PIK Your Poison -

How Deferred Interest Reshapes Private Credit

Paul Rintamäki Sascha Steffen

This version: March 20, 2025*

Abstract

This paper analyzes how Payment-in-Kind (PIK) loans—allowing borrowers to defer cash interest—impact the U.S. private credit market, focusing specifically on Business Development Companies (BDCs). While PIK loans offer short-term liquidity relief, they increase debt principal and borrower credit risk. We document a significant rise in PIK adoption, particularly during the COVID-19 pandemic and the subsequent period of elevated interest rates. Borrowers facing financial distress, especially with subordinated or second-lien loans, exhibit higher PIK usage. Although deferring interest payments generally raise loan delinquency rates, this relationship is weaker during COVID-19, suggesting that healthier firms also adopted PIK amid exogenous liquidity shocks. We find that both at the individual loan—as well as at the BDC portfolio—level increased reliance on deferred interest correlates with higher non-accrual rates and higher realized losses. PIK usage also increases disagreement about loan valuations and raises BDC's default risk. Despite substantial committed bank credit lines, BDCs with higher deferred interest exposure reduce their utilization of these facilities, indicating that bank-imposed contractual restrictions effectively limit credit availability precisely when liquidity needs rise. Consequently, BDCs with higher PIK exposure reduce total debt financing and exhibit lower asset growth and dividend payouts. Overall, our findings highlight a critical trade-off: while PIK structures offer valuable liquidity flexibility during stress periods, extensive use increases financial fragility, prompting banks to implement covenants and collateral restrictions.

JEL classification: G21, G32, G34
Keywords: Business Development Companies (BDC), Payment-in-Kind (PIK), private credit, default risk, banks, credit lines, covenants

* Paul Rintamäki, Aalto University School of Business P.O. Box 21210, 00076 Aalto, Finland, paul.rintamaki@aalto.fi. Sascha Steffen, Frankfurt School of Finance & Management, Adickesallee 32-34. 60322 Frankfurt, Germany, s.steffen@fs.de. Steffen greatly appreciates support from the Centre for European Transformation.

1 Introduction

Payment-in-Kind (PIK) loans allow borrowers to defer cash interest payments by capitalizing interest into the loan balance through the issuance of additional debt. This feature provides short-term relief to companies in a time of difficulty and was widely used during the Leveraged Buyout (LBO) boom before the Global Financial Crisis (e.g. Kaplan and Stein, 1993; Demiroglu and James, 2010). This flexibility can also lead to excessive debt levels and elevated default risk during economic downturns. The empirical evidence from the LBO market, however, is mixed. While Kaplan and Stein (1993) characterise the use deferred interest debt in publicly issued "junk" bonds as part of an "overheating" LBO market, Demiroglu and James (2010) argue that PIK structures in syndicated leveraged loans originated during the 2006-2007 period led to fewer defaults post LBO.[1] More recently, the International Monetary Fund (IMF) has highlighted concerns that the rising usage of PIK loans among private debt providers might amplify default and financial stability risks (IMF, 2024).[2]

In this paper, we analyze the trade-off between the short-term liquidity relief offered by deferred interest payments and the heightened vulnerability resulting from increased debt burdens, focusing specifically on private debt lending practices among U.S. Business Development Companies (BDCs).[3] Specifically, we analyze whether interest deferrals associated with PIK loans increase firms' vulnerability, thereby elevating risk exposure for private credit lenders and the broader banking sector. Banks provide a substantial amount of liquidity to nonbank financial institution (NBFIs) through credit lines, including private credit lenders (Acharya, Cetorelli, and Tuckman, 2024a). In 2024Q4, for example, banks

[1]The high-yield bond market indicates that PIK-related instruments have significantly elevated default rates. For example, during the 2009 downturn, "PIK-toggle" bonds had default rates approaching 30%, compared to roughly 17% for similar non-PIK issuers ("PIK Toggle: Not So Kind During the Downturn" (Moody's, 2010)).

[2]For example, increased competition with leveraged syndicated loan markets might facilitate the use of PIK options in private debt contracts. Credit rating agencies expressed similar concerns regarding the risks of PIK use in private debt contracts (Fitch Ratings, 2024).

[3]BDCs are closed-end investment funds that mainly lend to large and middle-market firms. They are among the largest lenders in the nonbank lending market, with total assets of USD 410 billion in 2024Q3 and total investments of USD 385 billion. Appendix B provides a list of U.S. BDCs as of 2024Q3.

extended roughly USD 60 billion in credit lines to BDCs, with an average utilization rate of 50%. As BDCs must continue paying dividends based on accrued income, even when borrowers defer cash interest payments, they might increase their borrowing by drawing on contingent liquidity provided by banks. Do BDCs become more reliant on credit lines when their borrowers begin deferring cash interest? Or do bank credit agreements impose strict collateral requirements and covenants, thereby limiting BDCs' ability to draw on these facilities if bank liquidity is constrained? If so, what are alternative sources of funding? This paper addresses these important issues.[4]

Panel A of Figure 1 shows the *PIK usage share* over the 2014 to 2024 period. PIK usage share is the value-weighted number of loans where borrowers use the PIK option relative to all loans in a given quarter. We also plot the average base rate over the same time period. We observe a cyclicality in PIK usage. During periods of economic expansion, PIK usage declined (from about 15% in 2014 to 10% in 2019), but we observe a significant increase first during the COVID-19 pandemic (during the 2020 to 2021 period) and an even larger PIK usage starting in 2022 when short-term interest rates increased in the U.S. due to tighter monetary policy.[5] As loans are largely floating-rate loans in the private debt market, a sudden and substantial interest rate hike increased the liquidity pressure on these firms. Moreover, some firms might have increased their debt levels during the COVID-19 pandemic by deferring interest, which further increased their cash interest payments when interest rates rose.

Even in frictionless markets, adding deferred interest to existing debt might increase the default risk of the firm. Moreover, if debt levels are already high, adding PIK debt might increase the agency cost of debt, leading to debt overhang or risk-shifting of the firm (Jensen, 1986; Wruck, 1990; Jensen, 2019).[6] Panel B of Figure 1 illustrates the share of non-accrual loans, measured as the cost value of non-accrual loans relative to the

[4]BDCs might therefore also be an interesting setting to investigate how risks among NBFIs might spill over to the banking sector. Recent papers investigate the implications of liquidity provision by banks to NBFIs (e.g. Acharya, Gopal, Jager, and Steffen, 2025a; Acharya, Gopal, and Steffen, 2025b), but none of them focuses on private credit.

[5]Consistently, we observe a significant increase in the base rate of these loans over this time period.

[6]Alternatively, the additional debt might also discipline managers.

total cost value of the loan portfolio, plotted against the PIK usage share lagged by four quarters over the 2014Q1-2024Q2 period. The chart reveals a clear positive relationship: higher PIK usage is associated with increased vulnerability in firms, reflected by a rise in the non-accrual loan share over the subsequent four quarters. Overall, these descriptive figures suggest that deferred interest through PIK options increases the vulnerability of firms.

We begin our analysis at the loan level using a dataset comprising close to 400,000 BDC loan-quarter observations and investigate when PIKs are being used. Our findings indicate that PIKs are more likely to be used during periods of high interest rates and typically with riskier loans. For example, firms are significantly more likely to rely on the PIK option if the loan is classified as non-accrual during the same period, and PIK options are attached typically to more junior loans. We also find that PIKs are associated with larger loans and they are often accompanied by the lender holding an equity stake in the borrowing firm.

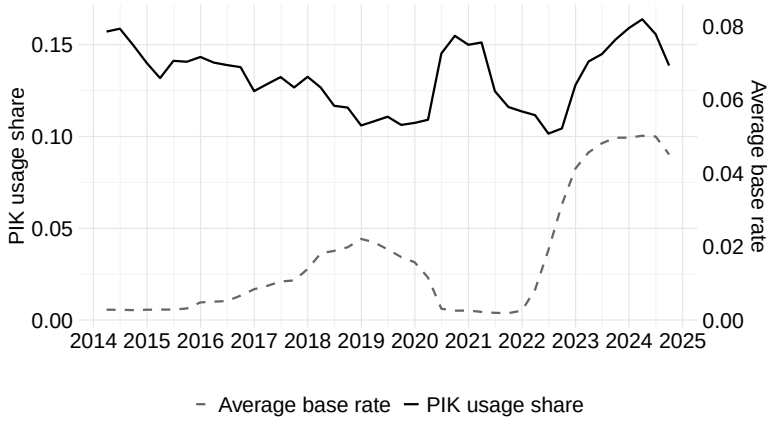
In the next step, we document that PIK usage increases the likelihood that a loan becomes non-accrual over the next four quarters. Using a variety of control variables and tight fixed effect specifications to account for the unobservable risk that increases both the likelihood that a firm uses the PIK option and that a loan becomes non-accrual, we find that using the PIK option increases the likelihood that a loan becomes delinquent by 5 percentage points (pp) over the next four quarters. This is a sizeable increase given the unconditional likelihood that a loan becomes non-accrual of 3%.[7]

Deferring cash interest payments imposes a cost on firms, as they incur an additional PIK spread over the standard cash spread. This PIK spread is substantial, effectively increasing the interest added to the debt principal by approximately 5%. Figure 2 presents the quarterly average PIK spread from 2012 to 2024. Notably, during periods of U.S. economic expansion, the PIK spread increased, which may indicate a deterioration in the

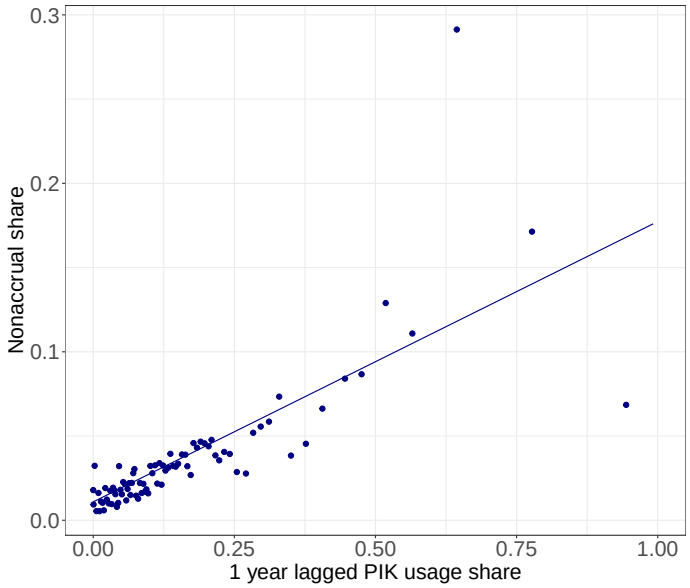
[7]We include an indicator whether the loan has already been non-accrual at the time interest was deferred and document, as expected, a significant and positive correlation to the loan remaining non-accrual. Loans with low fair value (relative to a par value) and loans with shorter remaining maturity are more likely to become non-accrual within the next four quarters.

Figure 1: PIK usage and firm vulnerability

Panel A - PIK usage share

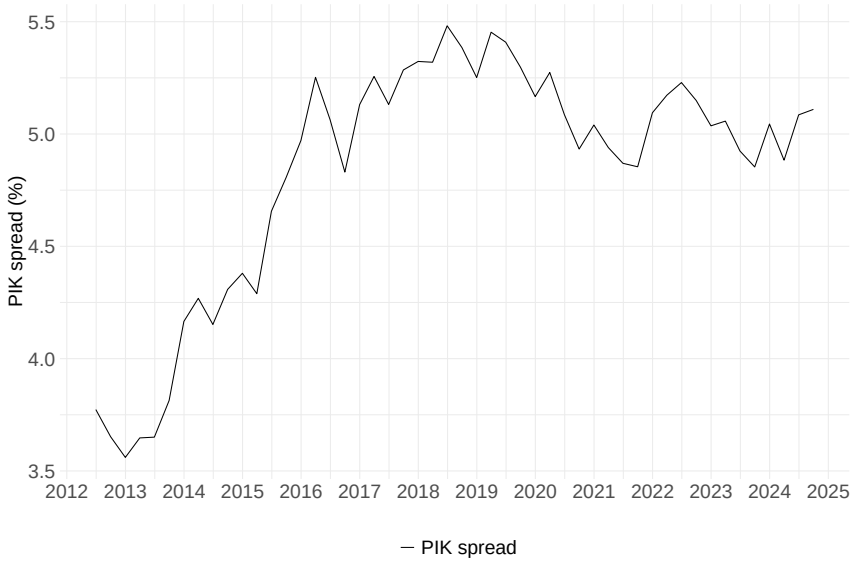


Panel B - Non-accrual share



Panel A shows the time-series of the PIK usage share across all BDCs' portfolio loans over the 2014Q1 to 2024Q3 period (solid line) as well as the average base rate (dashed line). PIK usage share is the value-weighted number of loans where borrowers use the PIK option relative to all loans in a given quarter. Panel B plots the non-accrual share in a BDC's loan portfolio on the four-quarter lagged PIK usage share using a binscatter with 100 bins.

Figure 2: Average PIK spread



The equal-weighted average PIK spread among loans that use PIK.

average credit quality of firms that decide to defer cash interest. In contrast, during the COVID-19 pandemic, the average PIK spread declined from about 5.5% to 4.75% and has remained stable throughout the subsequent period of rising interest rates. One plausible interpretation is that the pandemic adversely affected even higher-quality firms, forcing them to defer interest payments to conserve liquidity.

We investigate this hypothesis by examining the implications of utilizing the PIK option during the COVID-19 period. Our empirical analysis reveals that the probability of loan delinquency is significantly lower for firms that adopted the PIK option during COVID-19 compared to other periods. These loan-level results support the trade-off inherent in deferred interest: While it may enable firms to navigate liquidity constraints during periods of financial stress, such as the COVID-19 pandemic, the resultant increase in debt principal tends to elevate the risk of future delinquency.

In our loan-level analysis, we address the potential endogeneity of firms' PIK usage by

employing a stringent set of model specifications that incorporate fixed effect combinations for borrowers, year-quarter, BDC, loan type, and loan seniority. This methodology not only demonstrates the robustness of our key variables but also explains a substantial portion of the variation in delinquency rates.

We next examine whether, in addition to experiencing higher delinquency rates, BDCs realize lower gains on loans when borrowers opt for the PIK feature. Our analysis confirms that they indeed do. Specifically, loans on which interest payments have been deferred through the PIK option exhibit significantly higher realized losses compared to loans serviced with cash interest.

Furthermore, we exploit the unique setting where BDCs report quarterly fair value assessments of their loan portfolios. Given that these loans are typically not marked-to-market, this scenario allows us to examine potential valuation losses triggered by borrowers' decisions to defer interest payments. We document substantially lower fair values for loans following the adoption of the PIK option.

Since a single loan can be simultaneously held by multiple BDCs, each providing its own fair value estimate, we also investigate whether the dispersion in loan valuations across different lenders increases after borrowers defer interest payments. We hypothesize that increased default risk and heightened agency costs associated with PIK usage amplify valuation uncertainty, making loan assessments more challenging. Our findings consistently support this hypothesis. Collectively, our loan-level analyses demonstrate that reliance on deferred interest markedly increases borrower and loan vulnerability.

To further validate our findings and assess the aggregate impact of deferred interest, we extend our investigation to the BDC level. We first investigate how the deferred interest usage within a BDC portfolio correlates with different measures of BDC portfolio risk, such as portfolio delinquency, realized losses or its distance-to-default. Consistent with our loan-level tests, we document an increase in the vulnerability of BDCs when firms defer interest payments. Using a conservative estimate, the non-accrual share of a BDC in the following quarter increases by 0.06 pp when the PIK usage rates (defined as the percentage share of loans using the PIK option) increase by 1 pp. We also find that an

increase in PIK usage rates is associated with higher realized portfolio losses and lower model-implied distance-to-default for the BDC.

We next examine the debt structure of BDCs and document several new empirical findings. First, we observe a notable increase in debt financing relative to equity financing. This has been mainly driven by the increased importance of nonbank debt such as corporate bonds while bank loans relative to total assets have remained stable. However, bank funding plays an important role in many BDCs' liquidity management: a median BDC holds only about 2% of their assets in cash but maintains a significant liquidity buffer of undrawn credit lines of 16% of total assets.

The combination of deferred interest and BDC regulatory requirements also provides a unique setting to study this liquidity management. While deferred interest postpones BDCs' incoming cash flows, these payments made "in-kind" must still be recognized as income. Thus excessive use of deferred interest may pose liquidity pressures for BDCs that need to distribute approximately 90% of their income as dividends to maintain their attractive tax status as registered investment companies (RICs).

Our analysis shows that higher deferred interest payments are associated with a *lower* share of bank debt relative to total debt and *decreased* utilization of bank credit lines. Despite substantial credit lines extended to BDCs and their relatively high utilization rates compared to other non-bank financial institutions, banks thus appear largely insulated from the risks posed by rising deferred interest payments.[8]

To understand these results, we match BDCs to the LSEG Dealscan database to analyze their debt contracts. Although 191 distinct banks lend to BDCs, the lead arranger market is highly concentrated, with three banks arranging over 75% of these loans.[9] Ap-

[8]Our findings contrast with earlier evidence in the literature. Acharya et al. (2025a) show that banks do not contractually restrict credit-line drawdowns by REITs (another type of NBFI), while Acharya, Engle, Jager, and Steffen (2024b) document similar results for non-financial firms. Both REITs and non-financial firms draw heavily on their credit lines during periods of aggregate stress. An important distinction between our setting and the earlier literature is the underlying collateral. BDC portfolios primarily consist of risky loans to small- and medium-sized enterprises, whereas REIT collateral typically comprises mortgages. Consequently, differences in collateral risk may lead banks to impose stricter ex-ante contractual terms on BDCs compared to REITs or other non-finanical firms.

[9]These banks are JP Morgan, Truist Financial, and Sumitomo Mitsui Banking Corp., and differ from the institutions typically arranging loans for non-financial firms. One interpretation might be that loan

proximately 64% of loans extended to BDCs are secured. A review of a random sample of BDC SEC filings indicates that banks frequently impose collateral restrictions specifically designed to constrain credit line usage when deferred interest payments increase.[10] Moreover, covenants are extensively used: approximately 20% of loans include net-worth covenants and around 3% feature other financial covenants. However, all loan agreements include at least one general covenant (e.g., cash flow sweeps or material restrictions), with the average contract containing three such provisions. Additionally, 27% of loans contain asset coverage ratio requirements—effectively limiting debt usage—10% specify minimum liquidity levels, and about 7% include explicit restrictions on revolving credit usage. Overall, these findings suggest that bank lenders incorporate a rigorous set of restrictions to mitigate risks inherent in providing credit to BDCs.

Finally, we show that BDCs do not offset lower bank lending by increasing nonbank financing nor do they lower their cash holdings. Instead, we find that higher PIK usage is associated with BDCs decreasing their portfolio size as well as scaling down dividend growth. These results suggest that greater provision on PIK options constrains asset expansion, likely reflecting a deterioration in loan performance and reduced reinvestment and payout capacity for BDCs.

Related literature. Our paper relates to different strands of the literature. First, our paper relates to a broader literature on the leveraged loan market and LBOs in particular. Kaplan and Stein (1993) investigate LBOs in the 1980s and find evidence consistent with an overheating phenomenon in the buyout market in which public "junk" bonds replace private banks loans. Demiroglu and James (2010) investigate determinants of LBO structures. They document that only five LBO firms issued deferred interest debt during the 8 years from 1997 to 2004. In 2007, 20% of buyout firms issued deferred interest debt. Guo, Hotchkiss, and Song (2011) analyze 192 LBOs over the 1990 to 2006 period and document that about 23% of deals had PIK (and/or discount) features. They argue that using deferred interest debt as part of the capital structure is measure for credit risk for

contracts for BDCs differ substantially from those offered to other firms.

[10]For instance, a common covenant restricts the proportion of PIK loans to no more than 10% of the total value of eligible collateral portfolios.

lenders. Ivashina and Vallee (2025) show that PE sponsors might carve-out PIK related increases in debt from covenant, thereby weakening the position of lenders. Our paper is the first paper that investigates when firms choose to defer interest after loans have been extened and the implications. We show that PIK options are also common in senior secured and non-sponsored debt rather than in subordinated bonds and LBOs.

A growing literature highlights the increasing importance of private credit in corporate finance and BDCs as largest group of lenders in the private credit market.[11] For example, Davydiuk, Marchuk, and Rosen (2024a) find that BDC increased access to capital for firms, which in turn has stimulated economic growth and innovation. Davydiuk, Marchuk, and Rosen (2024b) document a greater reduction in portfolio risk for BDCs subject to stronger market discipline from their debtholders. Jang (2024) argues that similar to banks, direct lenders engage in active monitoring and relationship lending. Haque, Mayer, and Stefanescu (2024) argue that private debt serves as a substitute for long-term bank credit. We document that the option to defer interest payments in private credit increases the vulnerability of firms and, in turn, BDCs.

Another strand of the literature underscores the important role of non-bank financial institutions (NBFIs) across various lending sectors, including mortgages (Buchak, Matvos, Piskorski, and Seru (2018)), large corporate (Fleckenstein, Gopal, Gutierrez, and Hillenbrand (2023)), middle market (Chernenko, Erel, and Prilmeier (2022)), and small business lending (Gopal and Schnabl (2022)). This expansion in NBFI market share is partly driven by bank financing, especially through committed credit lines and associated liquidity insurance. Acharya et al. (2024a) document substantial funding relationships between unaffiliated banks and NBFIs via credit lines. Acharya et al. (2025a) highlight the risk of banks from lending to REITs via credit lines. Acharya et al. (2025b) document that banks respond to higher drawdown risk from firms financed by nonbanks by issuing fewer credit lines. Similar to our paper, Chernenko, Ialenti, and Scharfstein (2025) highlight that banks prefer lending to BDCs because loans to BDCs are over-collateralized.

[11] Block, Jang, Kaplan, and Schulze (2024) survey U.S. and European private debt investors. They conclude that the private debt market is both different from, but shares characteristics with the bank loan and syndicated loan markets.

Haque, Jang, and Wang (2025) highlight that bank lending to direct lenders is particularly attractive during monetary policy tightening. Jang and Rosen (2025) argue that losses to banks from direct lending are contained. We contribute to this literature and show that – despite the reliance on bank credit lines – BDCs with a larger share of loans with deferred interest decrease their bank funding and utilization of credit lines and the role of bank loan covenants in mitigating bank exposure to direct lenders.

2 Data and Institutional Setting

To investigate the implications of deferring interest payments on firms and private debt lenders, we construct a dataset at the BDC and loan level using different data sources.

2.1 Data

BDC investments. Our main dataset is LSEG LPC's BDC Collateral. BDC Collateral contains the universe of BDCs from 2012Q3 onwards, including active as well as discontinued BDCs. It collects the information directly from Security and Exchange Commission (SEC) filings and augments the data—whenever feasible—with information from other LSEG products such as secondary loan market pricing. Importantly, it contains BDC balance-sheet data as well as the schedule of investments on a quarterly basis for private and public BDCs. BDC Collateral provides detailed loan-level information, including borrower names, industry, par amount borrowed from the BDC, interest rates (base rate, cash spread, and PIK spread), remaining loan maturity, loan seniority, and loan type.[12] BDC Collateral groups loans into three loan seniority categories: first lien, second lien (both senior secured), and subordinated. They also provide additional information about security classes, which we group into five loan types: term loans, delay draw term loans (DDTLs), revolvers, unitranches, and others based on information provided in the security

[12]BDC Collateral does not contain financial information on borrowers, as BDCs are not required to report them.

class column(s).[13] BDC Collateral also provides quarterly performance measures, such as the fair value of the loan and the non-accrual status.

We augment BDC Collateral data with information from S&P Capital IQ and Pitchbook using Pitchbook identifiers. Pitchbook provides data both on the BDC level as well as for portfolio companies and investments.

BDCs report their filings with the SEC on a quarterly basis. Our analyses at the BDC level is thus based on a BDC—quarter panel. BDCs are clearly identified using a CIK number. To track the same loan within a BDC over time, we aggregate the data at the BDC—Borrower—Seniority—Loan Type—Quarter level.[14]

BDC capital structure. BDC Collateral provides broad details on BDC capital structures, including total debt and total assets, but does not distinguish between different debt types. To obtain comprehensive information on the structure of debt, we merge BDC Collateral with CapitalIQ and the combined CRSP/Compustat database. Following Colla, Ippolito, and Li (2013), we exclude BDC-quarter observations for which total debt reported in Compustat deviates by more than 10% from the sum of debt types reported in CapitalIQ. This process yields a matched sample of 83 BDCs, for which we obtain detailed quarterly data on drawn and undrawn credit lines, term loans, bonds, and commercial paper issuances from 2013Q1 through 2024Q4.

We augment our debt structure data with detailed loan-level information from LSEG Refinitiv Dealscan. Dealscan comprises information about loan terms (including credit lines and term loans), amounts, spreads, covenants, collateral as well as lenders. We obtain data on covenant violations by BDCs from the Saunders, Steffen, and Verhoff (2025) "CovenantAI" database. Finally, we obtain bond originations from LSEG Mergent FISD.

[13] We provide more details on data cleaning in Online Appendix OA.1.

[14] Typically these tuple identifies a single position but in the rare event, in which the BDC holds multiple loans with the same seniority and loan type of the same borrowing firm at the same period we group these positions (Rintamäki, 2024).

2.2 Institutional setting and Empirical Facts

BDCs are closed-end investment funds that mainly lend to large and middle-market firms. They are among the largest lenders in the nonbank lending market with total assets of about USD 410 billion in 2024Q3 and total investments of USD 385 billion.

Portfolio composition. Figure 3 illustrates the evolution of BDC portfolio composition by loan seniority over time. BDCs primarily invest in loans of varying seniority, with equity investments comprising a relatively smaller share. At the start of our sample period, first-lien loans represented approximately 30% of the portfolio, subordinated loans about 25%, and second-lien senior secured loans around 10%. By 2024Q4, second-lien and subordinated loans have shrunk considerably, becoming nearly negligible. Most notably, first-lien senior secured loans now dominate, accounting for roughly 75% of the total portfolio.

[Figure 3 here]

Figure 4 shows BDC portfolio composition by industry. We group firms into seven industries and provide a more detailed overview of industry sectors in Online Appendix OA.1. As of 2024, almost 60% of loans are originated in two sectors, Business Products (which includes, for example, shipping, transportation or wholesale) and Service and Information Technology (which includes, for example, media, technology, or communication), followed by Healthcare and Consumer Product/Financial Services. The two most noticeable developments over time are the increase in the importance of Information Technology and the decreasing importance of Energy (including oil & gas or utility firms). Energy is an almost negligible industry in BDC portfolios in 2024Q3.

[Figure 4 here]

Use of deferred interest in private debt contracts. PIK is utilized in private debt contracts in two primary ways. First, borrowers may defer interest payments from

the outset of loan origination. Second, borrowers may have the option to initially pay cash interest but later switch to deferred interest payments. The former arrangement is typically termed "PIK Note," while the latter is referred to as a "PIK toggle."

Panel A of Tabel 1 highlights several key differences between the two loan types. PIK-toggle loans are more common, more likely to be senior, larger in size, have floating interest rates, and typically have longer maturities. In contrast, PIK-notes usually feature lower cash spreads—defined as the interest spread over a reference rate when borrowers pay cash interest.

[Table 1 here]

Additionally, the PIK spread can apply either to the entire interest amount or to only a portion of the total interest costs. Our key borrower-lender-loan-level variable is PIK_{bltk}, an indicator that equals one if borrower b pays some part of its interest obligation to lender l in quarter t, for loan k, using PIK, and zero otherwise.

Panel B of Table 1 provides context with a specific example. "Exel Direct Inc." is a portfolio company of Garrison Capital Inc. (GARS), which provided a LIBOR-linked term loan with a five-year (60-month) maturity. According to GARS's quarterly filings, Exel Direct initially pays interest fully in cash and amortizes the loan principal over time, as evidenced by a declining par value.[15] While initial regulatory filings make no mention of payment-in-kind (PIK), starting in 2015Q2, the reports indicate a positive PIK spread. Initially, a 10% PIK spread is introduced while simultaneously reducing the cash spread from 13% to 3%. Thus, the total spread remains at 13%, but its composition shifts significantly from fully cash-based (13% cash, 0% PIK) to primarily PIK-based (3% cash, 10% PIK). The split between cash and PIK subsequently varies several times until maturity. Importantly, following the introduction of PIK payments, the loan's previously declining par value begins to rise, with periodic increases closely matching the dollar value

[15]The loan agreement appears to have special provisions; for instance, the borrower is allowed to reduce the interest rate and increase the principal in 2013Q3. Additionally, the cash spread rises from 11% to 13% after 18 months.

of quarterly PIK interest. This example clearly demonstrates how the reporting of a positive PIK spread in regulatory filings can reliably indicate the use of payment-in-kind interest.

Using the PIK option. As discussed in the Introduction, the use of PIK features in private debt contracts has increased over time, particularly during the COVID-19 pandemic and the subsequent period of elevated interest rates. To analyze trends in PIK adoption, we define the *PIK usage share* as the value-weighted proportion of loans in which borrowers exercise the PIK option relative to all loans originated in a given quarter.[16]

We document four empirical findings. First, Panel A of Figure 5 illustrates the PIK usage share by security type. Loans are categorized as either *Senior* (first and second lien) or *Junior* (subordinated debt). Consistent with expectations, junior debt exhibits higher PIK usage overall. However, the PIK usage share in senior loans exhibits a similar pattern of spiking in times of liquidity needs such as following COVID-19 and the monetary tightening that started in 2022.

[Figure 5 here]

Second, over the past decade, PIK-toggle loans have become increasingly prominent in private credit markets (Panel B of Figure 5).In 2013, more than 80% of outstanding loans with a PIK feature were structured as PIK notes; by 2022, this share had declined to below 30%.

Third, PIK usage varies notably across industries, as depicted in Figure 6. Traditionally, the energy and financial services sectors exhibit higher PIK usage. The energy sector, in particular, experienced substantial spikes—with usage exceeding 30%—during both the oil and gas shock and the COVID-19 pandemic periods. However, usage rates in the energy sector declined significantly in 2023 and 2024, reflecting the reduced prominence of energy loans in overall BDC portfolios. Across all sectors, PIK adoption increased during

[16] All variables are defined in detail in Section 2.3 and Appendix Table B.

COVID-19 and the subsequent period of elevated interest rates. As of 2024Q3, Healthcare, Business Products, and Information Technology display the highest average PIK usage shares.

[Figure 6 here]

BDC capital structure. Figure 7 shows the typical composition of a Business Development Company's (BDC) balance sheet as of the fourth quarter of 2022, providing insights into both asset holdings and funding sources. On the asset side, direct lending positions comprise the vast majority (98%) of total assets, emphasizing BDCs' primary role as specialized loan providers. Only a small fraction (2%) is held in cash or cash-equivalent reserves, reflecting their strategic focus on lending rather than liquidity accumulation.

[Figure 7 here]

Regarding liabilities and equity, nearly half (46%) of the BDC's funding comes from shareholder equity, suggesting a relatively robust capital cushion. Non-bank debt—including bonds, CLOs, and similar capital-market instruments—accounts for another significant portion (32%) of their funding structure. Bank financing, primarily through drawn credit lines (21%) and bank term loans (1%), represents approximately one-fifth of their funding. Additionally, BDCs maintain off-balance-sheet liquidity via undrawn bank credit lines (12%), ensuring capacity for future investments and flexibility to manage short-term liquidity requirements.

Overall, BDCs are highly lending-focused entities with minimal cash holdings, funded through a balanced mix of equity and diversified debt instruments. Their substantial equity base reflects regulatory and market-driven capitalization requirements, while undrawn credit lines provide critical contingent liquidity to support lending activities.

Figure 8 illustrates the evolution of the funding mix for a typical BDC's balance sheet (expressed as a percentage of total assets) from 2012Q3 through 2024Q4, highlighting several notable trends.

[Figure 8 here]

First, equity remains the dominant funding source but exhibits a gradual decline. Starting at approximately 65%–70% of total assets in 2012, equity financing decreases steadily, reaching the mid-50% range by the mid-2020s. Despite this downward trend, BDCs continue to be heavily equity-funded compared to other financial intermediaries.

Second, reliance on non-bank debt increases significantly during this period. Non-bank debt, including bonds, private placements, and CLOs, rises steadily from about 15%–20% to around 25%–30% of total assets, signaling a strategic shift towards capital-market financing.

Third, drawn credit lines maintain a relatively stable presence, typically accounting for about 10%–20% of total assets, suggesting consistent use of revolving credit facilities. In contrast, traditional bank term loans remain limited—usually below 10%—and exhibit a declining trend through the mid-2010s, before modestly increasing toward 2024–2025.

Finally, although not directly reflected on the balance sheet, BDCs maintain off-balance-sheet liquidity through undrawn credit lines (generally 10%–15% of total assets). These facilities provide additional financial flexibility, enabling BDCs to quickly address liquidity needs or capitalize on investment opportunities. Overall, the changing funding mix reflects BDCs' strategic preference for diversified financing, leveraging private debt markets and maintaining ample liquidity buffers while retaining substantial equity capitalization.

2.3 Descriptive statistics

Table 2 presents summary statistics at the BDC-level (Panel A) and loan level (Panel B) over the 2014Q1 to 2024Q4 period.

[Table 2 here]

Similarly to our loan-level variable PIK_{ltk}, we construct a corresponding measure at the lender-level, denoted $PIK\,usage\,share_{lt}$, by aggregating PIK_{bltk} to the BDC's portfolio level. Specifically, $PIK\,usage\,share_{lt}$ represents the par-value-weighted fraction

of a BDC's portfolio companies that pay some portion of their interest obligations "in-kind."

The average BDC in our sample has a PIK usage share of 13%, with considerable variation across funds (standard deviation of 16%). Mean assets under management (AUM) per BDC are USD 1.76 billion, though the distribution is skewed, with a median asset size of USD 0.69 billion. BDCs hold, on average, investments in 87 portfolio companies and have an average leverage ratio of 0.43. Internally managed BDCs represent only a small portion (6%) of the sample.[17] The median fund age is 5.5 years, but several BDCs have significantly longer operating histories.

Regarding financial performance, the median return on equity (ROE) among BDCs is 8%. Banks provide substantial funding, representing a median share of 44% of BDCs' total debt. Additionally, BDCs actively utilize credit lines, with an average utilization rate of 50%.

At the loan level, 9% of positions include a PIK component. The average all-in yield is 9.48%, with higher-risk loans carrying average PIK spreads of 5%, compared to average cash spreads of 6.38%. Floating-rate loans dominate, averaging a base rate of 2.98%, though this varies substantially over time. Average loan size is roughly $14 million, with loans typically trading at a fair-to-par value ratio of 0.91, suggesting moderate discounts, although these discounts widen significantly in bad times (Rintamäki, 2024). The median remaining maturity is 51 months or about 4 years. Consistent with Figure 3 above, 86% of loans are first-lien senior secured, 9% are second-lien, and 4% are subordinated, reflecting BDCs' preference for secured lending.

[17] BDCs are either internally or externally managed. Externally managed BDCs outsource management to an external adviser and are typically affiliated with larger investment firms, whereas internally managed BDCs handle operations in-house, often without external affiliations. The share of internally managed BDCs has declined significantly in recent decades; by Q4 2022, the vast majority of BDCs were externally managed.

3 Deferred Interest and Firm Vulnerability

3.1 When do firms use PIKs?

We begin our analysis by examining the determinants of PIK usage, employing the following regression model estimated via OLS:

$$PIK_{bltk} = \beta_1 \, Loan\,Terms_{bltk} + e_{bltk}$$

PIK_{bltk} is an indicator variable that takes a value of one if the lender l reports borrower b paying some portion of its interest in-kind in loan k and zero otherwise. The regression includes several loan-specific characteristics, such as loan size, base rate, a fixed-rate loan indicator, and loan seniority and loan type indicators.

Table 3 presents the regression results. Column (1) is a pooled regression highlighting key correlations between loan terms and the decision to defer cash interest payments. A few results (due to their economic magnitudes) stand out: A borrower is more likely to exercise the PIK option if the loan is already non-accrual, is a subordinated loan, is larger and if the base rate is higher.[18] The latter result suggests that–controlling for the loan being a fixed rate loan–that PIKs that are tied to a floating rate are used in times of high base rates.

[Table 3 here]

Across all specifications, we find that borrowers are more likely to defer interest if loans are already classified as non-accrual, with coefficient estimates ranging from 0.15 to 0.23. This suggests that borrowers who experience distress or reduced cash flow capacity often resort to PIK structures. Similarly, loan size is positively associated with PIK usage, implying that larger loans are more likely to incorporate PIK features.

[18] Most loans are tied to LIBOR and (eventually) to SOFR.

3.2 Deferred interest and future loan delinquency

Are loans more likely to become non-accrual if firms decide to defer cash interest payments? To test this we run the following regression model.

$$NonAccrual_{blk,t+4} = \beta_1 \, PIK_{bltk} + Controls + \alpha_{bt} + \alpha_{lt} + \alpha_{kt} + e_{bltk}$$

where $NonAccrual_{blk,t+4}$ is an indicator variable that equals one if the loan is classified as non-accrual in t plus four quarters. We also include the current non-accrual status, $NonAccrual_{blkt}$, as a loan is arguably more likely to stay non-accrual when it already is.

[Table 4 here]

Table 4 presents the regression estimates. In column (1), we regress $NonAccrual_{blk,t+4}$ only on PIK_{bltk} and year-quarter fixed effects. We find that loans have a 13pp higher likelihood of becoming delinquent in the four quarters after borrower have started to defer interests. In column (2), we add all control variables from Table 3 and the current non-accrual status. β_1 remains positive and significant but the economic significance drops substantially. That is, once we control for firm and loan risk characteristics, the effect is smaller but remains significant.

In models (3) to (6), we use a variety of borrower, year-quarter, BDC and loan type fixed effects. Across all specifications, the effect varies between 3pp and 5pp, which is large relative to an unconditional mean of 3%. The R^2 increases from 4% in column (1) to 89% in column (6) while β_1 remains largely constant. In other words, unobserved determinants of future delinquency that explain the remaining unexplained variation are unlikely to reduce the effect down to zero (Amiti and Weinstein, 2018).

Figure 2 in the introduction suggests that the quality of borrowers deciding to defer interest payments has increased during the COVID-19 pandemic. We test this hypothesis by examining firms' use of the PIK option during the COVID-19 pandemic (column (7)). Our empirical results indicate that loans with interest deferred during COVID-19 were significantly less likely to become delinquent compared to those in other periods.

These findings highlight a key trade-off: although deferring interest payments can ease liquidity pressures in times of financial stress, such as the COVID-19 crisis, the resulting accumulation of debt generally increases future delinquency risk.

In our loan-level analysis, we address the potential endogeneity of firms' PIK usage by employing a stringent set of model specifications that incorporate all control variables that have been shown to have explanatory power for PIK usage (compare Table 3) as well fixed effect combinations for borrowers, year-quarter, BDC, and seniority and loan type. This methodology not only demonstrates the robustness of our key variables but also explains a substantial portion of the variation in delinquency rates.

3.3 Deferred interest and future realized gains (and losses)

We next provide an alternative way to evaluate how deferred interest impacts loan performance and focus on realized gains from the loan for the BDC. Do BDCs c.p. realize lower gains from loans when borrowers exercise the PIK option? We estimate the following regression using OLS:

$$Realized\,gain_{blk,t+4} = \beta_1\, PIK_{bltk} + Controls + \alpha_b + \alpha_{lt} + \alpha_{kt} + e_{bltk}$$

where $Realized\,gain_{blk,t,t+4} = \frac{(Cost_{blk,t+4} - Cost_{blk,t}) - (Par_{blk,t+4} - Par_{blk,t})}{Par_{blk,t}}$ measures the percentage gains (or losses) of loan k. The numerator of the dependent variable captures the realized dollar net gains or losses that have occurred between period t and $t+4$, while the denominator normalizes this value using the outstanding size of the loan principal at the end of period t.

The amortized cost and par value of a loan differ because of three reasons: original issues discounts (or premiums), credit losses, or loan modifications and restructuring. First, if a loan is issued at a discount or premium to par, the amortized cost gradually converges to par over time as interest accrues. Second, amortized cost incorporates expected credit losses whereas par value does not adjust for impairments. Third, if a loan is restructured or impaired, the amortized cost is written down, while the par value remains unchanged.

As both par value and cost value increase (decrease) when the firm borrows (repays), we cannot simply evaluate changes in $Cost_{blk,t}$ to capture realized losses. But as $Par_{blk,t+4} - Par_{blk,t}$ changes *only* due to changes in loan balances while $Cost_{blk,t+4} - Cost_{blk,t}$ changes also due to write-downs (write-ups), realized gains can be calculated as the difference between both values.

[Table 5 here]

Table 5 presents regression results examining realized gains (or losses) at the loan level over four quarters. A key finding is that loans with PIK options experience significantly lower realized gains. This negative impact is highly significant across all specifications, suggesting that loans that use PIK are followed by lower realized gains compared to loans that do not use PIK. This result aligns with the idea that PIK loans often indicate financial distress or poorer credit quality, leading to higher realized losses.

The analysis incorporates various fixed effects to control for factors that could influence loan performance. Borrower and BDC fixed effects account for unobserved characteristics specific to individual firms and lenders, such as risk appetite or lending strategy. Year-quarter fixed effects control for macroeconomic conditions and market-wide credit cycles. Industry and loan-type fixed effects help isolate differences stemming from sector-specific risks and structural differences in loan instruments. Finally, interaction terms such as BDC-YearQuarter and Seniority-YearQuarter capture time-varying lender-specific effects and variations in loan seniority over time.

3.4 Deferred interest and valuation uncertainty

In a last set of tests, we take advantage of the fact that BDCs quarterly report their own assessment of the fair value of the loan. As loans are usually not marked-to-market, this provides an interesting opportunity to investigate possible market value losses following a borrower's decision to defer interest.

A loan is frequently held by different BDCs that have their own fair value assessment.

It is a testable hypothesis that increases in the use of PIK increases both default risk and agency costs of debt, making it more difficult for lenders to assess the fair value of a loan.

We construct a new measure of fair value dispersion between BDCs. More precisely, $CSD(Fair/Par_{blk,t+4})$ is the cross-sectional standard deviation of similar loans' value ($Fair/Par$-ratio) across all BDC's portfolios at the end of period $t+4$.[19] We hypothesize that the fair value dispersion increase after a borrower's decision to defer interest. We estimate the following regression using OLS:

$$CSD(Fair/Par_{blk,t+4}) = \beta_1 \, PIK_{bltk} + Controls + \alpha_b + \alpha_{lt} + \alpha_{kt} + e_{bltk}$$

Table 6 presents regression results examining the cross-sectional standard deviation (CSD) of loan valuations four quarters later.

[Table 6 here]

Using PIK with a loan is followed by significantly higher valuation dispersion. This positive and statistically significant relationship across all specifications suggests that PIK loans are associated with greater valuation uncertainty and greater disagreement about (often unobserved) market pricing.

The analysis incorporates various fixed effects to control for systematic differences in loan valuations. Borrower fixed effects account for idiosyncratic firm-specific characteristics that may influence loan dispersion, such as financial health or industry risk exposure. BDC fixed effects control for lender-specific differences, including risk appetite and valuation methodology. Year-quarter fixed effects capture time-varying macroeconomic conditions that could affect loan pricing volatility. Additionally, loan-type and seniority fixed effects help isolate valuation differences arising from structural characteristics of the debt instruments.

[19] For example, two loans held by two different lenders at the same period are considered similar if they are issued by the same borrower, have the same seniority (e.g. both are First Lien Senior Secured), and have the same Loan Type (e.g both are Term Loan).

3.5 Deferred interest and vulnerability of BDCs

To further validate our findings and examine the aggregate effects of deferred interest, we extend the analysis to the BDC level. Specifically, we explore how BDC-level deferred interest usage relates to portfolio performance indicators, including delinquency and default rates.

We first investigate the effect of PIK usage on the risk of the BDC. The specification takes the following form.

$$Risk_{l,t+1} = \beta_1 \, PIK \, usage \, share_{lt} + Controls_{lt} + \alpha_l + \alpha_t + e_{lt}$$

As defined above, $PIK \, usage \, share_{lt}$ represents the cost-value-weighted proportion of loans in a BDC's portfolio where borrowers defer interest using the PIK option in quarter t. To measure BDC risk ($Risk_{l,t+1}$), we use three measures: the non-accrual share (*nonaccrual share*), net realized gains during the following four quarters relative to current assets (*Realized gains*) and the Merton (1974) model's implied distance-to-default (*DtD*). We include standard control variables—fund size, leverage, profitability, and fund age, all lagged by one quarter—as well as BDC fixed effects, α_l, and year-quarter fixed effects α_t. The results are shown in Table 7.

[Table 7 here]

The results presented in Table 7 illustrate a clear relationship between a BDC's reliance on deferred interest (as measured by $PIK \, usage \, share_{lt}$) and its overall risk exposure. Specifically, a higher $PIK \, usage \, share_{lt}$ is associated with increased non-accrual costs, signaling elevated credit risk. This relationship persists after controlling for BDC fixed effects, although the magnitude of the coefficient decreases, suggesting that lender-specific characteristics explain some of the variations.

Similarly, as *Nonaccrual share* we find that high $PIK \, usage \, share_{lt}$ strongly predicts lower *Realized gains*. This result is strongly economically and statistically significant in all specifications. Finally, the observed negative correlation between $PIK \, usage \, share_{lt}$ and

distance-to-default highlights that increased reliance on deferred interest reduces BDCs' overall financial resilience.

4 How Does Deferred Interest Affect BDC Funding and Investment?

Even though interest is deferred (i.e., the BDC does not receive a cash-inflow), the BDC is obligated to recognize it as income. Given that regulatory requirements mandate the distribution of approximately 90% of income as dividends, this might lead to liquidity pressures. To safeguard against such liquidity risks, BDCs hold cash and secure liquidity through credit lines committed by banks, which can be drawn when needed. An important question, therefore, is whether BDCs with a higher proportion of deferred interest payments exhibit greater reliance on bank-committed lines of credit. Or, do BDCs use alternative funding sources such as the corporate bond market? And, what are the implications for subsequent BDC asset and dividend growth. These questions are addressed in the following analysis.

4.1 BDC liability structure and bank debt

We first provide more descriptive evidence how BDCs are funded. Figure 8 suggest a decreasing importance of equity and more reliance of debt, specifically bank originated debt, in capital structures of BDCs. Panel A of Table 8 provides further evidence for the 83 BDCs matched to Capital IQ. Bank lending is the most important funding source for BDCs. While they hardly borrow by issuing term loans, they mostly rely on bank credit line commitments to fund their investments. Still, a substantial part of their balance-sheet is funded through *Nonbank debt* (i.e., corporate bonds). Interestingly, BDCs rely mostly on bank provided credit lines for liquidity. While only 4% of assets is cash, about 16% of assets are credit line commitments by banks.

[Table 8 here]

Which banks are lending to BDCs? We match BDC Collateral to LSEG Refinitiv Dealscan and obtain matches for 83 BDCs and, in total, 197 banks. We identify the lead bank in each loan deal and construct a league table of lead arrangers for the year 2023 (Panel B of Table 8).[20] Based on this matched sample, about USD 40bn of loan have been issued during 2023, and the market is highly concentrated. About 75% of loans were originated by JP Morgan (USD 17bn), Truist Financial (USD 11bn) and Sumitomo Mitsui Banking Corp (USD 4bn).

We then investigate covenants and collateral restrictions using the information in the Dealscan database. We report these in Panel C of Table 8. Approximately 64% of loans extended to BDCs are secured. A review of a random sample of BDC SEC filings indicates that banks frequently impose collateral restrictions specifically designed to constrain credit line usage when deferred interest payments increase.[21] Moreover, covenants are extensively used: approximately 20% of loans include net-worth covenants, and around 3% feature other financial covenants. However, all loan agreements include at least one general covenant (e.g., cash flow sweeps or material restrictions), with the average contract containing three such provisions. Additionally, 27% of loans contain asset coverage ratio requirements—effectively limiting debt usage—10% specify minimum liquidity levels, and about 7% include explicit restrictions on revolving credit usage. Overall, these findings suggest that bank lenders incorporate a rigorous set of contingencies to mitigate risks inherent in providing credit to BDCs.

[20] We follow the syndicated loan literature when assigning the lead arranger role: (1) The bank has league table credit and its role is "Admin agent" or "Agent", "Arranger", "Bookrunner", "Lead Bank", "Lead manager", "Mandated Lead Arranger"; (2) The role is "Co-agent", "Co-arranger", "Collateral agent", "Coordinating arranger", "Documentation agent", "Managing agent", or "Syndication agent" and the bank receives league table credit; (3) the bank does not receive league table credit but is assigend the role "Admin agent" or "Arranger". This way, each loan facility is assigned a lead bank and more than 95% of loans only have one lead bank.

[21] For instance, a common covenant restricts the proportion of PIK loans to no more than 10% of the total value of eligible collateral portfolios.

4.2 Deferred interest and BDC financing choices

As documented above, BDCs rely more on credit line than cash in their liquidity management. An important question, therefore, is whether BDCs with a higher proportion of deferred interest payments exhibit greater reliance on bank-committed lines of credit or whether collateral restrictions and covenants imposed by banks effectively limit such reliance. We investigate this using the following model specification:

$$y_{l,t+1} = \beta_1 \, PIK \, usage \, share_{lt} + Controls_{lt} + \alpha_l + \alpha_t + e_{lt}$$

where the dependent variable $y_{l,t+1}$ captures either the utilization rate of credit lines (drawn credit relative to total committed credit) or the share of bank debt relative to total debt.

[Table 9 here]

Table 9 analyzes how PIK usage influences the subsequent debt funding structure of BDCs. Columns 1–3 present results on the relationship between PIK usage and the share of bank debt in total debt, while Columns 4–6 report analogous results for credit line utilization.

The findings indicate a statistically significant and economically meaningful negative relationship between PIK usage and both bank debt share and credit line usage in the subsequent period. In the specifications (Columns 1 and 4), a one percentage point increase in PIK usage is associated with a 0.66pp decrease in the share of bank debt and a 0.43pp decrease in credit line usage, both significant at the 1% level. The inclusion of year-quarter and BDC fixed effects attenuate these magnitudes slightly while maintaining statistical significance at conventional levels (1% and 5%).

These results suggest that greater reliance on PIK structures, which allow borrowers to defer cash interest payments, may signal heightened credit risk, reducing access to bank financing and credit line drawdowns. The decline in bank debt share implies that banks may be less willing to extend credit to BDCs with higher PIK exposure, potentially due to

concerns over asset quality and liquidity constraints. Similarly, the negative relationship with credit line usage suggests that BDCs with greater PIK exposure either face reduced access to credit facilities or exhibit a preference for alternative funding sources.[22]

The adjusted R^2 values indicate that the inclusion of BDC fixed effects substantially improves model fit, particularly for bank debt share (from 0.26 to 0.70) and credit line usage (from 0.12 to 0.39), underscoring the importance of accounting for lender heterogeneity. Overall, despite the substantial credit lines extended to BDCs and their relatively high utilization rates compared to other non-bank financial institutions, the banking sector seems to remain largely insulated from the risks associated with increased deferred interest payments.

In Table 10, we expand our analysis to future changes in nonbank funding (columns (4) to (6)), total debt (columns (7) to (9)), and cash holdings (columns (10) to (12)), all relative to total assets. The one-quarter lagged *PIK usage share* is again our key explanatory variable. In addition to bank funding, we find that also nonbank funding is declining and, consequently, total debt as well. Interestingly, cash holdings remain unchanged.

[Table 10 here]

4.3 Deferred interest and BDC investment choices

In Table 11 we extend these results and analyze the relationship between the usage of PIK interest structures and subsequent asset and dividend growth among BDCs. The table presents estimates for three key dependent variables: asset growth measured at fair value (FV) and cost value (CV) in Columns 1–4, and dividend growth in Columns 5–6.

[Table 11 here]

[22] Our initial investigation into the terms of BDCs' bank borrowing supports this conclusion. For example, terms in Ares Capital Corp's (ARCC) revolving funding facility from Wells Fargo and two other banks restrict the share of PIK loans in the eligible collateral portfolio. Since the required collateral portfolio directly scales with the size of the borrowed amount, high PIK usage share may restrict BDC's further bank borrowing or even force it to pay back existing debt. For details of this example, see the amendment in ARCC's 8-K filing from June 22, 2022.

The findings reveal a statistically significant and negative association between PIK usage and asset growth. A one percentage point increase in PIK usage is associated with a 0.10 percentage point reduction in fair-value asset growth (Column 1) and a 0.12 percentage point reduction in cost-value asset growth (Column 3), both at the 1% significance level. These magnitudes decrease slightly when BDC fixed effects are introduced (Columns 2 and 4), yet remain statistically significant at the 5% level. These results suggest that greater reliance on PIK structures constrains asset expansion, likely reflecting a deterioration in loan performance and reduced reinvestment capacity for BDCs.

Similarly, PIK usage is negatively associated with dividend growth. In the baseline specification (Column 5), a one percentage point increase in PIK usage is linked to a 0.07 percentage point decline in dividend growth, significant at the 5% level. However, when BDC fixed effects are included (Column 6), the coefficient becomes smaller (-0.04) and loses statistical significance. This attenuation suggests that the observed relationship between PIK usage and dividends may be partially explained by time-invariant BDC-specific characteristics, such as risk appetite or structural constraints on payout policies.

5 Conclusion

This paper provides novel insights into the implications of Payment-in-Kind (PIK) lending in the U.S. private credit market, with a specific focus on Business Development Companies (BDCs). By allowing borrowers to defer cash interest payments, PIK loans offer crucial short-term liquidity during periods of economic distress. However, our analysis highlights significant long-term costs, as these deferred interest structures often result in elevated credit risk, higher delinquency rates, and increased realized losses at both the loan and portfolio levels. Notably, the COVID-19 pandemic period illustrates that even healthier firms resorted to PIK loans under exogenous liquidity pressures, underscoring their dual role as both stabilizers and amplifiers of financial vulnerability.

At the BDC level, extensive reliance on deferred interest not only raises portfolio credit risk but also limits funding options due to restrictive covenants imposed by banks. Banks

significantly constrain BDCs' ability to draw on credit lines precisely when liquidity is most needed, compelling these lenders to scale back debt financing, investment growth, and dividend distributions. Our findings thus reveal an inherent trade-off: while PIK loans alleviate immediate liquidity constraints, they simultaneously amplify financial fragility and constrain lenders' operational flexibility.

There are several avenues for future research. First, exploring the systemic implications of deferred interest practices beyond BDCs to include broader segments of the non-bank financial sector would deepen understanding of financial stability risks. Second, comparative analyses across different international jurisdictions could provide insights as to how regulation impacts PIK lending practices and outcomes. Finally, understanding how evolving market structures in private credit affect the adoption and consequences of deferred interest payments represents an important question for future research.

References

Acharya, V. V., N. Cetorelli, and B. Tuckman (2024a): "Where Do Banks End and NBFIs Begin?" *NBER Working Paper*.

Acharya, V. V., R. Engle, M. Jager, and S. Steffen (2024b): "Why did bank stocks crash during COVID-19?" *The Review of Financial Studies*, 37, 2627–2684.

Acharya, V. V., M. Gopal, M. Jager, and S. Steffen (2025a): "Shadow Always Touches the Feet: Implications of Bank Credit Lines to Non-Bank Financial Intermediaries," *NYU Stern School of Business, Working Paper*.

Acharya, V. V., M. Gopal, and S. Steffen (2025b): "Fragile Financing? How Corporate Reliance on Shadow Banking Affects their Access to Bank Liquidity," *NYU Stern School of Business, Work in Progress*.

Amiti, M. and D. E. Weinstein (2018): "How much do idiosyncratic bank shocks affect investment? Evidence from matched bank-firm loan data," *Journal of Political Economy*, 126, 525–587.

Block, J., Y. S. Jang, S. N. Kaplan, and A. Schulze (2024): "A survey of private debt funds," *The Review of Corporate Finance Studies*, 13, 335–383.

Buchak, G., G. Matvos, T. Piskorski, and A. Seru (2018): "Fintech, regulatory arbitrage, and the rise of shadow banks," *Journal of Financial Economics*, 130, 453–483.

Chernenko, S., I. Erel, and R. Prilmeier (2022): "Why do Firms Borrow Directly From Nonbanks?" *The Review of Financial Studies*, 35, 4902–4947.

Chernenko, S., R. Ialenti, and D. S. Scharfstein (2025): "Bank Capital and the Growth of Private Credit," *Working Paper*.

Colla, P., F. Ippolito, and K. Li (2013): "Debt specialization," *The Journal of Finance*, 68, 2117–2141.

Davydiuk, T., T. Marchuk, and S. Rosen (2024a): "Direct lenders in the US middle market," *Journal of Financial Economics*, 162, 103946.

——— (2024b): "Market discipline in the direct lending space," *The Review of Financial Studies*, 37, 1190–1264.

Demiroglu, C. and C. M. James (2010): "The role of private equity group reputation in LBO financing," *Journal of Financial Economics*, 96, 306–330.

Fleckenstein, Q., M. Gopal, G. Gutierrez, and S. Hillenbrand (2023): "Non-bank Lending and Credit Cyclicality," *Working Paper*.

Gopal, M. and P. Schnabl (2022): "The rise of finance companies and fintech lenders in small business lending," *The Review of Financial Studies*, 35, 4859–4901.

Guo, S., E. S. Hotchkiss, and W. Song (2011): "Do buyouts (still) create value?" *The Journal of Finance*, 66, 479–517.

Haque, S., Y. S. Jang, and J. J. Wang (2025): "Indirect Credit Supply: How Bank Lending to Private Credit Shapes Monetary Policy Transmission," *Working Paper*.

Haque, S., S. Mayer, and I. Stefanescu (2024): "Private Debt versus Bank Debt in Corporate Borrowing," *Working Paper*.

IMF (2024): "The rise and risks of private credit," in *Global Financial Stability Report, April 2024*, International Monetary Fund.

Ivashina, V. and B. Vallee (2025): "Weak credit covenants," *Working Paper, Harvard Business School*.

Jang, Y. S. (2024): "Are Direct Lenders More Like Banks or Arm's-Length Investors?" *Working PAper*.

Jang, Y. S. and S. Rosen (2025): "Direct Lenders and Financial Stability," *Working Paper*.

Jensen, M. C. (1986): "Agency costs of free cash flow, corporate finance, and takeovers," *The American economic review*, 76, 323–329.

——— (2019): "Eclipse of the public corporation," in *Corporate governance*, Gower, 239–252.

Kaplan, S. N. and J. C. Stein (1993): "The evolution of buyout pricing and financial structure in the 1980s," *The Quarterly Journal of Economics*, 108, 313–357.

Rintamäki, P. (2024): "Endogenous Matching in the Private Debt Market," *Working Paper*.

Saunders, A., S. Steffen, and P. M. Verhoff (2025): "CovenantAI-New Insights into Covenant Violations," *Working Paper*.

Wruck, K. H. (1990): "Financial distress, reorganization, and organizational efficiency," *Journal of financial economics*, 27, 419–444.

Figure 3: BDC investment portfolio composition

The figure shows the composition of BDC's investment portfolios over the 2013Q1 to 2024Q3 period. Investments are decomposed into (1) Equity, (2) First Lien, (3) Second Lien, and (4) Subordinated Loans. Both First and Second Lien are senior secured loans.

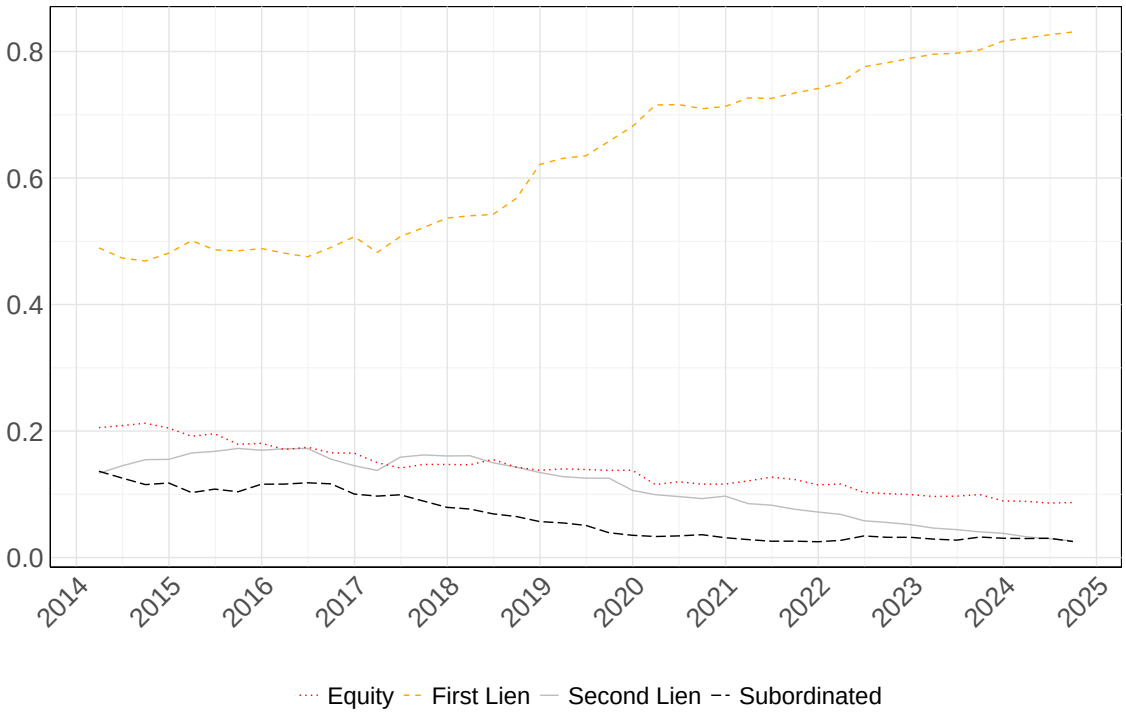


Figure 4: Industry mix in BDCs' portfolios

The figure shows the time-series of the value-weighted percentage of loans extended to different industries over the 2013Q1 to 2024Q3 period. Industries are defined in Online Appendix OA.1. Industry definitions are from Pitchbook.

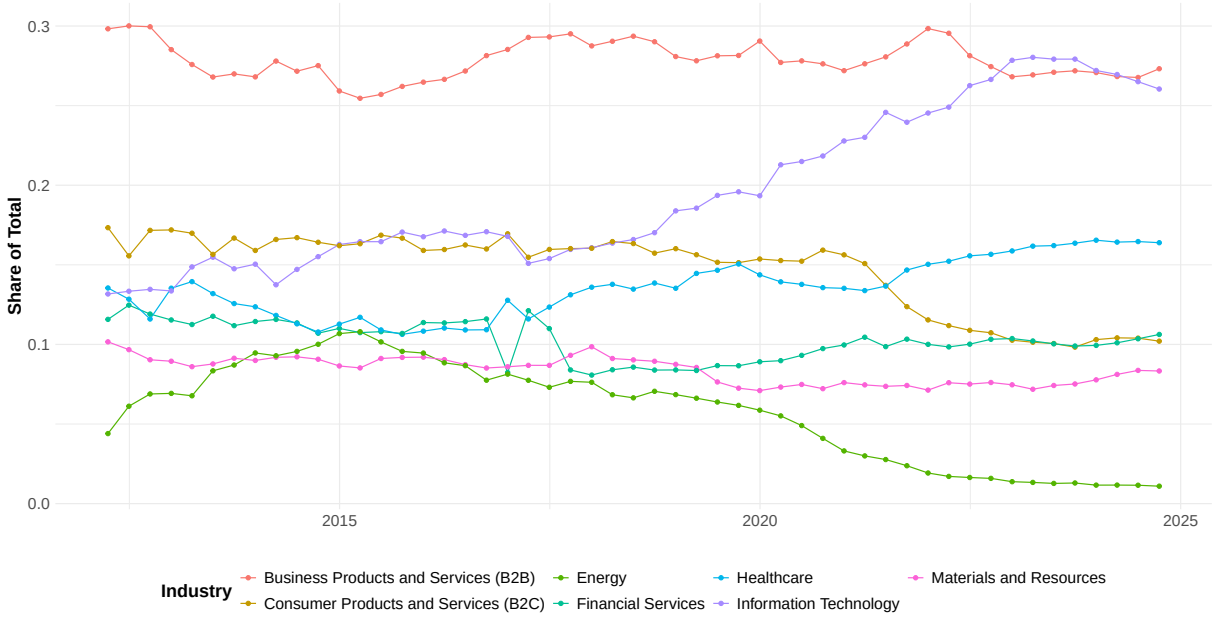
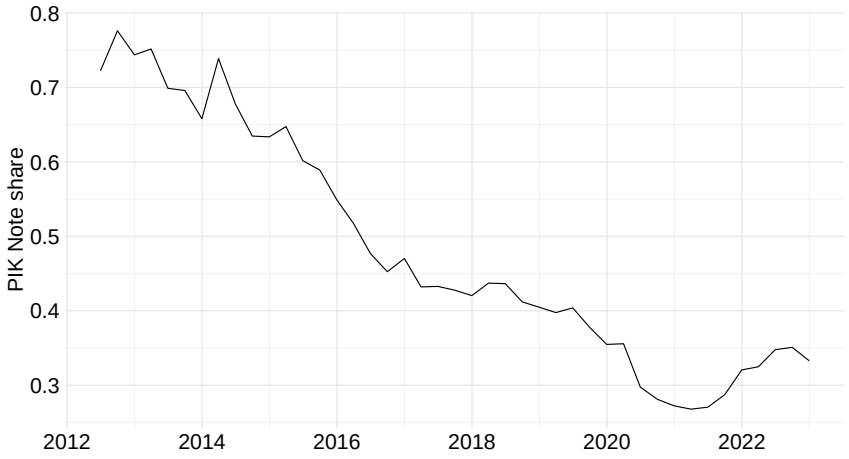


Figure 5: PIK-Notes and PIK Usage

Panel A shows the share of PIK Notes (relative to all PIK loans) during the 2012Q2 to 2022Q4 period. The sample excludes loans that originated after 2023 or before 2012Q2 to accurately categorize PIK loans. Panel B shows the time series of the PIK usage share across all BDCs' portfolio loans that are classified either as first-lien or second-lien senior secured loans over (solid line) or more junior - subordinated - loans (dashed line) during the 2012Q1 to 2024Q3 period. PIK usage share is the value-weighted number of loans where borrowers use the PIK option relative to all loans in a given quarter.

Panel A - Share of PIK Notes among all outstanding PIK loans



Panel B - PIK usage among different security types

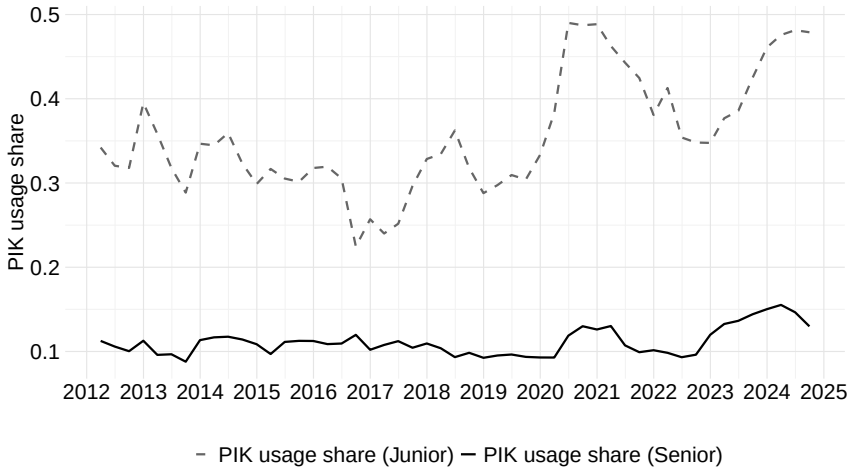


Figure 6: PIK usage in different industries

The figure shows the time-series of the PIK usage share across all sample loans in different industries. PIK usage share is the value-weighted number of loans where borrowers use the PIK option relative to all loans in a given quarter.

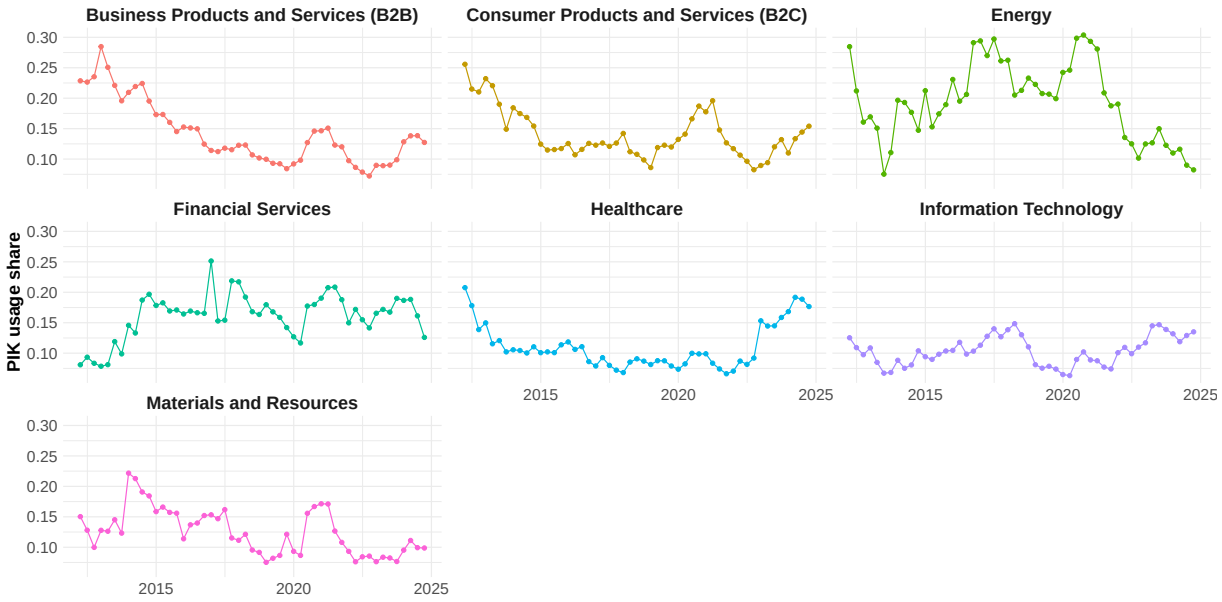


Figure 7: Balance sheet of the BDC sector in 2022Q4

This figure shows the aggregate BDC sector's balance sheet components (all relative to total assets) as of 2022Q4. Data is from Capital IQ.

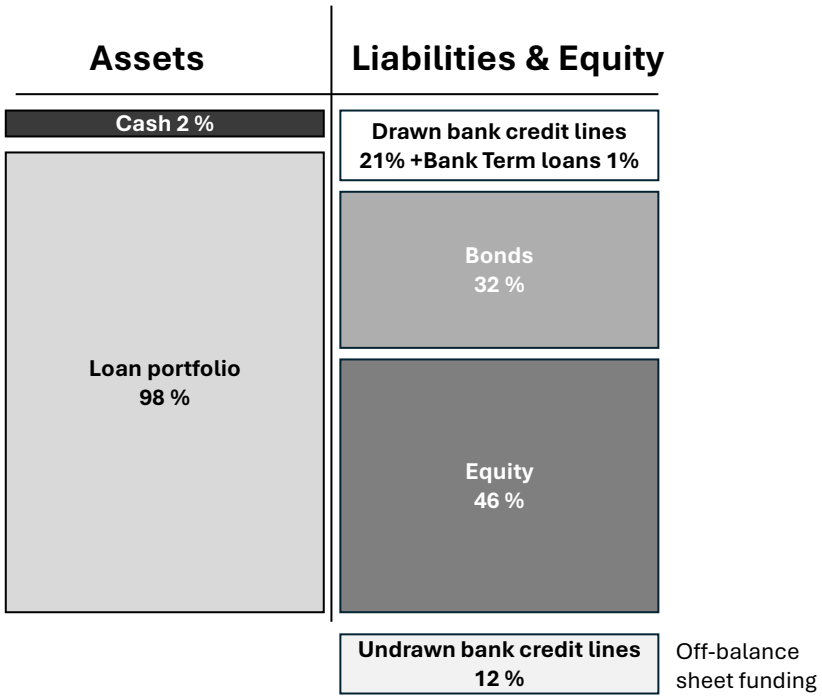


Figure 8: BDC debt capital structure

The figure shows the average share of different debt structure items relative to total assets across BDCs' balance sheets over the 2013Q1 to 2024Q3 period.

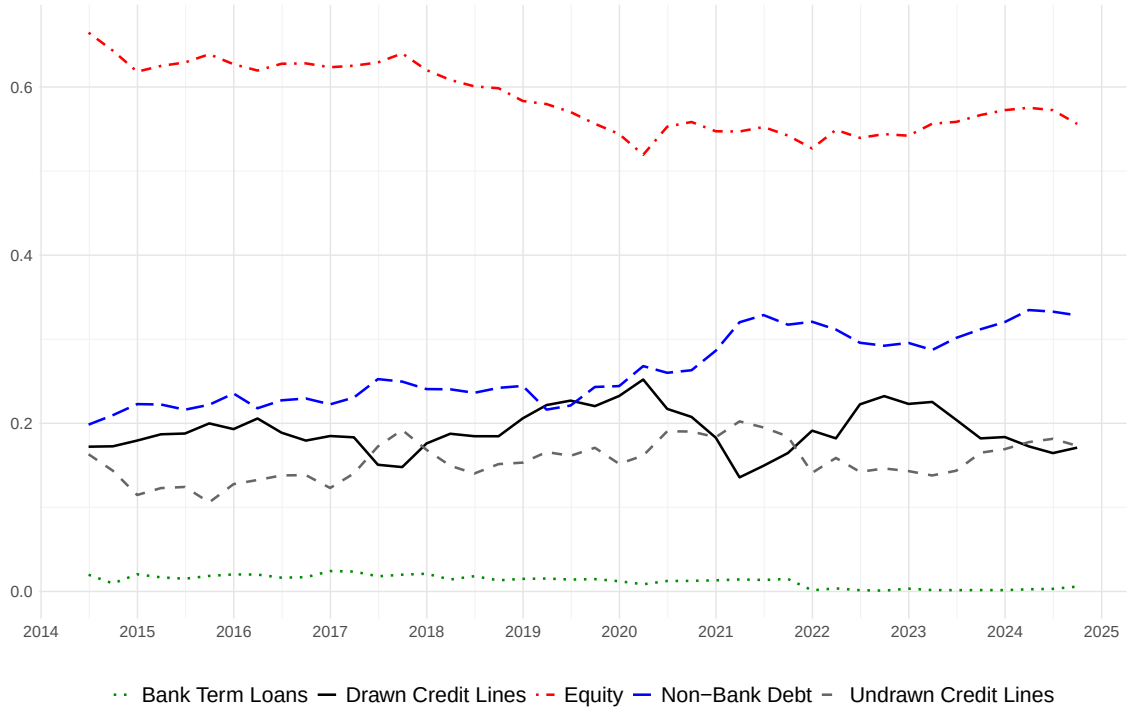
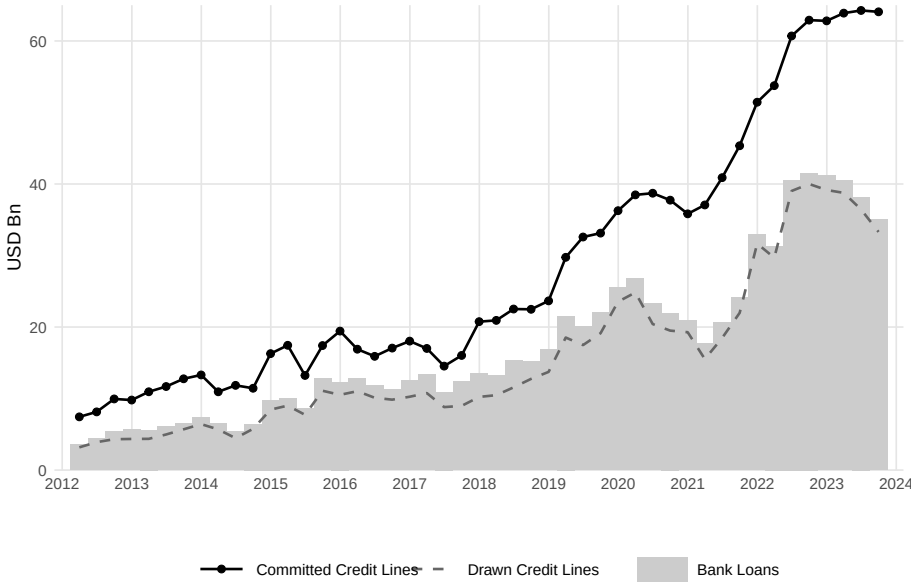


Figure 9: Bank lending to BDCs

Panel A shows outstanding bank debt of BDCs over the 2013Q1 to 2024Q3 period: *Committed Credit Lines* (the sum of drawn and undrawn credit lines), *Drawn Credit Lines* and *Bank Loans* (the sum of drawn credit lines and term loans). Panel B shows the time-series of bank debt as a percentage of total debt (*Bank debt share*) and *Credit line usage*.

Panel A - Outstanding bank debt



Panel B - Credit line usage and bank share

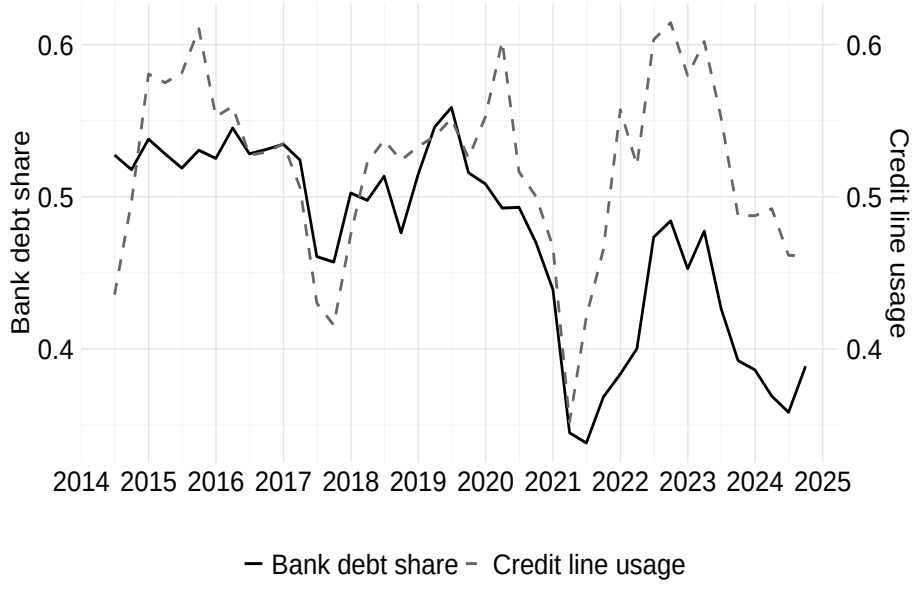
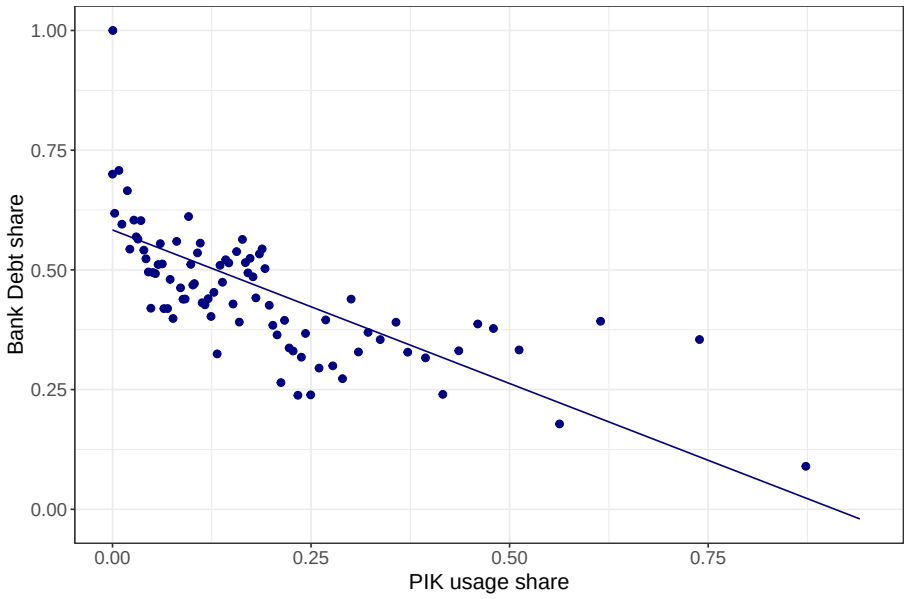


Figure 10: PIK usage and bank debt

Panel A (B) shows plots *Bank debt share* (*Credit line usage*) on *PIK usage share* using a binscatter with 100 bins.

Panel A - Bank Debt share and PIK usage share



Panel B - Credit line usage and PIK usage share

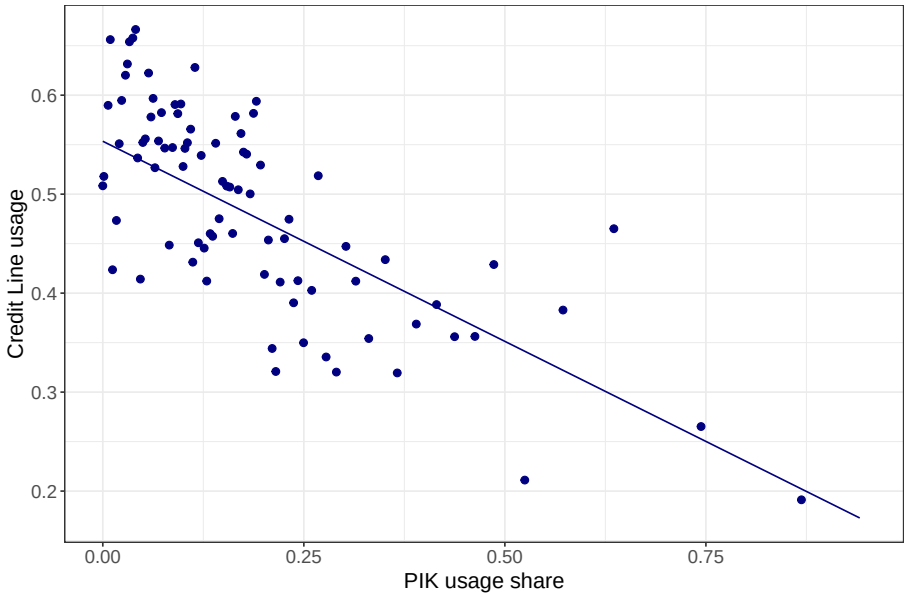


Table 1: Use of Deferred Interest (PIK) in Private Debt

Panel A shows the loan characteristics of "*PIK-Notes*" and "*PIK-Toggle*" loans at origination. The origiantion date is defined as the first date on which the loan enters the sample. *PIK-Notes* are defined as loans with deferred (instead of cash interest payments) over the entire duration of the loan. *PIK-Toggle* loans are loans for which borrowers initially pay in cash but switch to PIK at some point before maturity. *PIK spread (%)* is the average PIK spread. The sample excludes loans that originated after 2023 and the loans for which we do not appear in the sample at the start of sample 2012Q1 to more accurately identify *PIK-Notes*. Panel B shows how PIK is reported, using Garrison Capital Inc. as an example. This example illustrates how PIK reporting appears in our loan-level dataset. $PIK\,spread\,(\%)$ is zero when it is not reported. PIK takes the value of one if the $PIK\,spread\,(\%)$ is reported as positive and zero otherwise. $Pav\,value(\$\,million)$, $Cash\,spread\,(\%)$, $Time-to-maturity$ and $All-in-yield\,(\%)$ are debt characteristics measured at origination date. Detailed variable definitions are found in Appendix B.

Panel A: PIK-Toggle Loans vs. PIK-Notes

	Variable	PIK-Toggle	PIK-Note
1	Observations	3074	1308
2	First Lien Senior Secured	0.85	0.51
3	Fixed rate	0.21	0.64
4	Cash spread (%)	7.03	5.79
5	Par value ($ million)	18.39	28.36
6	Time-to-maturity (months)	60.30	55.49
7	All-in-yield (%)	8.99	11.64
8	PIK spread (%)	4.83	5.40

Panel B: Garrison Capital Inc. - An example of PIK reporting

YearQtr	BDC	Borrower	Seniority	All-in Yield	Cash Spread	PIK Spread	PIK	Par-value	Remaining Maturity
201302	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	12%	11%	0%	0	11.5	60
201303	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	5.75%	5.5%	0%	0	14.0	57
201304	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	12%	11%	0%	0	13.9	54
201401	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	12%	11%	0%	0	13.7	51
201402	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	12%	11%	0%	0	13.6	48
201403	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	12%	11%	0%	0	13.4	45
201404	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	13%	0%	0	13.2	42
201501	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	13%	0%	0	13.3	39
201502	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	3%	10%	1	13.7	36
201503	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	3%	10%	1	14.0	32
201504	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	3%	10%	1	14.3	29
201601	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	5%	8%	1	14.6	26
201602	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	5%	8%	1	14.9	23
201603	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	5%	8%	1	15.2	20
201604	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	11%	2%	1	15.4	17
201701	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14%	11%	2%	1	15.5	14
201702	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	14.06%	0%	13%	1	15.7	11
201703	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	15.25%	0%	14%	1	16.3	8
201704	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	15.38%	0%	14%	1	16.9	5
201801	Garrison Capital Inc.	Exel Direct Inc.	First Lien Senior Secured	15.69%	0%	14%	1	17.6	2

Table 2: Descriptive statistics

This table shows descriptive statistics for variables at the BDC level (Panel A) and at the loan level (Panel B). All variables are defined in Appendix B. The sample period for BDC-level data is from 2014Q1 to 2024Q4 and for loan-level data from 2012Q1 to 2024Q4.

Panel A: BDC-level data

Statistic	N	Mean	St. Dev.	Q1	Median	Q3
PIK usage share	3,642	0.13	0.17	0.004	0.08	0.18
Assets ($ billion)	4,211	1.62	3.75	0.26	0.61	1.66
Number of investees	2,361	83.02	67.24	34	67	117
Leverage	4,211	0.41	0.17	0.34	0.45	0.52
Fund Age (in years)	4,211	9.18	11.24	3	6	12
ROE	3,364	0.06	0.17	0.02	0.09	0.13
Bank debt share	1,938	0.48	0.30	0.25	0.46	0.70
Credit line usage	2,168	0.51	0.27	0.32	0.54	0.72
Non-accrual share	4,211	0.03	0.06	0.00	0.01	0.04
Realized gain(loss)$_{t,t+4}$	3,388	-0.03	0.22	-0.07	-0.005	0.01
Dist-to-Default(DtD)	1,500	6.01	3.08	3.85	5.96	8.10
Asset growth (CV)	3,968	0.08	0.20	-0.01	0.02	0.10
Asset growth (FV)	4,006	0.07	0.17	-0.02	0.02	0.10
Dividend growth	3,474	0.07	0.15	-0.000	0.002	0.06

Panel B: Loan-level data

Statistic	N	Mean	St. Dev.	Q1	Median	Q3
PIK	362,582	0.10	0.30	0	0	0
All-in-yield (%)	362,582	9.54	2.78	7.55	9.75	11.32
PIK spread (%)	35,996	4.96	4.26	2.00	3.38	7.19
Cash spread (%)	362,582	6.55	2.60	5.10	6.00	7.80
PIK+Cash spread (%)	362,582	7.04	2.70	5.50	6.27	8.25
Base rate (%)	299,817	2.88	2.14	0.61	2.49	5.09
Fixed rate loan	362,582	0.17	0.38	0	0	0
Non-accrual loan	362,582	0.03	0.16	0	0	0
Fair value ($ million)	362,582	15.98	38.53	2.23	6.74	16.52
Par value ($ million)	362,582	16.61	39.26	2.47	7.06	17.32
Cost value ($ million)	362,579	16.34	38.76	2.40	6.96	17.00
Fair/Par	362,581	0.95	0.13	0.97	0.99	1.00
Time to maturity (Months)	361,098	50.12	22.08	35.00	51.00	65.00
Dual holding	362,582	0.19	0.39	0	0	0
Realized gain(loss)$_{t,t+4}$(%)	196,728	0.10	1.39	0.00	0.16	0.45
PIK toggle	362,582	0.14	0.35	0	0	0
PIK note	362,582	0.04	0.20	0	0	0
Seniority classes						
First Lien Senior Secured	362,582	0.84	0.37	1	1	1
Second Lien Senior Secured	362,582	0.11	0.31	0	0	0
Subordinated Debt	362,582	0.05	0.22	0	0	0
Loan Type classes						
Revolver	362,582	0.05	0.23	0	0	0
Delay Draw Term Loan	362,582	0.07	0.25	0	0	0
Term Loan	362,582	0.80	0.40	1	1	1
Unitranche	362,582	0.06	0.24	0	0	0
Other	362,582	0.01	0.12	0	0	0

Table 3: Determinants of Interest Rate Deferrals

This table shows the results from OLS regressiond of PIK_t on various loan characteristics. PIK_t is an indicator variable that takes the value of one if the loan is reported to be paid in kind for that period. The sample excludes PIK Notes. $NonAccrual_t$ is an indicator variable that takes a value of one if the loan is reported as non-accrual for period t. $Maturity_t$ is the natural logarithm of the remaining time to maturity. $Fair/Par_t$ is the current valuation of the loan position. $Loan\,Size_t$ is the natural logarithm of the par value of the loan amount. $Fixed\,rate\,loan$ is an indicator variable that takes the value of one if the loan has a fixed interest rate. $Base\,rate_t$ is the loan's base rate at time t and zero if there is no base rate. $Dual\,holding_t$ is an indicator variable that takes the value of one if the BDC also has an equity stake in the borrowing firm. We include different fixed effect combinations. BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter e.g. 2022Q4. $Borrower$ refers to the identity of the borrower. $Seniority$ refers to loan seniority. $LoanType$ refers to security class e.g. Term Loan, Revolver etc. Standard errors are clustered at the BDC, year-quarter, and borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variable:			PIK$_t$		
Model:	(1)	(2)	(3)	(4)	(5)
Variables					
Constant	0.19***				
	(0.04)				
NonAccrual$_t$	0.18***	0.18***	0.13***	0.13***	0.13***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
Fair/Par$_t$	-0.09***	-0.09***	-0.09***	-0.04*	-0.03*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Loan Size$_t$	0.01***	0.01***	0.00***	0.00**	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Base rate$_t$	0.47***	-0.30	-0.43	-0.68	0.29
	(0.13)	(0.48)	(0.42)	(0.41)	(0.38)
Fixed rate loan	0.10***	0.10***	0.16***	0.09***	0.16***
	(0.02)	(0.03)	(0.04)	(0.02)	(0.03)
Maturity$_t$	-0.03***	-0.02***	-0.02***	-0.01	-0.01
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Dual holding$_t$	0.04***	0.04***	0.03***	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Fixed-effects					
YearQtr		Yes	Yes		
LoanType		Yes	Yes	Yes	
Seniority		Yes	Yes	Yes	
Borrower			Yes		
YearQtr-Borrower				Yes	Yes
BDC				Yes	
BDC-YearQtr					Yes
Seniority-YearQtr					Yes
LoanType-YearQtr					Yes
Fit statistics					
Observations	346,099	346,099	346,099	346,099	346,099
Adjusted R^2	0.07	0.08	0.44	0.75	0.76

Table 4: PIKs and Loan Delinquency

This table shows the results from OLS regressions of $NonAccrual_t + 4$ on PIK_t and various control variables. $NonAccrual_t$ ($NonAccrual_{t+4}$)is an indicator variable that takes a value of one if the loan reported as non-accrual for period t ($t + 4$). PIK_t is an indicator variable that takes the value of one if the loan is reported to be paid in kind for that period. $Maturity_t$ is the natural logarithm of the remaining time to maturity. $Fair/Par_t$ is the current valuation of the loan position. $Loan\,Size_t$ is the natural logarithm of the par value of the loan amount. $Fixed\,rate\,loan$ is an indicator variable that takes the value of one if the loan has a fixed interest rate. $Base\,rate_t$ is the loan's base rate at time t and zero if there is no base rate. $Dual\,holding_t$ is an indicator variable that takes the value of one if the BDC also has an equity stake in the borrowing firm. $COVID$ is a dummy variable that takes a value of one during the 2020Q1 to 2020Q2 period. We include different fixed effect combinations. BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter e.g. 2022Q4. $Borrower$ refers to the identity of the borrower. $Seniority$ refers to loan seniority. $LoanType$ refers to security class e.g. Term Loan, Revolver etc. Standard errors are clustered at the BDC, year-quarter and borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variable:				NonAccrual$_{t+4}$				
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PIK$_t$	0.12***	0.04***	0.05***	0.05***	0.03***	0.03***	0.05***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
NonAccrual$_t$		0.59***	0.30***	0.28***	0.45***	0.37***	0.28***	0.37***
		(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.02)	(0.04)
Fair/Par$_t$		-0.30***	-0.23***	-0.24***	-0.11***	-0.08***	-0.24***	-0.08***
		(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)
Loan Size$_t$		0.00**	0.00	0.00	0.00	0.00	0.00	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Base rate$_t$		-0.16	-0.28	-0.01	0.12	0.25*	0.01	0.26*
		(0.22)	(0.24)	(0.20)	(0.15)	(0.14)	(0.20)	(0.14)
Fixed rate loan		0.01**	0.00	0.01	0.01	0.01	0.01	0.01
		(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Maturity$_t$		-0.03***	-0.02***	-0.02***	-0.01	-0.01	-0.02***	-0.01
		(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Dual holding$_t$		0.00	-0.01***	-0.01***	0.00	0.00	-0.01***	0.00
		(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
PIK$_t$ × COVID							-0.04***	-0.03***
							(0.01)	(0.01)
Fixed-effects								
YearQtr	Yes	Yes	Yes	Yes			Yes	
Borrower			Yes	Yes			Yes	
Seniority			Yes					
LoanType			Yes	Yes	Yes	Yes	Yes	Yes
BDC			Yes					
Seniority-YearQtr				Yes	Yes		Yes	
BDC-YearQtr				Yes	Yes	Yes	Yes	Yes
YearQtr-Borrower					Yes			
YearQtr-Borrower-Seniority						Yes		Yes
Fit statistics								
Observations	221,178	201,199	201,199	201,199	201,199	201,199	201,199	201,199
Adjusted R^2	0.04	0.37	0.53	0.54	0.84	0.88	0.54	0.88

Table 5: Realized gains (losses) at loan-level

The results are based on loan-quarter level panel data. $Realized\,gain_{t,t+4}$ is the ratio between four quarter realized dollar gain (loss) on the loan between period t and $t+4$ divided by the par value of the loan at period t. Periodic realized dollar gain (loss) (e.g. between t and $t+4$) is calculated as $(Cost_{t+4} - Cost_t) - (Par_{t+4} - Par_t)$. The dependent variables are denoted in percentages (multiplied by 100) to ease the interpretability of the results. PIK_t is an indicator variable that takes the value of one if the loan is reported to be paid in kind for that period. The sample excludes PIK loans that are defined as the loan positions where PIK is being used at every quarter during the loan's lifetime. $NonAccrual_t$ is an indicator variable that takes a value of one if the loan is reported as non-accrual for period t. $Maturity_t$ is the natural logarithm of the remaining time to maturity. $Fair/Par_t$ is the current valuation of the loan position. $Loan\,Size_t$ is the natural logarithm of the cost value of the loan amount. $Fixed\,rate\,loan$ is an indicator variable that takes the value of one if the loan has a fixed interest rate. $Base\,rate_t$ is the loan's base rate at time t and zero if there is no base rate. $Dual\,holding_t$ is an indicator variable that takes the value of one if the BDC also has an equity stake in the borrowing firm. The fixed effects: BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter e.g. 2022Q4. $Borrower$ refers to the identity of the borrower. $Industry$ refers to the borrower's industry. $Seniority$ refers to loan seniority. $LoanType$ refers to security class e.g. Term Loan, Revolver etc. Standard errors are clustered at the BDC, year-quarter, and borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variable:	Realized gain$_{t,t+4}$ (%)					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	0.12***	0.63**				
	(0.03)	(0.27)				
PIK$_t$	-0.23***	-0.23***	-0.22***	-0.10**	-0.12**	-0.10**
	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
NonAccrual$_t$		-1.20***	-1.22***	-0.82***	-0.87***	-0.89***
		(0.19)	(0.18)	(0.13)	(0.13)	(0.12)
Fair/Par$_t$		-0.62**	-0.64**	-1.39***	-1.36***	-1.41***
		(0.26)	(0.26)	(0.25)	(0.25)	(0.24)
Loan Size$_t$		0.02*	0.02*	0.16***	0.17***	0.16***
		(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Base rate$_t$		1.71	8.85	3.77	3.94	5.57**
		(1.33)	(5.29)	(2.84)	(2.99)	(2.56)
Fixed rate loan		0.17*	0.30**	0.04	0.02	0.07
		(0.10)	(0.12)	(0.06)	(0.06)	(0.07)
Maturity$_t$		-0.01	0.00	0.19***	0.19***	0.20***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Dual holding$_t$		0.15**	0.13***	0.14***	0.13***	0.13***
		(0.06)	(0.05)	(0.03)	(0.04)	(0.04)
Fixed-effects						
YearQtr			Yes	Yes		
Borrower				Yes	Yes	Yes
LoanType				Yes	Yes	
Seniority				Yes	Yes	
BDC				Yes	Yes	
YearQtr-Industry					Yes	Yes
LoanType-YearQtr						Yes
Seniority-YearQtr						Yes
BDC-YearQtr						Yes
Fit statistics						
Observations	189,039	188,412	188,412	188,412	174,574	174,574
Adjusted R^2	0.00	0.02	0.02	0.20	0.21	0.27

Table 6: Cross-sectional standard deviation of loan valuations

The results are based on loan-quarter level panel data. $CSD(Fair/Par_{t+4})$ is the cross-sectional standard deviation of similar loans' $Fair/Par$-ratio across all BDC's portfolios at the end of period $t+4$. Two loans held by two different lenders at the same time are considered similar if they are issued by the same borrower, they have same seniority (e.g. both are First Lien Senior Secured) and they have a same Loan Type (e.g both are Term Loan). The dependent variables are denoted in percentages (multiplied by 100) to ease the interpretability of the results. PIK_t is an indicator variable that takes the value of one if the loan is reported to be paid in kind for that period. The sample excludes PIK loans that are defined as the loan positions where PIK is being used at every quarter during the loan's lifetime. $NonAccrual_t$ is an indicator variable that takes a value of one if the loan is reported as non-accrual for period t. $Maturity_t$ is the natural logarithm of the remaining time to maturity. $Fair/Par_t$ is the current valuation of the loan position. $Loan\,Size_t$ is the natural logarithm of the cost value of the loan amount. $Fixed\,rate\,loan$ is an indicator variable that takes the value of one if the loan has a fixed interest rate. $Base\,rate_t$ is the loan's base rate at time t and zero if there is no base rate. $Dual\,holding_t$ is an indicator variable that takes the value of one if the BDC also has an equity stake in the borrowing firm. The fixed effects: BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter e.g. 2022Q4. $Borrower$ refers to the identity of the borrower. $Industry$ refers to the borrower's industry. $Seniority$ refers to loan seniority. $LoanType$ refers to security class e.g. Term Loan, Revolver etc. Standard errors are clustered at the BDC, year-quarter, and borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variable:	CSD(Fair/Par$_{t+4}$)					
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	1.56***	2.20***				
	(0.11)	(0.47)				
PIK$_t$	1.02***	0.55**	0.59***	0.43**	0.47**	0.50***
	(0.34)	(0.21)	(0.21)	(0.21)	(0.18)	(0.17)
CSD(Fair/Par$_t$)		0.50***	0.50***	0.25***	0.22***	0.22***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
NonAccrual$_t$		0.63	0.59	-0.39	-0.60	-0.71
		(0.64)	(0.64)	(0.86)	(0.94)	(0.93)
Loan Size$_t$		-0.03	-0.04	0.01	0.00	-0.01
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Base rate$_t$		-4.48*	8.54**	1.95	4.13	4.45
		(2.57)	(3.98)	(5.28)	(5.14)	(5.88)
Fixed rate loan		-0.33**	-0.13	-0.30	-0.22	-0.23
		(0.15)	(0.15)	(0.20)	(0.20)	(0.24)
Maturity$_t$		-0.31***	-0.34***	-0.18	-0.07	-0.07
		(0.11)	(0.11)	(0.13)	(0.11)	(0.11)
Dual holding$_t$		-0.27***	-0.28***	-0.07	-0.12	-0.12
		(0.10)	(0.09)	(0.14)	(0.11)	(0.11)
Fixed-effects						
YearQtr			Yes	Yes		
Borrower				Yes	Yes	Yes
LoanType				Yes	Yes	
Seniority				Yes	Yes	
BDC				Yes	Yes	
YearQtr-Industry					Yes	Yes
LoanType-YearQtr						Yes
Seniority-YearQtr						Yes
BDC-YearQtr						Yes
Fit statistics						
Observations	123,968	112,756	112,756	112,756	102,173	102,173
Adjusted R^2	0.00	0.22	0.23	0.40	0.41	0.43

Table 7: PIKs and BDC risk profile

This table shows the results from OLS regressions of different variables associated with BDC risk on *PIK usage share*. *Non-accrual share* is the share of non-accrual investments to total investments at cost value. *Realized gains*$_{t,t+4}$ is the ratio between cumulative realized gains or losses of BDCs one year forward (from end of period t to end of period $t+4$) relative to total assets at time t. *DtD* is the distance-to-default for the BDC using an option-implied default-risk indicator based on Merton (1974). *PIK usage share* is the par-value weighted share of portfolio companies currently paying some proportion of interest rate in-kind. All columns include the following BDC level controls: lagged *ln Assets*, lagged *Leverage*, lagged profitability (*ROE*), lagged *Cash Share*, and *Fund Age*. We include different fixed effects. BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter e.g. 2022Q4. Standard errors are clustered at the BDC and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	Nonaccrual share$_{t+1}$			Realized gains$_{t+1,t+4}$			Dist-to-Default$_{t+1}$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PIK usage share$_t$	0.15***	0.13**	0.06***	-0.15**	-0.13*	-0.26**	-2.22**	-3.89***	-2.25**
	(0.05)	(0.06)	(0.02)	(0.07)	(0.07)	(0.10)	(1.08)	(0.84)	(1.00)
BDC controls		Yes	Yes		Yes	Yes		Yes	Yes
Fixed-effects									
YearQtr		Yes	Yes		Yes	Yes		Yes	Yes
BDC			Yes			Yes			Yes
Fit statistics									
Observations	3,508	2,868	2,868	2,904	2,516	2,516	1,584	1,290	1,290
Adjusted R^2	0.17	0.22	0.64	0.01	0.12	0.24	0.02	0.58	0.68

Table 8: BDC Liability Structure and Bank Debt

This table shows the liability structure of BDCs (Panel A) and a league table with the aggregate amount arranged as lead banks to BDCs in 2023 (Panel B). Panel A is restricted to a sample where we observe the debt structure.

Panel A: BDC Liability Structure (% Total Assets)

Statistic	N	Mean	St. Dev.	Pctl(25)	Median	Pctl(75)
Bank Loans						
Drawn credit lines	1,878	0.19	0.13	0.09	0.19	0.28
Term loans	1,878	0.01	0.04	0.00	0.00	0.00
Non bank debt	1,880	0.27	0.15	0.16	0.27	0.38
Equity	1,881	0.51	0.09	0.45	0.51	0.56
Off-balance sheet						
Undrawn credit lines	1,830	0.16	0.12	0.08	0.13	0.20
Cash	1,881	0.04	0.04	0.01	0.02	0.05

Panel B: Lead Arranger in 2023

Lender	Amount (USD mn)
JP Morgan	17,161
Truist Financial	10,865
Sumitomo Mitsui Banking Corp	3,935
ING Bank	2,250
Citibank NA	2,180
Bank of America NA	1,000
PNC Bank NA	545
Canadian Imperial Bank of Commerce	500
Keybank NA	500
BNP Paribas SA	200
Wells Fargo Bank NA	175
City National Bank	25
Total	39,336

Panel C: Loan covenants and collateral

	Mean	Std. Dev.
Secured (1/0)	0.64	0.48
Net Worth Covenant (1/0)	0.20	0.40
# Financial Covenants	0.07	0.42
Financial Covenants (1/0)	0.03	0.16
# General Covenants	2.53	1.25
General Covenants (1/0)	1.00	0.00
Asset Coverage Restriction (1/0)	0.27	0.44
Minimum Liquidity Covenant (1/0)	0.10	0.29
Revolving Credit Restriction (1/0)	0.07	0.26

Table 9: PIK Usage and Bank Debt Availability

This table shows the results from OLS regressions of proxies for bank debt on *PIK usage share*. *Bank debt share* is the BDC's bank debt share of total debt. *CL usage* is the BDC's share of drawn credit lines relative to total credit lines. *PIK usage share* is the par-value weighted share of portfolio companies currently paying some proportion of interest rate in-kind. All columns include the following BDC level controls: lagged *ln Assets*, lagged *Leverage*, lagged profitability (*ROE*), lagged *Cash Share*, and *Fund Age*. We include different fixed effects. *BDC* refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter e.g. 2022Q4. Standard errors are clustered at the BDC and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	Bank debt share$_{t+1}$			CL usage$_{t+1}$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Constant	0.58***			0.56***		
	(0.04)			(0.02)		
PIK usage share$_t$	-0.66***	-0.70***	-0.50***	-0.43***	-0.40***	-0.32**
	(0.15)	(0.17)	(0.09)	(0.09)	(0.13)	(0.13)
BDC controls		Yes	Yes		Yes	Yes
Fixed-effects						
YearQtr		Yes	Yes		Yes	Yes
BDC			Yes			Yes
Fit statistics						
Observations	1,810	1,461	1,461	2,036	1,669	1,669
Adjusted R^2	0.12	0.30	0.74	0.07	0.13	0.43

Table 10: PIK usage and subsequent changes in capital structure

This table shows the result from OLS regression of different debt capital structure components on *PIK usage share* and control variables. $\Delta BankDebt/Assets$ is change in bank debt over total assets. $\Delta NonbankDebt/Assets$ is the change in nonbank debt over total assets. $\Delta\, Total\, Debt/Assets_{t+1}$ is the change in total (bank plus nonbank) debt over total assets and $\Delta\, Cash/Assets_{t+1}$ is the change in balance-sheet cash over total assets. *PIK usage share* is the par-value weighted share of portfolio companies currently paying some proportion of interest rate in-kind. All columns include the following BDC level controls: lagged *ln Assets*, lagged *Leverage*, lagged profitability (*ROE*), lagged *Cash Share*, and *Fund Age*. We additional include some fixed effects. *BDC* refers to the identity of the BDC (Lender). *YearQtr* refers to the calendar quarter e.g. 2022Q4. Standard errors are clustered at the BDC and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	$\Delta BankDebt/Assets_{t+1}$			$\Delta NonbankDebt/Assets_{t+1}$			$\Delta TotalDebt/Assets_{t+1}$			$\Delta Cash/Assets_{t+1}$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables												
PIK usage share$_t$	-0.01	0.00	0.00	-0.01	-0.01**	-0.02*	-0.02*	-0.02*	-0.04**	0.01	0.01	0.01
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
BDC controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects												
YearQtr		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
BDC			Yes			Yes			Yes			Yes
Fit statistics												
Observations	1,348	1,348	1,348	1,348	1,348	1,348	2,866	2,866	2,866	2,866	2,866	2,866
Adjusted R^2	0.03	0.10	0.12	0.00	0.03	0.02	0.04	0.07	0.17	0.20	0.20	0.29

Table 11: PIKs and subsequent asset and dividend growth

This tables shows the results from OLS regressions of asset and dividend growth on PIK usage share and other control variables. *Asset growth (FV)* (CV, respectively) is the log change in BDC's total assets measured at fair (cost) value. *Dividend growth* is the log change in BDC's dividends paid to shareholders. *PIK usage share* is the par-value weighted share of portfolio companies paying some proportion of interest rate "in-kind". All columns include the following BDC level controls: lagged *ln Assets*, lagged *Leverage*, lagged profitability (*ROE*), lagged *Cash Share*, and *Fund Age*. We include fixed effects in some specifications. *BDC* refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter e.g. 2022Q4. Standard errors are clustered at the BDC and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	Asset growth(FV)$_{t+1}$		Asset growth(CV)$_{t+1}$		Dividend growth$_{t+1}$	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
PIK usage share$_t$	-0.08**	-0.07**	-0.09**	-0.08***	-0.05*	0.00
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
BDC controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects						
YearQtr	Yes	Yes	Yes	Yes	Yes	Yes
BDC		Yes		Yes		Yes
Observations	3,127	3,127	2,850	2,850	2,570	2,570
Adjusted R^2	0.18	0.43	0.10	0.18	0.19	0.44

A Variable definitions

Variable	Definition	Level	Source
All-in-yield	The sum of effective base rate, cash spread and PIK spread or the total interest rate if only that is reported. The effective base rate is the larger of the base rate floor and the current value of the base rate.	Loan-level	BDC Collateral
Asset growth (CV)	Log change in BDC's total assets measured in fair value	Lender-level	BDC Collateral
Asset growth (CV)	Log change in BDC's total assets measured in fair value	Lender-level	BDC Collateral
Asset growth (FV)	Log change in BDC's total assets measured in cost value	Lender-level	BDC Collateral
Assets	BDC's total assets (millions USD)	Lender-level	BDC Collateral
Bank debt share	Bank debt$_t$/Total Liabilities$_t$	Lender-level	Capital IQ
Base rate	The level of base rate. Zero if fixed rate loan.	Loan-level	BDC Collateral
Cash share	Cash$_t$/Total Assets$_t$	Lender-level	BDC Collateral
Cash spread	Cash spread for the loans over the base rate.	Loan-level	BDC Collateral
CL usage	Drawn credit lines$_t$/(Drawn credit lines$_t$+ Undrawn credit lines$_t$)	Lender-level	Capital IQ
Control/affiliated investment	An indicator variable that takes a value of one if the BDC reports the position to be controlled or affiliated investment, and zero otherwise	Loan-level	BDC Collateral
Dist-to-default	Distance-to-default for the BDC using an option-implied default-risk indicator based on Merton (1974). See Saunders et al. (2024) for a detailed methodology.	Lender-level	CRSP/Compustat
Dividend growth	Log change in BDC's dividends paid to shareholders	Lender-level	BDC Collateral
Fair/Par	Loan's fair value to par value ratio	Loan-level	BDC Collateral
Fixed-rate loan	Indicator variable that takes the value of one if the loan is fixed rate and zero otherwise	Loan-level	BDC Collateral
Fund Age	Age of the fund in years. We use ln(1+Age) as a control variable.	Lender-level	Pitchbook/Capital IQ/SEC Edgar
Leverage ratio	Total Liabilities$_t$/Total Assets$_t$	Lender-level	BDC Collateral
Loan size	Natural logarithm of the loan's par value	Loan-level	BDC Collateral
Maturity	Natural logarithm of the remaining time to maturity	Loan-level	BDC Collateral
Non-accrual	Indicator variable that takes a value of one if the loan is non-accrual	Loan-level	BDC Collateral
Non-accrual share	Non-accrual loan share of total cost value portfolio investments.	Lender-level	BDC Collateral
Nonbank debt share	(Total Liabilities$_t$-Bank debt$_t$)/Total Liabilities$_t$	Lender-level	Capital IQ
PIK	Indicator variable that takes the value of one if the loan is reported to be paid in kind for that period and zero otherwise	Loan-level	BDC Collateral
PIK income share	Share of PIK income relative to total investment income	Lender-level	Capital IQ
PIK note	Indicator variable that takes a value of one for all the loan's observations if the loan is reported to be paid in kind in every period of the lifetime of the loan, and zero otherwise.	Loan-level	BDC Collateral
PIK spread	PIK spread for the loans that use PIK, zero otherwise	Loan-level	BDC Collateral
PIK toggle	Indicator variable that takes a value of one for all the loan's observations if the loan is not reported to be paid in kind during some periods of the lifetime of the loan but not all, and zero otherwise.	Loan-level	BDC Collateral
PIK usage share	The par-value weighted share of portfolio companies that are paying some proportion of the interest rate "in-kind".	Lender-level	BDC Collateral
Realized gain(loss)$_{t,t+4}$	Cumulative net realized gains (losses) from end of period t to end of period $t+4$ divided by total assets at the end of period t.	Lender-level	BDC Collateral

Realized gain(loss)$_{t,t+4}$	$((Cost_{t+4} - Cost_t) - (Par_{t+4} - Par_t))/Par_t$. Par and Cost are loan par value and amortized cost.	Loan-level	BDC Collateral
ROE	Return on equity=Net income$_t$/Book Equity$_{t-1}$	Lender-level	BDC Collateral/Capital IQ

B BDCs in the sample as of 2024Q3

Table B2: BDCs in Sample

BDC Name	Ticker	CIK	Status	Assets (USD mn)
Blackstone Private Credit Fund	P-BCRED	1803498	Private	64 674,45
Ares Capital Corporation	ARCC	1287750	Public	27 100,00
Blue Owl Credit Income Corp. f.k.a Owl Rock Core Income Corp.	P-OLRCIC	1812554	Private	25 834,05
FS KKR Capital Corp f.k.a FS Investment Corporation	FSK	1422183	Public	15 149,00
Blue Owl Capital Corporation f.k.a Owl Rock Capital Corporation (ORCC)	OBDC	1655888	Public	14 090,78
HPS Corporate Lending Fund	P-HPSCLF	1838126	Private	13 773,40
Apollo Debt Solutions BDC	P-ADSBDC	1837532	Private	13 673,77
Blackstone Secured Lending Fund	BXSL	1736035	Public	12 371,57
Golub Capital BDC, Inc	GBDC	1476765	Public	8 705,98
Ares Strategic Income Fund	P-ARSTIF	1918712	Private	7 691,45
Prospect Capital Corporation	PSEC	1287032	Public	7 592,71
Sixth Street Lending Partners	P-SIXSLP	1925309	Private	6 731,61
Blue Owl Technology Finance Corp. f.k.a Owl Rock Technology Finance Corp.	P-ORTFIC	1747777	Private	6 685,02
North Haven Private Income Fund LLC	P-NHPIFL	1851322	Private	6 017,37
Goldman Sachs Private Credit Corp.	P-GSPCCP	1920145	Private	5 624,54
Blue Owl Technology Finance Corp. II f.k.a Owl Rock Technology Finance Corp. II	P-ORTFII	1889668	Private	5 370,75
Oaktree Strategic Credit Fund	P-OAKSCF	1872371	Private	5 223,37
Blue Owl Technology Income Corp. f.k.a Owl Rock Technology Income Corp.	P-OWLRTI	1869453	Private	5 189,14
Main Street Capital Corporation	MAIN	1396440	Public	5 094,78
Blue Owl Capital Corporation III f.k.a Owl Rock Capital Corporation III	OBDE	1807427	Public	4 464,33
MSD Investment Corp	P-MSDINC	1849894	Private	4 445,24
Franklin BSP Capital Corporation f.k.a Franklin BSP Capital L.L.C.	P-FBSPCC	1825248	Private	4 035,43
Monroe Capital Income Plus Corporation	P-MCIPCO	1742313	Private	3 817,46
Morgan Stanley Direct Lending Fund	MSDL	1782524	Public	3 793,37
Hercules Capital, Inc.	HTGC	1280784	Public	3 656,36
Goldman Sachs BDC, Inc.	GSBD	1572694	Public	3 545,49
Sixth Street Specialty Lending, Inc. f.k.a TPG Specialty Lending, Inc.	TSLX	1508655	Public	3 529,86
Golub Capital Private Credit Fund	P-GBCPCF	1930087	Private	3 513,52
New Mountain Finance Corporation	NMFC	1496099	Public	3 414,26
MidCap Financial Investment Corporation f.k.a Apollo Investment Corporation	MFIC	1278752	Public	3 216,03
Oaktree Specialty Lending Corp f.k.a Fifth Street Finance Corp.	OCSL	1414932	Public	3 198,34
Barings Private Credit Corporation	P-BARPCC	1859919	Private	3 055,14
TPG Twin Brook Capital Income Fund f.k.a AG Twin Brook Capital Income Fund	P-ATBCIF	1913724	Private	2 926,31
Barings BDC, Inc. f.k.a. Triangle Capital Corporation	BBDC	1379785	Public	2 605,08
Stone Point Credit Corporation f.k.a Stone Point Capital Credit LLC	P-STPTCC	1825384	Private	2 582,53
Bain Capital Specialty Finance, Inc	BCSF	1655050	Public	2 543,68
SLR Investment Corp. f.k.a Solar Capital Ltd.	SLRC	1418076	Public	2 442,91
Goldman Sachs Private Middle Market Credit II LLC	P-GPMMII	1772704	Private	2 397,77
Nuveen Churchill Direct Lending Corp. f.k.a Nuveen Churchill BDC Inc.	NCDL	1737924	Public	2 140,11
Blue Owl Capital Corporation II f.k.a Owl Rock Capital Corporation II	P-OWLRII	1655887	Private	2 136,67
PennantPark Floating Rate Capital Ltd.	PFLT	1504619	Public	2 108,85
T Series Middle Market Loan Fund LLC	P-TSMMLF	1885968	Private	2 083,00
Blackrock TCP Capital Corp. f.k.a TCP Capital Corp.	TCPC	1370755	Public	2 047,70
T. Rowe Price OHA Select Private Credit Fund	P-TRPOSF	1901164	Private	2 035,07
Kayne Anderson BDC, Inc.	KBDC	1747172	Public	2 028,25
FS Specialty Lending Fund f.k.a FS Energy and Power Fund	P-FSEN	1501729	Private	1 986,32
CION Investment Corporation	CION	1534254	Public	1 915,62
Carlyle Secured Lending, Inc. f.k.a TCG BDC, Inc	CGBD	1544206	Public	1 816,93
Carlyle Credit Solutions, Inc. f.k.a TCG BDC II, Inc.	P-TCGIII	1702510	Private	1 778,41
Trinity Capital Inc	TRIN	1786108	Public	1 734,76
AB Private Credit Investors Corporation	P-ABPCIC	1634452	Private	1 662,55
Crescent Capital BDC, Inc	CCAP	1633336	Public	1 645,05
Antares Strategic Credit Fund	P-ANSCRF	1993402	Private	1 632,63
New Mountain Guardian III BDC, L.L.C.	P-NMGIII	1781870	Private	1 607,88
Capital Southwest Corporation	CSWC	17313	Public	1 604,50
NMF SLF I, Inc.	P-NMFSLI	1766037	Private	1 507,90
Fidelity Private Credit Co LLC f.k.a Fidelity Private Credit Central Fund LLC	P-FPCRCF	1899996	Private	1 493,64
New Mountain Guardian IV BDC, L.L.C.	P-NMGBIV	1925531	Private	1 450,29
Barings Capital Investment Corporation	P-BARCIC	1811972	Private	1 436,57
Palmer Square Capital BDC Inc	PSBD	1794776	Public	1 413,55
PennantPark Investment Corp	PNNT	1383414	Public	1 389,09
Golub Capital BDC 4, Inc.	P-GCBLIV	1901612	Private	1 367,68
StepStone Private Credit Fund LLC	P-SSPCFL	1950803	Private	1 242,35
MSC Income Fund, Inc. f.k.a HMS Income Fund, Inc.	MSIF	1535778	Public	1 227,28
Saratoga Investment Corp.	SAR	1377936	Public	1 214,70
Fidelity Private Credit Fund	P-FIPRCF	1920453	Private	1 169,28
Nuveen Churchill Private Capital Income Fund	P-NCPCIF	1911066	Private	1 168,57
Fidus Investment Corporation	FDUS	1513363	Public	1 161,05
TCW Direct Lending VII LLC	P-TCWVII	1715933	Private	1 135,20
Runway Growth Finance Corp.	RWAY	1653384	Public	1 075,58
Silver Point Specialty Lending Fund	P-SRPSLF	1646614	Private	1 010,47
TCW Direct Lending VIII LLC	P-TDVIII	1825265	Private	957,51
Stellus Capital Investment Corp	SCM	1551901	Public	957,07
Middle Market Apollo Institutional Private Lending	P-MMAIPL	2006758	Private	926,28
KKR FS Income Trust	P-KKRFSI	1930679	Private	877,47
Gladstone Investment Corporation	GAIN	1321741	Public	868,78
Goldman Sachs Middle Market Lending Corp. II	P-GSMMII	1865174	Private	867,72

Continued on next page

Table B2 (Continued)

BDC Name	Ticker	CIK	Status	Assets (USD mn)
Diameter Credit Co	P-DIACRC	1916099	Private	843,06
BlackRock Private Credit Fund	P-BRPCRF	1902649	Private	813,78
Gladstone Capital Corporation	GLAD	1143513	Public	812,47
Varagon Capital Corp	P-VARCCP	1784700	Private	802,72
Horizon Technology Finance Corporation	HRZN	1487428	Public	793,07
TCW Direct Lending LLC	P-TCWD	1603480	Private	792,02
Oaktree Gardens OLP, LLC	P-OGOLPL	1974793	Private	787,07
Brightwood Capital Corp I	P-BRCCRPI	1895316	Private	781,59
TriplePoint Venture Growth BDC Corp.	TPVG	1580345	Public	778,35
HPS Corporate Capital Solutions Fund	P-HPSCSF	1989817	Private	730,33
Golub Capital Direct Lending Corporation	P-GCDLCP	1868878	Private	719,51
Kennedy Lewis Capital Company	P-KLCCOM	1911321	Private	714,62
KKR Enhanced US Direct Lending Fund-L Inc.	P-KKREDL	2012839	Private	710,53
Lafayette Square USA, Inc. f.k.a Lafayette Square Empire BDC, Inc.	P-LSEBDC	1849089	Private	688,41
WhiteHorse Finance, Inc.	WHF	1552198	Public	683,58
Jefferies Credit Partners BDC Inc.	P-JCPBDC	1959604	Private	663,75
Commonwealth Credit Partners BDC I, Inc.	P-CCPBDC	1841514	Private	653,96
First Eagle Private Credit Fund	P-FEPCRF	1890107	Private	571,10
Nuveen Churchill Private Credit Fund	P-NCPCRF	2022625	Private	555,58
26North BDC, Inc.	P-26NBDC	1950976	Private	555,29
Onex Direct Lending BDC Fund f.k.a Onex Falcon Direct Lending BDC Fund	P-OFDLBF	1860424	Private	554,05
Franklin BSP Real Estate Debt BDC	P-FBSPRE	2018545	Private	538,56
Bain Capital Private Credit	P-BACPCR	1899017	Private	533,95
Overland Advantage	P-OLDADT	1965934	Private	532,71
Monroe Capital Corporation	MRCC	1512931	Public	501,86
Phillip Street Middle Market Lending Fund LLC	P-PSMMLF	1948368	Private	491,55
OHA Senior Private Lending Fund (U) LLC	P-OSPLFL	1955010	Private	486,94
WTI Fund X, Inc.	P-WTIFXI	1850938	Private	468,42
Portman Ridge Finance Corporation f.k.a KCAP Financial, Inc.	PTMN	1372807	Public	463,67
TriplePoint Private Venture Credit Inc.	P-TPGVCL	1792509	Private	444,99
Redwood Enhanced Income Corp.	P-REDEIC	1870267	Private	433,00
Great Elm Capital Corp.	GECC	1675033	Public	427,03
Audax Credit BDC Inc.	P-ACBDCI	1633858	Private	422,26
SCP Private Credit Income BDC LLC	P-SCPPCI	1743415	Private	422,16
OFS Capital Corporation	OFS	1487918	Public	418,54
Carlyle Secured Lending III	P-CSLIII	1851277	Private	412,44
Vista Credit Strategic Lending Corp	P-VCRSLC	1919369	Private	397,35
Ares Core Infrastructure Fund	P-ARCINF	2031750	Private	364,43
Star Mountain Lower Middle-Market Capital Corp.	P-SMLMMC	1786835	Private	358,70
Silver Capital Holdings LLC	P-GSPMMC	1674760	Private	326,50
Lord Abbett Private Credit Fund	P-LAPCRF	2008748	Private	320,24
Golub Capital Direct Lending Unlevered Corp	P-GCDLUC	1901606	Private	314,08
Oxford Square Capital Corp. f.k.a TICC Capital Corp.	OXSQ	1259429	Public	312,92
New Mountain Guardian IV Income Fund, L.L.C.	P-NMGIVI	1976719	Private	311,21
KKR FS Income Trust Select	P-KKRITS	1975736	Private	310,18
PhenixFIN Corp f.k.a Medley Capital Corporation	PFX	1490349	Public	302,75
AB Private Lending Fund	P-ABPRLF	1982701	Private	289,99
Senior Credit Investments, LLC	P-SNCRIL	1959568	Private	282,04
Crescent Private Credit Income Corp.	P-CPCRIC	1954360	Private	281,83
BlackRock Direct Lending Corp	P-BRDLCO	1834543	Private	274,94
Muzinich BDC, Inc.	P-MUNBDC	1779523	Private	263,57
Stellus Private Credit BDC	P-SPCBDC	1901037	Private	262,52
Kayne DL 2021, Inc.	P-KAYDLI	1850787	Private	254,85
North Haven Private Income Fund A LLC	P-NHPIFA	1973476	Private	244,04
LGAM Private Credit LLC	P-LGAMPC	1983514	Private	237,72
SuRo Capital Corp. f.k.a Sutter Rock Capital Corp.	SSSS	1509470	Public	233,78
PIMCO Capital Solutions BDC Corp.	P-PCSBDC	1905824	Private	213,06
Investcorp Credit Management BDC, Inc. f.k.a CM Finance Inc	ICMB	1578348	Public	203,02
Venture Lending & Leasing IX, Inc.	P-VLLIXI	1717310	Private	191,85
PGIM Private Credit Fund	P-PGIMPC	1923622	Private	188,40
Logan Ridge Finance Corporation f.k.a Capitala Finance Corp	LRFC	1571329	Public	186,71
Steele Creek Capital Corporation f.k.a MSC Capital LLC	P-STCRCC	1817825	Private	172,95
AMG Comvest Senior Lending Fund	P-AMGCSL	1987221	Private	170,77
TCW Star Direct Lending LLC	P-TCWSDL	1916608	Private	147,87
BC Partners Lending Corporation	P-BCPLCO	1726548	Private	147,18
Manulife Private Credit Fund	P-MLPCRF	1988280	Private	131,44
Prospect Floating Rate & Alternative Income Fund, Inc.	P-PSIFIN	1521945	Private	106,32
Andalusian Credit Company, LLC	P-ADLCRC	1979306	Private	101,26
Equus Total Return, Inc.	EQS	878932	Public	95,51
Chicago Atlantic BDC, Inc. f.k.a Silver Spike Investment Corp.	LIEN	1843162	Public	89,28
BIP Ventures Evergreen BDC	P-BIPVRE	1950572	Private	87,97
Rand Capital Corporation	RAND	81955	Public	79,80
Muzinich Corporate Lending Income Fund, Inc	P-MCLIFI	1985375	Private	78,39
SLR HC BDC LLC	P-SLRHBL	1832148	Private	75,84
Wellings Real Estate Income Fund	P-WLREIF	1922947	Private	73,27
NexPoint Capital, Inc.	P-NXPTCP	1588272	Private	51,42
Hancock Park Corporate Income, Inc.	P-HPCPIN	1661306	Private	40,92
SLR Private Credit BDC II LLC	P-SLRPCB	1932591	Private	39,69
WTI Fund XI, Inc.	P-WTIXII	1987731	Private	27,60
Princeton Capital Corporation	PIAC	845385	Public	23,39
Guggenheim Credit Income Fund f.k.a Carey Credit Income Fund	P-GGCINF	1618697	Private	12,14
West Bay BDC LLC	P-WBBDCL	2020354	Private	8,24
Firsthand Technology Value Fund, Inc.	SVVC	1495584	Public	2,21
			Total Assets:	**408 352,22**

Online Appendix

Supplementary Material for:

PIK Your Poison -
How Deferred Interest Reshapes Private Credit

Paul Rintamäki & Sascha Steffen

OA.1 Data Appendix

OA.1.1 Sample Construction

This appendix outlines the data cleaning steps applied to a BDC Collateral's investment dataset, ensuring consistency, accuracy, and completeness. The process includes handling missing values, standardizing variable names, merging datasets, categorizing loan and investment types, and creating unique identifiers.

We construct the loan position identifier using four identifying information: lender, borrower, seniority (e.g. "First Lien Senior Secured"), and loan type (e.g. "Term loan", "Revolver," etc).

For seniority categorization, we rely on pre-existing BDC Collateral's `securitytype` classification. When creating a loan type categorization, we again mainly rely on existing `securityclassnormalized` variable of BDC Collateral. However, due to a number of missing observations, for this category, we fill in the missing variables based on the textual information in the `securitytyperaw` variable in BDC Collateral. This variable often has textual information that helps to assign the missing observations to BDC Collateral's existing categories. For example, if the `securitytyperaw` variable contains the strings "Delay" and "Draw" we set the missing `securityclassnormalized` to "Delay Draw Term Loan". We do the same for term loans, revolvers, ABL loans, bonds, unitranche loans, and letters of credit.

Finally, since this `securityclassnormalized` has several categories with only a handful of observations, such as "Aircraft Loan" with only 19 observations, we group these miscellaneous items into a larger group called "Other". After this step, we have five security class categories called "Delay Draw Term Loan", "Revolver", "Term Loan", "Unitranche" and "Other". For observations with no security class information available, we allocate them to "Term Loan" category, which seems to represent most of the loans.

We also use BDC Collateral's column `investmenttype` to classify loans into different control investments categories: "Controlled/Affiliated Investment", "Non-Controlled/Affiliated Investment" and "Non-Controlled/Non-Affiliated Investment". In rare cases where the same borrower-lender pair is allocated to more than one category in the same quarter, we set the control category to N/A. We follow this conservative approach also when assigning industry information and PE-sponsor identity: if there is conflicting information regarding the same borrower for the same period, we set the characteristic to N/A.

Since our main focus is on private credit, we drop three BDCs that do not fit this description. We drop MacKenzie Realy Inc and Terra Income Fund 6, which operate mainly as REITs and provide commercial real estate loans, and Newtek Business Services, which operates as a bank for a large part of the sample.[23] Even at their largest, these companies covered less than 0.7% of the total market, so dropping them has little significance on the representativeness of the sample. After dropping these three, we are left with 215 BDCs.

When calculating fund age, we rely primarily on information about the date of incorporation or founding date from Pitchbook, S&P Global. However, in the absence of information from these sources, we collect the dates of BDC inception date from SEC Edgar or internet searches and use those.

We also correct a few data errors in the BDC Collateral datasets. First, we manually check for rounding errors and other reporting errors for several investment level variables. For example, when the interest rates have been reported as 500% typically the correct number is 5%. Similarly, there are cases of misreporting in the "all-in yield". We correct for this by calculating the all-in-yield ourselves using its definition ($\textit{All-in-yield} = \max(\textit{Base rate, Floor}) + \textit{Cash Spread} + \textit{PIK Spread}$) and our knowledge of the values of left hand side of the equation. We also winsorize all the financial ratios (leverage, ROE,

[23] Unlike most other BDCs that typically have approximately 100 borrowers in the portfolio, Newtek Business Services originates hundreds of tiny business loans, overwhelming the other loans in terms of number but not in economic importance. Including these loans would create unnecessary bias in any OLS estimate toward Newtek's portfolio.

fair-to-par, etc) at 1% and 99% level.

OA.1.2 Industry Classification

For industry information we primarily use Pitchbook's existing industry categories called `primaryindustrysector`. However, since we are unable to match all the companies between BDC Collateral and Pitchbook, for the remaining unmatched firms we augment these industry categories using industry information provided by BDC Collateral. Specifically, the investment dataset of BDC Collateral reports industry information associated with each portfolio company, but this information is not standardized and contains typos. We use ChatGPT to allocate these industries to Pitchbook's `primaryindustrysector` categories to fill in the industry information for the remaining firms. Table A3 shows the mapping file generated by ChatGPT (after manually fixing the typos from the Industry column).

Table A3: Industry Classification Table

Primary Industry Sector	**Industry**
Business Products and Services (B2B)	Business Services
Business Products and Services (B2B)	Services
Business Products and Services (B2B)	Shipping
Business Products and Services (B2B)	Transportation
Business Products and Services (B2B)	Wholesalers
Consumer Products and Services (B2C)	Beverage Food & Tobacco Processing
Consumer Products and Services (B2C)	Consumer
Consumer Products and Services (B2C)	Entertainment & Leisure
Consumer Products and Services (B2C)	Hotel & Gaming
Consumer Products and Services (B2C)	Leisure & Entertainment
Consumer Products and Services (B2C)	Restaurants
Consumer Products and Services (B2C)	Retail & Supermarket
Consumer Products and Services (B2C)	Textiles & Apparel
Energy	Energy
Energy	Oil & Gas
Energy	Utilities
Financial Services	Financial Services
Financial Services	Real Estate
Financial Services	REITS
Healthcare	Healthcare
Information Technology	Broadcasting
Information Technology	Media
Information Technology	Technology
Information Technology	Telecommunications
Materials and Resources	Aerospace & Defense
Materials and Resources	Agriculture
Materials and Resources	Automotive
Materials and Resources	Chemical Plastic & Rubber
Materials and Resources	Construction
Materials and Resources	Manufacturing
Materials and Resources	Mining
Materials and Resources	Paper & Packaging

OA.2 Additional results using Pitchbook datasets

We use deal information and the BDC holding data from Pitchbook to conduct additional analysis.

OA.2.1 In what types of deals are PIKs used?

PIK usage varies across deal types. Table B4 shows PIK usage share for different deal types focusing on deal types with at least 100 loans. Debt issued for general purposes such as working capital (*Debt - General*) is the largest category followed by *Buyout/LBO* and *Debt Refinancing*. All three categories account for about 82% of loans in BDCs' portfolios. PIK usage shares range between 11% and 31% percent across these deal types, and riskier loans (such as those related to LBOs or leveraged recapitalizations) have higher usage shares.

Table B4: PIK Usage by Debt Type

This table shows the frequency of different deal types of BDC portfolio loans. *PIK share* is the fraction of loans for which borrowers have switched from cash to PIK payment. The data is from Pitchbook.

	Deal Type	PIK share	# of Loans
1	Debt - General	0.12	7,975
2	Buyout/LBO	0.16	2,850
3	Debt Refinancing	0.11	2,056
4	PE Growth/Expansion	0.20	860
5	Mezzanine	0.31	624
6	Dividend Recapitalization	0.11	455
7	Later Stage VC	0.19	219
8	Leveraged Recapitalization	0.16	160
	...		
	Other		478
	Total loans		15,677

OA.2.2 PIK and future bancrutpcy

Table B5: PIKs and future bancruptcy reorganization: Borrower-level panel

Dependent Variable:	BancruptcyReorg$_{t+4}$			
Model:	(1)	(2)	(3)	(4)
Variables				
Constant	0.01***			
	(0.00)			
PIK$_t$	0.00**	0.00**	0.00**	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)
BancruptcyReorg$_t$	0.99***	0.99***	0.99***	0.70***
	(0.00)	(0.00)	(0.00)	(0.02)
Fixed-effects				
YearQtr		Yes	Yes	
Industry			Yes	
Industry-YearQtr				Yes
Borrower				Yes
Fit statistics				
Observations	80,002	80,002	80,002	80,002
Adjusted R^2	0.84	0.84	0.84	0.89

Clustered (YearQtr & Borrower) standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

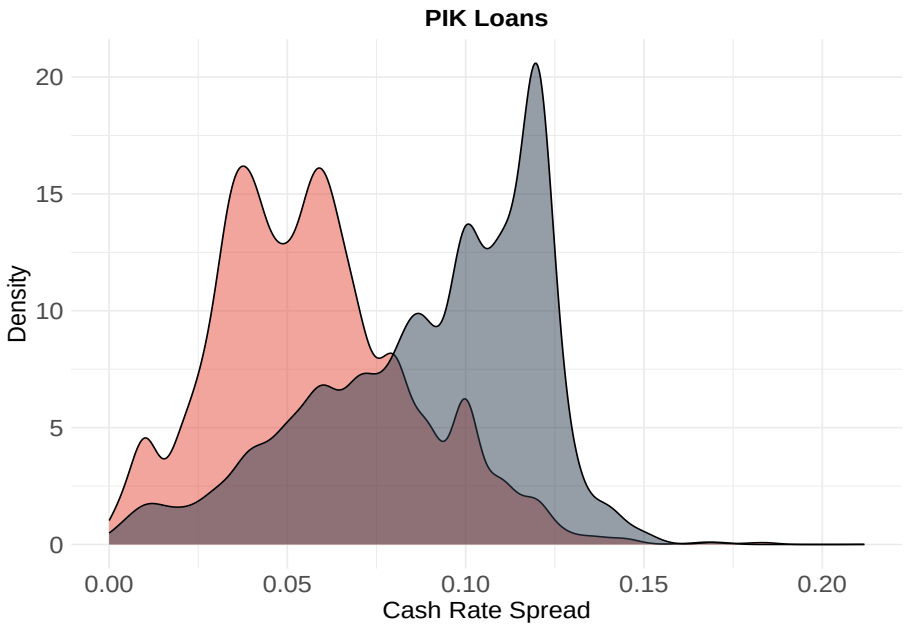
The tests are based on borrower-quarter-level panel data. $BancruptcyReorg_t$ is an indicator variable that takes a value of one if the borrower has experienced as bankruptcy and reorganization at period t or earlier. Similarly defined for $t+4$. PIK_t is an indicator variable that takes the value of one if the borrower has used PIK for any of its loans to BDC lenders for that period. The fixed effects: $YearQtr$ refers to the calendar quarter e.g. 2022Q4. *Borrower* refers to the identity of the borrower. $Industry$ refers to the borrower's industry. Standard errors are clustered at the, year-quarter, and borrower level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

OA.3 COVID-19 and PIK Usage

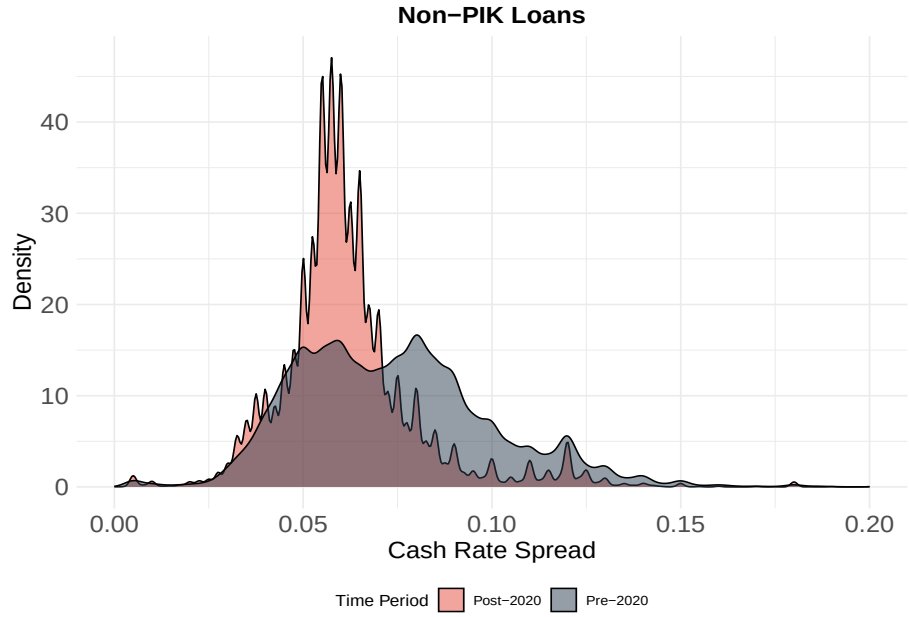
Figure C1: Use of PIK is moving to less risky borrowers

This figure shows the distribution of cash rate spread component of the loand for PIK- and Non-PIK -loans for pre- and post-2020 periods. We exclude loans with zero cash rate spread from both samples.

Panel A - PIK loans



Panel B - Non-PIK loans



OA.4 BDC Capital Structure

This section documents changes in the debt structure of BDCs over the period 2001Q1 to 2024Q4. To construct our time-series, we merge the Capital IQ and CRSP/Compustat databases. Following Colla et al. (2013), we exclude BDC-quarter observations for which total debt reported in Compustat deviates by more than 10% from the sum of debt types reported in Capital IQ. This procedure yields a matched sample of 83 BDCs, providing detailed quarterly data on drawn and undrawn credit lines, term loans, bonds, and commercial paper issuances.[24]

Panel A of Online Appendix Figure D2 illustrates the quarterly mean share of different on-balance-sheet debt items. Bank term loans and subordinated debt have traditionally played a minor role in BDC debt structures. As of 2024Q4, they account on average for about 10% of total BDC debt. BDCs predominantly finance themselves using drawn credit lines and corporate bonds, as discussed previously in the main text. Until 2009, drawn credit lines accounted for up to 70% of the BDC balance sheet. However, after the Global Financial Crisis (GFC), this share declined steadily while bond financing became increasingly prominent. Online Appendix Table D6 quantifies this shift. Between 2001 and 2009, credit lines (bonds) accounted for 52% (31%) of total debt, whereas from 2010 to 2024, credit lines (bonds) accounted for 35% (53%), respectively. The observed shift between these two periods is highly statistically significant.

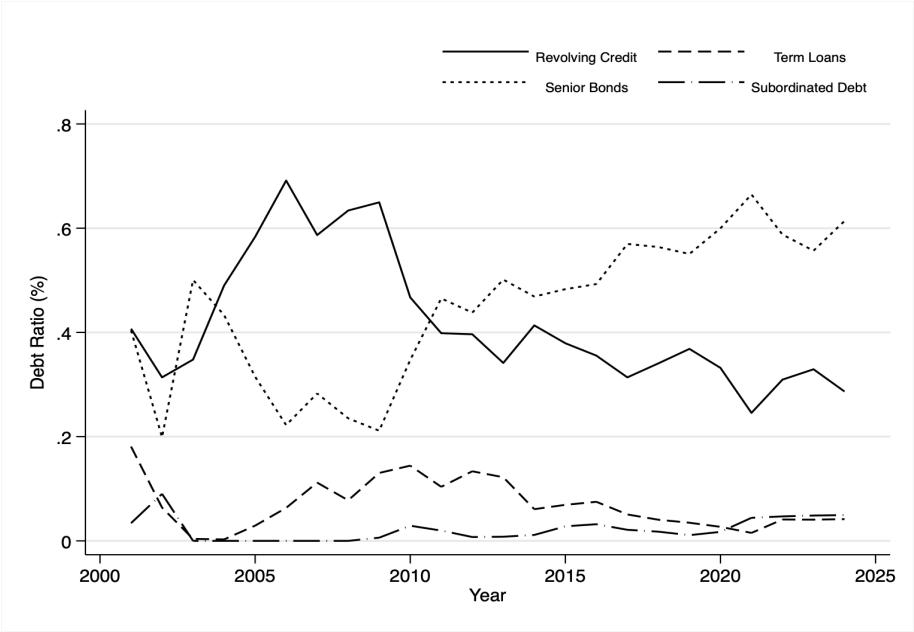
Panel B of Online Appendix Figure D2 shows drawn and undrawn credit lines, both expressed as percentages of total debt. Notably, undrawn credit lines have also declined significantly. Before 2010, undrawn credit even exceeded total balance-sheet debt, but it declined to approximately 50% by the end of our sample period. Despite this reduction, undrawn credit remains substantial and, as discussed earlier, continues to play a crucial role in BDC liquidity management.

[24]Note that this analysis does not require merging with the BDC Collateral dataset.

Figure D2: BDC Debt Capital Structure

Panel A shows the average share of different debt structure items relative to total debt over the 2001 to 2024 period. Panel B shows drawn and undrawn credit lines (both as a percentage of total debt).

Panel A - Debt structure



Panel B - Credit line commitments

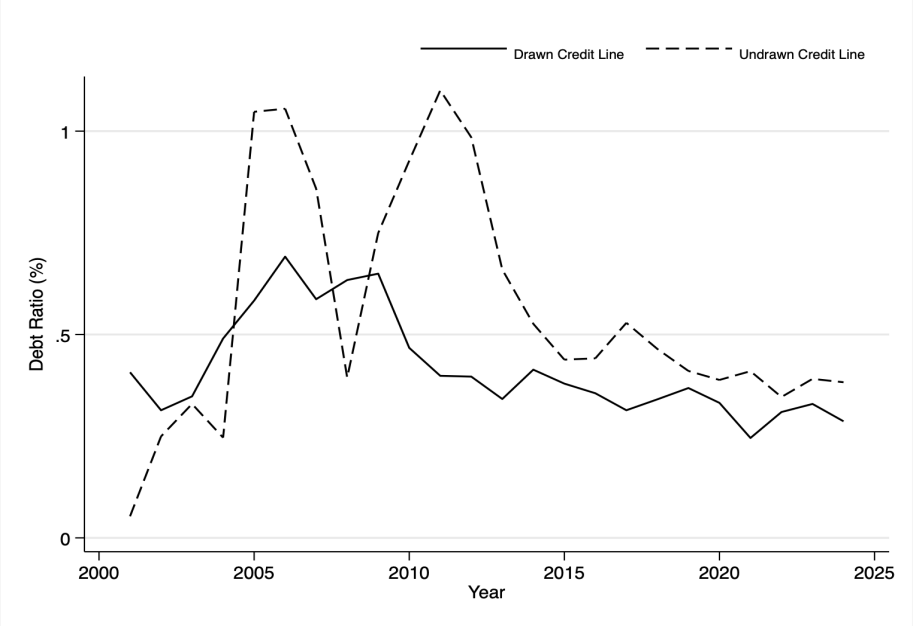


Table D6: BDC Capital Structure Over Time

This table shows the main capital structure components of BDCs (all relative to total debt). These include: Drawn credit lines (*Drawn CL*), *Term Loans*, *Senior Bonds* and Subordinated Bonds (*Sub. Bonds*). We show the mean for each year and then averages for the 2001 to 2009 and 2010 to 2024 periods, as well as the difference between both periods.

Year	Drawn CL	Term Loans	Senior Bonds	Sub. Bonds
2001	0.41	0.18	0.40	0.03
2002	0.31	0.06	0.20	0.09
2003	0.35	0.00	0.50	0.00
2004	0.49	0.00	0.43	0.00
2005	0.58	0.03	0.31	0.00
2006	0.69	0.06	0.22	0.00
2007	0.59	0.11	0.28	0.00
2008	0.63	0.08	0.24	0.00
2009	0.65	0.13	0.21	0.01
2010	0.47	0.14	0.35	0.03
2011	0.40	0.10	0.47	0.02
2012	0.40	0.13	0.44	0.01
2013	0.34	0.12	0.50	0.01
2014	0.41	0.06	0.47	0.01
2015	0.38	0.07	0.48	0.03
2016	0.36	0.08	0.49	0.03
2017	0.31	0.05	0.57	0.02
2018	0.34	0.04	0.56	0.02
2019	0.37	0.03	0.55	0.01
2020	0.33	0.03	0.60	0.02
2021	0.25	0.02	0.66	0.04
2022	0.31	0.04	0.59	0.05
2023	0.33	0.04	0.56	0.05
2024	0.29	0.04	0.61	0.05
(1) 2001-2009	0.52	0.07	0.31	0.01
(2) 2010-2024	0.35	0.07	0.53	0.03
$\Delta(2) - (1)$	-0.17***	-0.01	0.22***	0.01