When Flexibility Becomes Forbearance: Payment-in-Kind in Private Credit

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Abstract

Payment-in-Kind (PIK) provisions allow borrowers to capitalize unpaid interest, offering flexibility but potentially enabling excessive forbearance. Using comprehensive Business Development Company (BDC) loan data, we show that PIK primarily serves as a forbearance mechanism. It is concentrated among distressed firms and predicts persistent deterioration rather than recovery. Outcomes are significantly worse when PIK is exercised ex-post than when embedded at origination, with private equity sponsorship partially mitigating these effects. Consistent with forbearance, PIK is primarily linked to maturity extensions rather than recapitalizations. Although banks fund BDCs, they shield themselves from PIK-related risks through covenant restrictions, tightening BDC financing and reducing credit supply. The resulting financing constraints shift BDC portfolios toward PIK-paying positions and away from cash-paying loans, with the contraction concentrated in lending to new (but not existing) borrowers.

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1 Introduction

Payment-in-Kind (PIK) provisions allow borrowers to defer cash interest payments by rolling unpaid interest onto the outstanding loan principal. The theoretical framework for such provisions is well-established: contingent liquidity is valuable when external financing is costly (Holmstrom and Tirole, 1997; Gamba and Triantis, 2008), particularly when borrowers face transitory cash flow shocks but remain fundamentally solvent.[1] PIK provisions can thus serve a role similar to bank revolving credit facilities – providing contingent liquidity in markets where bank access is limited.

Yet contractual flexibility can also enable lenders to delay loss recognition. A large literature documents that weakly capitalized banks extend credit to insolvent borrowers – so-called zombie lending – to avoid writing down their loans (Peek and Rosengren, 2005; Caballero et al., 2008; Acharya et al., 2019). In this literature, capital constraints give undercapitalized banks incentives to evergreen distressed exposures. PIK provisions raise an analogous question in private credit markets. Unlike bank zombie lending, however, PIK embeds the flexibility to defer loss recognition directly in the loan contract – enabling forbearance without any capital constraint of the lender.[2]

We study which of these functions dominates PIK usage within U.S. private credit markets. Private credit refers to private market lending by non-bank financial institutions (NBFIs), and has experienced a significant growth in recent years.[3] Our empirical setting uses the universe of Business Development Company (BDC) lending – the largest identifiable segment of U.S. private credit – which provides quarterly loan-level observations

[1] A large literature in finance has discussed the value of financial flexibility for non-finanical firms. For example, financial flexibility is valuable when external funding is costly (Giambona et al., 2025), during crises when capital markets funding is unavailable (Campello et al., 2010; Acharya and Steffen, 2020; Fahlenbrach et al., 2021) or fixed costs are high (Barry et al., 2022), and to avoid costly financial distress and underinvestment (Bonaimé et al., 2014).

[2] The widespread use of PIK provisions has generated considerable debate among practitioners and policymakers. See e.g. "The rise and risks of private credit" by IMF (2024), "Why 'Payment-In-Kind' Debt Is So Appealing - and Risky" (Bloomberg, Nov 2025) or "Corporate debts mount as credit funds let borrowers defer payments" (Financial Times, Oct 2024).

[3] The exact market size estimates vary anywhere between $2-3 trillion global assets under management in 2024, up from approximately $300 billion since the Global Financial Crisis. See e.g. IMF (2024) and Financial Times (April, 2014).

including PIK usage, fair value assessments, and non-accrual classifications for every loan from the 2012 to 2024 period.[4]

To distinguish between efficient liquidity provision and zombie lending, we ask three questions. First, what determines PIK usage? Identifying the borrower characteristics and circumstances surrounding PIK usage helps to reveal whether it targets temporarily distressed but viable firms or fundamentally insolvent borrowers. Second, does borrower performance improve or deteriorate following PIK usage? If PIK bridges temporary liquidity shortfalls, borrowers should improve as financial constraints ease. Third, how do banks respond to the use of PIK options in BDC portfolios? Given banks' growing exposure to BDCs and potential spillover risks (Acharya et al., 2024), we examine whether banks enable PIK provision through credit lines or restrict financing to PIK-heavy BDCs. Bank credit supply to PIK-active BDCs reveals whether banks view PIK as value-enhancing flexibility or problematic forbearance. Our key contribution is to document that PIK provisions function primarily as contract-embedded forbearance mechanisms rather than efficient liquidity tools.

Our detailed loan-level dataset allows us to track each loan quarterly from origination until either maturity, write-off, or sale by the BDC. Moreover, it lets us distinguish between different types of PIK loans. While some borrowers defer interest payments immediately after loan origination (so-called "PIK notes"), we show that in recent years the market has shifted toward loans that include a "PIK toggle" that allows borrowers to exercise this option at some later point during the loan's lifecycle. We show that at origination, these loans exhibit significantly different characteristics: PIK-notes have higher interest rates, shorter maturity, are typically structured as subordinated debt with a fixed interest rate, and are frequently coupled with equity stakes for the lenders. In contrast, loans that use PIK toggles are more similar to loans that do not exhibit PIK use at all. These loans are typically first lien senior secured with floating rates and longer maturities.

Our starting point is to study the timing and circumstances under which borrowers

[4]BDCs are closed-end investment funds that specialize in lending primarily to middle-market firms. As of Q4 2024, they manage USD 441 billion in total assets and USD 417 billion in investments, representing a substantial share of U.S. private credit. We list all BDCs in our sample in the Online Appendix.

use PIK Toggles, exploiting our loan–quarter panel data.[5] We show that firms switch from cash interest to PIK typically when credit quality weakens, often after delinquency or loan valuation declines. Loans that toggle are larger and typically involve dual equity+debt-holding lenders and PE-sponsored borrowers. Finally, PIK use is much more prevalent among borrowers without access to bank financing, indicating that toggles operate as a substitute for bank-provided liquidity in segments where access to revolving credit is limited. While banks specialize in providing credit lines, private credit lenders supply contractual flexibility through contractual features such as PIK. Overall, our results are consistent with the view that firms in distress are more likely to use the PIK Toggle option.

To analyze if this distress is temporary or permament in nature we study the loan performance subsequent to PIK activation. We first document that PIK usage exhibits statistically significant and economically meaningful predictive power for credit deterioration in the quarters following the initiation of interest payment deferral. Using a variety of control variables and tight fixed effect specifications (based on borrower, industry, year-quarter, BDC, loan type, and seniority), we find that exercising the PIK option predicts 2-3 percentage point (pp) higher likelihood that a loan becomes delinquent (or "non-accrual") over the next quarter.[6] This is a sizeable increase given the unconditional likelihood that a loan becomes non-accrual of 3%.[7]

The quarterly fair value assessments of loans show that the fair value of loans (relative to the respective par value) can also be predicted to decline following PIK usage. The longer horizon local projection estimates confirm that PIK predicted distress is permanent rather than transitory with no improvement in credit conditions even after 8 quarters.

[5]PIK-Notes embed deferral from the origination and offer no time-series variation; we therefore focus on ex-post PIK Toggles in the main tests.

[6]Lenders classify loans as non-accrual when interest payments by borrowers are at least 90 days overdue, which constitutes a "technical default". Importantly, the usage of the PIK Toggle option does *not* constitute a default event.

[7]In March 2026, Moody's downgraded FS KKR Capital Corp — a USD 13 billion publicly traded BDC managed by one of the world's largest alternative asset managers — from investment grade to speculative grade. The rating agency cited "continued asset quality challenges" and specifically flagged the fund's elevated reliance on payment-in-kind (PIK) income, which at 14.7% of total investment income was more than double the peer median of 6.3%, as a signal of weaker earnings quality (Moody's Ratings, March 2026).

These results are consistent with the view that lenders' may be slow to mark down losses by instead providing forbearance in the form of PIK.[8] Finally, as loans with similar characteristics from the same borrower can be held in several BDC portfolios, we can study how valuation disagreement changes following PIK toggle use. Interestingly, we find that the fair value dispersion significantly increases after PIK activation, highlighting elevated uncertainty among private credit lenders regarding the fundamental value of the loans.

To further distinguish between the efficient liquidity provision and zombie lending hypotheses, we examine heterogeneity in post-PIK outcomes across key loan and lender characteristics. We test whether PIK's effects vary by time to maturity (which would allow temporary distress to resolve), loan size (which might incentivize extend-and-pretend behavior on large exposures), dual debt-equity holdings (which reflect superior monitoring and shareholder-aligned interest), and pre-existing credit quality. The evidence contradicts the use of PIK as liquidity tool: loans that are already nonaccrual and use PIK experience continued deterioration, while maturity structure or loan size show no moderating effects. A notable exception emerges for private equity-sponsored borrowers, where PIK usage leads to significantly less deterioration, consistent with PE sponsors' willingness to inject additional equity in exchange for PIK terms or their superior restructuring expertise (Hotchkiss et al., 2021; Jang, 2024; Haque et al., 2022, 2023). Similarly, in some specifications, PIK-use by firms with equity holding lenders experience less credit deterioration. These cross-sectional patterns indicate that PIK activation does not selectively benefit borrowers facing temporary liquidity constraints, but rather extends financing to fundamentally distressed firms across most loan characteristics, with PE sponsorship—and dual-holding lenders—providing the only meaningful mitigating factor.

We further distinguish between PIK-Notes, where interest deferral is embedded at origination and subject to contemporaneous lender screening, and PIK-Toggles, where borrowers exercise the deferral option ex-post, typically when credit quality deteriorates. This distinction proves economically meaningful: loans using PIK-Toggles exhibit 19-26

[8] Cross-sectional tests corroborate these findings, demonstrating that loans utilizing PIK toggles exit the sample with significantly larger losses relative to comparable non-PIK'd loans.

percentage points higher probability to become nonaccrual compared to 4-11 percentage points for PIK-Notes, with similar patterns for exit losses (16-21 percentage points versus 0-4 percentage points). To rigorously test whether these differential outcomes merely reflect ex-ante borrower selection rather than information revelation from ex-post activation, we obtain novel firm-level data from martini.ai, an AI-powered credit intelligence platform that provides comprehensive credit ratings and financial metrics for middle-market private firms. Controlling for origination-date firm size and credit ratings, we confirm that ex-post PIK-toggle activation conveys distinctly negative information about deteriorating borrower prospects beyond what ex-ante screening captures, indicating that PIK-Toggles function primarily as forbearance mechanisms for fundamentally distressed borrowers rather than planned liquidity management tools.

Consistent with forbearance rather than efficient restructuring, PIK-toggle usage predicts a 27-30pp increase in subsequent maturity extensions but only a 8-11pp increase in debt-to-equity swaps, indicating lenders systematically delay loss recognition rather than implement formal workouts. This pattern of extending maturities while avoiding write-downs mirrors zombie lending and extend-and-pretend behavior documented, for example, in Acharya et al. (2022) and Crosignani and Prazad (2024), raising concerns about hidden credit losses accumulating in private credit markets.

Lastly we study whether banks lending to BDCs enable or inhibit provision of PIK. If banks view PIK usage as benign activity we should expect them to support it by offering liquidity, while if they view it as harmful we might expect them to impose discipline on BDCs by reducing financing for PIK. Moreover, if PIK is viewed as harmful it raises concerns that, when realized, risks in BDC portfolios could transmit to banks.[9]

There is a compelling reason why we might expect a link between bank funding and increased PIK usage in BDCs' portfolios. While PIK deferrals do not require immediate cash outlays, they create liquidity pressures through a regulatory mismatch: deferred interest must be recognized as taxable income, compelling BDCs to distribute at least

[9]Several recent papers study the banks' increased exposure to NBFIs (Acharya et al., 2024; Chernenko et al., 2025; Albertus and Denes, Forthcoming).

90% as dividends to maintain RIC tax status despite receiving no corresponding cash inflows. We therefore examine whether excessive PIK provision leads BDCs to draw down bank credit lines, potentially transmitting credit risk to the banking sector.[10]

Despite substantial bank lending to BDCs, we find no evidence of risk transmission to banks through credit lines. BDCs with a high share of firms using PIK *reduce* bank debt relative to total debt (-0.51pp per 1pp increase in PIK usage) and credit line utilization (-0.38pp), reflecting covenant-based restrictions that effectively insulate banks from PIK-related losses. To document these covenant structures, we employ a web crawler to systematically extract and classify PIK-related covenant terms from BDC credit agreements filed with the SEC. Interestingly, it reveals that almost all bank credit lines contain explicit restrictions on PIK collateral eligibility.

These covenant-based constraints redirect the transmission channel away from banks and toward the real economy. We trace this channel in detail by decomposing BDC lending into PIK-paying and cash-paying positions, and into credit to new versus existing borrowers. While total BDC credit is unrelated to PIK usage, this headline stability masks a stark portfolio reallocation: higher PIK usage is associated with substantially more PIK credit (as deferred interest compounds into principal on loans that are difficult to exit) and significantly less non-PIK credit. The contraction in cash-paying loans falls almost entirely on new borrowers—those entering a BDC's portfolio for the first time—while lending to existing borrowers is unaffected. This asymmetry is the hallmark of forbearance-driven credit misallocation: PIK-heavy BDCs continue to roll over credit to their distressed borrowers but curtail new origination, crowding out viable firms that never receive funding in the first place. Overall, PIK provisions function primarily as a contract-embedded forbearance mechanism rather than efficient bridge financing for temporarily distressed but viable firms. PIK usage follows idiosyncratic credit deterioration, predicts persistent non-accrual

[10] Also regulators and supervisors recognize the potentially important linkages between banks and private credit lenders: "[Private credit] lenders' reliance on banks for liquidity could pose systemic liquidity risk to the banking sector if a sufficient number of PC lenders (BDCs and other [private credit] funds) draw down on their bank credit lines simultaneously in response to adverse aggregate shocks", (Federal Reserve Bank of Boston, 2025).

and fair value declines, and resolves through maturity extensions rather than balance-sheet restructuring – patterns that mirror extend-and-pretend behavior documented in bank lending but operating through contract design rather than capital constraints. The resulting financing constraints do not transmit risk to banks but instead contract private credit supply to middle-market firms, with the adjustment concentrated in reduced new lending.

Overall, PIK provisions function primarily as a contract-embedded forbearance mechanism rather than efficient bridge financing for temporarily distressed but viable firms. PIK usage follows idiosyncratic credit deterioration, predicts persistent non-accrual and fair value declines, and resolves through maturity extensions rather than balance-sheet restructuring – patterns that mirror extend-and-pretend behavior documented in bank lending but operating through contract design rather than capital constraints.

2 Related Literature

Our paper links to five strands of the literature: deferred interest in leveraged finance, contractual flexibility and creditor protection, zombie lending and forbearance, private credit and BDC lending, and bank–NBFI linkages. We discuss each in turn.

Deferred interest in leveraged finance. PIK structures are not new. Kaplan and Stein (1993) show how public junk bonds replaced private bank loans for financing large LBOs during the 1980s, with deferred-interest provisions already a standard feature of subordinated buyout debt. Demiroglu and James (2010) trace the subsequent rise in PIK issuance through 2007, and Guo et al. (2011) find that approximately 23% of LBOs from 1990–2006 include PIK structures, with PIK usage signaling higher credit risk at origination. These papers, however, measure PIK as an indicator at bond origination. They do not observe whether firms *exercise* the deferral option or track what happens to borrowers after activation. This distinction is consequential: a PIK provision that exists in a contract but is never exercised carries fundamentally different economic implications than one triggered during credit deterioration. We construct the first loan-level dataset that tracks

PIK exercise decisions through the full loan lifecycle – from origination through maturity, write-off, or sale – and distinguish between PIK structures embedded at origination (PIK-Notes) and those exercised ex-post at borrower discretion (PIK-Toggles).

Contractual flexibility and creditor protection. Recent work has begun examining how contractual design in leveraged lending may undermine creditor protection. Griffin et al. (2024) document a two-decade decline in covenent violations explained by an increased willingness to forego early detection of distressed borrowers in exchange for fewer inconsequential violations. Ivashina and Vallee (2025) show that covenants in leveraged loan contracts frequently contain carve-outs that permit additional borrowing even when it exacerbates debt-equity conflicts – flexibility that is built into the contract rather than exploited through renegotiation. PIK provisions represent a related but more consequential form of embedded flexibility: rather than enabling incremental borrowing through covenant loopholes, they allow outright deferral of cash interest obligations.

Zombie lending and forbearance. A large literature identifies zombie lending as a consequence of bank capital constraints. Peek and Rosengren (2005) show that undercapitalized Japanese banks directed credit to insolvent borrowers to avoid realizing losses. Caballero et al. (2008) establish that the resulting misallocation depressed productivity and investment across the Japanese economy. Acharya et al. (2019) and Acharya et al. (2021) extend this evidence to European banks after the sovereign debt crisis, showing that weakly capitalized banks evergreen loans to non-viable firms and that the congestion effects are large enough to crowd out lending to healthy borrowers.[11] Crosignani and Prazad (2024) identify a closely related pattern – extend-and-pretend behavior in commercial real estate – where lenders modify loan terms to avoid recognizing impairment.

Our paper departs from this literature in a fundamental way. The zombie lending channel requires capital constraints as the driving mechanism: banks forbear *because* writing down losses would erode their capital base. PIK provisions, by contrast, embed forbearance directly in the loan contract. The lender need not be undercapitalized – the option to

[11]Theory formalizes these incentives through gamble-for-resurrection behavior of undercapitalized intermediaries (Bruche and Llobet, 2014) or as a strategy where relationship lenders hide borrower distress until refinancing can be raised from uninformed arm's-length investors (Hu and Varas, 2021).

defer interest payments is available regardless of the lender's balance sheet position. We show that PIK-toggle activation predicts persistent nonaccrual, fair value declines, and resolution through maturity extensions rather than balance-sheet restructuring, mirroring the extend-and-pretend pattern in Crosignani and Prazad (2024) but operating through contract design rather than intermediary capital pressure. This distinction matters for policy: if forbearance arises from contractual optionality rather than capital inadequacy, capital regulation alone cannot address it.

Private credit and BDC lending. The rapid growth of private credit has generated a substantial literature in corporate finance.[12] Several papers trace the expansion of nonbank direct lending to increased bank regulation (Davydiuk et al., 2024b; Irani et al., 2021) and analyze how BDCs operate under their specific institutional constraints, including leverage limits (Balloch and Gonzalez-Uribe, 2021), market discipline from debtholders (Davydiuk et al., 2024c), and the trade-offs inherent in their fund structure (Rintamäki, 2024). On the borrower side, Jang (2024) shows that direct lenders engage in relationship lending and active monitoring, while Davydiuk et al. (2024a) study the implications of lenders' dual holdings of equity and debt. Jang et al. (2025) and Robinson and Wallskog (2025) analyze how PE affiliations and contractual complexity shape private credit contracts, and Zawadowski and Albuquerque (2025) examines the maturity wall problem facing private credit portfolios.

What is largely absent from this literature is an analysis of how contractual flexibility in private credit – the very feature that practitioners cite as its comparative advantage – functions in practice. Robinson and Wallskog (2025) argue that contract features such as PIK provisions and equity stakes make BDC lending attractive to borrowers and retail investors, but do not test whether these features serve as efficient liquidity tools or as forbearance mechanisms. We provide the first systematic evidence on how PIK provisions operate in private credit, showing that the contractual flexibility they provide functions predominantly as forbearance rather than efficient liquidity management.

[12] Block et al. (2024) survey U.S. and European private debt investors and argue that BDCs are representative of typical private debt lenders in the U.S.

Bank–NBFI linkages and transmission. A growing literature highlights the expanding funding relationships between banks and NBFIs. NBFIs have increased their market share across mortgages (Buchak et al., 2018), large corporate lending (Fleckenstein et al., 2025), middle-market lending (Chernenko et al., 2022), and small business lending (Gopal and Schnabl, 2022). This expansion is partly enabled by bank financing, particularly through committed credit lines. Acharya et al. (2024) show that bank credit line commitments to NBFIs tripled between 2013 and 2023, reaching $1.5 trillion. Acharya et al. (2025a) identify the risks to banks from credit line exposure to REITs, and Acharya et al. (2025b) show that banks respond to higher drawdown risk from nonbank-financed firms by issuing fewer and more expensive credit lines. For private credit specifically, Haque et al. (2024) argues that private debt substitutes for long-term bank credit, and Haque et al. (2025) find that bank lending to direct lenders is particularly attractive during monetary policy tightening.

The common concern in this literature is that bank credit lines to NBFIs create a channel through which NBFI portfolio stress transmits back to the banking sector. Our evidence identifies a different pattern. Despite substantial bank credit line exposure to BDCs, we find that BDCs with higher PIK usage *reduce* bank borrowing and credit line utilization. The mechanism is contractual: we extract and classify PIK-related covenant terms from BDC credit agreements filed with the SEC and show that virtually all bank credit lines contain explicit restrictions on PIK collateral eligibility. These covenants insulate banks from PIK-related losses but redirect the adjustment: rather than transmitting risk to banks, PIK-induced financing constraints manifest as reduced BDC asset growth and lower credit supply to middle-market firms. The transmission channel, therefore, runs not from BDCs to banks but from BDCs to the real economy – a distinction with direct implications for macroprudential policy.

3 Data and Institutional Setting

3.1 Data

Our loan-level panel covers the full universe of BDC lending from 2012 to 2024, tracking each loan quarterly from origination through exit — including the interest rate decomposition that allows us to identify PIK activation at the individual loan level.[13] The data are from LSEG LPC's BDC Collateral, which compiles SEC filings for all active and discontinued BDCs and reports borrower identity, industry, par amount, base rate, cash spread, PIK spread, remaining maturity, seniority, loan type, fair value, and non-accrual status.[14]

We augment the loan-level data with Pitchbook and S&P Capital IQ using Pitchbook identifiers and CIK numbers.[15] Pitchbook lets us track whether a borrower is private equity-backed at any given date and whether a bank has lent to the borrower within the preceding five years. Approximately 50% of loans in our sample are associated with borrowers that have recent bank financing, consistent with Haque et al. (2024) using confidential Fed Y-14 data. To track the same loan within a BDC over time, we aggregate observations at the BDC–Borrower–Seniority–Loan Type–Quarter level and define our loan identifier accordingly.

Finally, we obtain firm-level credit ratings and size measures from MartiniAI, a financial analysis firm specializing in private markets. This data is available from 2017 onward; we use it to test robustness of our baseline results to controls for origination-date credit quality.[16]

[13] Use of PIK in contracts is much more prevalent in private credit market, than for example in broadly syndicated loan (BSL) market, where the investment mandates of collateralized loan obligations (CLOs), has so far prevented the widespread adoption of PIK (White & Case, 2025).

[14] Variable definitions are in Appendix Table A. We provide details on data cleaning, including the removal of three small BDCs whose business models have no resemblance to direct corporate lending, in the Online Appendix.

[15] We match firm names to Pitchbook identifiers using Pitchbook's automated string-match algorithm, augmented with manual matching. Details are in the Online Appendix.

[16] MartiniAI provides a mapping file to BDC Collateral identifiers. Details of the variable construction are in the Online Appendix.

3.2 Example of PIK reporting

We illustrate PIK reporting with the loan history in Table 1. Sierra Income Corporation reports a First Lien Senior Secured Term Loan to Dynamic Energy Services International from 2014Q1 through 2019. The BDC's quarterly 10K/10Q filings decompose the stated all-in yield into a base rate, a cash spread, and a PIK spread – the portion of interest capitalized into principal rather than paid in cash. A non-zero PIK spread identifies PIK usage in a given quarter; we construct a binary indicator accordingly.[17]

The example captures the core pattern this paper studies. Through 2016Q1, the loan pays interest entirely in cash and amortizes normally. When the PIK spread first turns positive in 2016Q2, and then absorbs nearly all interest by 2016Q4, par value begins rising–consistent with unpaid interest compounding into principal. Simultaneously, fair value falls and the loan enters non-accrual by 2018Q1. The contractual terms continue to list a large PIK spread even as fair value declines toward zero.[18]

PIK provisions vary in practice – some loans defer the full interest payment, others only part; some contracts impose drawdown fees that raise the all-in spread, others are renegotiated on different terms.[19] The empirically relevant distinction for our analysis is between PIK Notes, where deferral is embedded at origination, and PIK Toggles, where borrowers exercise a deferral option post-origination. The example in Table 1 can thus be classified as PIK Toggle. We formalize this classification in Section 3.3.

3.3 PIK contracts: Types and usage patterns

PIK usage share. We define *PIK usage share* as the par value-weighted fraction of a BDC's loan portfolio that pays PIK interest in a given quarter. Figure 1, Panel A, plots this measure from 2012 to 2024. PIK usage is cyclical: it declined from about 19% in 2012 to 11% by 2019, rose during the COVID-19 pandemic, and increased sharply after 2022

[17] BDC filings also report par value, fair value (which we scale to par to obtain a loan price), non-accrual status, and maturity date. We describe all variable definitions in the Appendix, Table A.

[18] The series contains discrete jumps in par and months-to-maturity (e.g., 2018Q1, 2019Q1), consistent with amendments that reset reported terms.

[19] See for example, White & Case (2024, 2025).

when monetary tightening raised floating-rate borrowers' debt service burdens.

Average PIK spread. Among loans actively deferring interest, the average PIK spread has been approximately 5% of the loan balance per annum. Panel B of Figure 1 shows the quarterly average PIK spread from 2012 to 2024. The spread rose from 3.6% in 2013 to 5.5% in 2018, declined below 5% by 2021, and has remained stable through the subsequent period of rising rates.

Heterogeneity in PIK use. These aggregate patterns mask substantial variation along three dimensions, shown in Figure 2. First, junior (subordinated) debt exhibits higher PIK usage than senior (first and second lien) debt, but senior PIK usage spikes in the same stress episodes – COVID-19 and the 2022 rate tightening (Panel A). The declining trend in aggregate PIK usage share from 2012 to 2019 visible in Panel A of Figure 1 reflects BDCs' portfolio shift from junior toward senior debt, not a decline within seniority categories. Second, PIK usage is substantially more prevalent among borrowers without bank financing in the preceding five years, consistent with PIK serving as a substitute for bank-provided liquidity insurance (Panel B).

Third, and most consequential for our analysis, PIK contracts take two structurally distinct forms (Panel C). *PIK Notes* embed interest deferral as a permanent part of the interest rate starting from origination. *PIK Toggles* give borrowers an option to exercise PIK when deemed necessary—typically by switching from cash to PIK interest *ex-post*.[20] Panel C plots usage share for each type separately. Over the past decade, PIK Toggles have become the dominant form: the market has shifted from immediate (i.e., at origination) deferral structures toward discretionary usage, paralleling the broader portfolio shift from subordinated to senior secured lending.

[20]We classify a loan as a PIK Note if it pays PIK interest in every period during its lifetime. An alternative definition – PIK at origination regardless of subsequent usage – yields qualitatively similar results (see Online Appendix).

3.4 Summary statistics

Our empirical analysis uses three datasets: a loan-quarter panel, a loan-origination cross-section (collapsing the panel to each loan's first observation), and a BDC-quarter panel. Table 2 Panel B reports summary statistics at the loan level over the 2012Q1–2024Q4 period.[21]

PIK is active in 10% of loan-quarter observations. The median loan is a first-lien senior secured term loan (84%) with floating rate, par value of approximately USD 7 million, remaining maturity of 51 months, and a fair-to-par ratio of 0.99. Fifteen percent of observations are classified as PIK toggles, 4% as PIK notes. Nineteen percent involve lenders holding simultaneous equity stakes in the borrower, and about half of borrowers have received bank financing within the preceding five years.

Panel C compares loan characteristics at origination across PIK types. PIK-Toggle and PIK-Note loans serve structurally different purposes. Toggles are senior-secured instruments (85.8% first lien) deployed as optional liquidity insurance — borrowers activate the deferral option in only 41.6% of quarters. Notes are permanent capital structure features with 100% deployment, compressed cash spreads, higher PIK yield components (37.4% vs. 16.1% of all-in yield), and frequently subordinated or unsecured positioning (48.9%). Future non-accrual rates are sharply higher for toggles (25.2%) than for non-PIK loans (5.3%), while notes fall between (12.6%). Toggle loans exhibit maturity extensions in 57.2% of cases – consistent with the extend-and-pretend pattern we formalize in Section 5.

4 Why do firms use the PIK option?

PIK provisions can serve two distinct purposes. Under the liquidity provision view, PIK toggles allow borrowers to bridge transitory cash flow shortfalls driven by common shocks to their industry or the credit cycle — shocks that do not impair fundamental solvency

[21] Panel A in the Online Appendix reports BDC-level summary statistics. Variable definitions are in Appendix Table A.

(Kashyap et al., 2002; Holmström and Tirole, 1998). Under the forbearance view, toggle exercise reveals persistent, borrower-specific credit deterioration that lenders defer recognizing, extending the zombie lending literature to private credit markets (Peek and Rosengren, 2005; Caballero, Hoshi, and Kashyap, 2008).

These two views generate sharply different predictions. If PIK provides liquidity insurance against common shocks, industry×time fixed effects should absorb substantial variation in toggle exercise, and borrower-specific distress indicators should have limited explanatory power after controlling for industry conditions. If PIK functions primarily as forbearance, activation should be idiosyncratic, concentrated in specific borrower-lender relationships and driven by individual borrower distress that persists after saturating the model with industry×time effects (Khwaja and Mian, 2008; Amiti and Weinstein, 2018). We regress a PIK activation indicator on four groups of covariates – *Distress*, *Loan Terms*, *Ownership*, and *Lending Relationship* – and progressively tighten the fixed effect structure to decompose the variation.

$$PIK_{lk,t+1} = \sum_j \beta_{1j}\, Distress_{lkt} + \sum_j \beta_{2j}\, Loan\,Terms_{lkt} + \sum_j \beta_{3j}\, Ownership_{blt} + \sum_j \beta_{4j}\, LendingRelationship_{bt} + FEs + e_{lkt} \quad (1)$$

The dependent variable $PIK_{lk,t+1}$ equals one if the PIK spread for loan k from lender l is non-zero at time $t+1$. The *Distress* variables are $NonAccrual_{lkt}$, an indicator for whether the loan is marked as nonaccrual, and $I(Fair/Par_{lkt} < 0.8)$, an indicator for whether the loan is valued below 80% of par. *Loan Terms* include $Ln(Loan\,size)$, *Effective base rate*, $Ln(Time-to-Maturity)$, a $Fixed-rate\,loan$ indicator, and the loan's *All-in-spread* at origination.[22] Loan seniority and loan type are absorbed by fixed effects. *Ownership* variables are $Dual\,holding_{blt}$, indicating whether the lender holds an

[22]We control for the all-in-spread at origination date τ rather than at date t since using PIK often mechanically increases the all-in-spread, as there is often a some type of drawdown fee. This makes the two variables highly co-linear, and a time-varying *All-in-spread* a bad control.

equity stake in the borrower, and $PE\,Sponsored_{bt}$. *Lending Relationship* variables are $Ln(Number\,of\,BDCs)$ lending to borrower b at time t and $Bank\,financing_{bt}$, indicating whether the borrower received bank financing within the preceding five years.

The sample includes only loans with PIK toggles and loans without observable PIK components, excluding PIK notes. Our primary interest is the borrower's active decision to exercise the toggle after origination.[23] Standard errors are clustered at the Borrower, BDC, and YearQtr levels. The sample period is 2012Q1–2024Q1.

Table 3 presents the results. Distress is the strongest predictor of PIK activation across all specifications: borrowers are substantially more likely to defer interest when loans are classified as nonaccrual or valued at a significant discount. Larger loan balances, fixed interest payments and shorter remaining maturities are associated with higher PIK usage. While most loans in the sample are floating-rate loans, we find that when PIK is used, firms also often automatically switch to fixed interest payments generating the positive correlations. For the loans that have not (yet) undergone this switch, column (2) also shows that PIK is more likely to be used when the effective interest rate is high.[24] This implies that deferring interest is a specific mechanism that can insulate zombie firms from contractionary monetary policy, corroborating evidence by Albuquerque and Mao (2025). PIK loans are more likely to involve lenders with equity stakes in the borrower (Dual-holding) and PE-sponsored firms. Borrowers without bank financing in the preceding five years are substantially more likely to use PIK, consistent with the toggle serving as a substitute for bank-provided liquidity insurance in market segments where credit lines are unavailable.

The fixed effect structure reveals which view – liquidity provision or forbearance – better fits the data. Adding Industry × YearQtr fixed effects in Column (4) increases the Adjusted R^2 by only 1 percentage point relative to Column (3). Under the liquidity provision view, PIK should respond to temporary, industry-wide shocks – the type absorbed

[23] Including the PIK notes has quantitatively little impact on the results.

[24] This effect disappears when we add year-quarter fixed effects, which absorbs most of the variation in the effective base rate as most loans are tied to the same LIBOR/SOFR base rate, but also reappears strongly in the most stringent specification in column (8).

by industry-time interactions. The negligible incremental R^2 shows that PIK activation is instead driven by idiosyncratic, within-industry, firm-specific factors.

The relationship dimension reinforces this conclusion. Replacing separate Borrower and BDC fixed effects with interacted Borrower × BDC fixed effects in Column (7) increases the Adjusted R^2 by 4 percentage points. Time-invariant, relationship-specific factors between a given lender and borrower explain a substantial share of PIK variation. These relationship-specific factors should matter less under efficient liquidity provision but are a well-established determinant of zombie lending (Hu and Varas, 2021). In the next section, we show that the distress associated with PIK activation is persistent rather than temporary.

5 Implications of PIK Usage for Loan Performance

The previous section established that PIK activation concentrates in distressed borrowers. A natural question follows: does PIK bridge temporary distress or defer recognition of permanent impairment? We address this question in this section exploiting our loan-quarter panel to track short-run loan dynamics following PIK activation.

5.1 Panel tests: PIK and future loan outcomes

If PIK provides efficient liquidity to fundamentally viable borrowers experiencing a temporary shock, loan performance should stabilize or improve in the quarters following activation. If PIK instead functions as forbearance—deferring recognition of losses on permanently impaired credits—we should observe persistent deterioration. We test between these predictions by estimating the following specification:

$$y_{lk,t+1} = \beta_1 \, PIK_{lkt} + Controls + FEs + e_{lk,t+1} \tag{2}$$

The dependent variable $y_{lk,t+1}$ takes three forms. $NonAccrual_{lk,t+1}$ is an indicator for

whether the loan is classified as non-accrual at $t+1$—a technical default triggered when interest payments are at least 90 days overdue.[25] $Fair/Par_{lk,t+1}$ is the ratio of the loan's fair value to par at $t+1$, capturing valuation changes. $CSD(Fair/Par)_{k,t+1}$ is the cross-sectional standard deviation of fair-value-to-par ratios across BDCs holding similar loans from the same borrower at $t+1$, measuring valuation disagreement among lenders.[26] We motivate the first two variables with the view that PIK activation may contain information about future distress not fully reflected in current prices. The third variable captures the possibility that PIK—by increasing both default risk and the complexity of cash flow claims—makes fair value assessment more difficult.[27]

Each specification includes the time-t value of the dependent variable to account for high autocorrelation and to test whether PIK activation contains information beyond what current loan status already reveals. We include all control variables from Table 3 and progressively tighten the fixed effect structure: $Industry \times YearQtr$ absorbs time-varying industry conditions, $BDC \times YearQtr$ accounts for lender-specific risk appetite and funding costs, and $Borrower \times BDC$ controls for endogenous lender-borrower matching.[28] Standard errors are three-way clustered by $Borrower$, BDC, and $YearQtr$.

Table 4 presents the results. Columns (1)–(2) show that PIK activation predicts a 2–3 percentage point increase in the probability that the loan becomes nonaccrual in the next quarter. This is a large effect: the unconditional nonaccrual rate in our sample is 3%, so PIK activation approximately doubles the likelihood of technical default. Columns (3)–(4) document a parallel pattern in valuations: a single quarter of PIK usage is followed by a 100 basis point decline in the fair-value-to-par ratio in the next period. Because we

[25] Importantly, the use of the PIK Toggle option does *not* constitute a default event.

[26] 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 loans).

[27] This view is shared by practitioners. For example, Kennedy Lewis Capital Corp writes in their 2024 annual report: "*[...]PIK instruments may have unreliable valuations because the accruals require judgments about collectability of the deferred payments and the value of any associated collateral.*"

[28] Borrower fixed effects address persistent differences in management quality and firm size. $BDC \times YearQtr$ fixed effects are particularly important because PIK provision activity could correlate with lender characteristics—such as risk appetite or leverage constraints—that also influence valuation practices. Without these controls, supply-side factors could confound the results.

control for the time-t loan value—which is reported *after* the lender already knows that PIK has been activated in the same quarter—this finding implies that not all negative information embedded in PIK activation is incorporated into valuations in a timely manner. Columns (5)–(6) show that PIK use is followed by significantly higher valuation dispersion among lenders, consistent with PIK increasing uncertainty about the loan's fundamental value.

Taken together, PIK activation is not followed by recovery in loan performance. Instead, it predicts statistically and economically significant deterioration—in delinquency risk, in valuations, and in lender agreement about what the loan is worth. The fact that PIK contains predictive information beyond what is already captured in current nonaccrual status and fair values suggests that loan valuations at the time of PIK activation are systematically too high, consistent with delayed loss recognition.

5.1.1 Impulse response functions

To evaluate the persistence of the predictive power of PIK for $NonAccrual$, $Fair/Par$ and $CSD(Fair/Par)$. We run the following local-projection regressions

$$y_{lk,t+h} = \beta_h PIK_{lkt} + \sum_{j=0}^{4} \gamma_{hj}\, y_{lk,t-j} + Controls + FEs + e_{lk,t+h}$$

where h runs from 1 to 8 and $y_{lk,t+h}$ is either $NonAccrual$, $Fair/Par$ or $CSD(Fair/Par)$ at time $t+h$ for loan k of borrower b held by lender l. PIK_{lkt} is an indicator variable that equals one if the PIK toggle is used for loan k in time t. We include the following fixed effects: $YearQtr \times Industry + YearQtr \times BDC + Borrower \times BDC + Seniority + LoanType$. In addition to the five lagged dependent variables, we include the following controls $Ln(Loan\,Size)$, $Effective\,Base\,rate$, $Fixed\,rate\,loan$, $Ln(Time\text{-}to\text{-}Maturity)$, $Dual\,holding$, $PE\,Sponsored$, $Bank\,financing$ with all measured at time t and *All-in-spread* measured at the origination date τ. Then we collect the β_h coefficients and plot them in a graph with the 95% confidence based on three-way clustered standard errors by $Borrower$, BDC, and $YearQtr$.

Figure 3 shows that the persistence of predictive results for $NonAccrual$, $Fair/Par$, and $CSD(Fair/Par)$ extends beyond just over the next quarter. The predictive power of PIK usage persists even after 2 years for $NonAccrual$ and $Fair/Par$. These results corroborate the view that users of PIK are generally experiencing persistent difficulties rather than temporary problems, and PIK use is generally followed by further distress rather than a swift recovery. With $CSD(Fair/Par)$, the effect is a bit more short-lived as the β_h coefficient converges back to zero between quarter $h = 5$ and $h = 6$. This means that valuation disagreement between lenders following PIK use seems to fully self-correct over time, probably because these valuations are public information and lenders may learn from each other's valuations.

5.1.2 Heterogeneity

Next, we investigate whether the use of PIK toggle as a signal of a firm's repayment prospect masks heterogeneity between borrowers. To do so, we run the following OLS regression

$$\begin{aligned} y_{lk,t+1} = \beta_1 PIK_{lkt} + \beta_2 y_{lkt} + \beta_3 X_{lkt} + \beta_4 PIK_{lkt} \times y_{lkt} \; + \beta_5 PIK_{lkt} \times X_{lkt} \\ + Controls + FEs + e_{lk,t+1} \end{aligned} \tag{3}$$

We now add the interaction terms between PIK and lagged dependent variable y_{lkt} as well as several other characteristics—first just with PE sponsored indicator, but then also with log time to maturity, dual holding indicator, log loan size—all stacked in vector X_{lkt}. We also include other similar controls that were used above. As our focus is primarily on the interaction terms, when analyzing the results, we restrict our attention to estimates for β_1, β_4, and β_5.

Table 5 presents the results. Let us first focus on Columns (1)-(3) that show the results for $NonAccrual$. In Column (1), we include only the $PIK \times PE\,Sponsored$ interaction, loan controls that we also used in Table 3 and $YearQtr$, $Borrower$, $LoanType$, $Seniority$

fixed effects. Interestingly, the positive sign for PIK and the negative sign for $PIK \times PE\,Sponsored$, but smaller in absolute terms, suggest that the negative signal of PIK gets dampened when the borrower has a PE sponsor. This suggests that PE sponsored firms are special as they are able to avoid delinquency with better success when using PIK compared to non-PE sponsored firms. We also study other sources of heterogeneity in Column (2). While $PIK \times PE\,Sponsored$ remains economically and statistically significant in these Columns, most other interaction terms are zero. There are exceptions, though. PIK use by firms with equity-holding lenders tends to experience less credit deterioration, which could indicate that only more comprehensive workouts involving debt-to-equity swaps can make PIK a viable form of support. Similarly, in Column (2), the positive coefficient PIK (while controlling for $PIK \times NonAccrual$) indicates that even if the loan is not nonaccrual this period, using PIK indicates that the chances grow that it will be nonaccrual the next period. Moreover, the positive coefficient on the interaction $PIK \times NonAccrual$ indicates that if a loan is already nonaccrual *and* uses PIK, there are higher chances that it will continue to be assigned as nonaccrual in the next period relative to the case when it is nonaccrual but does not rely on PIK. This is important as it further indicates that PIK is more likely to be used by unobservably bad borrowers with permanent issues rather than viable borrowers that only require some liquidity relief.

In Column (3) we add $YearQtr \times BDC$, $BDC \times Borrower$, and $YearQtr \times Borrower$ fixed effects. The $YearQtr \times Borrower$ fixed effects automatically restricts the sample to firms that have multiple loans outstanding, while when conditioning on the borrower's overall financial situation. This suggests that PIK is likely to lead to higher delinquencies for the loans that are tied to PIK interest. Thus, PIK can be a bad signal not just about the borrower's overall prospects but also about the prospects of the very loan that uses PIK. Similarly, the presence of a PE sponsor helps to prevent future loan delinquencies for these loans.

We find similar results when we use the $Fair/Par$ as the dependent variable in Columns (4)-(6). First, the coefficient for the interaction term $Fair/Par \times PIK$ suggests that the starting value of $Fair/Par$ also matters to the loan response following PIK

use. For example, the estimates in Column (2) suggest that when the loan is valued at 80 cents on the dollar and loan uses PIK, then the expected next period fair/par ratio is $(-0.07 + 0.07 \times 0.8 = -0.014)$ 78.6 cents on the dollar, while if the starting point is that loan is valued on par, then the expected decline in loan value is zero $(-0.07+0.07\times 1 = 0)$. Said differently, the negative signal of the PIK gets amplified if the existing value of the loan is low. Second, similarly, as we saw with $NonAccrual$, we observe that in Columns (4)-(5), PE-backing of the firm has a positive impact on PIK users, and PE-backed firms do not expect as big declines in loan values following PIK use. In column (6), this effect is no longer statistically significant, potentially because the $YearQtr \times Borrower$ fixed effects restrict the variation within the same firms with multiple loans. However, the nonlinear effect of $Fair/Par \times PIK$ on future valuations remains.

To check visually if these results for PE-sponsored borrowers make sense, we plot in Figure 4 the average value of the loan (on the left) and non-accrual probability (on the right) 3 years before and after the first time PIK toggle is used. What the figure clearly illustrates is that deterioration of credit conditions, measured by declining average loan value and increasing non-accrual rate, starts typically already slightly before the PIK is first used, suggesting that PIK is more likely to be a symptom rather than a cause of a firm's difficulties. However, based on the visual inspection, it looks like using PIK also does little to help this deteriorating trend since credit continues to deteriorate following the first time PIK is used, all the way until the end of the observation window.

Interestingly, however, the different lines for PE-sponsored and non-sponsored firms suggest that there exists some heterogeneity in these trends. After the introduction of PIK, the sharp decline in loan value seems to moderate slightly for PE-sponsored firms, while similar moderation is not observable among the loans of non-PE-sponsored firms. This widening gap can also be observed in the average non-accrual rate on the right side of the figure, though the "kink" among PE-sponsored loans is less distinct. These patterns are thus consistent with the documented results in Table 5.

5.2 Cross-sectional test: PIK and future loan outcomes

5.2.1 Heterogeneity from PE sponsorship

The panel tests above are useful to understand the short-term dynamics around PIK use, but they do not reveal what the definite outcomes are for loans that end up using PIK and how these outcomes compare against loans that do not defer interest payments. Similarly, based on the previous test, we cannot determine whether PE-sponsored ownership helps permanently prevent worse loan outcomes or is simply a short-term effect.

Thus, we now focus on cross-sectional data, using initial loan characteristics at loan origination, and examine how these characteristics explain the likelihood that a loan will later become nonaccrual and exit the sample with a significant discount at the termination date. As explained in more detail in Section 3, we define origination quarter as the year-quarter of the first observation when the loan appears in the sample.

Precisely, we start with the following cross-sectional regression

$$y_{lk,\tau} = \beta_1 \, PIK\,Toggle_{lk,\tau+n} + Controls + FEs + e_{lk,\tau} \tag{4}$$

where τ denotes the year-quarter when the loan first appears in the sample, which we call the origination period and the loan outcome, $y_{lk,\tau}$, is either $Future\,NonAccrual_{lk,\tau+m}$, which takes a value of one if the loan becomes nonaccrual at any date $\tau + m$ after origination date τ, or $I(Fair/Par_{lk,T} < 0.8)$, which takes a value of one if the loan has a valuation below 0.8 at the loan termination quarter T. The main explanatory variable of interest, $PIK\,Toggle_{lk,\tau+n}$, takes a value of one if the borrower uses the PIK option at some date $\tau + n \geq \tau$ following loan origination. Although we studied PIK toggles above in previous sections, we use this more explicit reference $PIK\,Toggle_{lk,\tau+n}$ to separate this cross-sectional variable from the panel data variable PIK_{lkt} used above, and because we introduce comparative results between PIK notes and PIK toggles further below in this section. We also include a set of control variables that capture the observable loan terms and borrower characteristics (same as used above) measured at the time of origination

and $Pre\text{-}PIK\ Amend_{lk,\tau+s}$, which we define below. We also standardize the continuous variables (but not the binary variables) to ease the interpretation of some of the results.

In addition to the baseline model, we are also interested in studying the heterogeneity in these outcomes, we augment this baseline specification by adding an interaction term $PIK\ Toggle_{lk,\tau+n} \times PE\ Sponsored_{b,\tau}$ and interaction terms with $PIK\ Toggle_{lk,\tau+n}$ and several other origination dated characteristics. These characteristics relate to loan terms, such as loan size, maturity, and dual-holding, similarly to the previous section, but we also include $Pre\text{-}PIK\ Amend_{lk,\tau+s}$, a variable which takes a value of one if the loan has experienced an amendment before the first time PIK is used for that loan.[29] While we cannot observe amendments directly, we use instances of maturity extension or a loan becoming non-accrual as proxies of an amendment occurring. This is because becoming non-accrual automatically triggers a renegotiation or an amendment, while a maturity extension also requires an amendment. With $I(Fair/Par_{lk,T} < 0.8)$ as the dependent variable, the sample is further restricted to loans that have already exited the sample since we need this to observe each loan's termination date T. Table 6 shows the results.

Columns (1) and (2) indicate that firms using the PIK option are 27pp more likely to experience delinquency at some point in the future compared to those loans that do not use the PIK option. Focusing then on Column (3), we observe a large and positive coefficient for $PIK\ Toggle_{lk,\tau+n}$ and a large negative coefficient on the interaction term $PIK\ Toggle_{lk,\tau+n} \times PE\ Sponsored_{b\tau}$, which suggests that using PIK toggle is followed by an elevated nonaccrual probability, but more so for non-PE-sponsored firms. This is consistent with the hypothesis that lenders typically require PE sponsors to inject additional equity in exchange for debt amendments that increase debt burden, such as PIKs. With non-sponsored firms, there may not exist similar deep-pocketed financial backers that can do this, which then leads to a higher delinquency probability.[30]

[29] In other words, we require that $\tau + s \leq \tau + n$ and if there is no PIK used at all, but there is an amendment, then this is automatically satisfied.

[30] While we do not observe in our data these PE sponsors' equity injections, prior studies suggest that they are frequently used in distress situations. For example, Hotchkiss et al. (2021) finds that PE owners are more likely to inject new equity into firms in distress situations, while Jang (2024) finds similar evidence from the COVID period and also shows that equity injection clauses are regularly included in

Interestingly the interaction term $PIK\,Toggle_{lk,\tau+n} \times Dual\,holding_{b\tau}$ is positive and not statistically different from zero, contrasting the result shown in Table 5 where *Dual holding* is measured at time t and not at origination τ. These contrasting findings may indicate that the mitigating effect which is presented above in the panel data tests seems to arise from dual-holding measured at the time of PIK use, which can arise e.g., following a post-origination workout and debt-to-equity swap, but not from at-origination-equity-stakes.

Another important finding is that the interaction term $PIK\,Toggle_{lk,\tau+n} \times Pre\text{-}PIK\,Amend_{lk,\tau+s}$ is positive and statistically significantly different from zero, suggesting that PIK toggles that are activated after a loan amendment, rather than before them are associated with a higher probability of experiencing nonaccrual compared to amended loans that do not use PIK afterwards.

Columns (4)-(6) complement these results by instead looking at the outcome that the loan exits the sample with a significant discount. The results are analogous: First, columns (1) and (2) show that using PIK toggle post-origination is followed by a 22-26 pp higher probability that the loan will also exit the sample with a significant discount—a finding which is also statistically significantly different from zero at 1% critical level. Second, these adverse outcomes seem to be somewhat mitigated by the presence of a PE sponsor as the result drops from 36pp for non-sponsored firm to 19pp for sponsored firm. In contrast to nonaccrual results, the coefficient for the interaction term $PIK\,Toggle_{lk,\tau+n} \times Pre\text{-}PIK\,Amend_{lk,\tau+s}$ is still positive but not statistically significant.

5.2.2 Heterogeneity between PIK-Notes and PIK-Toggles

Next, we draw attention to the heterogeneity in loan outcomes between PIK-Notes and PIK-Toggles. As described earlier, firms might use PIK in two different ways, either as a permanent component of interest payment right from the loan origination ("PIK-Note") or switch to PIK at some point before loan maturity ("PIK-Toggle"). In the previous section, we have focused on PIK-Toggles as they are more similar to contingent liquidity provision

the contracts between private debt lenders and private equity sponsors. Haque et al. (2023) also shows that PE sponsors' active engagement— through monitoring and support in distress—reduces lenders' need for monitoring and information production.

through bank credit lines, whereas PIK-Notes are similar to bonds (often subordinated and fixed-rate), and are often designed as a permanent way for borrowers to save cash to finance a strategy of aggressive growth.

A crucial difference between PIK-Notes and PIK-Toggles lies in the timing and informational environment of their use. PIK components in PIK-Notes are exclusively put in place at origination, when lenders can evaluate the borrower's contemporaneous creditworthiness and calibrate loan terms to the observed risk profile. This aligns with recent evidence that private debt funds rely heavily on ex ante screening and sponsor relationships to manage credit risk (Block et al., 2024; Jang, 2024). In contrast, PIK-Toggles are exercised ex-post, typically when borrower quality deteriorates or refinancing options become prohibitively costly.[31] As PIK-Notes are extended under conditions of active risk assessment, we hypothesize that such borrowers are less likely to enter distress. By contrast, toggling into PIK reflects deteriorating fundamentals and is more likely to precede severe loan outcomes

To test this, we construct two variables: $PIK - Note_{lk}$ takes the value of one if a lender has issued a PIK-Note to a borrower at origination (but the borrower has not toggled afterwards); $PIK - Toggle_{lk}$ takes the value of one if the borrower has activated the PIK-Toggle at some point before loan maturity (but did not have a PIK-Note). We estimate equation (3) using OLS cross-sectional regression, while using $Future\,NonAccrual_{lk,\tau+m}$ and $I(Fair/Par_{lk,T} < 0.8)$ as the dependent variables. We include all standard control variables measured at origination using OLS and, as before, restrict the sample period to loan originations that occur between 2012Q2-2021Q4.

Table 7 documents results consistent with this hypothesis. In Panel A, where we focus on the full sample, the point estimate in Column (1)-(3) suggests that firms that use PIK-Toggle have a 19-26pp higher likelihood that a loan becomes non-accrual compared to non-PIK users, while for PIK note users, the difference to non-PIK users is only 6-11pp. PIK toggle users are also 16-21pp more likely to exit the sample with a significant discount

[31] The activation of a toggle therefore resembles the "covenant-lite" dynamic in direct lending, where the absence of binding early-warning triggers shifts recognition of credit stress to later stages (Chernenko et al., 2022).

(Column (4)-(6)) relative to those that do not use PIK, while PIK-Notes these effects vary between 0-4pp and are not significantly different from zero.

In Panel B, we focus on the Post-2017 sample by augmenting the data using Martini-AI firm size and rating fixed effects. Controlling for origination-date firm size and credit ratings allows us to test whether these different outcomes merely reflect ex-ante borrower selection rather than information revelation from ex-post activation. The results confirm that ex-post PIK-toggle activation conveys distinctly negative information about deteriorating borrower prospects beyond what ex-ante screening captures, indicating that PIK-Toggles function primarily as forbearance mechanisms for fundamentally distressed borrowers rather than planned liquidity management tools. In contrast, similar to Panel A, the PIK notes convey only midly more negative information about future loan outcomes compared non-PIK'd loans.

5.2.3 Maturity extensions and debt-to-equity swaps

The evidence thus far indicates that PIK users experience persistent deterioration rather than recovery. A natural question follows: How do lenders ultimately resolve these distressed loans? Specifically, do lenders implement comprehensive restructurings that restore borrower solvency, or do they engage in forbearance by extending maturities to delay loss recognition?

Financial distress can be addressed through two distinct mechanisms. Debt-to-equity swaps reduce the borrower's outstanding debt in exchange for equity stakes, improving leverage ratios and aligning lender-borrower incentives through shared ownership. This approach acknowledges credit losses immediately but positions both parties to benefit from recovery. Alternatively, maturity extensions provide borrowers with additional repayment time without reducing debt obligations. While extensions can be appropriate when borrowers face temporary liquidity constraints, they constitute forbearance when used to avoid recognizing losses on fundamentally insolvent credits, a practice commonly termed "extend-and-pretend."

The institutional features of PIK financing create natural linkages to both mecha-

nisms. On one hand, PIK combined with debt-to-equity swaps could represent legitimate restructuring: lenders defer cash interest to preserve borrower liquidity while injecting fresh equity (or converting debt) to improve solvency. On the other hand, PIK combined with maturity extensions may signal forbearance: lenders capitalize unpaid interest into growing principal balances and extend maturity dates to postpone default recognition, all while maintaining the pretense that debt will be repaid at par.

We test this empirically by examining whether loans experiencing PIK activation are subsequently more likely to receive (1) maturity extensions or (2) debt-to-equity swaps. We construct two outcome variables: *Maturity Extension* equals one if the loan's remaining maturity increases quarter-over-quarter, and *Debt-to-Equity Swap* equals one if a BDC's debt claim on a borrower decreases while simultaneously its equity stake increases. We then study if either of those events have happened after loan origination (at some date $\tau + m$) by using an indicator that flags such event as our dependent varibale $y_{lk,\tau+m}$. We run the following OLS regression:

$$y_{lk,\tau+m} = \beta_1 \, PIK\,Toggle_{lk,\tau+n} + \beta_2 \, PIK\,Note_{lk,\tau} + Controls + FEs + e_{lk,\tau}$$

and report the results in Table 8.

Loans activated with PIK Toggles are 27–30pp more likely to receive maturity extensions compared to non-PIK loans (Columns (1) to (3)), whereas PIK Notes show no significant association with maturity extensions and even a statistically significant negative relationship in Column (2). This finding is striking because it reveals a fundamental structural difference: discretionary PIK provisions (Toggles) predict forbearance-style maturity extensions, while predetermined PIK provisions (Notes) do not.

Columns (4)–(6) reveal a secondary but less pronounced response: PIK Toggle activation associates with a 8–11pp increase in debt-to-equity swaps. PIK Notes again show the opposite pattern, with a lower likelihood of debt-to-equity conversions in the baseline specifications (Columns (4) to (5)), though this effect attenuates with the addition of borrower and BDC-year-quarter fixed effects (Column (6)).

The differential magnitudes are economically significant and important. The point estimate for maturity extensions (27–30pp) exceeds that for debt-to-equity swaps (8–11pp) by a factor of 3, indicating that maturity extensions are the dominant resolution mechanism when PIK Toggles are exercised. While both outcomes occur with elevated frequency, the even higher likelihood of maturity extensions strongly supports the forbearance hypothesis: discretionary PIK largely enables lenders to postpone recognition of credit losses through repeated maturity deferrals rather than to facilitate fundamental restructurings that recapitalize distressed borrowers. This pattern is inconsistent with PIK functioning as efficient bridge financing for temporarily distressed, viable firms. Instead, it aligns with zombie lending dynamics wherein lenders extend obligations to avoid recognizing losses on inherently insolvent loans.[32]

6 PIK usage and BDCs' funding and investment

PIK provisions create a distinctive institutional friction for BDCs themselves: interest income must be recognized for tax purposes even though no cash is received. This creates a critical funding challenge. Given Registered Investment Company (RIC) requirements mandating distribution of at least 90% of net investment income as dividends, a BDC with high interest deferrals must fund distributions to shareholders from existing liquidity reserves, draw down bank credit lines, issue bonds, liquidate portfolio positions, and reduce lending, or reduce dividend payments.

How the BDCs' financiers view PIK usage has direct implications for how these flexibility provisions get financed. If banks see BDCs' PIK offering as an efficient liquidity provision tool, then we would expect them to promote it by offering credit lines to PIK-heavy BDCs. Conversely, if banks contractually restrict their exposure through PIK covenants, the financing pressure manifests instead as reduced asset growth and constrained credit

[32]In the Online Appendix, we support these results using survival analysis and a hazard model, which reveals that using PIK in the previous period lowers the probability of a loan exiting the sample, consistent with the view that PIK is often coupled with maturity extensions that prolong the holding period of distressed firms.

supply to borrowers.

We investigate this mechanism empirically by examining three central questions: (1) Do BDCs with high PIK usage increase their reliance on bank credit lines, or do bank covenants contractually limit such reliance? (2) What contractual protections do banks employ to insulate themselves from PIK-driven financing pressure? And, (3) when banks constrain credit access to high-PIK BDCs, how do these constraints manifest in BDC balance sheet decisions—reduced asset growth, reduced lending, dividend cuts, or increased bond issuance?

6.1 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 et al. (2013), we exclude BDC-quarter observations for which total debt reported in BDC Collateral deviates by more than 10% from the total debt reported in CapitalIQ. This process yields a matched sample of 66 unique BDCs, for which we obtain detailed quarterly data on drawn and undrawn credit lines, term loans, bonds, and commercial paper issuances from 2012Q1 through 2024Q4.

BDC capital structure. Panel A of Figure 5 shows the composition of the aggregate BDC sector's balance sheet as of the fourth quarter of 2022, providing insights into both asset holdings and funding sources.[33] 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. Regarding liabilities and equity, nearly half (46%) of the BDCs' funding comes from shareholder equity, suggesting a relatively robust capital cushion. Other debt—such as bonds, and sim-

[33]This excludes the BDCs that do not report the detailed funding mix.

ilar 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 through undrawn bank credit lines (12%), ensuring capacity for future investments and flexibility in managing 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.

Panel B illustrates the evolution of the funding mix for a typical BDC's balance sheet (expressed as a percentage of total assets) from 2012Q1 through 2024Q4, highlighting notable trends, such as a decline in equity funding replaced by bank and nonbank debt financing.

Bank Lending to BDCs. Figure 6 illustrates trends in bank lending to Business Development Companies (BDCs) from 2013Q1 to 2024Q3. Panel A presents the evolution of outstanding bank debt, decomposed into *Committed Credit Lines*, *Drawn Credit Lines*, and *Bank Loans*. The data show a steady increase in total committed credit over the sample period, with pronounced growth beginning around 2018 and peaking in 2023 at over USD 60 billion. Drawn credit lines and bank loans followed similar upward trends, though with greater cyclicality and a recent moderation in 2024.

Panel B depicts the share of bank debt relative to total BDC debt and the utilization rate of credit lines. Bank debt share fluctuated between 0.35 and 0.55, peaking during mid-cycle expansions and declining sharply in 2020–2021. Credit line usage exhibited similar cyclical variation, with high utilization preceding declines in bank debt share. We also point out how the decline in bank loan and credit line usage coincided with an increase in PIK usage in 2020-2021, documented in Figure 1 in Section 3.

6.2 Deferred interest and BDC financing choices

As documented above, BDCs rely more on credit lines 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, and bank debt overall as a share of total debt funding, or whether collateral restrictions and covenants imposed by banks effectively limit such reliance.

We investigate these questions using the following OLS model:

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

where the dependent variable $y_{l,t}$ is either *Bank Debt Share* or *Credit Line Usage*. If higher PIK usage leads BDC to draw down more of its bank credit line and rely more on bank debt (rather than other forms such as bonds), we would expect β_1 to be positive. Conversely, if greater PIK usage reduces reliance on bank debt and increases use of alternative funding sources, we would expect β_1 to be negative. In either case studying the contemporanous correlation is appropriate but we check that results would be similar if we lagged PIK usage by one period. We start by showing the unconditional relationship between bank debt reliance and PIK usage, but then add one-period lagged covariates that include each BDC's time-varying characteristics, such as log fund size, leverage, cash share, profitability, and log fund age and $YearQtr$ fixed effects that control for aggregate changes in BDCs' bank debt reliance, and BDC fixed effects that control for unobservable (and time-invariant) BDC specific factors that could influence the fund's appetite for bank debt such as manager preferences and risk aversion.

Table 9 shows the results. Results, which evaluate the relationship between PIK usage and the share of bank debt in total debt, are presented in columns (1) to (3), and those that address credit line utilization are presented in columns (4) to (6). We observe a statistically significant, and economically substantial, negative association between PIK usage and both the bank debt share and credit line usage. Specifically, the most conservative specifications in columns (3) and (6) indicate that a one percentage point increase in PIK usage leads

to a 0.52 percentage point reduction in the proportion of bank debt and a 0.38 percentage point decrease in credit line utilization, both significant at the 1% threshold.

These results indicate that BDCs do not utilize bank-provided credit lines to finance PIK private credit structures. Instead, the evidence suggests that a greater reliance on PIK features serves as an indicator of heightened credit risk, leading to reduced access to bank financing and credit line drawdowns. The observed decrease in bank debt share suggests that banks are unwilling to extend credit to BDCs that use these funds to compensate for their lossed cash flow due to deferred interest. Likewise, the significant negative correlation with credit line usage indicates that BDCs with greater reliance on PIK face tighter constraints on accessing bank credit facilities when PIK is employed.

To assess this mechanism, we systematically analyze the contract terms of bank-provided credit lines to BDCs as disclosed in SEC regulatory filings. Our approach involves identifying all relevant 8-K and 8-K/A documents pertaining to bank financing and closely reviewing sections that address PIK provisions. While we allocate the details of this data collection exercise to the Online Appendix along with an example that highlights such a restriction, our review reveals that banks almost universally impose explicit limits on permissible PIK exposure, directly tying these constraints to the amount a BDC may borrow.[34] The underlying reason is that BDC investment portfolios, or discrete portions thereof, often designated as the "borrowing base", serve as collateral for bank debt. Since this collateral coverage must scale with the magnitude of outstanding borrowings, an elevated PIK usage share can restrict further bank borrowing or trigger a requirement to repay existing debt. Thus the negative relationship that we document between bank debt reliance and PIK usage seems to mechanically driven by these contractual terms.

In summary, while BDCs receive substantial bank credit lines and exhibit higher utilization rates relative to other nonbank financial intermediaries, these contractual protections and borrowing base mechanics effectively insulate the banking sector from the risks associated with increased deferred interest payments.

[34]For the subset of BDCs with credit line outstanding, we find language restricting PIK appears in over 90% of credit line agreements. 90% is a lower bound since there may be language that refers to PIK, but which we fail to identify with our web crawler.

6.3 Deferred interest and BDC balance sheet and payout choices

In Table 10, we expand our analysis to future changes in leverage ratio (columns (1) to (2)), and cash holdings (columns (3) to (4)), log change in asset growth (columns (5) to (6)) and log change in paid dividends (columns (7) to (8)). The asset growth is based on the cost value of asset, because we want to abstract from asset level changes that are due to valuation chagnes, but using the fair value of assets would generate very similar results. The one-quarter lagged *PIK usage share* is again our key explanatory variable. We also include the same controls as in Table 9 and $YearQtr$ fixed effects. We show all the results without and with BDC fixed effects, because in the former case the coefficient reflects differences between BDCs (high-PIK BDCs vs low-PIK BDCs) plus within-BDC variation, whereas with the latter it reflects only variation within the same BDC over time, that is how outcomes change when that BDC's PIK share rises relative to its own average.

Columns (1)-(2) show that we do not find evidence that lower cash flows from high PIK usage are financed with BDCs tilting toward more leveraged capital structure. Quite the contrary, the estimate in column (2) suggests that BDCs lower their leverage ratio in the next period following high PIK usage. In columns (3) and (4), we also show that their cash share relative to total assets does not change following changes in the level of PIK usage.

In contrast, the findings in columns 5 and 6 reveal a statistically significant and negative association between PIK usage and asset growth. A one percentage point increase in PIK usage is associated with approximately 0.09 percentage point reduction in asset growth, at the 1% significance 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, there is some evidence that PIK usage is negatively associated with dividend growth. In the baseline specification (column 7), a one percentage point increase in PIK usage is linked to approximately 0.06 percentage point reduction in dividend growth, significant at the 5% level. However, when BDC fixed effects are included (column 8),

the coefficient becomes smaller (-0.02) 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 different approaches to payout policies.

To examine whether current reliance on payment-in-kind (PIK) financing predicts changes in subsequent credit exposure, we estimate similar BDC-quarter panel regressions where the dependent variable is log of total credit, the log of credit currently paying in kind, or the log of non-PIK credit for BDC l in quarter $t+1$. We keep the $PIK\ usage\ share_{l,t}$, as the key explanatory variable and include teh same controls as above.

Table 11 shows a clear composition effect. In columns (1) and (2), the coefficient on $PIK\ usage\ share_{l,t}$ is economically small and statistically insignificant, indicating little evidence that greater use of PIK is associated with more lending going forward. By contrast, the association with the future PIK book is large and precisely estimated: the coefficient is 4.3 in column (3) and 3.9 in column (4), both significant at the 1% level. Interpreted as a semi-elasticity, a 10 percentage-point increase in current PIK usage share is associated with roughly 0.39–0.43 log points higher PIK credit in the next quarter, equivalent to about 48–54% higher PIK par value. The opposite pattern appears for non-PIK credit. In columns (5) and (6), the coefficient on PIK usage share is negative and highly significant, ranging from -1.24 to -1.69. A 10 percentage-point increase in PIK usage share is therefore associated with approximately 12–16% lower non-PIK credit in the subsequent quarter. Taken together, these estimates suggest that heavier current use of PIK is linked to a reallocation of the portfolio toward PIK-paying positions and away from cash-paying loans.

7 Conclusion

PIK provisions in private credit function as contract-embedded forbearance mechanisms. Borrowers exercise PIK toggles when credit quality deteriorates, not to bridge temporary liquidity shortfalls. Toggle activation predicts persistent nonaccrual rates, sustained fair

value declines, and resolution overwhelmingly through maturity extensions (27–30 percentage points higher) rather than formal debt-to-equity restructuring (8–11 percentage points) – patterns that persist for at least eight quarters. The gap between PIK-Toggles and PIK-Notes is the sharpest evidence: ex-post toggle exercise predicts 19–26 percentage points higher nonaccrual probability versus 4–11 percentage points for notes structured at origination. Controlling for origination-date credit ratings and firm size confirms that this gap reflects information revelation from deteriorating borrower prospects, not ex-ante selection. PIK in private credit operates through the same economic logic as zombie lending and extend-and-pretend behavior in banking – but the mechanism is contractual optionality, not lender capital constraints.

The transmission of PIK-related risk follows a specific chain. Deferred interest must be recognized as taxable income under RIC requirements, compelling BDCs to distribute dividends despite receiving no corresponding cash inflows. This mismatch creates liquidity pressure that would naturally increase demand for bank credit lines. Yet bank credit agreements almost universally restrict PIK collateral eligibility: BDCs with higher PIK usage reduce bank borrowing and credit line utilization, not because they choose to, but because covenant structures force the adjustment. Banks have insulated themselves. The consequence is that PIK-induced financing constraints do not transmit to the banking sector but instead manifest as reduced BDC asset growth and contracted credit supply to middle-market firms – the borrowers least able to access alternative funding.

This mechanism carries a direct implication for financial regulation. The zombie lending literature suggests a capital regulation remedy: raise intermediary capital requirements to reduce forbearance incentives. Our findings show that forbearance can arise from contract design independent of the lender's capital position. BDCs are not undercapitalized when they offer PIK – they are exercising flexibility embedded in the loan terms. Strengthening BDC capital requirements alone would not prevent PIK-based forbearance; it may even reinforce it by raising the cost of formal write-downs relative to continued deferral. A more effective supervisory approach would monitor PIK prevalence and toggle activation rates as leading indicators of portfolio deterioration – signals that are observable in BDC

filings and that precede the nonaccrual and fair value declines we identify. The NBFI regulatory framework should treat contractual forbearance provisions as a distinct source of hidden credit risk, separate from and additional to balance-sheet leverage.

BDCs are the most transparent segment of private credit: they file quarterly with the SEC and mark portfolios to fair value. The forbearance patterns we identify are visible precisely because of this disclosure regime. The same contractual mechanisms – PIK toggles, maturity extensions, deferred loss recognition – operate across the broader private credit market, where reporting requirements are weaker and portfolio-level data are unavailable. The scale of hidden credit losses in those segments remains unknown, but the economic forces that generate them are the same ones we identify here.

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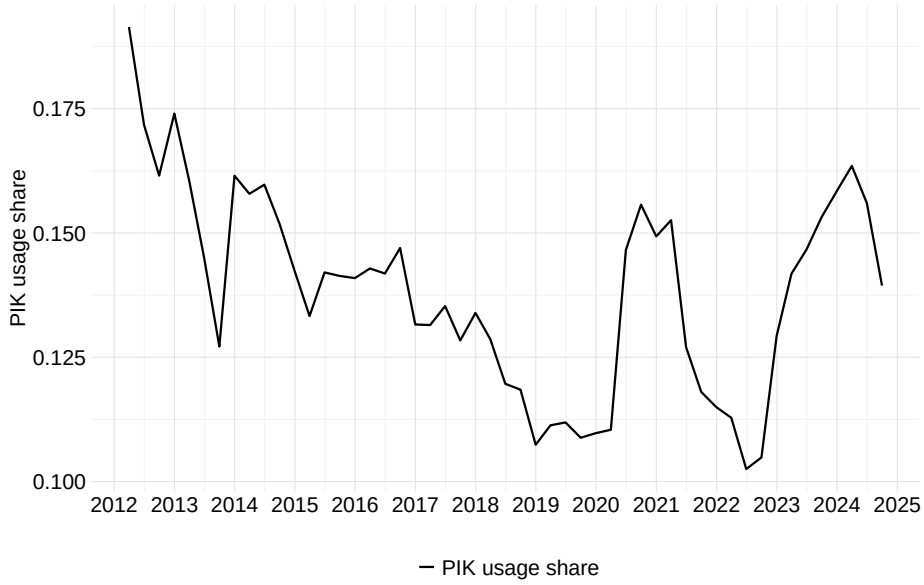
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Figure 1: PIK usage across the financial cycle

Figure shows the time-series of the PIK usage share across all BDCs' portfolio loans over the 2012Q1 to 2024Q3 period.PIK usage share is the value-weighted number of loans in which borrowers use PIK, relative to all loans in a given quarter. Panel B shows the equal-weighted average PIK spread among loans that use PIK.

Panel A - PIK usage share



Panel B - Average PIK spread among active PIK loans

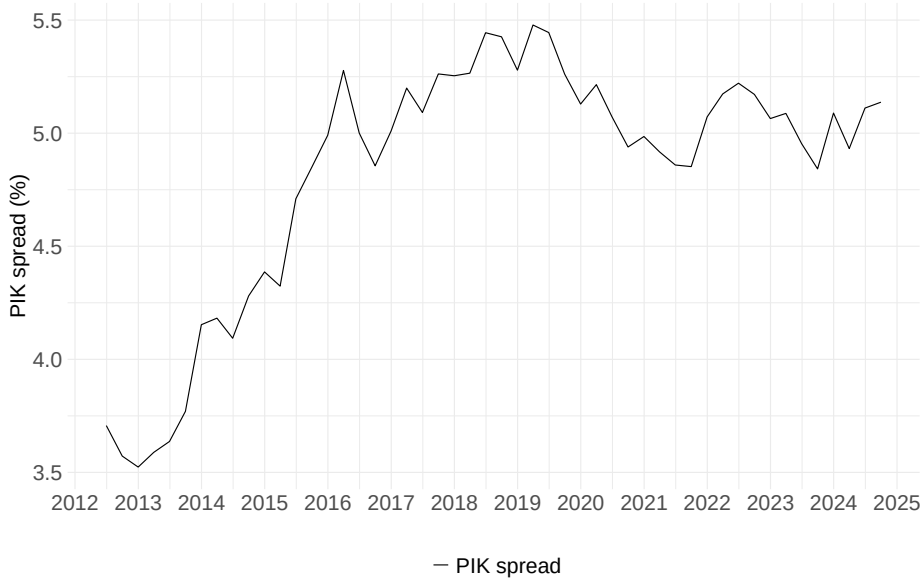
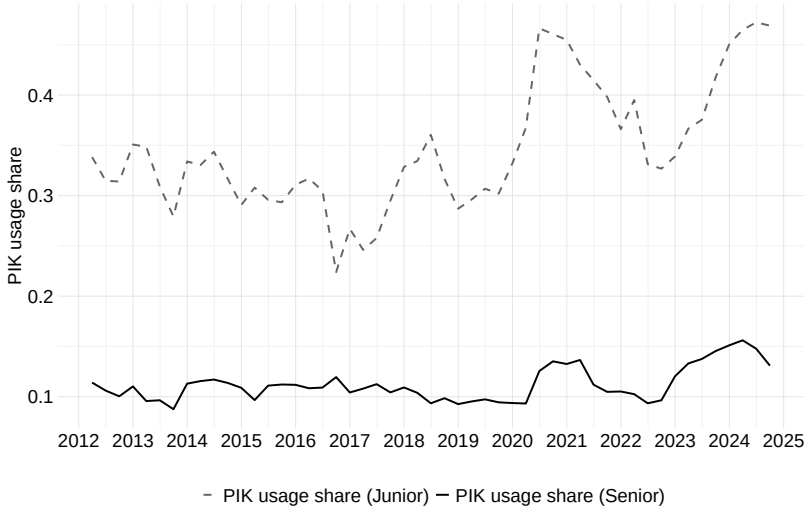


Figure 2: Heterogeneity in PIK users

Panel A decomposes the PIK usage share to senior loans, which include First Lien and Second Lien Senior Secured loans, and junior loans, which include Subordinated Debt across all BDCs' portfolio loans during the 2012Q1 to 2024Q3 period. PIK usage share is the value-weighted number of loans where borrowers use the PIK relative to all loans in a given quarter. Panel B shows the time series of the PIK usage share decomposed to loans of those borrowers who have received a bank loan within the preceding 5 years (solid line) and those who have not (dashed line). Panel C shows the PIK usage share for PIK Notes and PIK Toggle, respectively. PIK usage share for PIK toggles is the value-weighted number of loans in which borrowers use the PIK option, relative to all loans in a given quarter, while excluding PIK notes, while PIK usage share for PIK notes is the value-weighted number of loans in which borrowers use the PIK, relative to all loans in a given quarter, while excluding PIK toggles.

Panel A - PIK usage share based on loan seniority



Panel B - PIK usage among different types of borrowers

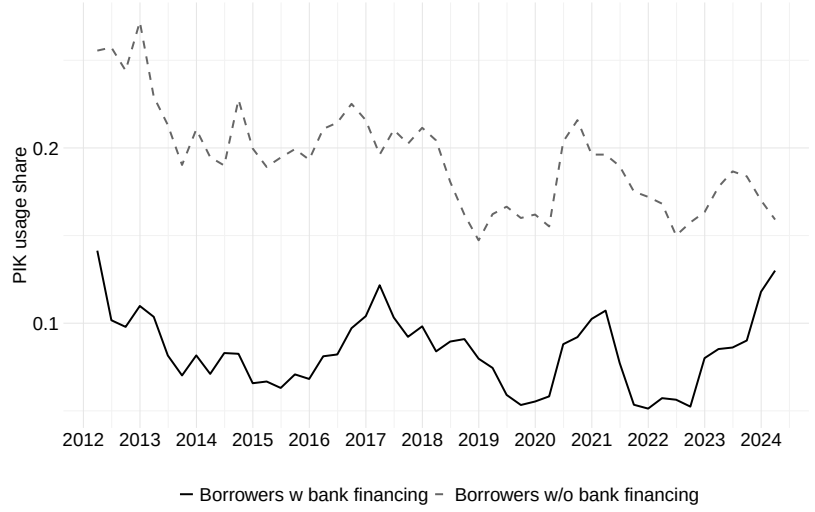


Figure 2: Heterogeneity in PIK users (continued)

Panel C - PIK usage share among PIK Notes and PIK Toggles

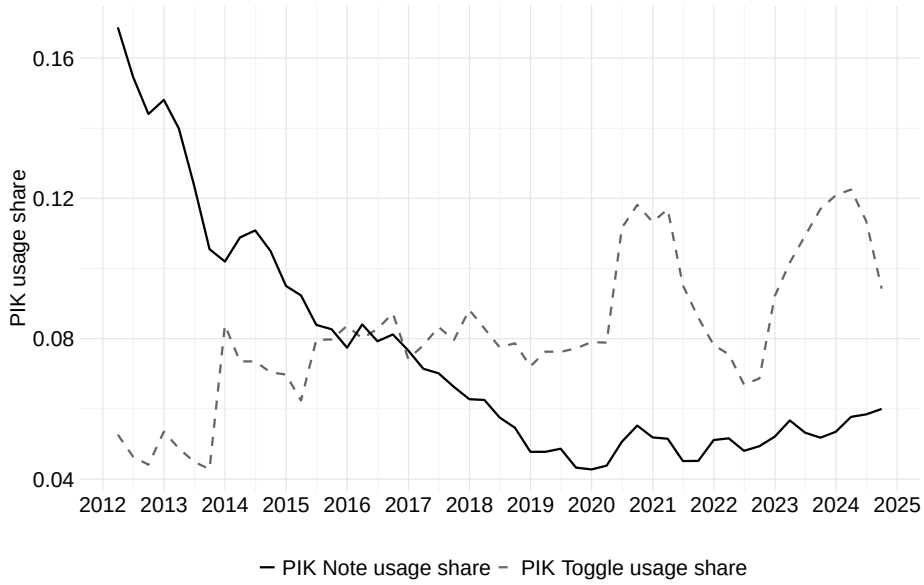


Figure 3: Impulse response functions

The figure plots the impulse response functions based on the following local-projection regression

$$y_{lk,t+h} = \beta_h PIK_{lkt} + \sum_{j=0}^{4} \gamma_{hj}\, y_{lk,t-j} + Controls + FixedEffects + e_{lk,t+h}$$

where h runs from 1 to 8 and $y_{lk,t+h}$ is either $NonAccrual$, $Fair/Par$ or $CSD(Fair/Par)$ at time $t+h$ for loan k of borrower b held by lender l. PIK_{lkt} is an indicator variable that equals one if the PIK toggle is used for loan k in time t. We include the following fixed effects: $YearQtr \times Industry + YearQtr \times BDC + Borrower \times BDC + Seniority + LoanType$. In addition to the five lagged dependent variables, we include the following controls $Ln(Loan\,Size)$ $Effective\,Base\,rate$, $Fixed\,rate\,loan$, $Ln(Time\text{-}to\text{-}Maturity)$, $Dual\,holding$, $PE\,Sponsored$, $Bank\,financing$ with all measured at time t and *All-in-spread* measured at the origination date τ. The y-axis shows the level of the β_h coefficient, while the x-axis denotes the horizon h. The blue line represents the mean estimates, while the shaded area illustrates the 95% confidence intervals based on three-way clustered standard errors by BDC, Borrower, and year-quarter.

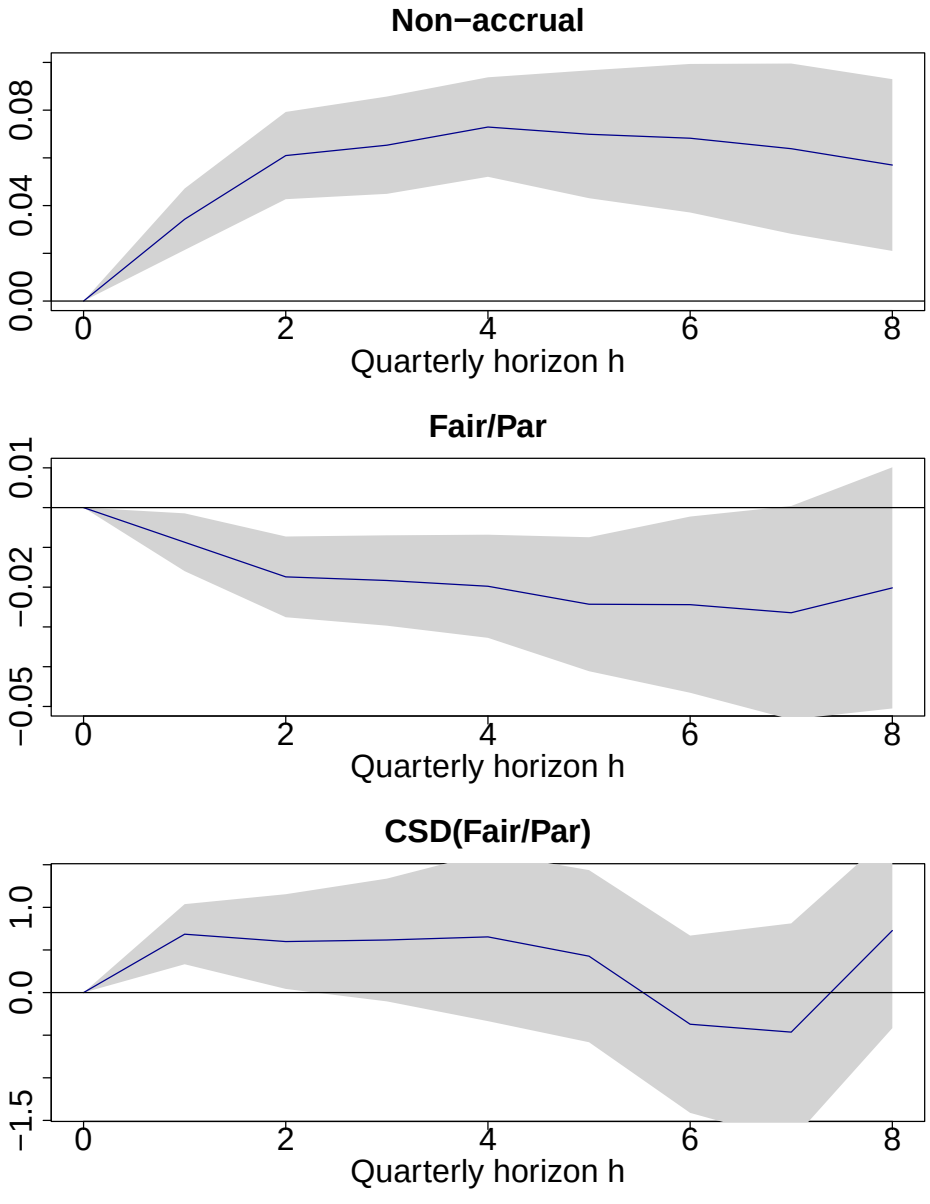
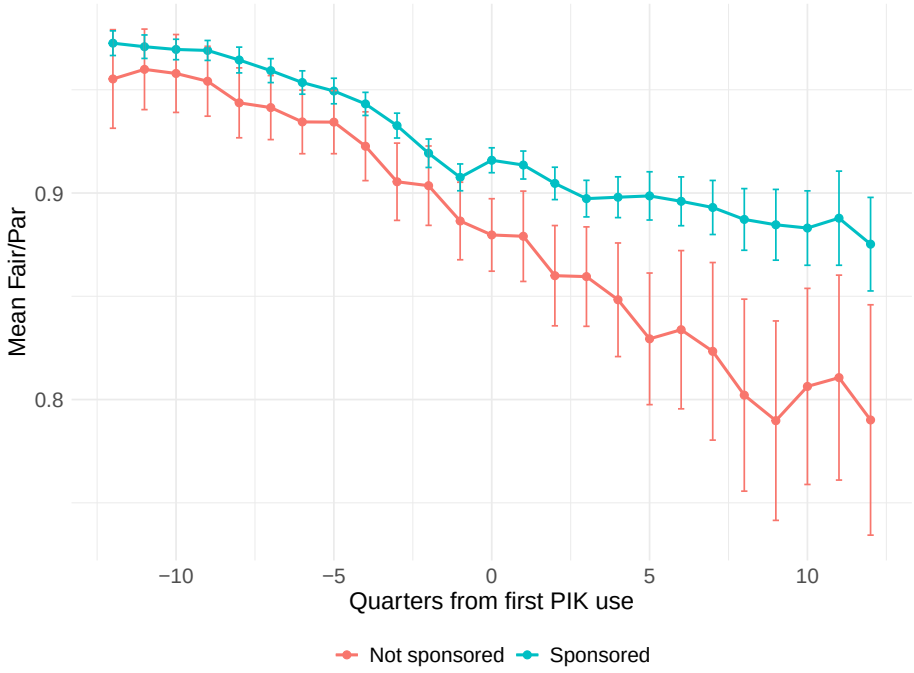


Figure 4: PE Sponsors and PIK use

Panel A - Average Fair/Par-ratio around first time of PIK use



Panel B - NonAccrual rate around first time of PIK use

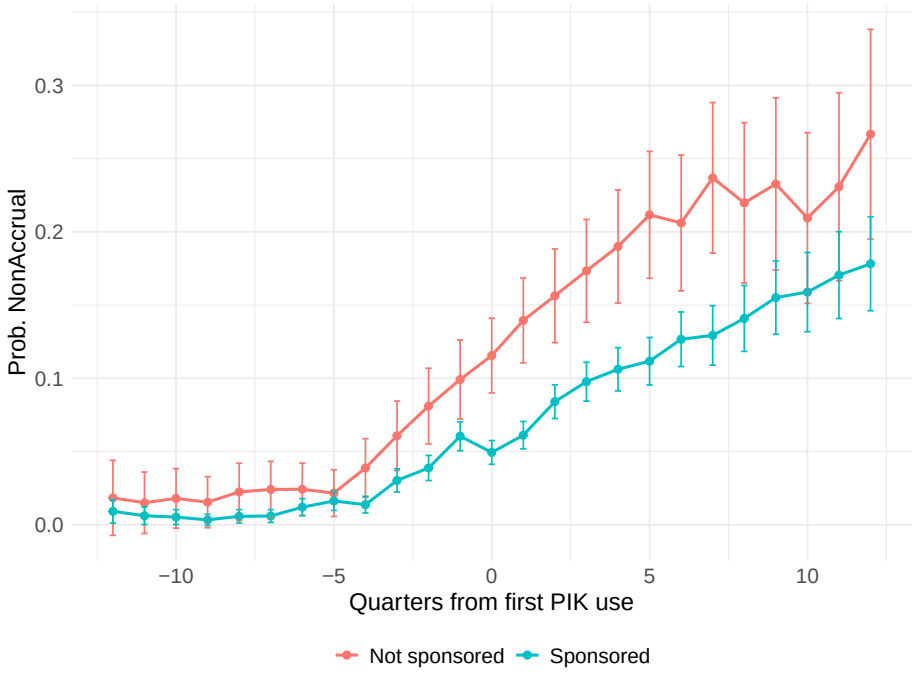
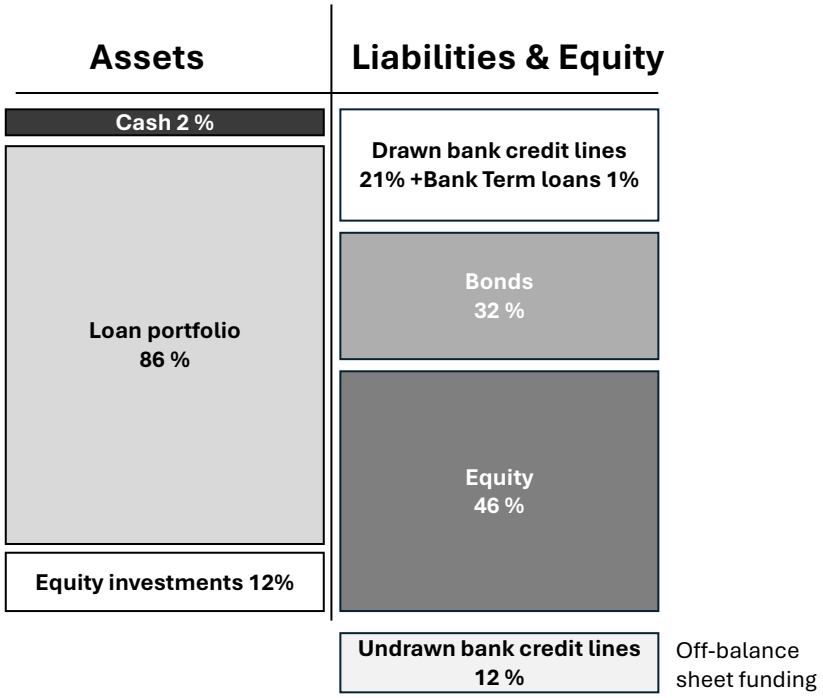


Figure 5: BDC capital structure

Panel A shows the aggregated BDC sector's balance sheet components (all relative to total assets) as of 2022Q4 for a subset of BDCs with all balance sheet data available. Panel B shows the average share of different debt structure items relative to total assets across all BDCs' balance sheets over the 2012Q1 to 2024Q3 period.

Panel B - Balance sheet of the BDC sector in 2022Q4



Panel B - BDC debt capital structure

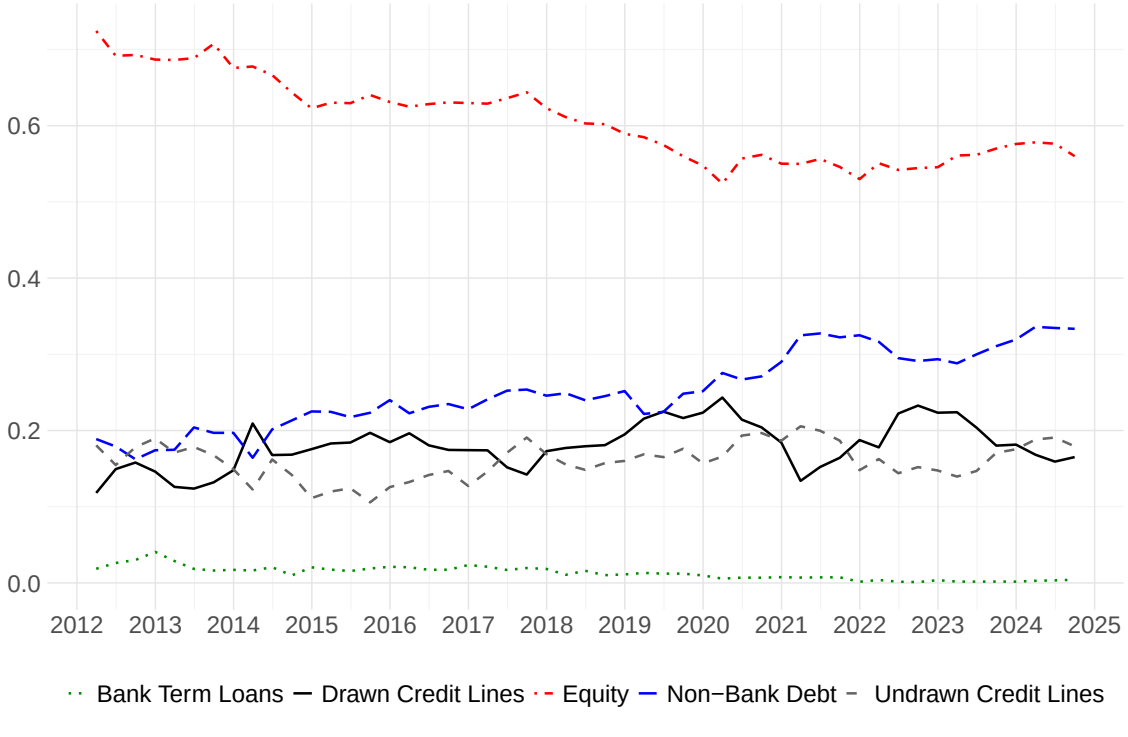
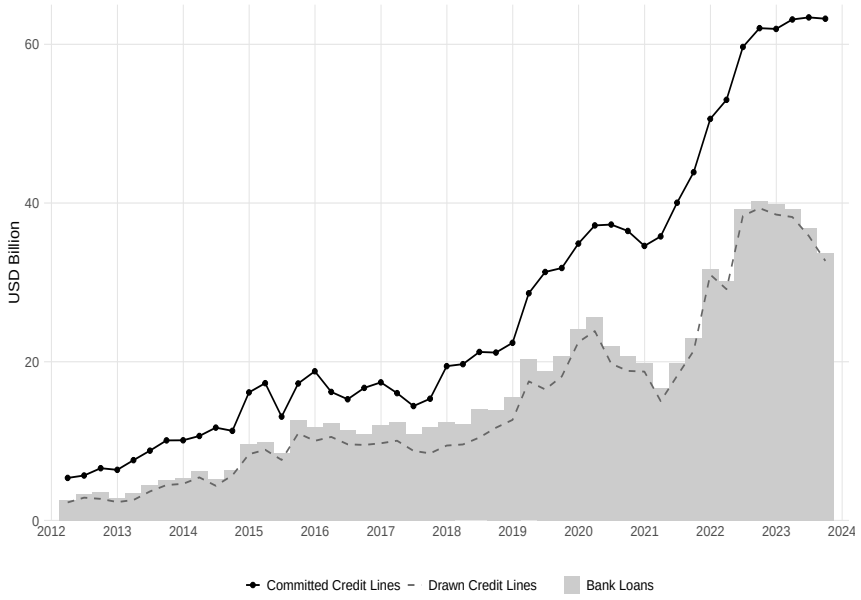


Figure 6: Bank lending to BDCs

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

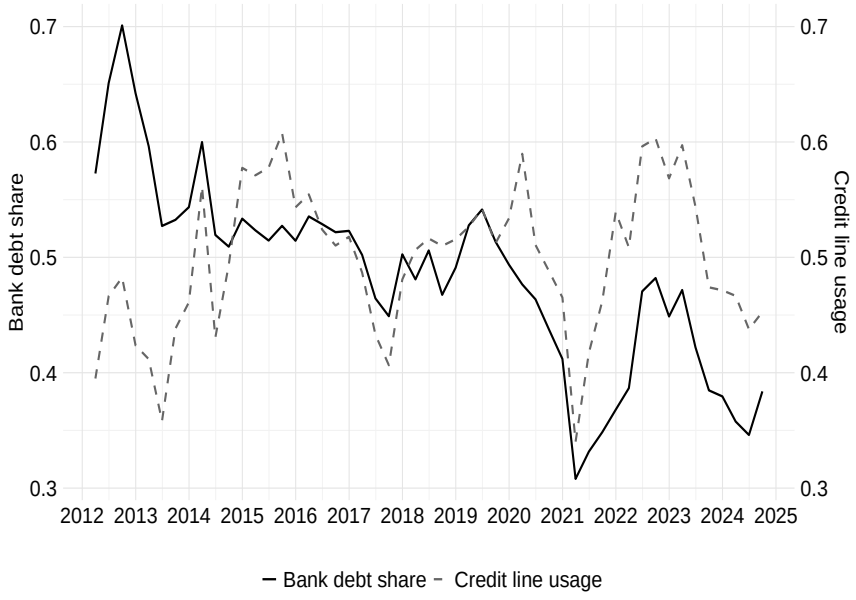


Table 1: Use of Deferred Interest (PIK) in Private Debt

This table shows an example of loan reporting in BDC Collateral in the form of First Lien Senior Secured Term Loan to Dynamic Energy Services International from Sierra Income Corporation.

YearQtr	All-in-yield	Base rate	Effect. Base	Cash Spread	PIK Spread	PIK	Par	Fair/Par	NonAccrual	Months-to-Maturity
201401	9.5 %	0.6 %	1 %	8.5 %	0 %	0	10.00	1.00	0	48
201402	9.5 %	0.2 %	1 %	8.5 %	0 %	0	9.90	1.00	0	45
201403	9.5 %	0.2 %	1 %	8.5 %	0 %	0	9.80	1.00	0	42
201404	9.5 %	0.2 %	1 %	8.5 %	0 %	0	9.60	0.97	0	39
201501	9.5 %	0.2 %	1 %	8.5 %	0 %	0	9.50	0.98	0	36
201502	9.5 %	0.2 %	1 %	8.5 %	0 %	0	9.40	0.99	0	33
201503	9.5 %	0.2 %	1 %	8.5 %	0 %	0	9.20	0.97	0	30
201504	9.5 %	0.9 %	1 %	8.5 %	0 %	0	9.10	0.97	0	27
201601	9.5 %	0.9 %	1 %	8.5 %	0 %	0	9.00	1.00	0	24
201602	11 %	0.5 %	1 %	8.5 %	1.5 %	1	8.50	0.96	0	20
201603	9.5 %	0.5 %	1 %	8.5 %	0 %	0	8.40	0.83	0	17
201604	14.3 %	0.8 %	0.8 %	0 %	13.5 %	1	8.70	0.85	0	14
201701	14.5 %	1 %	1 %	0 %	13.5 %	1	9.00	0.85	0	11
201702	14.7 %	1.2 %	1.2 %	0 %	13.5 %	1	9.30	0.85	0	11
201703	14.7 %	1.2 %	1.2 %	0 %	13.5 %	1	9.60	0.85	0	8
201704	15.1 %	1.6 %	1.6 %	0 %	13.5 %	1	9.90	0.85	0	5
201801	15.4 %	1.9 %	1.9 %	0 %	13.5 %	1	10.30	0.61	1	13
201802	15.8 %	2.3 %	2.3 %	0 %	13.5 %	1	10.60	0.30	1	10
201803	15.9 %	2.4 %	2.4 %	0 %	13.5 %	1	11.00	0.29	1	7
201804	11.3 %	2.7 %	2.7 %	0.3 %	8.5 %	1	11.70	0.13	1	4
201901	13.5 %	0 %	0 %	0 %	13.5 %	1	5.50	0.11	1	34
201902	13.5 %	0 %	0 %	0 %	13.5 %	1	5.60	0.11	1	31
201903	13.5 %	0 %	0 %	0 %	13.5 %	1	5.90	0.11	1	27
201904	13.5 %	0 %	0 %	0 %	13.5 %	1	6.10	0.11	1	24
202001	13.5 %	0 %	0 %	0 %	13.5 %	1	6.30	0.07	1	21
202002	13.5 %	0 %	0 %	0 %	13.5 %	1	6.60	0.07	1	18
202003	13.5 %	0 %	0 %	0 %	13.5 %	1	6.80	0.07	1	15
202004	13.5 %	0 %	0 %	0 %	13.5 %	1	7.00	0.07	1	12
202101	13.5 %	0 %	0 %	0 %	13.5 %	1	7.30	0.07	1	9
202102	13.5 %	0 %	0 %	0 %	13.5 %	1	7.50	0.00	1	6
202103	13.5 %	0 %	0 %	0 %	13.5 %	1	7.40	0.00	1	3

Table 2: Descriptive statistics

This table shows descriptive statistics for loan-level variables. Detailed variable definitions are provided in Appendix A. For Panel A the sample period is from 2012Q1 to 2024Q4. All statistics are based on all available loan observation, except $PIK\ spread$, which is calculated from observations where PIK spread is above zero. Panel B shows the share of loans with a given loan characteristic at origination for "*PIK-notes*", "*PIK-toggle*" loans, and loans with "*No PIK used*". The origination date is defined as the first date on which the loan enters the sample. *PIK-notes* are defined as loans with deferred interest payments over the entire duration of the loan. *PIK-toggle* loans are loans for which borrowers do not defer interest in every period but only in some periods. *Non PIK'd loans*" refers to loans that never use PIK. For Panel B, all variables are measured at origination, except $Avg\ Cash\ Spread\ share$, $Avg\ PIK\ Spread\ share$, $Maturity\ extension$, $Share\ of\ time\ using PIK$, which are measured based on the loan's subsequent lifetime, and $I(Fair/Par < 80\%)\ (at\ termin.)$, which is measured at loan termination date, and $Future\ NonAccrual$ that is calculated from the post-origination sample. Panel B sample excludes loans that appear in the sample for less than 4 periods, loans that originate after 2021Q4, or before 2012Q2, loans that have $Fair/Par < 0.97$ or have nonaccrual status at the implied origination date, and loans that cannot be matched to Pitchbook. Column "Diff No-Toggle" ("Diff No-Note") calculates the pairwise mean-difference and associated Welch standard errors in the parentheses between loans with no PIK used and PIK toggles (respectively with no PIK used and PIK-notes).

Panel A: Loan-level panel data

Statistic	N	Mean	St. Dev.	Q1	Median	Q3
PIK	382,239	0.10	0.30	0	0	0
All-in-yield (%)	382,239	9.53	2.81	7.68	9.75	11.30
PIK spread (%)	37,734	4.95	4.23	2.00	3.38	7.09
Cash spread (%)	382,239	6.46	2.62	5.00	6.00	7.75
Fixed rate loan	382,239	0.17	0.37	0	0	0
Non-accrual loan	382,239	0.03	0.16	0	0	0
Fair value ($ million)	382,239	16.01	38.81	2.18	6.68	16.49
Par value ($ million)	382,239	16.67	39.54	2.44	7.02	17.31
Fair/Par	382,049	0.95	0.15	0.97	0.99	1.00
Time to maturity (Months)	382,239	49.84	22.43	35.00	51.00	65.00
Dual holding	382,239	0.19	0.39	0	0	0
PE Sponsored	308,737	0.81	0.39	1	1	1
PIK Toggle loan	382,239	0.15	0.36	0	0	0
PIK Note loan	382,239	0.04	0.19	0	0	0
Bank financing	197,311	0.49	0.50	0	0	1
Number of BDC-lenders	382,239	4.07	4.75	1	2	5

Panel B: PIK type differences

Variable	No PIK used	PIK-toggle	PIK-note	Diff No-Toggle	Diff No-Note
Observations	8730	1196	413		
First Lien Senior Secured (%)	80.3	85.8	51.1	-5.5 (1.1)	29.2 (2.5)
Fixed rate (%)	13.6	19.9	67.6	-6.3 (1.2)	-54.0 (2.3)
Par value ($ million)	14.43	19.52	18.44	-5.09 (1.28)	-4.01 (2.31)
Time-to-maturity (Months)	67.25	61.48	57.34	5.77 (0.54)	9.91 (1.03)
All-in-yield (%)	7.8	8.9	11.9	-1.1 (0.1)	-4.2 (0.2)
Avg Cash Spread share (%)	78.9	64.8	54.3	14.2 (0.6)	24.6 (1.6)
Avg PIK Spread share (%)	0.0	16.1	37.4	-16.1 (0.5)	-37.4 (1.6)
Number of BDCs	3.04	3.06	1.98	-0.02 (0.09)	1.06 (0.09)
Bank financing (%)	55.5	39.7	28.3	15.8 (1.5)	27.2 (2.3)
PE Sponsored (%)	87.6	88.5	76.3	-0.8 (1.0)	11.3 (2.1)
Dual Holding (%)	15.2	28.2	56.2	-13.0 (1.4)	-41.0 (2.5)
I(Fair/Par<80%) (at termin.) (%)	5.3	25.2	12.6	-20.0 (1.8)	-7.3 (1.9)
Future nonaccrual (%)	3.0	26.2	11.4	-23.1 (1.3)	-8.3 (1.6)
Maturity extension (%)	26.4	57.2	26.9	-30.8 (1.5)	-0.4 (2.2)
Share of time using PIK (%)	0.0	41.6	100.0	-41.6 (0.8)	-100.0 (0.0)

Table 3: Determinants of PIK usage

This table shows the results from OLS regression of PIK use on various loan characteristics. The sample period is 2012Q1-2024Q1. PIK_{lkt} is an indicator variable that takes the value of one if the loan k from lender l to borrower b is reported to be paid in kind for period t. The sample excludes PIK Notes. $NonAccrual_{lkt}$ is an indicator variable that takes a value of one if the loan is reported as non-accrual for period t. $Ln(Time\text{-}to\text{-}Maturity_{lkt})$ is the natural logarithm of the remaining time to maturity. $I(Fair/Par_{lkt} < 0.8)$ is an indicator variable that takes a value of one if the loan's fair/par ratio is below 0.8, and zero otherwise. $Ln(Loan\,Size_{lkt})$ is the natural logarithm of the par value of the loan amount. $Fixed\,rate\,loan_{lkt}$ is an indicator variable that takes the value of one if the loan has a fixed interest rate at time t and zero otherwise. $Effec.\,Base\,rate_{lkt}$ is the maximum value between the loan k's base rate and the interest rate floor (if one exists) at time t and zero if the loan has no base rate. $All\text{-}in\text{-}spread_{lk\tau}$ is the all-in-spread at time of the origination τ. $Dual\,holding_{blt}$ is an indicator variable that takes the value of one if the BDC l also has an equity stake in the borrowing firm b. $PE\,Sponsored_{bt}$ is a dummy variable that takes a value if the borrower is private equity sponsored in period t and zero otherwise. $Bank\,financing_{bt}$ is an indicator variable that takes the value of one if the borrower has received a bank loan during the preceding five years. We exclude the intercept term from the results whenever the model has one. The last column restricts the sample to firms with multiple loans outstanding in that 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. *Industry* refers to the industry 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, borrower, and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variable:	$PIK_{lk,t+1}$							
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Distress								
NonAccrual$_{lkt}$	0.28***	0.19***	0.19***	0.19***	0.12***	0.12***	0.10***	0.11**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.05)
I(Fair/Par$_{lkt}$ < 0.8)		0.05***	0.05***	0.04***	0.03***	0.03***	0.03**	0.00
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Loan Terms								
Ln(Loan Size$_{lkt}$)		0.01***	0.01***	0.01***	0.00***	0.00***	0.01***	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ln(Time-to-Maturity)$_{lkt}$		-0.03***	-0.02***	-0.02***	-0.02***	-0.02***	-0.01	-0.02
		(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Effec. Base rate$_{lkt}$		0.39**	0.25	0.36	0.36	0.50	0.44	1.40***
		(0.18)	(0.42)	(0.44)	(0.35)	(0.33)	(0.36)	(0.46)
Fixed rate loan$_{lkt}$		0.10***	0.10***	0.11***	0.15***	0.18***	0.23***	0.16***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
All-in-spread$_{lk\tau}$		0.26	0.37	0.38	0.35	0.36	0.73	1.16**
		(0.23)	(0.27)	(0.25)	(0.22)	(0.23)	(0.55)	(0.54)
Ownership								
Dual holding$_{blt}$		0.03***	0.03***	0.03***	0.02*	0.01	0.01	
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	
PE Sponsored$_{bt}$		0.04***	0.04**	0.04***	0.02	0.02	0.00	
		(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	
Lending Relationship								
Ln(Number of BDCs)$_{bt}$		0.00	0.00	0.00	-0.01***	-0.01***	-0.02***	
		(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	
Bank financing$_{bt}$		-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***	
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
YearQtr			Yes					
LoanType			Yes	Yes	Yes	Yes	Yes	Yes
Seniority			Yes	Yes	Yes	Yes	Yes	Yes
YearQtr-Industry				Yes	Yes	Yes	Yes	
Borrower					Yes	Yes		
BDC						Yes		
Borrower-BDC							Yes	Yes
YearQtr-Borrower								Yes
BDC-YearQtr								Yes
Observations	248,640	163,933	163,933	163,891	163,891	163,891	163,891	163,004
Adjusted R^2	0.03	0.08	0.09	0.10	0.50	0.50	0.55	0.80
Dependent variable mean	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.06

Table 4: Predictive regressions: PIK and loan outcomes

This table shows the results from OLS regressions of $NonAccrual_{lk,t+1}$, $Fair/Par_{lk,t+1}$ and $CSD(Fair/Par)_{bk,t+1}$ on PIK_{lkt} and various control variables. The sample period is 2012Q1-2024Q1. $NonAccrual_{lkt}$ ($NonAccrual_{lk,t+1}$)is an indicator variable that takes a value of one if the loan is reported as non-accrual for period t ($t+1$). $Fair/Par_{lkt}$ is the valuation of the loan k at time t. $CSD(Fair/Par)_{bk,t+1}$ is the cross-sectional standard deviation of similar loans' $Fair/Par$-ratio across all BDCs' portfolios at the end of period t multiplied by 100. Two loans held by two different lenders at the same time are considered similar if they are issued by the same borrower, have the same seniority, and have the same loan type. PIK_{lkt} is an indicator variable that takes the value of one if the loan k from lender l to borrower b is reported to be paid in kind for period t. The sample excludes PIK Notes. We include control variables: $Ln(Time\text{-}to\text{-}Maturity)_{lkt}$ is the natural logarithm of the remaining time to maturity. $Ln(Loan\,Size)_{lkt}$ is the natural logarithm of the par value of the loan amount. $Fixed\,rate\,loan_{lkt}$ is an indicator variable that takes the value of one if the loan is tied to a fixed interest rate at time t. $Effec.\,Base\,rate_{lkt}$ is the loan's base rate at time t and zero if there is no base rate. $All\text{-}in\text{-}spread_{lk\tau}$ is the all-in-spread at time when the loan k first appears in the sample at time τ. $Dual\,holding_{blt}$ is an indicator variable that takes the value of one if the BDC also has an equity stake in the borrowing firm. $PE\,Sponsored_{bt}$ is a dummy variable that takes a value if the borrower is private equity sponsored in period t and zero otherwise, an indicator for borrower b that has received $Bank\,financing_{bt}$ in the preceding 5-year period to t. 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. $Industry$ 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, borrower, and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	NonAccrual$_{lk,t+1}$		Fair/Par$_{lk,t+1}$		CSD(Fair/Par)$_{bk,t+1}$	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK$_{lkt}$	0.03***	0.03***	-0.01***	-0.01***	0.64***	0.64***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.17)	(0.14)
Loan controls	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr	Yes		Yes		Yes	
LoanType	Yes	Yes	Yes	Yes	Yes	Yes
Seniority	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr-Industry		Yes		Yes		Yes
YearQtr-BDC		Yes		Yes		Yes
Borrower-BDC		Yes		Yes		Yes
Observations	163,973	163,931	162,705	162,663	101,304	101,298
Adjusted R^2	0.72	0.73	0.81	0.82	0.40	0.48
Dependent variable mean	0.03	0.03	0.95	0.95	1.37	1.37

Table 5: Predictive regressions: Heterogeneity in PIK'd loan outcomes

This table shows the results from OLS regressions of $NonAccrual_{lk,t+1}$ and $Fair/Par_{lk,t+1}$ on PIK_{lkt} and various control variables. The sample period is 2012Q1-2024Q1. $NonAccrual_{lkt}$ ($NonAccrual_{lk,t+1}$)is an indicator variable that takes a value of one if the loan is reported as non-accrual for period t ($t+1$). $Fair/Par_{lkt}$ is the valuation of the loan k at time t. PIK_{lkt} is an indicator variable that takes the value of one if the loan k from lender l to borrower b is reported to be paid in kind for period t. The sample excludes PIK Notes. We include control variables: $Ln(Time-to-Maturity_{lkt})$ is the natural logarithm of the remaining time to maturity. $Ln(Loan\,Size_{lkt})$ is the natural logarithm of the par value of the loan amount. $Fixed\,rate\,loan_{lkt}$ is an indicator variable that takes the value of one if the loan is tied to a fixed interest rate at time t. $Effec.\,Base\,rate_{lkt}$ is the loan's base rate at time t and zero if there is no base rate. $All\text{-}in\text{-}spread_{lk\tau}$ is the all-in-spread at time when the loan k first appears in the sample at time τ. $Dual\,holding_{blt}$ is an indicator variable that takes the value of one if the BDC also has an equity stake in the borrowing firm. $PE\,Sponsored_{bt}$ is a dummy variable that takes a value if the borrower is private equity sponsored in period t and zero otherwise, an indicator for borrower b that has received $Bank\,financing_{bt}$ in the preceding 5-year period to t. We also include one-period lags of each dependent variable. The lower interaction terms and other controls are included but not shown. 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. $Industry$ 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, borrower, and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	NonAccrual$_{lk,t+1}$			Fair/Par$_{lk,t+1}$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK$_{lkt}$	0.05***	0.05***	0.06	-0.02***	-0.07***	-0.09
	(0.01)	(0.02)	(0.05)	(0.01)	(0.02)	(0.06)
PIK$_{lkt}$ × PE Sponsored$_{bt}$	-0.03***	-0.02**	-0.03**	0.02***	0.01**	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
PIK$_{lkt}$ × Ln(Time-to-Maturity)$_{lkt}$		0.00	-0.01		0.00	-0.01
		(0.00)	(0.01)		(0.00)	(0.01)
PIK$_{lkt}$ × Dual holding$_{blt}$		-0.02**	0.00		0.01	-0.01
		(0.01)	(0.01)		(0.00)	(0.01)
PIK$_{lkt}$ × Ln(Loan Size)$_{lkt}$		0.00***	0.00*		0.00	0.00
		(0.00)	(0.00)		(0.00)	(0.00)
PIK$_{lkt}$ × NonAccrual$_{lkt}$		0.03*	0.07**			
		(0.02)	(0.03)			
PIK$_{lkt}$ × Fair/Par$_{lkt}$					0.07***	0.13***
					(0.02)	(0.05)
Loan controls	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr	Yes	Yes		Yes	Yes	
Borrower	Yes	Yes		Yes	Yes	
LoanType	Yes	Yes	Yes	Yes	Yes	Yes
Seniority	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr-Borrower			Yes			Yes
YearQtr-BDC			Yes			Yes
Borrower-BDC			Yes			Yes
Observations	163,973	163,973	163,034	162,705	162,705	161,608
Adjusted R^2	0.73	0.73	0.87	0.82	0.82	0.88
Dependent variable mean	0.03	0.03	0.02	0.95	0.95	0.95

Table 6: PIK Toggles and future loan outcomes

The results are based on a lender-loan-origination level data, where origination date is defined as the date when the loan first appears in the sample in the lender's portfolio. The sample period is restricted to loan originations occurring between 2012Q2-2021Q4. $Future\,NonAccrual_{lk\tau+m}$ is an indicator variable that takes a value of one if the loan becomes nonaccrual at any date $\tau + m$ following the origination date τ, and zero otherwise. $I(Fair/Par_{lk,T} < 0.8)$ is an indicator variable that takes a value of one if the loan has a value below 80% at the last observation date T before exiting the sample and zero otherwise. $PIK\,Toggle_{lk,\tau+n}$ is an indicator variable that takes a value of one if the borrower uses its PIK toggle during the subsequent lifetime of the loan, and zero otherwise. We exclude PIK notes from the sample. Loan controls include $Ln(Time\text{-}to\text{-}Maturity)$, $Ln(Loan\,Size)$, indicator for $Fixed\,rate\,loan$, loan's *All-in-spread*, $Effec.\,Base\,rate$, indicator for presence of $Dual\,holding$, indicator for borrower's $PE\,Sponsored$ status, indicator for firm that has received $Bank\,financing$ in preceeding 5-years with all control variables measured at origination date τ and *Pre-PIK* $Amend_{bl,\tau+s}$ that is an indicator variable that takes a value of one if the loan experiences a maturity extension or becomes nonaccrual at any date $\tau + s$ following the origination date τ but preceding the earliest PIK use date $\tau + n$ (if any), and zero otherwise. All except the indicator variables are standardized (*std*) with a mean of zero and a variance of one. The lower interaction terms and other controls are included but not shown. The fixed effects: BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter of the origination e.g. 2022Q4. $Industry$ 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, borrower, and year-quarter levels. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	Future NonAccrual$_{lk,\tau+m}$			I(Fair/Par$_{lk,T}$ <0.8)		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK Toggle$_{lk,\tau+n}$	0.27***	0.27***	0.35***	0.22***	0.26***	0.36***
	(0.02)	(0.02)	(0.06)	(0.03)	(0.03)	(0.08)
PIK Toggle$_{lk,\tau+n}$ × PE Sponsored$_{b\tau}$			-0.16**			-0.17**
			(0.06)			(0.07)
PIK Toggle$_{lk,\tau+n}$ × Ln(Time-to-Maturity)$_{lk,\tau}$			0.00			0.02
			(0.01)			(0.02)
PIK Toggle$_{lk,\tau+n}$ × Ln(Loan Size)$_{lk,\tau}$			0.03			0.02
			(0.02)			(0.02)
PIK Toggle$_{lk,\tau+n}$ × Dual-holding$_{bl\tau}$			0.05			0.05
			(0.05)			(0.06)
PIK Toggle$_{lk,\tau+n}$ × Pre-PIK Amend$_{lk,\tau+s}$			0.12**			0.11
			(0.05)			(0.07)
Loan controls	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr	Yes			Yes		
Seniority	Yes	Yes	Yes	Yes	Yes	Yes
LoanType	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr-Industry		Yes	Yes		Yes	Yes
YearQtr-BDC		Yes	Yes		Yes	Yes
Observations	10,048	10,037	10,037	6,771	6,761	6,761
Adjusted R^2	0.20	0.29	0.30	0.11	0.18	0.19
Dependent variable mean	0.07	0.07	0.07	0.07	0.07	0.07

Table 7: Difference in loan outcomes between PIK-Notes and PIK-Toggles

The results are based on a lender-loan-origination level data, where origination date is defined as the date when the loan first appears in the sample in the lender's portfolio. The sample period is restricted to loan originations occurring between 2012Q2-2021Q4. $Future\,NonAccrual_{lk,\tau+m}$ is an indicator variable that takes a value of one if the loan becomes nonaccrual at any $\tau+m$ following the origination date τ, and zero otherwise. $I(Fair/Par_{lk,T} < 0.8)$ is an indicator variable that takes a value of one if the loan has a value below 80% at the last observation date T before exiting the sample and zero otherwise. $PIK\text{-}Toggle_{lk}$ is an indicator variable that takes a value of one if the borrower uses its PIK toggle during the subsequent lifetime of the loan, and zero otherwise, while also not being a PIK note. $PIK\text{-}Note_{lk}$ takes a value of one if the loan is classified as a PIK note, and zero otherwise. Loan controls include $Ln(Time\text{-}to\text{-}Maturity)$, $Ln(Loan\,Size)$, indicator for $Fixed\,rate\,loan$, loan's *All-in-spread*, $Effec.\,Base\,rate$, indicator for presence of *Dual holding*, indicator for borrower's $PE\,Sponsored$ status, indicator for firm that has received $Bank\,financing$ in preceeding 5-years with all control variables measured at origination date τ. All except the indicator variables are standardized (*std*) with mean zero and variance of one. The fixed effects: BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter of the origination e.g. 2022Q4. $Industry$ 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, borrower, and year-quarter levels. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Panel A: Full sample

Dependent Variables:	Future NonAccrual$_{lk,\tau+m}$			I(Fair/Par$_{lk,T} < 0.8$)		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK Note$_{lk,\tau}$	0.06***	0.04*	0.11***	0.04*	0.03	0.00
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)
PIK Toggle$_{lk,\tau+n}$	0.24***	0.26***	0.19***	0.20***	0.21***	0.16***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.05)
Loan controls		Yes	Yes		Yes	Yes
YearQtr	Yes	Yes		Yes	Yes	
Seniority	Yes	Yes	Yes	Yes	Yes	Yes
LoanType	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr-Industry			Yes			Yes
YearQtr-BDC			Yes			Yes
Borrower			Yes			Yes
Observations	16,757	10,459	10,448	11,287	7,096	7,086
Adjusted R^2	0.11	0.14	0.65	0.06	0.08	0.45
Dependent variable mean	0.07	0.07	0.07	0.07	0.08	0.08

Table 7: Difference in loan outcomes between PIK-Notes and PIK-Toggles (continued)

Panel B: Post-2017 sample with Martini-AI firm size and rating fixed effects

Dependent Variables:	Future NonAccrual$_{lk,\tau+m}$			I(Fair/Par$_{lk,T} < 0.8$)		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK Note$_{lk,\tau}$	0.05**	0.07***	0.07**	0.01	0.04	0.02
	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)	(0.04)
PIK Toggle$_{lk,\tau+n}$	0.22***	0.21***	0.21***	0.14***	0.18***	0.14***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.05)	(0.04)
Loan controls		Yes	Yes		Yes	Yes
YearQtr	Yes			Yes		
Seniority	Yes	Yes	Yes	Yes	Yes	Yes
LoanType	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr-Industry		Yes	Yes		Yes	Yes
YearQtr-BDC		Yes	Yes		Yes	Yes
YearQtr-Firm Size			Yes			Yes
YearQtr-Rating			Yes			Yes
Observations	5,490	5,489	5,489	3,113	3,112	3,112
Adjusted R^2	0.11	0.19	0.21	0.05	0.12	0.10
Dependent variable mean	0.05	0.05	0.05	0.06	0.06	0.06

Table 8: PIKs, Maturity Extensions and Debt-to-Equity Swaps

The results are based on a lender-loan-origination level data, where origination date is defined as the date when the loan first appears in the sample in the lender's portfolio. The sample period is restricted to loan originations occurring between 2012Q2-2021Q4. $Maturity\,Extension_{lk,\tau+m}$ is an indicator variable that takes a value of one if the loan receives maturity extension at any date $\tau + m$ following the origination date τ, and zero otherwise. $Debt\text{-}to\text{-}Equity\,Swap_{lk,\tau+m}$ is an indicator variable that takes a value of one if the borrower receives debt to equity swap at any date $\tau + m$ following the origination date τ, and zero otherwise. $PIK\text{-}Toggle_{lk,\tau+n}$ is an indicator variable that takes a value of one if the borrower uses its PIK toggle during the subsequent lifetime of the loan, and zero otherwise, while also not being a PIK note. $PIK\text{-}Note_{lk}$ takes a value of one if the loan is classified as a PIK note, and zero otherwise. Loan controls include $Ln(Time\text{-}to\text{-}Maturity)$, $Ln(Loan\,Size)$, indicator for $Fixed\,rate\,loan$, loan's *All-in-spread*, $Effec.\,Base\,rate$, indicator for presence of $Dual\,holding$, indicator for borrower's $PE\,Sponsored$ status, indicator for firm that has received $Bank\,financing$ in preceeding 5-years with all control variables measured at origination date τ. All except the indicator variables are standardized (*std*) with mean zero and variance of one. The fixed effects: BDC refers to the identity of the BDC (Lender). $YearQtr$ refers to the calendar quarter of the origination e.g. 2022Q4. *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, borrower, and year-quarter levels. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	Maturity Extension$_{lk,\tau+m}$			Debt-to-Equity Swap$_{lk,\tau+m}$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK Toggle$_{lk,\tau+n}$	0.27***	0.27***	0.30***	0.08***	0.08***	0.11***
	(0.03)	(0.03)	(0.05)	(0.02)	(0.02)	(0.03)
PIK Note$_{lk,\tau}$	-0.04	-0.04*	0.10	-0.10***	-0.10***	0.01
	(0.03)	(0.02)	(0.08)	(0.02)	(0.02)	(0.05)
Loan controls	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr	Yes			Yes		
LoanType	Yes	Yes	Yes	Yes	Yes	Yes
Seniority	Yes	Yes	Yes	Yes	Yes	Yes
BDC	Yes	Yes		Yes	Yes	
YearQtr-Industry		Yes	Yes		Yes	Yes
YearQtr-BDC			Yes			Yes
Borrower			Yes			Yes
Observations	10,459	10,448	10,448	10,459	10,448	10,448
Adjusted R^2	0.14	0.16	0.40	0.45	0.46	0.74
Dependent variable mean	0.30	0.30	0.30	0.15	0.15	0.15

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: *Ln(Assets)*, *Leverage*, profitability (*ROE*), *Cash Share*, and *Ln(Fund Age)* all measured at $t-1$. We exclude the intercept term from the results whenever the model has one. 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$_{lt}$			CL usage$_{lt}$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK usage share$_{lt}$	-0.66***	-0.58***	-0.51***	-0.50***	-0.44***	-0.38***
	(0.15)	(0.14)	(0.10)	(0.09)	(0.10)	(0.09)
BDC controls		Yes	Yes		Yes	Yes
YearQtr		Yes	Yes		Yes	Yes
BDC			Yes			Yes
Observations	1,783	1,622	1,622	1,714	1,563	1,563
Adjusted R^2	0.12	0.29	0.71	0.09	0.19	0.42
Dependent variable mean	0.47	0.44	0.44	0.50	0.50	0.50

Table 10: PIKs and subsequent balance sheet and payout changes

This table shows the results from OLS regressions of BDC's asset, balance sheet, and payout changes on PIK usage share and other control variables. The results are based on BDC-quarter-level panel data. $Debt/Assets$ is the ratio between BDC's total liabilities and total assets. $\Delta\left(Debt/Assets\right)_{l,t+1}$ is the change in $Debt/Assets$ between quarter t and $t+1$ and correspondingly defined for $\Delta\left(Cash/Assets\right)_{l,t+1}$. $\Delta lnAsset_{l,t+1}$ is the log change in BDC's total assets measured in cost value. $\Delta lnDiv_{l,t+1}$ is the log change in BDC's dividends paid to shareholders. $PIK\ usage\ share_{l,t}$ 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: *Ln(Assets)*, *Leverage*, profitability (*ROE*), *Cash Share*, and *Ln(Fund Age)* all measured at t. We exclude the intercept term from the results whenever the model has one. We additionally 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, year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	$\Delta(Debt/Assets)_{l,t+1}$		$\Delta(Cash/Assets)_{l,t+1}$		$\Delta lnAsset_{l,t+1}$		$\Delta lnDiv_{l,t+1}$	
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables								
PIK usage share$_{lt}$	-0.01	-0.03**	0.00	0.01	-0.07***	-0.11***	-0.05*	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.03)	(0.03)
BDC controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YearQtr	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BDC		Yes		Yes		Yes		Yes
Observations	3,098	3,098	3,098	3,098	3,098	3,098	2,765	2,765
Adjusted R^2	0.07	0.16	0.02	0.02	0.20	0.45	0.19	0.45
Dependent variable mean	0.00	0.00	0.00	0.00	0.06	0.06	0.05	0.05

Table 11: PIKs and lending to PIK vs non-PIK firms

This table shows the results from OLS regressions of BDC lending on PIK usage share and other control variables. The results are based on BDC-quarter-level panel data. $\ln(\text{Credit}_{lt+1})$ is the log of total portfolio par value at BDC l in quarter $t+1$. $\ln(\text{Credit}^{PIK}_{lt+1})$ is the log of par value on loans currently paying interest in-kind. $\ln(\text{Credit}^{nonPIK}_{lt+1})$ is the log of par value on only cash-paying loans. Columns (3)–(4) and (5)–(6) restrict to BDC-quarters with positive PIK and non-PIK par value, respectively. $PIK\ usage\ share_{l,t}$ 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: *Ln(Assets)*, *Leverage*, profitability (*ROE*), *Cash Share*, and *Ln(Fund Age)*all measured at t. We exclude the intercept term from the results whenever the model has one. We additionally 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, year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	$\ln(\text{Credit}_{lt+1})$		$\ln(\text{Credit}^{PIK}_{lt+1})$		$\ln(\text{Credit}^{non-PIK}_{lt+1})$	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK usage share$_{lt}$	0.14	0.07	4.30***	3.90***	-1.24***	-1.69***
	(0.44)	(0.23)	(0.50)	(0.36)	(0.40)	(0.29)
BDC controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects						
YearQtr	Yes	Yes	Yes	Yes	Yes	Yes
BDC		Yes		Yes		Yes
Fit statistics						
Observations	2,886	2,886	2,238	2,238	2,876	2,876
Adjusted R^2	0.85	0.97	0.79	0.89	0.86	0.97

Table 12: PIK and lending to new vs. existing borrowers

This table shows the results from OLS regressions of BDC lending on PIK usage share and other control variables. The results are based on BDC-quarter-level panel data. $\ln(\text{Credit}_{lt+1})$ is the log of total portfolio par value at BDC l in quarter $t+1$. $\ln(\text{Credit}^{new}_{lt+1})$ is the log of par value on loans to borrowers appearing for the first time in the BDC portfolio. $\ln(\text{Credit}^{exist}_{lt+1})$ is the log of par value on loans to borrowers already present in prior quarters. A borrower is classified as new in the first quarter it appears at a given BDC; existing in all subsequent quarters. Columns (3)–(4) and (5)–(6) restrict to BDC-quarters with positive new and existing par value, respectively. PIK usage share is the par-value weighted share of portfolio companies currently paying some proportion of their interest rate in-kind, measured at t. All columns include the following BDC-level controls measured at t: log BDC total assets, leverage ratio, return on equity, cash-to-assets ratio, and fund age. $YearQtr$ refers to calendar quarter fixed effects. BDC refers to BDC identity fixed effects. Standard errors are clustered at the BDC and year-quarter level. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Dependent Variables:	$\ln(\text{Credit}_{lt+1})$		$\ln(\text{Credit}^{new}_{lt+1})$		$\ln(\text{Credit}^{exist}_{lt+1})$	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK usage share$_{lt}$	0.20	0.07	-0.40*	-0.73**	0.23	0.12
	(0.42)	(0.21)	(0.23)	(0.34)	(0.37)	(0.20)
BDC controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects						
YearQtr	Yes	Yes	Yes	Yes	Yes	Yes
BDC		Yes		Yes		Yes
Fit statistics						
Observations	2,886	2,886	2,255	2,255	2,870	2,870
Adjusted R^2	0.85	0.97	0.56	0.68	0.87	0.97

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

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.	Loan-level	LSEG
All-in-spread	All-in-yield - effective base rate	Loan-level	LSEG
$\Delta lnAsset$	Log change in BDC's total assets in cost value terms	Lender-level	LSEG
Assets	BDC's total assets (millions USD)	Lender-level	LSEG
Bank debt share	Bank debt_t/Total Liabilities_t	Lender-level	CapitalIQ
Bank financing	An indicator variable that takes a value of one if the borrower has obtained a bank loan within the past 5 years and zero otherwise.	Borrower-level	Pitchbook
Base rate	The level of base rate. Zero if a fixed-rate loan.	Loan-level	LSEG
Cash share	Cash/Total Assets	Lender-level	LSEG
Cash spread	Cash spread for the loan over the base rate.	Loan-level	LSEG
CSD(Fair/Par)	Cross-sectional standard deviation of $Fair/Par$ across lenders of loans sharing the same borrower, seniority, and loan type.	Loan-level	LSEG
CL usage	Drawn credit lines/(Drawn+Undrawn credit lines)	Lender-level	CapitalIQ
$\Delta lnDiv$	Log change in BDC's dividends paid to shareholders	Lender-level	LSEG
Dual holding	Indicator variable that takes the value of one if the lender has equity/pref.share/warrant stake in the borrowing firm and zero otherwise	Borrower-lender-level	LSEG
Debt-to-Equity Swap	Indicator variable that takes a value of one if the face value of borrower b's debt held by BDC l decreases, while simultaneously the fair value of lender l's equity stake in borrower b increases from previous period. In the cross-sectional test, the variable takes the value of one if the borrower receives a debt-to-equity swap after origination, and zero otherwise.	Loan-level	LSEG
Effective base rate	max{Base rate, Interest rate floor}	Loan-level	LSEG
Fair/Par	Loan's fair value to par value ratio	Loan-level	LSEG
$I(Fair/Par < 0.8)$	Indicator variable that takes a value of one if the loan's fair/par ratio is below 0.8, and zero otherwise. In cross-sectional data, this is measured at the last observation date for that loan.	Loan-level	LSEG
Fixed-rate loan	Indicator variable that takes the value of one if the loan is tied to a fixed rate and zero otherwise	Loan-level	LSEG
Fund Age	Age of the fund in years. We use ln(1+Age) as a control variable.	Lender-level	CapitalIQ /EDGAR
Future NonAccrual	An indicator variable that takes a value of one if the loan is reported as non-accrual at any date following the loan origination date, and zero otherwise.	Loan-level	LSEG
Leverage ratio	Total Liabilities/Total Assets	Lender-level	LSEG
Ln(Loan size)	Natural logarithm of the loan's par value	Loan-level	LSEG
Ln(Num-of-BDCs)	Natural logarithm of the number of BDC-lenders of the borrower.	Borrower-level	LSEG
Ln(Time-to-matur.)	Natural logarithm of the remaining time to maturity	Loan-level	LSEG
Maturity Extension	Indicator variable that takes a value of one if the loan's remaining $\textit{time-to-maturity}_{t-1} < \textit{time-to-maturity}_t$, and zero otherwise. In the cross-sectional test, the variable takes the value of one if maturity is ever extended after origination, and zero otherwise.	Loan-level	LSEG
Non-accrual	An indicator variable that takes a value of one if the loan is reported to be non-accrual, and zero otherwise.	Loan-level	LSEG
PE Sponsored	An indicator variable that takes a value of one if the borrower is PE-sponsored in a given quarter and zero otherwise.	Borrower-level	Pitchbook
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	LSEG
PIK-Note	Indicator variable that takes a value of one for loans that are reported to be paid in kind in every period of the lifetime of the loan, and zero otherwise.	Loan-level	LSEG
PIK spread	PIK spread for the loans that use PIK, zero otherwise.	Loan-level	LSEG
PIK-Toggle	Indicator variable that takes a value of for loans that are reported to be paid in kind in any (but not every) period of the lifetime of the loan, and zero otherwise.	Loan-level	LSEG
PIK usage share	Par-value weighted share of loans in the BDC's portfolio that are paying some proportion of the interest rate "in-kind".	Lender-level	LSEG
ROE	Return on equity_t=Net income_t/Book Equity_{t-1}	Lender-level	CapitalIQ /LSEG