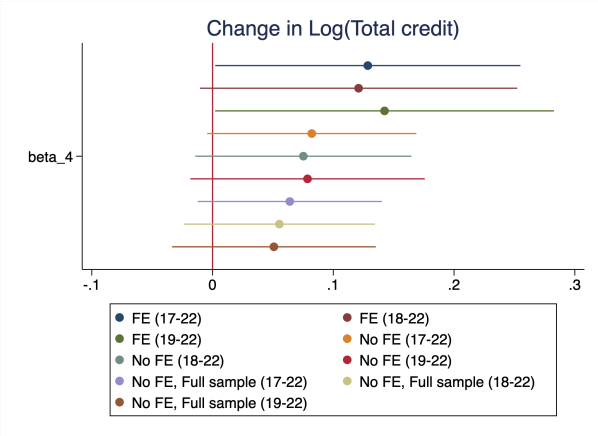
Figure 6.2: Influence of firm-time fixed effects



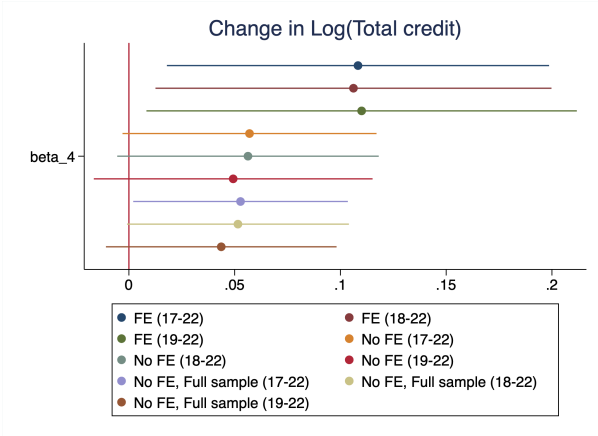
Panel A: I(PE-BDC recent deal), β_2, Spec 6.1



Panel B: Log(N(PE-BDC prior deal)+1), β_2, Spec 6.1



Panel C: I(PE-BDC recent deal), β_4, Spec 6.2



Panel D: Log(N(PE-BDC prior deal)+1), β_4, Spec 6.2

Note: This figure plots the main coefficients of interest in regression specifications 6.1 (β_2) and 6.2 (β_4) using total credit growth as the outcome variable by subsample (2019Q1-2022Q3, 2018Q1-2022Q3, and 2017Q1-2022Q3), separately 1) with firm-time fixed effects for multiple-BDC borrowers, 2) without firm-time fixed effects for multiple-BDC borrowers, and 3) without firm-time fixed effects for all borrowers including single-BDC borrowers. Panels A and C plot β_2 in regression 6.1 and β_4 in regression 6.2 for I(PE-BDC recent deal), and Panels B and D, β_2 in regression 6.1 and β_4 in regression 6.2 for Log(N(PE-BDC prior deal)+1), respectively.

6.3 Takeaways

The key takeaways from this section are summarized as the following. The analysis of the COVID distress resolution data from the Database revealed that direct lenders demonstrated

more flexibility than banks in renegotiating with their distressed borrowers. These renegotiations, in part, appear to be facilitated by direct lenders inducing greater skin-in-the-game from the PE sponsors, highlighting the relationship surplus sharing dynamics with PE sponsors playing a potentially important role in distress resolution. Additionally, using BDCs' loan holdings data, I identified credit supply effects of direct lenders' repeated interaction with PE sponsors. Direct lenders' prior relationships with PE sponsors were associated with more favorable continuation lending during the pandemic, in the form of higher credit growth and lower interest rates, particularly for firms in more distressed industries. These results suggest that, similar to banks, direct lenders establish close relationships and provide continuation lending to their relationship borrowers during times of financial stress.

CHAPTER 7

DISCUSSION

7.1 What explains direct lenders' active monitoring?

As described previously, recent research has found that nonbanks, in general, employ a more arm's-length lending approach than banks (Irani et al., 2021; Chernenko et al., 2022; Loumioti, 2022; Aldasoro et al., 2023). These findings are consistent with the long-standing view that banks are unique in their ability to collect soft information through monitoring (Diamond, 1984; Fama, 1985). To the extent that banks rely on cheaper deposit funding and deposit demandability ensures that banks properly monitor and not extract rents, it is also not surprising that nonbank intermediaries that rely on more expensive funding sources monitor less.

Then, what explains direct lenders' active monitoring? In fact, Diamond and Rajan (2001) explain why deposit fragility is a desirable feature for banks (given their reliance on deposits), but it does not imply that an intermediary needs demandable deposits to be able to monitor. In other words, as long as other intermediaries with a different financing structure have the ability to monitor and have organizational or contractual arrangements in place that provide them with proper incentives to monitor, no theory precludes them from providing monitoring-intensive loans.

As illustrated in Section 2.2, direct lenders' human capital largely originates from the private equity and banking industries. Extensive bodies of work have shown that both industries employ a monitoring-intensive investment approach (Nini et al., 2012; Kaplan and Stromberg, 2009), so investment professionals at direct lenders likely possess the expertise required for monitoring-intensive lending. Therefore, an important question now is whether direct lenders have arrangements in place that incentivize their investment professionals to engage in close monitoring.

A theory by Winton and Yerramilli (2008) provides one explanation. In their theory, private equity and venture capital funds have greater monitoring incentives than banks because the former face higher funding costs (compared to banks' virtually risk-free deposits) and have a compensation structure marked by high-powered incentives. As documented in Section 2.2, direct lenders not only have a similar funding structure and sources (mostly locked-up equity financing from institutional investors) but also a similar compensation structure (management fees and carried interest) as private equity and venture capital funds. Furthermore, because the loans that direct lenders make are not readily traded in secondary markets (as also shown in Section 2.2), direct lenders likely have a greater incentive to enhance returns through close monitoring rather than active trading.

7.2 What makes banks special if direct lenders provide relationship lending?

Given that direct lenders provide relationship lending as banks do, does that mean that banks should no longer be viewed as special?

Not necessarily. Another critical function of banks, not emphasized earlier, is liquidity creation. Banks accommodate liquidity demands on both their assets and liabilities: households withdraw from their deposits, and corporations draw down on their revolving credit lines upon unforeseen liquidity shocks. Because holding cash is costly due to forgone interests, as long as the demands for liquidity from households and corporations are not perfectly correlated, Kashyap et al. (2002) argue that it is less costly for banks to create liquidity than institutions that specialize only in taking deposits or providing revolving credit. Furthermore, Gatev and Strahan (2006) show that banks experience deposit inflows when market liquidity dries up, making banks better positioned than other financial institutions to meet corporate liquidity demands.

Several facts presented in this paper corroborate that banks are still more uniquely po-

sitioned than direct lenders to meet corporate liquidity demands. As previously shown in Table 3.3, banks provide more revolver financing than direct lenders to PE-backed firms, both at the extensive margin (i.e. indicator for revolver: 87.5% vs 69.1%) and intensive margin (i.e. the fraction of revolver commitment to total commitment: 19.4% vs 10.1%). Moreover, besides relationship surplus sharing, another explanation for the higher frequencies of sponsor equity injection in distressed direct lending deals than in distressed bank lending deals, as illustrated in Tables 5.1 and 6.2, could be that bank-reliant firms have more revolving credit availability.

Importantly, as documented in Section 2.2, direct lenders frequently rely on lines of credit at the fund level. This raises the possibility that the observed relationship lending by direct lenders during the COVID period may have been facilitated by their access to bank liquidity. In fact, in the mortgage lending market, nonbanks also heavily rely on bank lines of credit (Jiang, Matvos, Piskorski, and Seru, 2023). Hence, even if direct lenders may be more skilled than banks in resolving distress, we cannot rule out the possibility that they could not have achieved the same in a counterfactual world where they do not rely on bank lines of credit. If the answer is yes, then banks could be seen as even more special given their liquidity support for nonbank intermediation.

CHAPTER 8

CONCLUSION

In this paper, I studied whether direct lenders lend more like banks or arm's-length investors. Using a novel database for direct loans to PE buyouts, I document that direct lenders proactively use covenants to monitor and exert control over borrower activities. Nearly 99% of senior loans originated by direct lenders have a financial covenant and, on average, at least two. Moreover, upon covenant violation, direct lenders frequently place additional restrictions on borrower activities during renegotiation such that, going forward, borrowers become more conservative in their investment and financial policies. Hence, in contrast to prior studies that find nonbanks as being more arm's-length, direct lenders appear to closely monitor their borrowers as banks do.

Furthermore, during the COVID pandemic, direct lenders more flexibly renegotiated with distressed borrowers, involving more equity injections from PE sponsors than banks. This highlights that the mutual incentives between direct lenders and PE sponsors to preserve relationships facilitate distress resolution. Finally, firms backed by PE sponsors with established relationships with direct lenders received more favorable continuation lending during the pandemic. This came in the form of higher credit growth and lower interest rates, particularly in industries that were more heavily impacted by pandemic. Overall, these findings suggest that direct lenders are not fair-weather friends but instead actively engage in relationship lending as banks normally do.

The results in this paper suggest that direct lenders can be viewed as banks on the assets side but PE funds on the liabilities side, i.e. relationship lending supported by mostly locked-up equity financing and some long-term bank debt. Such a view raises several intriguing questions for future research. First, given similar funding sources as in PE, would flows into direct lenders also be pro-cyclical (Kaplan and Stromberg, 2009; Aramonte and Avalos, 2021)? Second, as discussed in Section 7, how important is direct lenders' reliance on bank

lines of credit for their relationship lending capacity? Answers to both questions could shed light on the efficacy of direct lenders' intermediation in bigger downturns.

Third, why do banks lend to direct lenders for them to make corporate loans when, instead, they could have lent directly to those companies? How much of this can be explained by regulatory arbitrage versus a desire to smooth competition with lenders with more innovative lending technology (Buchak, Matvos, Piskorski, and Seru, 2018; Jiang, 2023; Block et al., 2022)?

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APPENDIX A
ADDITIONAL TABLES

Table A.1: Variable descriptions

Variable Name	Description
Borrower characteristics	
I(Upper Middle-Market)	Equals 1 if revenue is between $500M and $1B by time of issuance
Revenue	Revenue in $M by time of issuance
Assets	Total Assets in $M by time of issuance
Ln(Assets)	Natural logarithm of Assets by time of issuance
Revenue/Assets	Revenue scaled by Total Assets by time of issuance
EBITDA/Assets	EBITDA scaled by Total Assets by time of issuance
I(EBITDA<0)	Equals 1 if EBITDA is negative by time of issuance
Cash/Assets	Cash scaled by Total Assets by time of issuance
Debt/Assets (pre-deal)	Total Debt scaled by Total Assets by time of issuance
Net PP&E/Assets	Net Property, Plant, and Equipment scaled by Total Assets by time of issuance
Inventory/Assets	Inventory by Total Assets scaled by time of issuance
Receivable/Asset	Accounts Receivable by Total Assets scaled by time of issuance
Basic loan terms	
Days to maturity	Number of days until maturity
I(Pricing grid)	Equals 1 if there is a pricing grid (i.e. performance pricing)
Spread over LIBOR	Mean interest rate spread over LIBOR in bps, weighted by facility commitments
Total commitment	Sum of all facility commitments (revolver and term loan only, excluding delayed draw term loan) in USD million
Debt/Assets (at issuance)	Total Debt scaled by Total Assets right after issuance
I(Revolver)	Equals 1 if there exists a revolving credit facility
I(Term loan)	Equals 1 if there exists a term loan facility
I(Delayed draw term loan)	Equals 1 if there exists a delayed draw term loan facility
I(Borrowing base)	Equals 1 if there exists a borrowing base requirement on specific assets
Revolver commitment ratio	Total revolver commitment divided by Total commitment
I(Bank revolver)	Equals 1 if there exists a bank that funds a portion of the revolver
I(Bank term loan)	Equals 1 if there exists a bank that funds a portion of the term loan
I(Bank syndicate)	Equals 1 if there exists a bank syndicate

Table A1: Variable Descriptions (continued)

Variable Name	Description
Monitoring-related loan terms	
I(Financial covenant)	Equals 1 if there exists a financial covenant
N(Financial covenant)	Number of financial covenants
I(Debt to CF covenant)	Equals 1 if there exists a maximum debt to EBITDA covenant
I(CF coverage ratio covenant)	Equals 1 if there exists a minimum fixed charge, interest, or debt service coverage ratio covenant
I(Minimum CF covenant)	Equals 1 if there exists a minimum EBITDA or revenue covenant
I(Net worth covenant)	Equals 1 if there exists a minimum net worth covenant
I(Debt to BS covenant)	Equals 1 if there exists a maximum debt to balance sheet (e.g. total assets or equity) covenant
I(Liquidity covenant)	Equals 1 if there exists a minimum liquidity covenant
I(CapEx covenant)	Equals 1 if there exists a maximum capital expenditure covenant
CapEx limit/Assets	Capital expenditure covenant limit divided by Total Assets
Debt/EBITDA required	Maximum Debt/EBITDA required by a covenant
I(Equity cure)	Equals 1 if an equity cure right exists
Investment limit	A dollar limit on investments of any type under negative covenants
Debt issuance limit	A dollar limit on debt incurrence of any type under negative covenants
Sub. debt issuance limit	A dollar limit on sub. debt issuance of any type under negative covenants
Asset sale limit	A dollar limit on asset sales of any type under negative covenants
I(Acquisition blocked)	Equals 1 if there is an outright block on any acquisitions
I(Acquisition limited)	Equals 1 if there is a dollar limit on permitted acquisitions
I(Acquisition unlimited)	Equals 1 if there is no dollar limit on permitted acquisitions
Acquisition limit	A dollar limit on contractually permitted acquisitions
Builder basket limit	A dollar limit that can interchangeably used for debt issuance, investments, and restricted payments
I(Lender board obs. right)	Equals 1 if lenders have a board observation right
I(Lender meeting/call)	Equals 1 if borrower is required to conduct periodic lender meetings
Renegotiated Monitoring terms	
I(Debt to CF cov. Added/Tightened)	Equals 1 if a debt to EBITDA covenant was added/tightened
I(CF coverage ratio cov. Added/Tightened)	Equals 1 if a fixed charge, interest, or debt service coverage ratio covenant was added/tightened
I(Liquidity cov. Added/Tightened)	Equals 1 if a liquidity covenant was added/tightened
I(CapEx cov. Added/Tightened)	Equals 1 if a capital expenditure covenant was added/tightened
I(Minimum CF cov. Added/Tightened)	Equals 1 if a minimum EBITDA covenant was added/tightened
I(Financial covenant Added/Tightened)	Equals 1 if a financial covenant was added/tightened
I(Liens Tightened)	Equals 1 if a negative covenant on liens was tightened
I(Indebtedness Tightened)	Equals 1 if a negative covenant on debt issuance was tightened
I(Investments/acquisition Tightened)	Equals 1 if a negative covenant on investments/acquisition was tightened
I(Asset sales Tightened)	Equals 1 if a negative covenant on asset sales was tightened
I(Payment/affil. trans. Tightened)	Equals 1 if a negative covenant on restricted payments/affiliate transactions was tightened
I(Negative covenant Tightened)	Equals 1 if a negative covenant was tightened

Table A1: Variable Descriptions (continued)

Variable Name	Description
I(Lender board obs. right Added/Tightened)	Equals 1 if a lender board observation right was added/tightened
I(Lender meeting/call Added/Tightened)	Equals 1 if borrower's requirement to conduct a periodic meetings with the lenders was added/tightened
I(Lender-approved advisor condition Added)	Equals 1 if a condition to appoint a lender-approved advisor was added
I(Weekly CF forecast Added)	Equals 1 if a weekly CF forecast reporting requirement was added
I(Non-covenant monitoring Tightened)	Equals 1 if one of I(Lender board obs. right Added/Tightened), I(Lender meeting/call Added/Tightened), I(Lender-approved advisor condition Added), or I(Weekly CF forecast Added) equals 1
I(Sponsor equity injection)	Equals 1 if borrower's PE sponsor was required to inject equity
I(Any intervention)	Equals 1 if I(Financial covenant Added/Tightened), I(Negative covenant Tightened), I(Non-covenant monitoring Tightened), or I(Sponsor equity injection) equals 1
COVID distress-related variables	
COVID revenue growth	Revenue growth from 2019Q4 to 2020Q4
Distress event	Evidence of a payment or covenant default during COVID
Payment default	Evidence of a default on payment obligations
P&I deferral	Evidence of payment obligations deferred
Covenant renegotiation	Evidence of a loan amendment that relaxed an existing covenant
Restructuring	Evidence of restructuring transaction
In-court restructuring	Restructuring took place in court (Chapter 11 or 7)
Out-of-court restructuring	Restructuring took place out-court
Sponsor equity injection	Evidence of equity injection by an existing PE sponsor
Sponsor exit	Evidence of exit of an existing PE sponsor through restructuring
BDC holdings data variables	
Total credit	Total credit extended by the BDC lender to the firm ($ million)
Log(Total credit)	Natural logarithm of Total credit plus $1
1L share	Share of first-lien debt as a fraction of Total credit
2L share	Share of second-lien debt as a fraction of Total credit
Δ Log(Total credit)	Quarterly change in Log(Total credit)
Δ Log(1L+2L)	Quarterly change in Log(first-lien debt + second-lien debt)
Δ Log(1L)	Quarterly change in Log(first-lien debt)
1L all in yield rate	All-in-yield on first-lien debt (%)
I(PE-BDC recent deal)	Equals 1 if the PE sponsor and BDC lender pair had a prior deal in the past five years.
N(PE-BDC prior deal)	Number of prior deals between the PE sponsor and BDC lender pair
Log(N(PE-BDC prior deal)+1)	Natural logarithm of N(PE-BDC prior deal) plus 1
Firm-BDC duration	Number of quarters of the relationship between the firm and the BDC lender
Log(Firm-BDC duration)	Natural logarithm of Firm-BDC duration
Disrupted Industry	Equals 1 if the firm is an industry highly impacted by COVID

Table A.2: Direct lenders' founding and fundraising history

Panel A: Summary Statistics

	N	mean	median	sd
I(Founding Year $\geq$ 2008)	67	0.51	1.00	0.50
Founding Year	67	2007.43	2008.00	7.20
I(Bank-related)	67	0.48	0.00	0.50
I(Bank-spinoff)	67	0.10	0.00	0.31
I(Bank founder)	67	0.46	0.00	0.50
I(PE-related)	67	0.54	1.00	0.50
I(PE founder)	67	0.27	0.00	0.45
I(PE-affiliated)	67	0.33	0.00	0.47
I(Insurance-affiliated)	67	0.07	0.00	0.26
I(Pension-affiliated)	67	0.01	0.00	0.12
I(Has a direct lending PD fund)	67	0.85	1.00	0.36
N(Direct lending PD funds)	67	6.21	4.00	6.60
I(Has a BDC)	67	0.58	1.00	0.50
N(BDCs)	67	1.19	1.00	1.51

Panel B: Summary Statistics by Direct Lender Age

	Old				Young			
	N	mean	median	sd	N	mean	median	sd
I(Bank-related)	33	0.42	0.00	0.50	34	0.53	1.00	0.51
I(PE-related)	33	0.58	1.00	0.50	34	0.50	0.50	0.51
I(Has a direct lending PD fund)	33	0.79	1.00	0.42	34	0.91	1.00	0.29
I(Has a BDC)	33	0.67	1.00	0.48	34	0.50	0.50	0.51
N(Direct lending PD funds)	33	7.06	6.00	7.47	34	5.38	4.00	5.60
N(BDCs)	33	1.42	1.00	1.62	34	0.97	0.50	1.38

Panel C: Regression Results

	(1)	(2)	(3)	(4)
	I(Has a direct lending fund)	I(Has a BDC)	Log(N(Direct lending funds)+1)	Log(N(BDCs)+1)
Log(Age+1)	-0.010	0.020***	-0.001	0.024**
	(0.007)	(0.007)	(0.018)	(0.010)
Constant	1.007***	0.278**	1.584***	0.218
	(0.116)	(0.127)	(0.285)	(0.165)
N	67	67	67	67
R-squared	0.04	0.08	0.00	0.09

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Old (Young) refers to direct lenders that were founded before (in or after) 2008.
Sources: Pitchbook, Preqin, Google

Table A.3: Basic loan terms by financing type

	PE-Direct				PE-Bank				Public-Bank			
	N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD
Total commitment (USD M)	288	122.639	81.100	119.412	112	277.605***	189.000	318.511	400	286.894	200.000	274.335
Debt/Assets (at issuance)	288	0.644	0.527	0.474	112	0.770**	0.608	0.544	400	0.336***	0.306	0.220
Debt/EBITDA (at issuance)	262	6.293	5.738	3.055	107	6.299	6.207	2.654	335	3.830***	3.341	3.106
Spread over LIBOR (bps)	288	676.819	650.000	188.903	112	488.290***	475.000	138.628	400	284.438***	250.000	158.193
I(Pricing grid)	288	0.372	0.000	0.484	112	0.491**	0.000	0.502	400	0.730***	1.000	0.445
Days to maturity	288	1893.694	1826.000	308.765	112	2121.679***	2191.000	407.514	400	1761.205***	1826.000	491.751
I(Revolver)	288	0.691	1.000	0.463	112	0.875***	1.000	0.332	400	0.900	1.000	0.300
I(Term loan)	288	0.997	1.000	0.059	112	0.946***	1.000	0.226	400	0.445***	0.000	0.498
I(Delayed draw term loan)	288	0.278	0.000	0.449	112	0.152***	0.000	0.360	400	0.043***	0.000	0.202
Revolver commitment ratio	288	0.101	0.089	0.117	112	0.194***	0.132	0.237	400	0.692***	1.000	0.389
I(Borrowing base)	288	0.090	0.000	0.287	112	0.170**	0.000	0.377	400	0.263**	0.000	0.441
I(Bank revolver)	288	0.132	0.000	0.339	112	0.875***	1.000	0.332	400	0.900	1.000	0.300
I(Bank term loan)	288	0.087	0.000	0.282	112	0.946***	1.000	0.226	400	0.445***	0.000	0.498
I(Bank syndicate)	288	0.153	0.000	0.360	112	1.000***	1.000	0.000	400	1.000	1.000	0.000

*Note: This table reports the summary statistics of basic loan terms of the loan sample by the three financing types: PE-Direct, PE-Bank, and Public-Bank. Variable descriptions can be found in Table A.1 in the Appendix section. The sample period is from 2013 to 2019. *, **, and *** indicate the statistical significance for mean differences between the financing types in the adjacent columns at 10%, 5%, and 1%, assuming unequal variances.*

Table A.4: Covenant-related loan terms by financing type

	PE-Direct				PE-Bank				Public-Bank			
	N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD
I(Financial covenant)	288	0.986	1.000	0.117	112	0.964	1.000	0.186	400	0.915*	1.000	0.279
N(Financial covenant)	288	2.087	2.000	1.037	112	1.500***	1.000	0.838	400	1.837***	2.000	0.896
I(Debt to CF covenant)	288	0.917	1.000	0.277	112	0.920	1.000	0.273	400	0.698***	1.000	0.460
I(CF coverage ratio covenant)	288	0.528	1.000	0.500	112	0.330***	0.000	0.472	400	0.700***	1.000	0.459
I(Minimum CF covenant)	288	0.149	0.000	0.357	112	0.009***	0.000	0.094	400	0.048***	0.000	0.213
I(Net worth covenant)	288	0.014	0.000	0.117	112	0.018	0.000	0.133	400	0.065***	0.000	0.247
I(Debt to BS covenant)	288	0.000	0.000	0.000	112	0.009	0.000	0.094	400	0.052***	0.000	0.223
I(Liquidity covenant)	288	0.101	0.000	0.301	112	0.071	0.000	0.259	400	0.168***	0.000	0.374
I(CapEx covenant)	288	0.378	0.000	0.486	112	0.143***	0.000	0.351	400	0.107	0.000	0.310
CapEx limit/Assets	109	0.088	0.055	0.102	16	0.084	0.043	0.110	43	0.078	0.047	0.093
Debt/EBITDA required	264	5.990	6.000	1.793	103	6.293	6.500	1.707	279	3.701***	3.500	1.071
I(Debt/EBITDA required>6)	264	0.443	0.000	0.498	103	0.573**	1.000	0.497	279	0.022***	0.000	0.145
I(Equity cure)	288	0.698	1.000	0.460	112	0.670	1.000	0.472	400	0.048***	0.000	0.213
Investment limit/Assets	288	0.021	0.009	0.033	112	0.040***	0.020	0.066	400	0.023**	0.002	0.119
Debt issuance limit/Assets	288	0.017	0.000	0.033	112	0.040***	0.023	0.059	400	0.018***	0.000	0.039
Sub. debt issuance limit/Assets	288	0.030	0.016	0.045	112	0.053***	0.033	0.067	400	0.037*	0.018	0.107
Asset sales limit/Assets	288	0.048	0.010	0.322	112	0.063	0.013	0.406	400	0.023	0.004	0.100
I(Acquisition blocked)	288	0.049	0.000	0.215	112	0.036	0.000	0.186	400	0.140***	0.000	0.347
I(Acquisition limited)	288	0.625	1.000	0.485	112	0.589	1.000	0.494	400	0.390***	0.000	0.488
I(Acquisition unlimited)	288	0.326	0.000	0.470	112	0.375	0.000	0.486	400	0.470*	0.000	0.500
Acquisition limit/Assets	194	0.326	0.176	0.427	70	0.194**	0.079	0.431	212	0.099*	0.045	0.139
I(Builder basket)	288	0.403	0.000	0.491	112	0.527**	1.000	0.502	400	0.098***	0.000	0.297
Builder basket limit/Assets	288	0.015	0.000	0.069	112	0.019	0.000	0.038	400	0.003***	0.000	0.014

*Note: This table reports the summary statistics of monitoring-related loan terms of the loan sample by the three financing types: PE-Direct, PE-Bank, and Public-Bank. Variable descriptions can be found in Table A.1 in the Appendix section. The sample period is from 2013 to 2019. *, **, and *** indicate the statistical significance for mean differences between the financing types in the adjacent columns at 10%, 5%, and 1%, assuming unequal variances.*

Table A.5: Regression results: Basic loan terms

	(1) Debt/Assets	(2) Debt/Assets	(3) Spread over LIBOR (bps)	(4) Spread over LIBOR (bps)	(5) I(Revolver)	(6) I(Revolver)	(7) I(Borrowing base)	(8) I(Borrowing base)
Direct X PE-backed	-0.122***	-0.112**	189.493***	161.014***	-0.181***	-0.176***	-0.079	-0.145***
	(0.033)	(0.049)	(13.646)	(14.762)	(0.038)	(0.046)	(0.050)	(0.041)
PE-backed	0.421***	0.240***	214.420***	175.405***	-0.024	-0.118*	-0.081	-0.056
	(0.034)	(0.052)	(20.404)	(19.947)	(0.045)	(0.063)	(0.088)	(0.048)
Ln(Assets)		-0.029		-37.974***		-0.045***		-0.041**
		(0.020)		(6.839)		(0.010)		(0.016)
I(Upper Middle-Market)		0.018		3.983		0.040		0.001
		(0.018)		(14.428)		(0.023)		(0.045)
Cash/Assets		0.017		-88.246**		-0.427**		-0.031
		(0.170)		(39.703)		(0.181)		(0.097)
Inventory/Assets		-0.036		77.743**		-0.295***		0.858***
		(0.119)		(32.286)		(0.081)		(0.082)
Receivable/Assets		-0.152		59.878		-0.632**		0.021
		(0.108)		(66.570)		(0.209)		(0.119)
Net PP&E/Assets		0.043		60.065		-0.233*		0.198***
		(0.103)		(40.211)		(0.124)		(0.061)
EBITDA/Assets		0.664***		-108.338**		0.192**		-0.187*
		(0.101)		(44.678)		(0.082)		(0.088)
I(EBITDA<0)		0.149***		114.662***		-0.147		0.083
		(0.025)		(29.144)		(0.089)		(0.060)
Debt/Assets (pre-deal)		0.496***		72.710**		-0.077		0.071
		(0.049)		(24.200)		(0.100)		(0.052)
Debt/Assets (at issuance)				32.147**				
				(13.510)				
Constant	0.341***	0.280	278.807***	456.094***	0.898***	1.415***	0.256**	0.345**
	(0.026)	(0.161)	(17.210)	(53.693)	(0.014)	(0.101)	(0.083)	(0.111)
Industry Effects	No	Yes	No	Yes	No	Yes	No	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	800	800	800	800	800	800	800	800
R-squared	0.19	0.35	0.54	0.62	0.08	0.16	0.05	0.30

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression coefficients for basic loan terms by "PE-Direct", "PE-Bank", and "Public-Bank" loans following regression specification 3.1. Fama-French 12 industry fixed effects and origination year fixed effects were included. The standard errors are clustered at the industry level.

Table A.6: Regression results: Covenants

	(1) N(CF cov)	(2) N(CF cov)	(3) I(CapEx cov)	(4) I(CapEx cov)	(5) Debt issuance limit	(6) Debt issuance limit	(7) Investment limit	(8) Investment limit
Direct X PE-backed	0.338***	0.200***	0.236***	0.149***	-0.023***	-0.020***	-0.020***	-0.018**
	(0.052)	(0.059)	(0.038)	(0.035)	(0.005)	(0.004)	(0.006)	(0.007)
PE-backed	-0.128	-0.299**	0.086**	0.042	0.017***	0.013*	0.012	0.000
	(0.112)	(0.109)	(0.032)	(0.048)	(0.004)	(0.006)	(0.014)	(0.019)
Ln(Assets)		-0.192***		-0.113***		0.005		-0.002
		(0.024)		(0.020)		(0.003)		(0.004)
I(Upper Middle-Market)		0.004		0.055		-0.002		-0.002
		(0.085)		(0.041)		(0.005)		(0.004)
Cash/Assets		-0.289		-0.251**		0.022		0.134
		(0.352)		(0.082)		(0.027)		(0.075)
Inventory/Assets		-0.371		-0.047		0.002		-0.012
		(0.269)		(0.164)		(0.016)		(0.013)
Receivable/Assets		0.299*		-0.048		-0.001		-0.038
		(0.137)		(0.147)		(0.008)		(0.043)
Net PP&E/Assets		0.148		0.155*		-0.004		-0.025
		(0.110)		(0.072)		(0.010)		(0.022)
EBITDA/Assets		-0.150		0.035		0.041***		0.081***
		(0.198)		(0.069)		(0.013)		(0.023)
I(EBITDA<0)		-0.522**		-0.051		0.009		0.007
		(0.189)		(0.075)		(0.006)		(0.008)
Debt/Assets (pre-deal)		-0.328***		-0.098**		0.014**		0.020*
		(0.080)		(0.036)		(0.006)		(0.010)
Constant	1.415***	2.796***	0.082***	0.786***	0.021***	-0.017	0.026**	0.022
	(0.102)	(0.202)	(0.014)	(0.149)	(0.002)	(0.023)	(0.009)	(0.034)
Industry Effects	No	Yes	Yes	Yes	No	Yes	No	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	800	800	800	800	800	800	800	800
R-squared	0.05	0.22	0.16	0.22	0.06	0.11	0.01	0.09

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression coefficients for covenant-related loan terms by "PE-Direct", "PE-Bank", and "Public-Bank" loans following regression specification 3.1. Fama-French 12 industry fixed effects and origination year fixed effects were included. The standard errors are clustered at the industry level.

Table A.7: Renegotiated terms upon covenant violation

	All (2016Jan-2021Mar)				Pre-COVID (2016Jan-2020Feb)				All, using I(bank syndicate)			
	Direct		Bank		Direct		Bank		Direct		Bank	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Panel A: Pre-violation monitoring terms												
I(Debt to CF covenant)	251	0.976	89	0.933	106	0.962	46	0.891	198	0.980	142	0.944*
I(CF coverage ratio covenant)	251	0.522	89	0.517	106	0.642	46	0.696	198	0.520	142	0.521
I(Liquidity covenant)	251	0.135	89	0.101	106	0.160	46	0.130	198	0.152	142	0.092*
I(CapEx covenant)	251	0.259	89	0.225	106	0.340	46	0.283	198	0.273	142	0.218
I(Minimum CF covenant)	251	0.088	89	0.056	106	0.123	46	0.065	198	0.101	142	0.049*
I(Lender board obs. right)	251	0.104	89	0.056	106	0.123	46	0.065	198	0.121	142	0.049**
I(Lender meeting/call)	251	0.207	89	0.202	106	0.179	46	0.283	198	0.217	142	0.190
Panel B: Renegotiated monitoring terms												
I(Any intevention)	251	0.769	89	0.674*	106	0.689	46	0.630	198	0.803	142	0.662***
I(Financial covenant Added/Tightened)	251	0.590	89	0.472*	106	0.462	46	0.435	198	0.606	142	0.493**
I(Debt to CF cov. Added/Tightened)	251	0.008	89	0.011	106	0.009	46	0.022	198	0.010	142	0.007
I(CF coverage ratio cov. Added/Tightened)	251	0.000	89	0.000	106	0.000	46	0.000	198	0.000	142	0.000
I(Liquidity cov. Added/Tightened)	251	0.518	89	0.360***	106	0.340	46	0.239	198	0.525	142	0.408**
I(CapEx cov. Added/Tightened)	251	0.096	89	0.079	106	0.142	46	0.152	198	0.106	142	0.070
I(Minimum CF cov. Added/Tightened)	251	0.263	89	0.135***	106	0.255	46	0.152	198	0.278	142	0.162***
I(Negative covenant Tightened)	251	0.382	89	0.382	106	0.330	46	0.283	198	0.389	142	0.373
I(Liens Tightened)	251	0.080	89	0.124	106	0.066	46	0.065	198	0.086	142	0.099
I(Indebtedness Tightened)	251	0.151	89	0.225	106	0.113	46	0.174	198	0.086	142	0.099
I(Investments/acquisition Tightened)	251	0.219	89	0.270	106	0.094	46	0.239**	198	0.227	142	0.239
I(Payment/affil. trans. Tightened)	251	0.303	89	0.337	106	0.283	46	0.239	198	0.298	142	0.331
I(Asset sales Tightened)	251	0.084	89	0.202**	106	0.066	46	0.152	198	0.086	142	0.155*
I(Non-covenant monitoring Tightened)	251	0.442	89	0.360	106	0.453	46	0.348	198	0.455	142	0.373
I(Lender board obs. right Added/Tightened)	251	0.084	89	0.045	106	0.094	46	0.043	198	0.096	142	0.042**
I(Lender meeting/call Added/Tightened)	251	0.215	89	0.112**	106	0.226	46	0.109*	198	0.222	142	0.141*
I(Advisor appointment condition Added)	251	0.135	89	0.112	106	0.217	46	0.087**	198	0.146	142	0.106
I(Weekly CF forecast Added)	251	0.339	89	0.281	106	0.302	46	0.261	198	0.348	142	0.289
I(Sponsor capital infusion)	251	0.458	89	0.281***	106	0.443	46	0.283*	198	0.455	142	0.352*

*Note: This table reports the summary statistics of monitoring-related loan terms that were tightened during renegotiation of covenant violation. Variable descriptions can be found in Table A.1 in the Appendix section. *, **, and *** indicate the statistical significance for mean differences between the financing types in the adjacent columns at 10%, 5%, and 1%, assuming unequal variances.*

Table A.8: Firm investment policies around covenant violations

	$\Delta Ln(Assets)_{i,t+1}$			$\Delta Ln(PP\&E)_{i,t+1}$			$\Delta CapEx/Assets_{i,t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Violate_{i,t+1}$	-0.127***	-0.107***	-0.077**	-0.135***	-0.144***	-0.136***	-0.006**	-0.005**	-0.010**
	(0.022)	(0.024)	(0.031)	(0.031)	(0.035)	(0.038)	(0.002)	(0.002)	(0.004)
$Violate_{i,t}$	-0.094***	-0.091***	-0.162***	-0.052	-0.025	-0.036	0.002	0.005*	0.006
	(0.026)	(0.029)	(0.039)	(0.034)	(0.039)	(0.062)	(0.003)	(0.003)	(0.004)
$Debt/Assets_{i,t}$	0.030	0.192***	0.039	-0.185***	-0.065	-0.084	-0.006***	-0.011**	-0.008
	(0.032)	(0.063)	(0.060)	(0.030)	(0.064)	(0.091)	(0.002)	(0.005)	(0.007)
$Debt/Assets_{i,t-1}$		-0.331***	-0.208***		-0.145*	-0.076		0.016***	0.014
		(0.071)	(0.074)		(0.077)	(0.113)		(0.006)	(0.009)
$EBITDA/Assets_{i,t}$	1.249***	1.099***	0.523**	0.816***	0.882***	0.619**	-0.020**	0.000	0.028
	(0.125)	(0.227)	(0.212)	(0.121)	(0.197)	(0.276)	(0.009)	(0.018)	(0.021)
$EBITDA/Assets_{i,t-1}$		0.073	0.619***		-0.323	0.008		-0.029	-0.063***
		(0.242)	(0.237)		(0.240)	(0.341)		(0.019)	(0.023)
$Ln(Assets)_{i,t}$	-0.058***	-0.029	0.031	-0.007	0.076*	0.128*	0.001	-0.000	0.003
	(0.012)	(0.045)	(0.052)	(0.013)	(0.044)	(0.076)	(0.001)	(0.004)	(0.006)
$Ln(Assets)_{i,t-1}$		-0.009	-0.030		-0.089**	-0.132*		0.001	-0.002
		(0.047)	(0.049)		(0.045)	(0.074)		(0.004)	(0.006)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	PreCOVID	All	All	PreCOVID	All	All	PreCOVID
N Firms	1229	838	456	1177	810	454	803	571	369
N	2724	1701	760	2594	1629	755	1611	1061	574
R-squared	0.24	0.24	0.25	0.10	0.13	0.20	0.09	0.11	0.16

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for the regression specification 5.1 on three outcome variables: $\Delta Ln(Assets)$, $\Delta Ln(PP\&E)$, and $\Delta CapEx/Assets$. For each outcome variable, three separate results are presented: the first column displays the results using one-year lagged control variables, the second, adding two-year lagged control variables, and the third, using only pre-COVID data. Standard errors are clustered by firm.

Table A.9: Firm financial policies around covenant violations

	$\Delta Ln(Debt)_{i,t+1}$			$\Delta Debt/Assets_{i,t+1}$			$\Delta Cash/Assets_{i,t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Violate_{i,t+1}$	-0.111***	-0.096***	-0.093***	0.001	0.010	-0.003	0.011**	0.006	0.001
	(0.022)	(0.023)	(0.030)	(0.023)	(0.030)	(0.045)	(0.004)	(0.005)	(0.006)
$Violate_{i,t}$	-0.133***	-0.111***	-0.176***	-0.053**	-0.060**	-0.053	-0.002	-0.004	0.003
	(0.022)	(0.025)	(0.037)	(0.027)	(0.025)	(0.045)	(0.004)	(0.005)	(0.006)
$Debt/Assets_{i,t}$	-0.175***	-0.077	-0.048	-0.085*	-0.165*	0.098	-0.011**	-0.017**	-0.014
	(0.026)	(0.048)	(0.061)	(0.051)	(0.085)	(0.113)	(0.004)	(0.008)	(0.012)
$Debt/Assets_{i,t-1}$		-0.094*	-0.099		0.267***	0.092		0.014	0.017
		(0.054)	(0.065)		(0.066)	(0.072)		(0.009)	(0.013)
$EBITDA/Assets_{i,t}$	0.753***	0.814***	0.367*	-0.488***	-0.234	-0.175	-0.047***	-0.032	0.024
	(0.100)	(0.157)	(0.217)	(0.161)	(0.218)	(0.343)	(0.017)	(0.027)	(0.029)
$EBITDA/Assets_{i,t-1}$		-0.289	0.186		-0.486**	-0.510		-0.016	-0.043
		(0.206)	(0.279)		(0.212)	(0.315)		(0.033)	(0.036)
$Ln(Assets)_{i,t}$	-0.029***	0.084***	0.084	0.017	0.071*	0.068	0.006***	0.011*	-0.007
	(0.009)	(0.031)	(0.052)	(0.012)	(0.041)	(0.051)	(0.002)	(0.006)	(0.008)
$Ln(Assets)_{i,t-1}$		-0.123***	-0.112**		-0.079**	-0.095*		-0.006	0.012
		(0.031)	(0.050)		(0.040)	(0.049)		(0.006)	(0.008)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	PreCOVID	All	All	PreCOVID	All	All	PreCOVID
N Firms	1220	833	454	1222	833	454	1214	826	446
N	2706	1691	755	2708	1691	755	2647	1645	738
R-squared	0.17	0.17	0.23	0.09	0.11	0.17	0.08	0.11	0.17

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for the regression specification 5.1 on three outcome variables: $\Delta Ln(Debt)$, $\Delta Debt/Assets$, and $\Delta Cash/Assets$. For each outcome variable, three separate results are presented: the first column displays the results using one-year lagged control variables, the second, adding two-year lagged control variables, and the third, using only pre-COVID data. Standard errors are clustered by firm.

Table A.10: Regressions of distress resolution types on financing type

	(1) I(P&I deferral)	(2) I(P&I deferral)	(3) I(Restructuring)	(4) I(Restructuring)	(5) I(Bankruptcy)	(6) I(Bankruptcy)
Direct	0.150**	0.128*	-0.195**	-0.123*	-0.121***	-0.096***
	(0.060)	(0.073)	(0.078)	(0.064)	(0.042)	(0.032)
COVID revenue growth	-0.229*	-0.242*	-0.325**	-0.393***	-0.253**	-0.287***
	(0.127)	(0.127)	(0.150)	(0.119)	(0.100)	(0.101)
Ln(Assets) (Pre-COVID)		-0.024		0.019		-0.002
		(0.024)		(0.037)		(0.027)
Debt/Assets (Pre-COVID)		-0.035		0.350***		0.127**
		(0.083)		(0.078)		(0.059)
EBITDA/Assets (Pre-COVID)		-0.084		-0.659**		-0.234
		(0.279)		(0.279)		(0.149)
Cash/Assets (Pre-COVID)		0.419		0.228		-0.173
		(0.735)		(0.491)		(0.291)
Non-Cash Current Assets/Assets (Pre-COVID)		-0.001		-0.027		0.010
		(0.151)		(0.089)		(0.067)
Net PP&E/Assets (Pre-COVID)		-0.237		0.018		0.088
		(0.142)		(0.103)		(0.070)
Constant	0.061	0.585	0.264***	-0.326	0.109***	0.053
	(0.057)	(0.525)	(0.070)	(0.757)	(0.033)	(0.561)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
N	224	224	224	224	224	224
R-squared	0.19	0.20	0.18	0.29	0.28	0.32

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the full regression results for I(P&I deferral), I(Restructuring), and I(Bankruptcy) with estimated coefficients on all included variables.

Table A.11: Regressions of distress resolution types on financing type

	(1) I(Sponsor injection)	(2) I(Sponsor injection)	(3) I(Sponsor exit)	(4) I(Sponsor exit)
Direct	0.213***	0.222***	-0.137**	-0.109*
	(0.067)	(0.075)	(0.065)	(0.055)
COVID revenue growth	-0.306**	-0.296*	-0.237*	-0.307**
	(0.147)	(0.158)	(0.120)	(0.114)
Ln(Assets) (Pre-COVID)		0.057		-0.001
		(0.052)		(0.040)
Debt/Assets (Pre-COVID)		0.013		0.195***
		(0.088)		(0.049)
EBITDA/Assets (Pre-COVID)		-0.556		-0.719**
		(0.489)		(0.261)
Cash/Assets (Pre-COVID)		-0.078		0.140
		(0.905)		(0.456)
Non-Cash Current Assets/Assets (Pre-COVID)		-0.192		0.024
		(0.198)		(0.109)
Net PP&E/Assets (Pre-COVID)		-0.071		0.035
		(0.221)		(0.111)
Constant	0.149**	-0.815	0.208***	0.143
	(0.060)	(1.040)	(0.052)	(0.772)
Industry FE	Yes	Yes	Yes	Yes
Fiscal Quarter FE	Yes	Yes	Yes	Yes
N	224	224	224	224
R-squared	0.20	0.24	0.17	0.22

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the full regression results for I(Sponsor injection) and I(Sponsor exit) with estimated coefficients on all included variables.

Table A.12: Regressions of distress resolution types on financing type

	(1) I(Bankruptcy, Post-COVID)	(2) I(Bankruptcy, Post-COVID)	(3) I(OOB)	(4) I(OOB)	(5) I(M&A)	(6) I(M&A)	(7) I(Failure)	(8) I(Failure)
Direct	-0.040	-0.029	-0.009	-0.022	-0.080	-0.095*	-0.112**	-0.124**
	(0.027)	(0.029)	(0.019)	(0.025)	(0.053)	(0.051)	(0.051)	(0.047)
COVID revenue growth	0.043	0.059	0.001	-0.025*	-0.013	-0.017	0.034	0.028
	(0.032)	(0.037)	(0.011)	(0.014)	(0.106)	(0.106)	(0.111)	(0.113)
Ln(Assets) (Pre-COVID)		0.015		-0.026		-0.002		0.000
		(0.016)		(0.016)		(0.023)		(0.027)
Debt/Assets (Pre-COVID)		0.012		-0.014		-0.045		-0.043
		(0.042)		(0.009)		(0.041)		(0.065)
EBITDA/Assets (Pre-COVID)		0.124		-0.097		-0.143		-0.103
		(0.144)		(0.069)		(0.175)		(0.258)
Cash/Assets (Pre-COVID)		-0.093		-0.122		0.137		0.033
		(0.134)		(0.138)		(0.419)		(0.482)
Non-Cash Current Assets/Assets (Pre-COVID)		-0.041		0.056		0.023		0.066
		(0.105)		(0.101)		(0.117)		(0.202)
Net PP&E/Assets (Pre-COVID)		-0.055		0.032		0.003		0.028
		(0.069)		(0.080)		(0.085)		(0.134)
Constant	0.059**	-0.229	0.020	0.522	0.139***	0.232	0.201***	0.230
	(0.023)	(0.350)	(0.014)	(0.337)	(0.037)	(0.451)	(0.039)	(0.543)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	224	224	224	224	224	224	224	224
R-squared	0.14	0.16	0.23	0.27	0.13	0.13	0.13	0.13

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the full regression results for I(Bankruptcy, Post-COVID), I(OOB), I(M&A), and I(Failure) with estimated coefficients on all included variables.

Table A.13: Future deal activity and sponsor injection

	(1) Ln(N(Deal, post-COVID)+1)	(2) I(Deal, post-COVID)
I(Sponsor injection)	0.213**	0.150*
	(0.100)	(0.080)
Ln(N(Prior Deal, past 5 years)+1)	0.438***	
	(0.064)	
I(Prior Deal, past 5 years)		0.353***
		(0.077)
COVID revenue growth	0.184	0.160
	(0.166)	(0.139)
Ln(Assets) (Pre-COVID)	0.051	0.047
	(0.044)	(0.037)
Debt/Assets (Pre-COVID)	-0.188**	-0.169**
	(0.095)	(0.077)
EBITDA/Assets (Pre-COVID)	0.487	0.397
	(0.375)	(0.345)
Cash/Assets (Pre-COVID)	0.620	0.257
	(0.830)	(0.649)
Non-Cash Current Assets/Assets (Pre-COVID)	-0.178	-0.117
	(0.234)	(0.255)
Net PP&E/Assets (Pre-COVID)	-0.216	-0.201
	(0.197)	(0.158)
Constant	-0.875	-0.718
	(0.840)	(0.713)
Industry FE	Yes	Yes
Fiscal Quarter FE	Yes	Yes
N	165	165
R-squared	0.57	0.40

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the results from regressing measures of deal activity (i.e. log number of deals + 1 and an indicator of a deal) of each direct lender-PE sponsor pair between March 2021 and September 2023 on I(Sponsor injection). To account for differences in the nature of distress, the same set of controls and fixed effects used in Table 6.2 is included, and to account for past deal activity of each pair, the respective measures of their deal activity between 2016 and 2020 are also included. Standard errors are clustered at lender level.

Table A.14: Full table including results for controls in Table 6.4

Panel A: Sponsor-BDC relationship measure = I(PE-BDC recent deal)

	(1) Δ Log(Total credit)	(2) Δ Log(1L+2L)	(3) Δ Log(1L)	(4) 1L all in yield rate (%)
I(PE-BDC recent deal)_t-1	0.012	0.009	0.016	-0.009
	(0.019)	(0.019)	(0.020)	(0.035)
I(PE-BDC recent deal)_t-1 × COVID	0.083***	0.072***	0.059**	-0.125**
	(0.028)	(0.027)	(0.029)	(0.061)
Log(Firm-BDC duration)_t-1	0.056***	0.054***	0.052***	0.019
	(0.017)	(0.016)	(0.017)	(0.033)
Log(Firm-BDC duration)_t-1 × COVID	-0.007	-0.014	-0.019	0.089
	(0.030)	(0.030)	(0.031)	(0.073)
Log(Total credit)_t-1	-0.256***	-0.255***	-0.260***	0.022**
	(0.010)	(0.010)	(0.010)	(0.011)
1L share_t-1	-0.197**	-0.499***	-0.460***	0.008
	(0.079)	(0.074)	(0.081)	(0.102)
2L share_t-1	0.022	-0.288***	-0.142*	-0.144
	(0.083)	(0.078)	(0.085)	(0.189)
Constant	4.079***	4.350***	4.382***	6.672***
	(0.188)	(0.184)	(0.195)	(0.223)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
Sample	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3
N	19123	19123	19123	15529
R-squared	0.51	0.51	0.50	0.90

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Panel B: Sponsor-BDC relationship measure = Log(N(PE-BDC Prior deal)+1)

	(1) Δ Log(Total credit)	(2) Δ Log(1L+2L)	(3) Δ Log(1L)	(4) 1L all in yield rate (%)
Log(N(PE-BDC prior deal)+1)_t-1	0.003	0.001	0.002	-0.004
	(0.015)	(0.014)	(0.015)	(0.028)
Log(N(PE-BDC prior deal)+1)_t-1 × COVID	0.053**	0.046**	0.043*	-0.111**
	(0.021)	(0.021)	(0.023)	(0.048)
Log(Firm-BDC duration)_t-1	0.056***	0.054***	0.052***	0.019
	(0.017)	(0.016)	(0.017)	(0.032)
Log(Firm-BDC duration)_t-1 × COVID	-0.007	-0.014	-0.020	0.091
	(0.030)	(0.030)	(0.031)	(0.073)
Log(Total credit)_t-1	-0.256***	-0.254***	-0.259***	0.022**
	(0.010)	(0.010)	(0.010)	(0.011)
1L share_t-1	-0.197**	-0.498***	-0.459***	0.004
	(0.080)	(0.075)	(0.081)	(0.102)
2L share_t-1	0.021	-0.289***	-0.143*	-0.146
	(0.083)	(0.078)	(0.085)	(0.189)
Constant	4.074***	4.347***	4.380***	6.683***
	(0.189)	(0.185)	(0.196)	(0.224)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
Sample	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3	19Q1-22Q3
N	19123	19123	19123	15529
R-squared	0.51	0.51	0.50	0.90

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for regression specification 6.1. Panel A reports the results using I(PE-BDC recent deal) as the relationship measure, and Panel B, Log(N(PE-BDC Prior deal)+1). Firm-year-quarter and BDC-year-quarter fixed effects were included. Standard errors were double-clustered by BDC and borrowing firm.

Table A.15: Summary statistics (Q1 2018-Q3 2022)

	N	mean	p10	p25	median	p75	p90	sd
Total credit (M)	22329	21.296	0.992	2.930	7.896	19.950	46.470	55.804
Log(Total credit)	22329	15.788	13.807	14.891	15.882	16.809	17.654	1.559
1L share$_{t-1}$	22329	0.765	0.000	0.602	1.000	1.000	1.000	0.387
2L share$_{t-1}$	22329	0.184	0.000	0.000	0.000	0.000	1.000	0.367
Δ Log(Total credit)	22329	-0.005	-0.545	-0.003	-0.000	0.000	0.545	0.681
Δ Log(1L+2L)	22329	-0.008	-0.533	-0.003	-0.001	0.000	0.507	0.656
Δ Log(1L)	22329	-0.003	-0.510	-0.003	-0.000	0.000	0.530	0.700
1L all in yield rate (%)	18669	7.167	4.750	6.000	7.000	8.250	9.500	2.012
I(PE-BDC recent deal)$_{t-1}$	22329	0.379	0.000	0.000	0.000	1.000	1.000	0.485
N(PE-BDC prior deal)$_{t-1}$	22329	1.978	0.000	0.000	1.000	2.000	5.000	3.091
Log(N(PE-BDC prior deal)+1)$_{t-1}$	22329	0.747	0.000	0.000	0.693	1.099	1.792	0.769
Firm-BDC duration (qtrs)$_{t-1}$	22329	6.659	1.000	3.000	5.000	10.000	14.000	4.852
Log(Firm-BDC duration)$_{t-1}$	22329	1.829	0.693	1.386	1.792	2.398	2.708	0.663
Disrupted Industry$_{t-1}$	22329	0.179	0.000	0.000	0.000	0.000	1.000	0.383

Note: This table reports the summary statistics for the estimation sample in Table A.16 columns 1 and 2 where Δ Log(Total credit) was used as the dependent variable.

Table A.16: PE-BDC relationship and credit supply during COVID (Q1 2018-Q3 2022)

Panel A: Sponsor-BDC relationship measure = I(PE-BDC recent deal)

	(1) Δ Log(Total credit)	(2) Δ Log(1L+2L)	(3) Δ Log(1L)	(4) 1L, all in yield (%)
I(PE-BDC recent deal)_t-1	0.017	0.015	0.017	-0.004
	(0.017)	(0.017)	(0.018)	(0.036)
I(PE-BDC recent deal)_t-1 × COVID	0.074***	0.062**	0.055*	-0.129**
	(0.028)	(0.027)	(0.029)	(0.063)
Log(Firm-BDC duration)_t-1	0.055***	0.053***	0.051***	0.024
	(0.016)	(0.015)	(0.016)	(0.032)
Log(Firm-BDC duration)_t-1 × COVID	-0.009	-0.015	-0.020	0.085
	(0.030)	(0.029)	(0.030)	(0.074)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
BDC x Firm loan controls	Yes	Yes	Yes	Yes
Sample	18Q1-22Q3	18Q1-22Q3	18Q1-22Q3	18Q1-22Q3
N	22329	22329	22329	17671
R-squared	0.51	0.51	0.51	0.90

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Panel B: Sponsor-BDC relationship measure = Log(N(PE-BDC Prior deal)+1)

	(1) Δ Log(Total credit)	(2) Δ Log(1L+2L)	(3) Δ Log(1L)	(4) 1L, all in yield (%)
Log(N(PE-BDC prior deal)+1)_t-1	0.005	0.003	0.002	-0.012
	(0.013)	(0.013)	(0.013)	(0.029)
Log(N(PE-BDC prior deal)+1)_t-1 × COVID	0.048**	0.041**	0.041*	-0.103**
	(0.021)	(0.020)	(0.022)	(0.050)
Log(Firm-BDC duration)_t-1	0.055***	0.054***	0.052***	0.024
	(0.016)	(0.015)	(0.016)	(0.032)
Log(Firm-BDC duration)_t-1 × COVID	-0.009	-0.016	-0.021	0.087
	(0.030)	(0.029)	(0.030)	(0.073)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
BDC x Firm loan controls	Yes	Yes	Yes	Yes
Sample	18Q1-22Q3	18Q1-22Q3	18Q1-22Q3	18Q1-22Q3
N	22329	22329	22329	17671
R-squared	0.51	0.51	0.51	0.90

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for regression specification 6.1. Panel A reports the results using I(PE-BDC recent deal) as the relationship measure, and Panel B, Log(N(PE-BDC Prior deal)+1). Firm-year-quarter and BDC-year-quarter fixed effects were included. BDC-Firm time-varying controls include lagged total credit, and the share of 1L and 2L debt to total credit. Standard errors were double-clustered by BDC and borrowing firm.

Table A.17: Summary statistics (Q1 2017-Q3 2022)

	N	mean	p10	p25	median	p75	p90	sd
Total credit (M)	24375	20.805	0.995	2.944	7.920	19.734	44.591	54.038
Log(Total credit)	24375	15.786	13.810	14.895	15.885	16.798	17.613	1.543
1L share$_{t-1}$	24375	0.756	0.000	0.589	1.000	1.000	1.000	0.394
2L share$_{t-1}$	24375	0.194	0.000	0.000	0.000	0.000	1.000	0.375
Δ Log(Total credit)	24375	-0.005	-0.511	-0.003	0.000	0.000	0.515	0.651
Δ Log(1L+2L)	24375	-0.008	-0.477	-0.003	-0.000	0.000	0.454	0.630
Δ Log(1L)	24375	-0.004	-0.450	-0.003	0.000	0.000	0.475	0.676
1L all in yield rate (%)	20128	7.187	4.800	6.000	7.000	8.250	9.500	2.012
I(PE-BDC recent deal)$_{t-1}$	24375	0.370	0.000	0.000	0.000	1.000	1.000	0.483
N(PE-BDC prior deal)$_{t-1}$	24375	1.905	0.000	0.000	1.000	2.000	5.000	3.007
Log(N(PE-BDC prior deal)+1)$_{t-1}$	24375	0.728	0.000	0.000	0.693	1.099	1.792	0.761
Firm-BDC duration (qtrs)$_{t-1}$	24375	6.255	1.000	2.000	5.000	9.000	14.000	4.838
Log(Firm-BDC duration)$_{t-1}$	24375	1.759	0.693	1.099	1.792	2.303	2.708	0.680
Disrupted Industry$_{t-1}$	24375	0.182	0.000	0.000	0.000	0.000	1.000	0.386

Note: This table reports the summary statistics for the estimation sample in Table A.18 columns 1 and 2 where Δ Log(Total credit) was used as the dependent variable.

Table A.18: PE-BDC relationship and credit supply during COVID (Q1 2017-Q3 2022)

Panel A: Sponsor-BDC relationship measure = I(PE-BDC recent deal)

	(1) Δ Log(Total credit)	(2) Δ Log(1L+2L)	(3) Δ Log(1L)	(4) 1L, all in yield (%)
I(PE-BDC recent deal)_t-1	0.021	0.017	0.022	0.001
	(0.016)	(0.015)	(0.017)	(0.036)
I(PE-BDC recent deal)_t-1 × COVID	0.068**	0.057**	0.046*	-0.134**
	(0.027)	(0.026)	(0.028)	(0.064)
Log(Firm-BDC duration)_t-1	0.052***	0.050***	0.049***	0.030
	(0.015)	(0.015)	(0.016)	(0.032)
Log(Firm-BDC duration)_t-1 × COVID	-0.008	-0.014	-0.020	0.078
	(0.029)	(0.028)	(0.030)	(0.074)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
BDC x Firm loan controls	Yes	Yes	Yes	Yes
Sample	17Q1-22Q3	17Q1-22Q3	17Q1-22Q3	17Q1-22Q3
N	24375	24375	24375	18958
R-squared	0.51	0.52	0.51	0.90

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Panel B: Sponsor-BDC relationship measure = Log(N(PE-BDC Prior deal)+1)

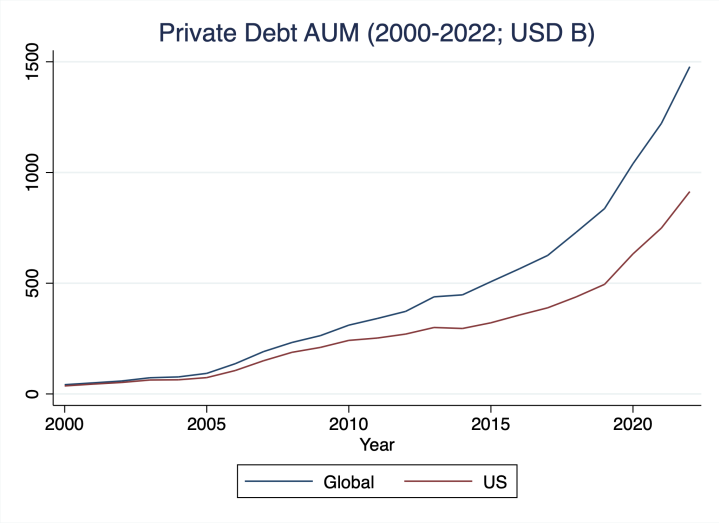
	(1) Δ Log(Total credit)	(2) Δ Log(1L+2L)	(3) Δ Log(1L)	(4) 1L, all in yield (%)
Log(N(PE-BDC prior deal)+1)_t-1	0.008	0.005	0.007	-0.009
	(0.012)	(0.012)	(0.012)	(0.029)
Log(N(PE-BDC prior deal)+1)_t-1 × COVID	0.043**	0.038*	0.035	-0.105**
	(0.020)	(0.020)	(0.021)	(0.050)
Log(Firm-BDC duration)_t-1	0.052***	0.050***	0.049***	0.030
	(0.015)	(0.015)	(0.016)	(0.032)
Log(Firm-BDC duration)_t-1 × COVID	-0.008	-0.014	-0.021	0.080
	(0.029)	(0.028)	(0.030)	(0.074)
Firm x YQ FE	Yes	Yes	Yes	Yes
BDC x YQ FE	Yes	Yes	Yes	Yes
BDC x Firm loan controls	Yes	Yes	Yes	Yes
Sample	17Q1-22Q3	17Q1-22Q3	17Q1-22Q3	17Q1-22Q3
N	24375	24375	24375	18958
R-squared	0.51	0.52	0.51	0.90

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: This table reports the estimated regression results for regression specification 6.1. Panel A reports the results using I(PE-BDC recent deal) as the relationship measure, and Panel B, Log(N(PE-BDC Prior deal)+1). Firm-year-quarter and BDC-year-quarter fixed effects were included. BDC-Firm time-varying controls include lagged total credit, and the share of 1L and 2L debt to total credit. Standard errors were double-clustered by BDC and borrowing firm.

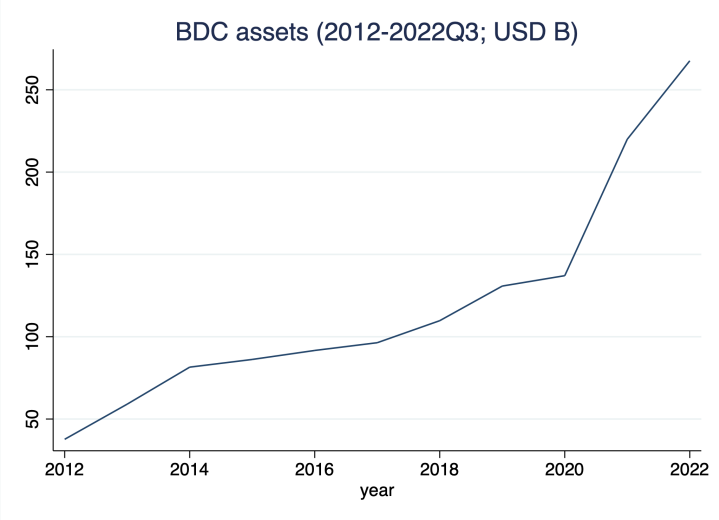
APPENDIX B
ADDITIONAL FIGURES

Figure B.1: Private debt assets under management



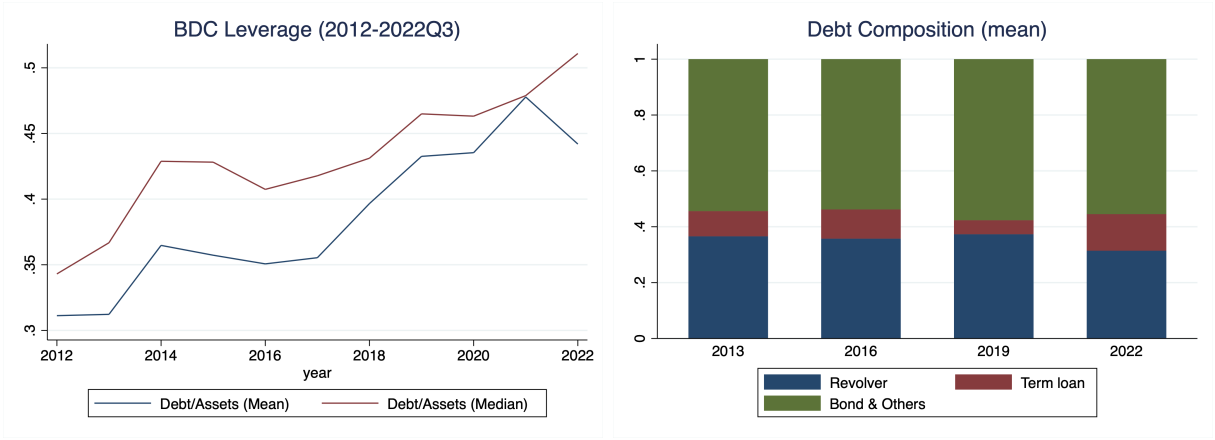
Source: Preqin

Figure B.2: BDC total assets



Source: Refinitiv

Figure B.3: BDC use of debt

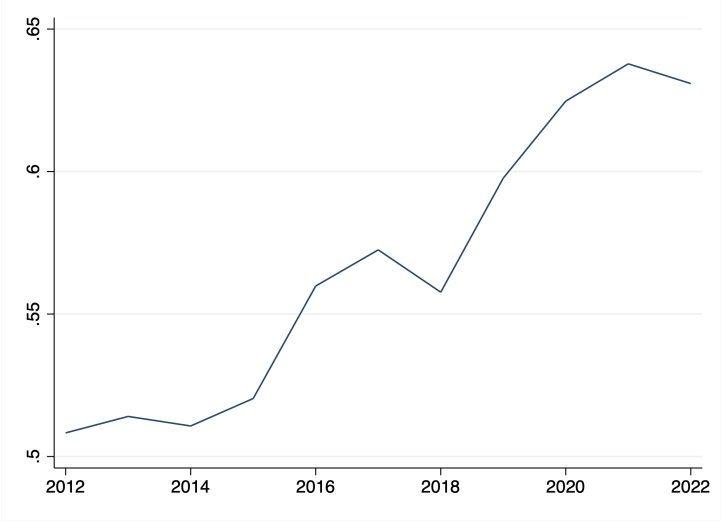


Panel A: Debt/Assets Leverage

Panel B: Debt composition

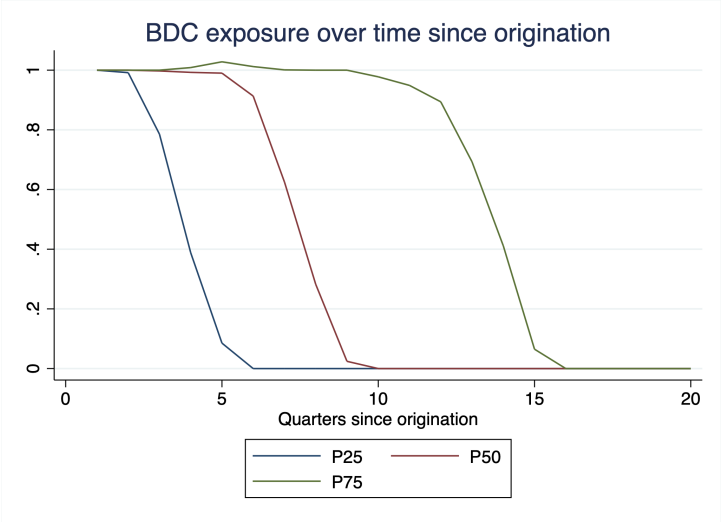
Source: BDC Collateral, Capital IQ

Figure B.4: Fraction of BDC senior debt investments funding US PE buyouts



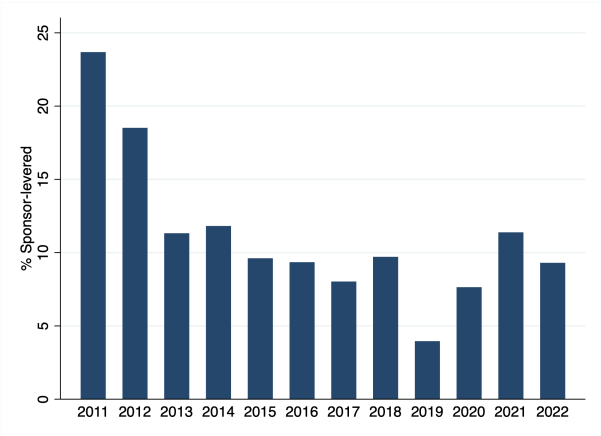
Source: Pitchbook, Refinitiv

Figure B.5: BDC exposure over time since origination (PE-backed deals)

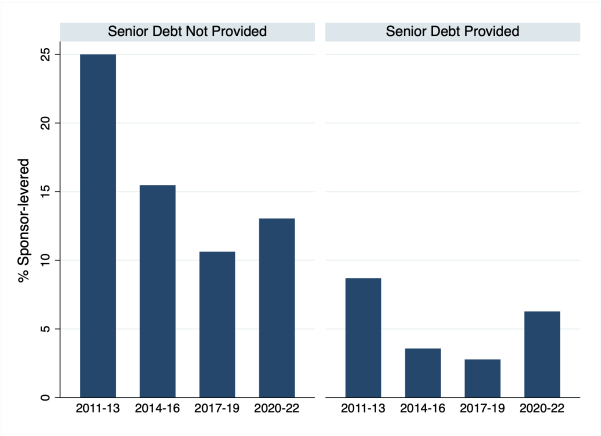


Source: Pitchbook, Refinitiv

Figure B.6: Fraction of sponsor-levered among all buyouts funded by PE-affiliated direct lenders



Panel A: All debt



Panel B: Senior debt

Source: Pitchbook, Refinitiv

Figure B.7: Examples of long, permissive contractual definitions

Panel A shows an example of definition of negative covenant on investments, and Panel B, that of liens.

Panel A: Negative covenant on Investments

Section 9.05 **Investments, Loans and Advances**. The Borrower will not, and will not permit any Restricted Subsidiary to, make, or permit to remain outstanding, any Investments in or to any Person, except that the foregoing restriction shall not apply to:

(a) Investments reflected in the Initial Financial Statements or disclosed to the Lenders in Schedule 9.05.

(b) Cash Equivalents.

(c) Investments made by the Borrower in or to any Restricted Subsidiary or made by any Restricted Subsidiary in or to the Borrower or any other Restricted Subsidiary.

(d) loans or advances to employees, officers or directors in the ordinary course of business of the Borrower or any of its Restricted Subsidiaries, in each case only as permitted by applicable law, but in any event not to exceed $2,500,000 in aggregate at any time outstanding.

(e) Investments in stock, obligations or securities received in settlement of debts arising from Investments permitted under this Section 9.05 or from accounts receivable and other similar obligations arising in the ordinary course of business, which Investments are obtained by the Borrower or any Restricted Subsidiary as a result of a bankruptcy or other insolvency proceeding of, or difficulties in collecting from, the obligor in respect of such obligations.

(f) Investments constituting Debt permitted under Section 9.02.

(g) Investments in one or more Unrestricted Subsidiaries accomplished by transfers to such Unrestricted Subsidiaries of all of the Equity Interests in (or substantially all of the assets of) either or both of Rice Olympus Midstream LLC and Rice Poseidon Midstream LLC; so long as, at the time of any such transfer, Rice Olympus Midstream LLC and Rice Poseidon Midstream LLC, as applicable, do not own any Borrowing Base Properties, Unproven Acreage, any interest in Hydrocarbons produced or to be produced therefrom, any commodity Swap Agreement included in the most recent determination of the Borrowing Base or any Equity Interests in any Restricted Subsidiary that owns any of the foregoing.

(h) other Investments that do not exceed $50,000,000 in the aggregate at any time.

Panel B: Negative covenant on Liens

ARTICLE V

NEGATIVE COVENANTS

Each Credit Party covenants and agrees that until the Facility Termination Date:

5.1 Limitation on Liens. No Credit Party shall, and no Credit Party shall suffer or permit any of its Restricted Subsidiaries to, directly or indirectly, make, create, incur, assume or suffer to exist any Lien upon or with respect to any part of its Property, whether now owned or hereafter acquired, other than the following ("**Permitted Liens**"):

(a) Liens pursuant to any Loan Document (including pursuant to any amendment in connection with an Incremental Facility, any Extension or Extension Offer, any Refinancing Amendment, any Permitted Repricing Amendment or any other amendment entered into from time to time in accordance with the terms hereof);

(b) Liens existing on the date hereof and set forth on Schedule 5.1(b);

(c) Liens for Taxes, assessments or governmental charges (other than any such Lien imposed under ERISA) which are not overdue for a period of more than thirty (30) days or which are being contested in good faith and by appropriate proceedings diligently conducted, if adequate reserves with respect thereto are maintained on the books of the applicable Person to the extent required in accordance with GAAP, or result with respect to any Tax, assessment or governmental charges the non-payment of which would not result in a breach of Section 4.14;

(d) statutory or common law Liens of landlords, carriers, warehousemen, mechanics, materialmen, repairmen, construction contractors or other like Liens arising in the Ordinary Course of Business which secure amounts not overdue for a period of more than sixty (60) days or if more than sixty (60) days overdue, are unfiled (or if filed have been discharged or stayed) and no other action has been taken to enforce such Lien or which are being contested in good faith and by appropriate proceedings diligently conducted, if adequate reserves with respect thereto are maintained on the books of the applicable Person to the extent required in accordance with GAAP;

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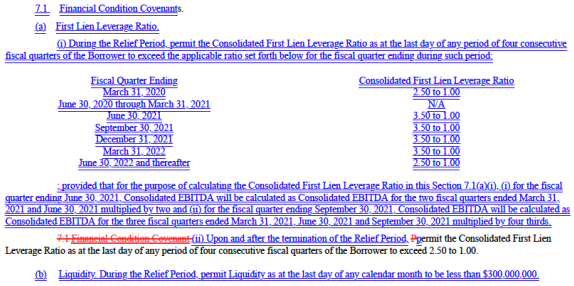
(e) (i) pledges, deposits or Liens arising as a matter of law in the Ordinary Course of Business in connection with workers' compensation, payroll taxes, unemployment insurance and other social security legislation and (ii) pledges and deposits in the Ordinary Course of Business securing liability for reimbursement or indemnification obligations of (including obligations in respect of letters of credit or bank guarantees for the benefit of) insurance carriers providing property, casualty or liability insurance to the Borrower or any of its Restricted Subsidiaries;

(f) deposits to secure the performance and payment of bids, trade contracts, governmental contracts and leases (other than Indebtedness for borrowed money), statutory obligations, surety, stay, customs and appeal bonds, performance bonds and other obligations of a like nature (including those to secure health, safety and environmental obligations) incurred in the Ordinary Course of Business;

(g) easements, rights-of-way, restrictions, covenants, conditions, encroachments, protrusions and other similar encumbrances and minor title defects affecting real property which, in the aggregate, do

Figure B.8: Examples of renegotiated loan terms from amended loan agreements



7.1 Financial Condition Covenants.

(a) First Lien Leverage Ratio.

(i) During the Relief Period, permit the Consolidated First Lien Leverage Ratio as at the last day of any period of four consecutive fiscal quarters of the Borrower to exceed the applicable ratio set forth below for the fiscal quarter ending during such period:

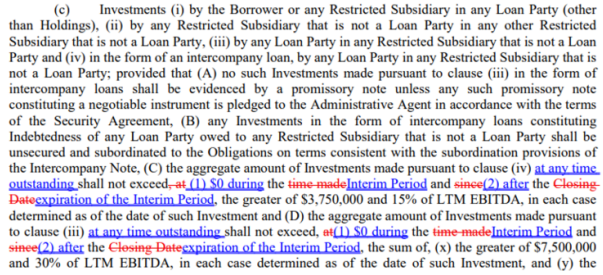
Fiscal Quarter Ending	Consolidated First Lien Leverage Ratio
March 31, 2020	2.50 to 1.00
June 30, 2020 through March 31, 2021	N/A
June 30, 2021	3.50 to 1.00
September 30, 2021	3.50 to 1.00
December 31, 2021	3.50 to 1.00
March 31, 2022	3.50 to 1.00
June 30, 2022 and thereafter	2.50 to 1.00

; provided that for the purpose of calculating the Consolidated First Lien Leverage Ratio in this Section 7.1(a)(i), (i) for the fiscal quarter ending June 30, 2021, Consolidated EBITDA will be calculated as Consolidated EBITDA for the two fiscal quarters ended March 31, 2021 and June 30, 2021 multiplied by two and (ii) for the fiscal quarter ending September 30, 2021, Consolidated EBITDA will be calculated as Consolidated EBITDA for the three fiscal quarters ended March 31, 2021, June 30, 2021 and September 30, 2021 multiplied by four thirds.

~~7.1 Financial Condition Covenant~~ (ii) Upon and after the termination of the Relief Period, ~~P~~permit the Consolidated First Lien Leverage Ratio as at the last day of any period of four consecutive fiscal quarters of the Borrower to exceed 2.50 to 1.00.

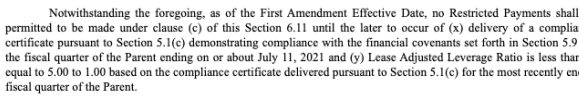
(b) Liquidity. During the Relief Period, permit Liquidity as at the last day of any calendar month to be less than $300,000,000.

Panel A: Debt to CF cov relaxed, liq. cov. added



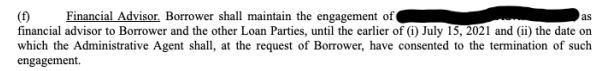
(c) Investments (i) by the Borrower or any Restricted Subsidiary in any Loan Party (other than Holdings), (ii) by any Restricted Subsidiary that is not a Loan Party in any other Restricted Subsidiary that is not a Loan Party, (iii) by any Loan Party in any Restricted Subsidiary that is not a Loan Party and (iv) in the form of an intercompany loan, by any Loan Party in any Restricted Subsidiary that is not a Loan Party; provided that (A) no such Investments made pursuant to clause (iii) in the form of intercompany loans shall be evidenced by a promissory note unless any such promissory note constituting a negotiable instrument is pledged to the Administrative Agent in accordance with the terms of the Security Agreement, (B) any Investments in the form of intercompany loans constituting Indebtedness of any Loan Party owed to any Restricted Subsidiary that is not a Loan Party shall be unsecured and subordinated to the Obligations on terms consistent with the subordination provisions of the Intercompany Note, (C) the aggregate amount of Investments made pursuant to clause (iv) at any time outstanding shall not exceed, ~~at~~ (1) $0 during the ~~time made~~Interim Period and ~~since~~(2) after the ~~Closing Date~~expiration of the Interim Period, the greater of $3,750,000 and 15% of LTM EBITDA, in each case determined as of the date of such Investment and (D) the aggregate amount of Investments made pursuant to clause (iii) at any time outstanding shall not exceed, ~~at~~(1) $0 during the ~~time made~~Interim Period and ~~since~~(2) after the ~~Closing Date~~expiration of the Interim Period, the sum of, (x) the greater of $7,500,000 and 30% of LTM EBITDA, in each case determined as of the date of such Investment, and (y) the

Panel B: Negative cov. on investments tightened



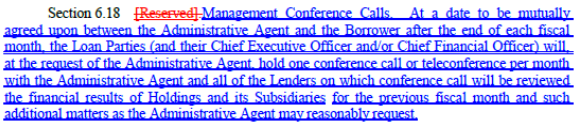
Notwithstanding the foregoing, as of the First Amendment Effective Date, no Restricted Payments shall be permitted to be made under clause (c) of this Section 6.11 until the later to occur of (x) delivery of a compliance certificate pursuant to Section 5.1(c) demonstrating compliance with the financial covenants set forth in Section 5.9 for the fiscal quarter of the Parent ending on or about July 11, 2021 and (y) Lease Adjusted Leverage Ratio is less than or equal to 5.00 to 1.00 based on the compliance certificate delivered pursuant to Section 5.1(c) for the most recently ended fiscal quarter of the Parent.

Panel C: Negative cov. on payment tightened



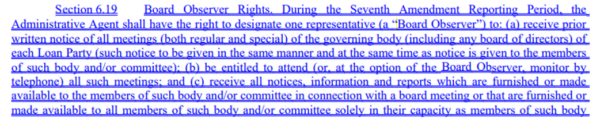
(f) Financial Advisor. Borrower shall maintain the engagement of [redacted] as financial advisor to Borrower and the other Loan Parties, until the earlier of (i) July 15, 2021 and (ii) the date on which the Administrative Agent shall, at the request of Borrower, have consented to the termination of such engagement.

Panel D: Lender-approved advisor condition added



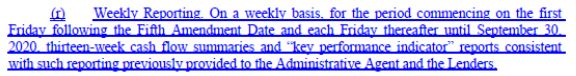
Section 6.18 ~~[Reserved]~~ Management Conference Calls. At a date to be mutually agreed upon between the Administrative Agent and the Borrower after the end of each fiscal month, the Loan Parties (and their Chief Executive Officer and/or Chief Financial Officer) will, at the request of the Administrative Agent, hold one conference call or teleconference per month with the Administrative Agent and all of the Lenders on which conference call will be reviewed the financial results of Holdings and its Subsidiaries for the previous fiscal month and such additional matters as the Administrative Agent may reasonably request.

Panel E: Lender meeting/call added



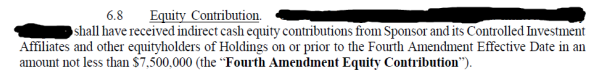
Section 6.19 Board Observer Rights. During the Seventh Amendment Reporting Period, the Administrative Agent shall have the right to designate one representative (a "Board Observer") to: (a) receive prior written notice of all meetings (both regular and special) of the governing body (including any board of directors) of each Loan Party (such notice to be given in the same manner and at the same time as notice is given to the members of such body and/or committee); (b) be entitled to attend (or, at the option of the Board Observer, monitor by telephone) all such meetings; and (c) receive all notices, information and reports which are furnished or made available to the members of such body and/or committee in connection with a board meeting or that are furnished or made available to all members of such body and/or committee solely in their capacity as members of such body.

Panel F: Lender board observer right added



(r) Weekly Reporting. On a weekly basis, for the period commencing on the first Friday following the Fifth Amendment Date and each Friday thereafter until September 30, 2020, thirteen-week cash flow summaries and "key performance indicator" reports consistent with such reporting previously provided to the Administrative Agent and the Lenders.

Panel G: Weekly cash flow forecast added

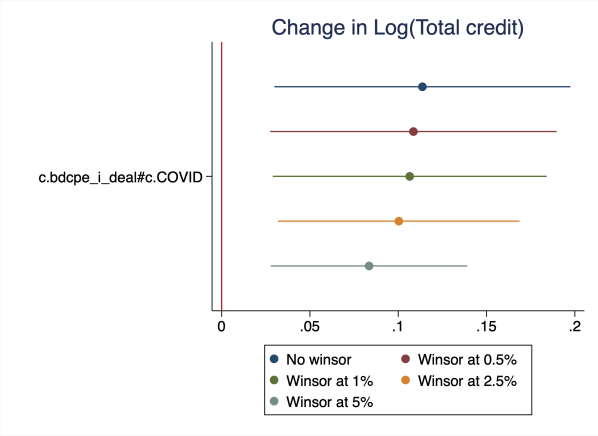


6.8 Equity Contribution. [redacted] shall have received indirect cash equity contributions from Sponsor and its Controlled Investment Affiliates and other equityholders of Holdings on or prior to the Fourth Amendment Effective Date in an amount not less than $7,500,000 (the "**Fourth Amendment Equity Contribution**").

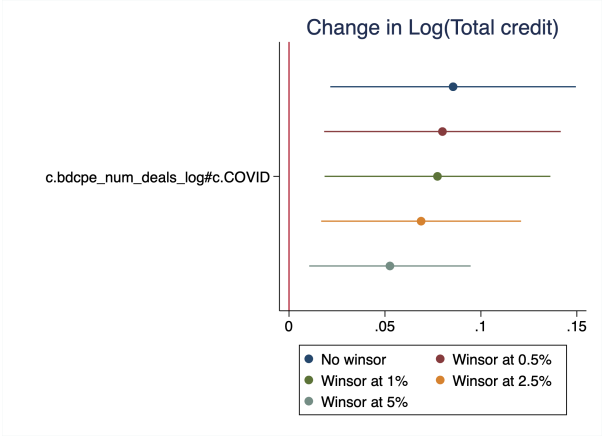
Panel H: Sponsor equity injection

Note: Each of the panels shows an example of how loan terms were contractually amended as a result (or in anticipation of) covenant violation.

Figure B.9: Effects of winsorization



Panel A: I(PE-BDC recent deal)



Panel B: Log(N(PE-BDC prior deal)+1)

Note: This figure reports the estimated regression coefficients of quarterly total credit growth on the PE-BDC relationship measures under the regression specification 6.1 for the main sample used for the estimation in Table 6.1 with different levels of winsorization: no winsorization and winsorization at 0.5%, 1%, 2.5% and 5%.

APPENDIX C
QUANTIFYING NEGATIVE COVENANT FLEXIBILITY

Like financial covenants, borrowers naturally want to relax the restrictiveness of negative covenants to maintain operational flexibility, as opposed to lenders who want to protect their claims from the borrowers' potential risk-shifting actions. But how do we quantify the flexibility in negative covenants?

A typical negative covenant starts with boilerplate language that specifies a set of actions that the borrower is prohibited from undertaking. Then, it is subsequently weakened by specifying conditions under which the restricted action is permitted (referred to as a "carve-out") or amount up to which the restricted action is permitted (referred to as a "basket" or "deductible") (Ivashina and Vallee, 2022). An example of a carve-out and a basket on a negative covenant on investment is shown in Figure B.7.[1]

As noted by Ivashina and Vallee (2022), there is no standard way of measuring negative covenant slackness. I attempt to measure it with the size of the "general basket," which I believe is more economically interpretable than measures based on the number of carve-outs or baskets. Ivashina and Vallee (2022) and Buccola and Nini (2022) show that there can be multiple baskets within a negative covenant. The general basket refers to the most generous type of basket; it is a basket that is free of any condition. In the case of the example in Figure B.7 Panel B, this would refer to the item (h): "other Investments that do not exceed $50,000,000 in the aggregate at any time" (recall that the basket in item (d) had a condition that the basket limit amount applies only investments consisting of "loans or advance to employees, officers, or directors in the ordinary course of business"). Hence, this captures the ultimate freedom that the borrower has when making any type of investment.

There are generally six types of negative covenants: liens, debt issuance, investments, asset sales, affiliate transaction and restricted payments (Ivashina and Vallee, 2022). Based on my preliminary inspection of loan agreements, I found that identifying a general basket is relatively easier for negative covenants on investment, debt issuance, and asset sales, compared to others.[2] Therefore, I collect this information for those three types only. If found, I record the basket's size. If not found, I record it as 0. Moreover, within the negative covenant on investment, one can also identify the restrictions on acquisitions. Following the approach by Becher et al. (2022), I record the indicator for whether an acquisition is permitted and its basket amount if permitted.

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1. As explained previously, a negative covenant definition starts with a boilerplate clause that restricts the borrower's investment activity: "The Borrower will not, and will not permit any Restricted Subsidiary to, make, or permit to remain outstanding, any Investments in or to any Person." Then, it is weakened by stating "except that the foregoing restriction shall not apply to" and followed by a list of permitted exceptions. Each of these permitted exception items are examples of a carve-out, and dollar-denominated limits that appear in each are examples of a basket. As shown, carve-outs and baskets are not mutually exclusive and can be used together, e.g. the item (d) in Figure B.5 Panel A: "loans or advance to employees, officers, or directors in the ordinary course of business .... but in any event not to exceed $2,500,000 in aggregate at anytime outstanding."

2. One just needs to look for the following phrases "other", "additional", or "any other" in front of the key word specifying the restricted action.