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

Paul Rintamäki Sascha Steffen

This version: August 23, 2026*

Abstract

Payment-in-Kind (PIK) provisions allow borrowers to capitalize unpaid interest, offering flexibility but potentially enabling excessive forbearance. Testing predictions of a simple model with comprehensive Business Development Company (BDC) loan data, we show that PIK is primarily used for forbearance. PIK delays the recognition of early losses while predicting persistent deterioration later rather than recoveries. Adverse outcomes are driven by PIK exercised after (not at) origination. Consistently, lenders of PIK'ed loans extend their maturities rather than recapitalize the borrowers. Funding markets discipline excessive PIK-lending by BDCs: an increase in PIK-exposure reduces bank funding, and public equity investors discount PIK-exposure exercised post-origination.

JEL classification: G21, G32, G34
Keywords: Payment-in-Kind (PIK), Private Credit, Forbearance, Zombie Lending, Covenants, Financial Stability

---

* First Version: April 2025. Both authors are at Frankfurt School of Finance & Management, Adickesallee 32-34. 60322 Frankfurt, Germany. Contact details: p.rintamaki@fs.de (Rintamäki) and s.steffen@fs.de (Steffen). We greatly appreciate support from the Centre for European Transformation. We thank James Albertus (discussant), Bo Becker, Tobias Berg, Harald Hau, Maximilian Jager, Vesa Pursiainen (discussant), Jun Quian, Francesco Sannino, Daniel Streitz, Zexi Wang (discussant) and seminar and conference participants at Peking University Guanghu School of Business, Fudan International School of Finance, City University Hong Kong, National University of Singapore, Singapore Management University, the ESRB Expert Group on Nonbank Financial Intermediation, De Nederlandsche Bank, University of Amsterdam, Northern Finance Association 2025 meeting, Frankfurt School of Finance & Management, Private Equity Research Consortium 2025 Symposium, Federal Reserve Day-Ahead conference, European Winter Finance Summit, SGF 2026, and CEPR-ESSFM for valuable comments and suggestions. An earlier version of the paper was circulated under the title "PIK now and pay later - How deferred interest reshapes private credit".

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

[1] A large literature in finance has discussed the value of financial flexibility for non-financial 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, 2024).

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

The BDC setting is particularly well-suited for studying PIK. First, BDCs lend primarily to private middle-market firms, where the opacity is high, access to bank financing is more limited and contractual flexibility may be especially valuable. Second, the detailed information about contract terms, fair values, and non-accrual classifications each quarter allows us to measure subsequent credit performance after PIK use.[5] Third, BDCs themselves rely on bank credit lines, and publicly traded BDCs on stock market investors, making it possible to study how their financiers respond to high PIK exposure.

A central feature of our analysis is the distinction between two forms of PIK. Some loans are structured as *PIK notes*, in which interest is paid in kind from the outset and the PIK is a permanent component the interest rate spread. Other loans feature *PIK toggles*, options that allow the borrower to switch from cash interest to PIK (and vice versa) during the life of the loan. This distinction is economically important. PIK notes are priced and screened at origination, when the lender observes the borrower and structures the contract accordingly. By contrast, PIK-toggle activation after origination reveals new information during the loan's life and is more likely to coincide with deteriorating fundamentals.

To guide our empirical approach, we develop a simple theoretical framework built around a single lending relationship. At an interim date the borrower is either healthy, servicing the loan in cash (or, under a PIK note, capitalizing interest as contracted from the outset), or distressed and unable to pay. In the distressed state the lender privately observes the loan's expected recovery value and chooses between simply capitalizing the missed interest (PIK), or recognizing the loan loss and marking it to its restructuring value. Continuing with PIK is efficient whenever the continuation value exceeds the restructuring

[4]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 Table A1 of the Online Appendix.

[5]Lenders classify loans as non-accrual when interest payments by borrowers are at least 90 days overdue, which constitutes a "technical default". Fair value estimates are based on assessments by third-party valuation agents or by BDCs themselves. The opacity and subjectivity around valuations might allow BDC to mark down prices slowly, creating a fruitful environment for slow realization (or hiding) of losses.

value; but because carrying a loan as performing yields the lender a private benefit the lender's actual threshold for continuation is more permissive than the efficient one. This opens a "forbearance band", a loan value region where distressed loans worth less than their restructuring value but above the lender's threshold are nonetheless kept performing and carried at an inflated mark. The model yields eight testable predictions that help distinguish these regimes empirically, which we group under three broad questions.

First, what determines PIK usage? Identifying the borrower characteristics and circumstances surrounding PIK usage helps clarify the extent to which it is used to hide issues rather than to help resolve them. Second, does borrower performance improve or deteriorate following PIK usage? If PIK is primarily used to bridge short-term liquidity shortfalls for relatively healthy firms, the PIK should be a neutral or a positive signal of future loan outcomes. Whereas if PIK is used by permanently distressed firms, letting BDC managers hide and postpone these losses, we should expect the loan performance to gradually deteriorate following PIK use as initially over-reported loan values get written down later.[6] Third, how do BDC financiers—banks and public equity investors—respond to BDCs' PIK exposure? If high PIK exposure is seen as a hidden signal of bad portfolio quality and the agency issues, it should be associated with lower share price valuations and less bank funding due to restrictive covenants.

We first show that, consistent with our theoretical predictions, PIK use of loans are positively associated with proxies of private benefit. As proxies we use management income incentive fee contract terms (the BDC manager's share of investment income and the hurdle rate) that increase BDCs' incentives to offer PIK and avoid reporting delinquencies. This effect is primarily coming from loans that are reported as PIK but not (yet) reported as delinquent. We also document several novel facts about PIK use. For example, loans using PIK are typically larger, tied to fixed rate, and more common among borrowers without recent access to bank financing or with fewer BDC lenders, with the latter result indicating that forbearance may be easier when information about potential losses can be

[6] Baron et al. (2026) find that liquidity-based interventions historically predict only small, temporary increases in bank market value during crises, as declines in values are typically driven by permanent solvency problems.

kept hidden from other creditors, such as banks.

We then examine loan performance after PIK use. Across specifications, PIK use predicts subsequent credit deterioration. Using PIK increases the probability of a loan becoming non-accrual in the future, experiencing lower fair-value-to-par ratios, and exhibiting greater valuation disagreement across BDCs holding the same loan. For example, using a variety of control variables and high-dimensional 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 (i.e. "non-accrual") even one quarter ahead. This is a sizeable increase given the unconditional likelihood that a loan becomes non-accrual of 3%.[7] Local-projection estimates show that these effects are persistent and increasing with horizon rather than quickly reversed, suggesting that PIK use is more closely associated with lasting credit impairment that is being slowly written down than with temporary and mean-reverting liquidity shocks.

Through the lens of the model predictions, these findings indicate that often PIK use happens within the forbearance band, where PIK enables over-reporting of loan values. However, the model also predicts that actions, such as capital injection from borrowers' shareholders, that increase the continuation value of the lender's claim can move the loan out of the forbearance band, reduce overreporting and thus dampen the predictability of PIK on adverse loan outcomes. Indeed, consistent with this prediction, we find that private equity sponsorship mitigates some of the negative post-PIK outcomes, consistent with sponsors' ability or willingness to inject capital, renegotiate claims, or support distressed portfolio companies (Hotchkiss et al., 2021; Jang, 2024; Haque et al., 2022, 2023).

Heterogeneity in PIK loan types also matters. The adverse outcomes are especially pronounced for PIK toggles activated after origination. Loans that move into PIK during

[7] In March 2026, Moody's downgraded FS KKR Capital Corp — a $13 billion publicly traded BDC — 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 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).

their life cycle are substantially more likely to exit in non-accrual status or at a large discount to par. By contrast, PIK notes and loans using PIK toggle from origination have weaker predictive power for adverse exit outcomes once origination characteristics are controlled for. This pattern supports the view that ex-post PIK activation contains negative information about borrower fundamentals, whereas PIK terms known at origination are more likely to be incorporated into screening, pricing, and contract design.

We also study whether PIK is paired with restructuring tools that improve borrower balance sheets. If PIK were primarily part of efficient recapitalization, we would expect it to be associated with debt-to-equity swaps that reduce leverage. Instead, PIK is more closely linked to maturity extensions. Among severely impaired loans, maturity extensions are substantially more common than debt-to-equity conversions, including among loans that use PIK. This evidence is consistent with an "extend-and-pretend" mechanism: PIK allows borrowers to avoid cash interest payments while maturity extensions postpone repayment, but the underlying debt claim is not necessarily resolved.

We next examine whether BDCs' own financiers discipline PIK lending. BDCs rely heavily on bank credit lines, creating a potential channel through which stress in private credit could transmit to the banking sector. On the one hand, if banks view PIK as a benign liquidity provision, BDCs with high PIK exposure should be able to finance such exposure through bank borrowing. On the other, BDC credit agreements frequently restrict the eligibility of PIK-heavy assets in borrowing bases, potentially forcing BDCs to reduce their bank borrowing when PIK exposure increases. Consistent with the latter, we find that higher PIK exposure is associated with reduced bank debt funding and lower credit-line utilization. These results suggest that banks limit their exposure to deferred-interest assets rather than passively funding PIK-heavy portfolios.

Stock price valuations of public BDCs provide a complementary way of testing the model's predictions regarding outside financiers' reactions to high PIK exposure. If the stock market investors understand that PIK use is associated with overreported loan valuation in the forbearance regime they will price a discount on the stock prices of PIK-heavy BDCs relative to BDCs' self-reported asset values. When testing this empirically, we find

that aggregate PIK exposure is not significantly related to BDC's market-to-book value ratios, but this masks important heterogeneity across PIK types. Equity investors discount PIK-toggle exposure, which our loan-level evidence links to deterioration and forbearance. By contrast, PIK-note exposure is positively associated with valuation, consistent with the interpretation that PIK notes have a contract design and pricing that investors value. Public equity markets therefore appear to distinguish between PIK embedded at origination and PIK activated later in response to borrower stress.

Taken together, the evidence indicates that while PIK provisions in private credit can function as a useful liquidity relief it can equally operate as a contract-embedded forbearance mechanism allowing BDCs to postpone and hide losses of unviable firms. Empirically, this forbearance is driven by post-origination PIK use, and on average followed by persistent credit deterioration as initially over-reported loan values are gradually marked down. BDCs' outside financiers appear to recognize BDCs' forbearance tendencies and over-reporting and set contractual guardrails on PIK or discount portfolios accordingly.

2 Related Literature

Our paper links to different strands in the literature: deferred interest in leveraged finance, zombie lending and forbearance, private credit and BDC lending, and bank–NBFI linkages.

Deferred interest in leveraged finance. PIK structures are not new. Kaplan and Stein (1993) documents their presence in LBOs already in the 1980s. Later, 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, and Bhanot et al. (2026) finds that PIK-bonds exhibit higher default rates compared to similar-non-PIK bonds, but the effect reverses when controlling for observable bond characteristics. These papers, however, measure PIK at bond origination but do not observe whether firms *exercise* the deferral option or track the subsequent loan performance post-exercise. We show that 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.

Zombie lending and forbearance. A large literature studies zombie lending as a consequence of bank capital constraints. Undercapitalized banks may evergreen loans to distressed borrowers to avoid recognizing losses, leading to credit misallocation and weaker productivity growth. Empirically, zombie lending has been studied at least in Japan in the 1990s (Peek and Rosengren, 2005; Caballero et al., 2008), in Europe in 2010s (Acharya et al., 2019, 2021a; Blattner et al., 2023), and more recently among U.S corporate (Favara et al., 2024), and commercial real estate, bank lending (Crosignani and Prazad, 2024).[8] Our paper identifies a channel where PIK provisions embed forbearance directly in the contract, so the lender need not be undercapitalized for cash-interest deferral to occur. 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. Ivashina (2025) provides a careful account of this research.[9] 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 financiers (Davydiuk et al., 2024c), and the trade-offs inherent in their fund structure (Rintamäki, 2024; Mistopoulou and Steffen, 2026). On the borrower side, Jang (2024) shows that direct lenders engage in relationship lending and active monitoring, Davydiuk et al. (2024a) studies the implications of lenders' dual holdings of equity and debt, and Haque et al. (2024) argues that private debt substitutes for long-term bank credit. Jang et al. (2025) and Robinson and Wallskog (2025)

[8] Theoretical mechanisms include gamble-for-resurrection incentives among undercapitalized intermediaries (Bruche and Llobet, 2014; Acharya et al., 2021b), relationship lenders' incentives to hide borrower distress until refinancing can be obtained from uninformed investors (Hu and Varas, 2021) and by preserving the continuation value of relationship absence of asymmetric information (Faria-e Castro et al., 2024). Our interpretation is closest to Hu and Varas (2021), except in our model the costs of forbearance are implicitly borne by the fund's shareholders.

[9] 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.

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. Lastly, Daniel et al. (2026) and Jang and Kim (2025) show that over-reporting of BDCs' loan valuations, relative to liquid funds and third-party appraisals respectively, increase in crisis periods.

What is largely absent from this literature is an analysis of how contractual flexibility in private credit, the feature that practitioners cite as its comparative advantage, functions in practice. 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.

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., 2026). Recent work highlights these exposures, through banks' credit-line exposure to REITs (Acharya et al., 2025a), drawdown risk from nonbank-financed firms (Acharya et al., 2025b), and indirect bank credit supply through BDCs at monetary tightening (Haque et al., 2025).

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: PIK-related covenants insulate banks from potential losses but redirect the adjustment. Rather than transmitting risk to banks, heavy portfolio exposure on PIK borrowers feeds back into credit supply.[10] 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.

[10]We document this in the Online Appendix Table A7 but discuss the findings in Section 7.2.

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.[11] 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.[12]

We augment the loan-level data with Pitchbook and S&P Capital IQ using Pitchbook identifiers and CIK numbers.[13] 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 information about BDCs' management fee contracts from their SEC filings.

3.2 Example of PIK reporting

We illustrate PIK reporting in Table 1 with an example. Sierra Income Corporation reports a First Lien Senior Secured Term Loan to Dynamic Energy Services International from 2014Q1 through 2021Q3. The BDC's quarterly 10K/10Q filings decompose the stated

[11] 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).

[12] 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 Section 1.1 of the Online Appendix.

[13] We match firm names to Pitchbook identifiers using Pitchbook's automated string-match algorithm, augmented with manual matching. Details are in Section 1.2 of the Online Appendix.

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, and we construct a binary indicator, called PIK, that we use heavily in the empirical analysis below. BDCs also report loan's par value, fair value (scaled to par), non-accrual status, and maturity date at the time of the filing.

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, the par value begins rising–consistent with unpaid interest compounding into principal. Simultaneously, fair value falls, and the loan enters non-accrual status by 2018Q1. The contractual terms continue to list a large PIK spread even as fair value declines toward zero.[14]

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.[15] The empirically relevant distinction for our analysis is between PIK Notes, where the permanent interest deferral feature is embedded at origination, and PIK Toggles, where borrowers exercise a deferral option, typically 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 for the full sample of loans 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 when monetary tightening raised floating-rate borrowers' debt service burdens.

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

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

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, in Panel B, 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.[16]

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 *post-origination*.[17] 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.

[16] Haque et al. (2024) show that credit lines are roughly half of bank loans among the middle market loans. However, in our sample, the outstanding revolvers have constituted only about 2% of the aggregate credit outstanding in BDCs' portfolios. A potential reason for the discrepancy is that meeting unpredictable drawdowns requires the liquid balance sheet that combination of reserves and deposit funding provides (Kashyap et al., 2002; Gatev and Strahan, 2006), but which BDCs lack. This leaves the revolver to banks and pushes the BDCs' contingent liquidity into the loan's payment terms.

[17] We classify a loan as a PIK Note if it pays PIK interest in every period during its lifetime.

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 reports the summary statistics for the first two.[18] Panel A reports summary statistics at the loan-quarter panel for the full 2012Q1–2024Q4 period. PIK is active in 10% of loan-quarter observations. The mediam loan has a 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 B compares the average loan characteristics at loan origination across loan types.[19] PIK-Toggle and PIK-Note loans serve structurally different purposes. Toggles are senior-secured instruments (88.7% first lien) deployed as optional liquidity insurance as borrowers activate the deferral option in only 41.2% of quarters. Notes are permanent capital structure features with 100% deployment, higher all-in-yield (12%) resulting from higher PIK yield components (4.7%), and frequently subordinated or unsecured positioning (43.6%). Non-accrual rates at exit are sharply higher for toggles (19.7%) than for non-PIK loans (2.2%), while notes fall between (9.7%). Toggle loans exhibit maturity extensions in 50.8% of cases, which is consistent with the extend-and-pretend pattern we document in Section 5. Before that we formalize a simple theoretical framework that guides our empirical tests.

4 Theoretical Framework

Payment-in-kind can do two very different things. It can provide efficient liquidity insurance, or it can let a lender postpone recognizing a loss it would be socially efficient to

[18] Table A6 in the Online Appendix reports BDC-level descriptive statistics.

[19] The table notes describe the sample construction. Section 1.3 of the Online Appendix describe it in length.

take now. The model isolates the single margin that separates these uses and shows that it is governed by two primitives: a *technological* one (does continuing an impaired loan recover more or less than restructuring and recognizing the loss?) and an *agency* one (how large is the lender's private benefit from non-recognition?). The framework is deliberately minimal: three dates, two states, one borrower, one lender, one outside financier.

4.1 Environment

Agents, dates, technology. A risk-neutral *borrower* (B) holds a single loan with face value normalized to 1, coupon $c \in (0,1)$, and maturity at $t = 2$; there is no discounting ($\beta = 1$).[20] A risk-neutral *lender* (L), i.e. the BDC manager, holds the loan and reports its value. *Outside financier* (F) observes the actions and tries to draw inference about the true portfolio value. At $t = 0$ the loan is originated and the contract is set, including whether PIK is permitted and in what form: a *PIK note*, under which interest capitalizes by contract in every state, or a *PIK toggle*, a liquidity option the borrower exercises only upon a coupon shortfall. At $t = 1$ Nature draws a state $s \in \{\mathsf{H}, \mathsf{L}\}$ with probabilities $(\pi_{\mathsf{H}}, \pi_{\mathsf{L}})$ summing to one; borrower and lender observe s. In state L, when the borrower is short of cash, the lender chooses a payment treatment, and reports the loan value, either truthfully or with inflated mark. The outside financier only observes actions and reprices the portfolio. At $t = 2$ cash flows realize and the loan resolves.

States. In the *healthy* state H the borrower has no coupon shortfall: it services the loan in cash and repays in full, so the lender collects $1 + 2c$ (or $(1 + c)^2$ if the coupon is contractually capitalized under a PIK note). A healthy borrower never approaches the lender for continuation funding, so H does not affect lender's decision at $t = 1$.

In the *low* state L the borrower is short of cash and seeks continuation funding. The loan's continuation value W, the lender's $t = 2$ expected payoff if the loan is kept alive, is revealed to B and L at $t = 1$ (but is latent to F) and realized at $t = 2$; it is drawn from a distribution G on $[0, (1+c)^2]$. A draw $W = (1+c)^2$ means the loan is expected to recover

[20] Online Appendix OA3 presents an extension that relaxes this no-discounting assumption.

in full, while a low draw means a deeply impaired loan. The lender has also an option to recognize the loan default and restructure the firm which gives a value $R \in (0, 1)$ for every distressed loan. Thus the only loan-level primitive is the sign of $W - R$.[21]

Assumption 1. G places positive mass both above and below R: continuing is efficient for some distressed loans ($W > R$: continuation option value dominates) and inefficient for others ($W < R$: the borrower diverts or burns assets, so the losses should be recognized and firm restructured).

Actions and carrying values. At $t = 1$ the lender and borrower choose one of three treatments.

- **C (cash):** the borrower pays c. Feasible only if cash on hand $\geq c$.
- **P (PIK)** without non-accrual: the unpaid coupon capitalizes, the $t = 2$ contractual claim becomes $(1 + c)^2$, and the loan stays classified performing at a fair-value mark $m_1 > R$.
- **N (non-accrual):** the loan is recognized as delinquent, marked to recovery R. Lender helps the firm to restructure.[22]

In the low state L the borrower cannot pay c, so action C is infeasible and the choice is between PIK and non-accrual; in H the borrower pays c in cash and the loan performs. The PIK margin takes the two contractual forms set at $t = 0$, which differ only in H: a note capitalizes the coupon in every state (so a healthy borrower still PIKs), whereas a toggle is exercised only on a shortfall, so it is not used in H and yields a performing PIK loan only in L.

[21] As $t = 2$ expected payoffs are higher after state H than after L, there exist a positive correlation between $t = 1$ liquidity needs and eventual default probability. This assumption is made for tractability but it is fairly innocuous having a consequential impact only on P5 (see Table 3 below). With negative correlation use of PIK toggle would be interpreted as a positive signal of loan quality, despite of enabling forbearance.

[22] Empirically, non-accrual loans may or may not still accrue PIK interest. Similarly, reporting non-accrual should not be seen as perfect proxy of lender recognizing and/or addressing loan's problems. Thus the distinguishing feature of this state is not the universal absence of PIK, but recognition that distress is real and actions that address the issues beyond just a simple payment deferral.

Information and objective. B and L observe s and the continuation value W, while the outside financier (F) does not and thus cannot verify the reported mark. The lender maximizes

$$U_L = \underbrace{\mathbb{E}[\text{terminal recovery on the loan}]}_{\text{NPV term, capped at firm value}} + \underbrace{B \cdot \mathbf{1}\{\text{performing and not falsified at } t=1\}}_{\text{private benefit of non-recognition}}, \tag{1}$$

where $B \geq 0$ is the manager's private benefit of avoiding non-accrual. This can be interpreted as fees from higher reported NAV or from PIK interest, maintaining a good relationship with the PE sponsor, borrowing-base eligibility, fundraising ability for the next fund, and reduced effort from monitoring or new-deal sourcing, etc. The benefit accrues to any loan carried above R, including the healthy H loan; there it is non-distortionary, since no recognition decision arises, and it does not enter the loan's fair value, so it leaves the cutoff below unchanged.

Assumption 2. The lender maximizes (1). The private benefit B accrues to the manager. Financier F prices the BDC stock competitively given the lender's observed actions.

4.2 The forbearance cutoff

Proposition 1 (Consent)**.** *In state* L *the borrower under limited liability weakly prefers PIK to recognition (strictly when continuation leaves positive equity); in* H *the borrower is healthy and pays cash, so the consent question does not arise. Hence PIK occurs iff the lender offers it, and the equilibrium object is the lender's action.*

Panel A of Table 3 visualizes the stages of the game, while Panel B shows lender payoffs in detail from each action. In H both C and P are feasible and, since $(1+c)^2+B > 1+2c+B$, the lender would weakly prefer P; but the healthy borrower's treatment is fixed by the contract form (cash under a toggle, which is not triggered, or capitalization under a note) rather than chosen at $t = 1$, so a healthy borrower is not converted into PIK. The actual decision for the lender arise only in L.

Proposition 2 (Optimal action and the forbearance cutoff)**.** *For every $B \geq 0$ the lender plays $a(\mathsf{H}) = \mathrm{C}$. For a distressed loan with recovery W,*

$$a = \mathrm{P} \quad \Longleftrightarrow \quad W + B > R \quad \Longleftrightarrow \quad W > \widehat{w} \;\equiv\; R - B. \tag{2}$$

The lender therefore continues every loan with $W > \widehat{w}$ and recognizes the rest. A planner who excludes the private benefit continues iff $W > R$. Since $\widehat{w} = R - B \leq R$, the unique inefficiency is the forbearance band $W \in (\widehat{w}, R) = (R - B, R)$: loans that should be recognized as nonaccrual and restructured, are kept performing. Its mass is $G(R) - G(R - B)$ and the deadweight loss is $\int_{R-B}^{R} (R - W)\, dG(W) \geq 0$, strictly positive iff $B > 0$ and G has mass in $(R - B, R)$.

The cutoff is the heart of the model. The private benefit lowers the continuation cutoff from the efficient R to $R - B$; every loan in the resulting band $(R - B, R)$ is forborne. As $B \to 0$ the band vanishes and the rule is first-best; as B grows the band widens downward into ever more impaired loans.

The behaviour of the lender is indexed by whether the forbearance band carries mass.

Proposition 3 (Scenarios)**.** *The lender's cutoff rule, together with F's competitive Bayesian pricing, is a Perfect Bayesian Equilibrium; by Assumption 2 the action is dominant given (s, W), so the outcome is unique on the path. The lender reports truthfully unless truth-telling would force recognition of a loan it prefers to keep performing. Healthy loans (H) are carried at V_{H}, while distressed loans are marked*

$$m_{\mathsf{L}}(W) = \begin{cases} W & W \geq R \quad \textit{(efficient continuation; truthful, already performing)}, \\ \widehat{V} \in (R, (1+c)^2] & R - B < W < R \quad \textit{(forbearance; over-marked)}, \\ R & W \leq R - B \quad \textit{(recognized)}. \end{cases}$$

We distinguish the scenario without forbearance, from a case where it exists.

1. ***No forbearance.*** *Either $B = 0$ or G has no mass in $(R - B, R)$: the cutoff*

coincides with the efficient R, every distressed loan is continued iff $W > R$ and recognized otherwise, all reported marks are truthful. This is first-best.

2. ***Forbearance*** *$B > 0$ with positive mass in $(R - B, R)$: those loans are carried at a performing over-mark $\widehat{V} > R > W$. This is the unique inefficient regime; the PIK without nonaccrual pools efficiently continued loans ($W > R$) with forborne ones ($R - B < W < R$).*[23]

The benign use of PIK is the upper tail $W > R$ of the recovery distribution, always continued and honestly marked. Forbearance is the band just below R that the private benefit drags into the performing pool.

4.3 Testable predictions

The following predictions distinguish forbearance actions from those without; derivations are in Appendix B.

1. Private benefit proxy, like higher management fees, is associated with higher likelihood of reporting PIK. ⇒ *In distress the lender chooses P rather than recognizes iff $W > \widehat{w} = R - B$, so $\Pr(P \mid \mathsf{L}) = 1 - G(R - B)$ is increasing in B: a higher private benefit lowers the cutoff $\widehat{w}$ and shifts distressed loans from non-accrual into performing PIK. (Appendix B.3)*

2. Predictable decline in a loan's Fair/Par after PIK. ⇒ *Over-marked loans converge to the truth by $t = 2$: $\mathbb{E}[m_2 - m_1] < 0$ in the forbearance band, zero otherwise. (Appendix B.4)*

3. Cross-BDC dispersion in a loan's Fair/Par after PIK use. ⇒ *Lenders with heterogeneous B_j apply different cutoffs $R - B_j$, so a commonly held loan with $R - B < W < R$ is forborne by some and recognized by others. (Appendix B.5)*

[23] We present in Appendix B.11 an extension that endogenously pins down the value $\widehat{V}$ and B.

4. PE sponsor's equity injection lowers the predictable Fair/Par decline after PIK. ⇒ *An injection raises a loan's W. If it lifts W above R the loan leaves the forbearance band and is honestly marked, so the predictable markdown disappears (Appendix B.6).*

5. Loans with PIK in place at origination have better terminal outcomes (higher Fair/Par, fewer non-accruals) than loans that activate toggle later ⇒ *A toggle that is PIK'ing at $t = 1$ is necessarily distressed state* L*, whereas a note PIKs even when healthy (*H*). The post-origination PIK toggle activation is an information event, that reveals this selection (Appendix B.7).*

6. Loans that exit impaired have used payment deferral rather than recapitalization, and exit later. ⇒ *Interpretation: Action P is the deferral bundle (PIK or maturity extension) and action N is conversion (debt-to-equity swaps), which recognizes the loss and resolves the claim at its restructuring value. Without forbearance, deeply impaired credits are restructured early and deferral appears only on efficiently continued loans; under forbearance the band is deferred, never converted, and resolves late at $W < R$ (Appendix B.8).*

7. Borrowing base constrains PIK lending; a BDC's bank borrowing is decreasing in its PIK exposure. ⇒ *A bank cap on performing-PIK collateral rations PIK to the highest-W loans; binding only under forbearance, it pushes the marginal forborne loan off the bank base and into non-bank funding (Appendix B.9).*

8. BDC portfolio's market-to-book value decreases with *PIK-toggle* exposure, and toggle exposure is priced strictly below note exposure. ⇒ *The outside financier prices the expected over-mark of the forbearance band as a discount on the BDC's portfolio. An activated toggle reveals the low state, so the toggle share carries the hidden-loss discount; a note capitalizes in every state, so its wedge is diluted by healthy borrowers. Without forbearance the two exposures are priced identically; with forbearance toggle exposure is priced strictly below note exposure (Appendix B.10; Online Appendix OA.3).*

Panel C of Table 3 collects the regime-discriminating observables. Each row is a prediction that we test empirically below, and the bolded cells are what we find in the data.

5 Determinants of PIK use

We start by establishing in which types of settings is PIK actually used and combining this to testing Prediction 1. We regress a PIK use indicator on five groups of covariates – *Manager Incentives*, *Loan Terms*, *Ownership*, and *Lending Relationship*, and *BDC-level controls* – and progressively tighten the fixed effect structure to decompose the variation.

$$PIK_{lk,t}^{(i)} = \sum_j \beta_{1j}\, Manager\, Incentives_{lt} + \sum_j \beta_{2j}\, Loan\, Terms_{lkt} + \sum_j \beta_{3j}\, Ownership_{blt} + \sum_j \beta_{4j}\, LendingRelationship_{bt} + \sum_j \beta_{5j} BDC\, Controls_{lt} + FEs + e_{lkt} \quad (3)$$

The dependent variable is one of three indicator variables: PIK_{lkt} equals one if the PIK spread for loan k from lender l is non-zero at time $t+1$, and zero otherwise, whereas $PIK_{lkt}^{(NonAccrual)}$ and $PIK_{lkt}^{(Accrual)}$ are obtained by multiplying PIK_{lkt} with $NonAccrual_{lkt}$ and $(1-NonAccrual_{lkt})$ indicators respectively. This decomposes the PIK-loans to those that are simultaneously in nonaccrual or accrual status. Our measures of $Manager\, Incentives$ proxy the private benefit. First, we use BDC's income incentive fee rate, which is typically around 15-20% of the pre-incentive net invesment income, for the portion that exceeds some threshold, set by the product of previous period net asset value and hurdle rate. Second, we interact this measures with the hurdle rate of this incentive income that acts as a "strike price" for this management fee call option. The motivation for these variabels is two-fold. First, PIK income directly boosts income incentive fees as effectively all externally managed BDCs count the paid-in-kind income toward the fee base. This directly increases manager's incentives to offer PIK. Second the incentives to reach for income (using PIK) will be higher if the incentive fee contract has a high hurdle

rate, to overcome before the fees start to accrue, but only if the incentive fee rate (i.e. the gains from PIK) is high. Thus in the regression, the interaction term of high incentive fee rate and hurdle rate should be positive.[24] We focus here only on the externally managed BDCs (over 90% of the sample) that have (and report) these incentive fees but the results would be economically and statistically similar when including the internally managed funds by setting their fee rates to zero.

We also include other covariates. *Loan Terms* include $Ln(Loan\,size_{lkt})$, *Effective base rate*$_{lkt}$, $Ln(Time\text{-}to\text{-}Maturity_{lkt})$, a $Fixed\,rate\,loan_{lkt}$ indicator, and the loan's *All-in-spread*$_{lk}$ at origination.[25] Loan seniority and loan type are absorbed by fixed effects. *Ownership* variables are $Dual\,holding_{blt}$, indicating whether the lender holds an equity stake in the borrower, and $PE\,Sponsored_{bt}$, that indicates if the borrower is backed by a private equity firm at that period. *Lending Relationship* variables are $Ln(Number\,of\,BDCs_{bt})$ 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 loans with PIK toggles and loans without observable PIK use. Finally we include some standard BDC-level controls: log fund size, leverage, cash share, profitability, log fund age, and base managment fee rate.[26] Standard errors are clustered at the Borrower, BDC, and YearQtr levels.

Table 4 presents the results. Across the specifications we find that income incentive fee rate is positively associated with higher propensity of PIK toggle use. For example, column 1 suggest that, all else equal, one standard deviation increase in fee rate is associated with 2.26 pp increase in PIK use. When including the hurdle rate variable and its interaction with incentive fee rate, we find that this estimate sits at 3.16 pp for a loan where lender's

[24] We describe the details of BDCs' typical management fee structure in Online Appendix OA1.5. BDCs often typically also have a base management fee, but since is not tied to PIK income its incentive role is smaller. Nevertheless we include it as our list of controls.

[25] We control for the all-in-spread at origination date τ rather than at date t since using PIK often causes an increase in all-in-spread, as there is often exists some extra drawdown spread for PIK use. This makes the two variables highly co-linear, and a time-varying *All-in-spread* an outcome of PIK use i.e. a "bad control".

[26] We exclude the PIK notes from these panel regressions, as by definition the indicator variable PIK does not contain any within-loan variation among PIK-notes. However, all the results would be both statistically and economically similar when including PIK notes.

hurdle rate sits at the mean value, and at 4.17pp when both the hurdle rate and the income incentive fee rate are one standard deviation above the average. For these private benefit proxies the results differ notably across specifications. For overall PIK use, the coefficient on fee variables positive, suggesting that BDCs that benefit from PIK in the form of betters fees are more likely to offer PIK. Then, the decomposing PIK usage by non-accrual status reveals that this overall result arises more from cases where BDC is reporting PIK but not reporting nonaccrual, while higher fee rates have smaller correlation with PIK reporting with nonaccrual. If these incentive fee rates are useful proxies of manager's private benefit, then these patterns are consistent with the model's prediction P1 that suggests that lenders use PIK more frequently if it allows them to postpone recognizing loan impairments and generates them more fee income for longer.

We also document other novel facts about PIK use. Larger loan balances, fixed interest payments and shorter remaining maturities are associated with higher likelihood of 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, this implies that deferring interest is a mechanism that can insulate zombie firms from contractionary monetary policy, corroborating evidence by Albuquerque and Mao (2025). Columns (3) and (5) suggest that loans where the BDC also holds an equity stake (*Dual holding*), are more likely to be assigned as PIK without nonaccrual but less likely to be assinged as PIK with nonaccrual. Lastly, columns (1), (3) and (5) suggest that borrowers without bank financing in the preceding five years are substantially more likely to use PIK.

6 PIK and Subsequent Loan Outcomes

Section 4 showed that the in the presence of forbearance, the model has unique predictions about what happens after PIK is used. This section confronts those predictions with the data along three margins. Section 6.1 uses the loan-quarter panel to test the dynamic predictions: whether PIK is followed by stablization and recovery (no forbear-

ance) or by persistent deterioration, rising valuation dispersion, and alleviating role of private equity sponsors (forbearance). Section 6.2 turns to terminal outcomes, studying the note/toggle/never-PIK taxonomy to ask whether the adverse information is concentrated in options exercised after origination. Section 6.3 examines whether PIK aligns with the restructuring tools, i.e. recapitalizations versus maturity extensions, that distinguish efficient continuation from extend-and-pretend. Overall, the evidence universally points to forbearance.

6.1 Testing the forbearance channel

Panel C of Table 3 gives scenario-discriminating predictions for post-PIK loan dynamics. We continue by testing predictions P2 and P3, by estimating

$$y_{lk,t+1} = \beta_1 \, \text{PIK}_{lkt} + \phi \, y_{lkt} + \gamma' X_{lkt} + \text{FEs} + e_{lk,t+1}, \tag{4}$$

where the outcome $y_{lk,t+1}$ is one of three model objects: $\text{NonAccrual}_{lk,t+1}$ and $\text{Fair/Par}_{lk,t+1}$ measure the predictable deterioration in P2, and $\text{CSD(Fair/Par)}_{k,t+1}$—the cross-sectional standard deviation of fair-value-to-par ratios across BDCs holding similar loans of the same borrower—measures the lender disagreement in P3.[27] The key explanatory variable is PIK_{lkt} and an important control is the lagged dependent variable y_{lkt}, which captures the current status of the loan and any cumulative pre-trends that are captured in loan value. Since the value and non-accrual status at time t are reported after the lender already knows PIK has been used at that period, the coefficient β_1 isolates the new (or hidden) information in PIK beyond what the current loan status already reveals. Under no forbearance there is no incremental information so β_1 is zero. In contrast, under forbearance it is adverse information that is not yet incorporated into the contemporaneously reported loan values or nonaccual status so $\beta_1 < 0$ for Fair/Par and $\beta_1 > 0$ for Non-accrual regressions respectively. We include the same controls from Table 4 and progressively sat-

[27] Two loans held by different lenders in the same period are "similar" if they share borrower, seniority, and loan type. Using the PIK toggle is not itself a default event.

urate the fixed effects (Industry × YearQtr, BDC × YearQtr, Borrower × BDC); standard errors are three-way clustered by borrower, BDC, and year-quarter.[28]

Deterioration and disagreement (P2 and P3). We start by analyzing the outcomes in the short horizon. Non-zero PIK status predicts a 3 percentage-point increase in the probability of non-accrual in the following quarter (columns 1–2). Against an unconditional non-accrual rate of 3%, PIK roughly doubles the likelihood of technical default. Valuations move in parallel: a single quarter of PIK is followed by a an about 100 bp decline in Fair/Par (columns 3–4), even though we condition on the time-t valuation. This conditional decline is consistent with forbearance interpretation established in P2 that predicts a negative predictability after PIK use as the over-reported value $m_1 > R > W$ converges to the true expected value W by $t = 2$. In contrast this pattern cannot be generated without forbearance (no predictable drift, $W > R$). Consistent with P3, PIK is also followed by significantly higher cross-lender valuation dispersion (columns 5–6). In the model, the disagreement arises when lenders facing different incentives value the same loans differently.[29]

Persistence: transitory versus permanent. The one-quarter result does not by itself distinguish a transitory liquidity shock that mean-reverts from persistent impairment that the lender is slow to recognize. Also, it is highly likely that it will take lender longer than one-quarter to recognize losses or incorporate the full information into the loan values. We therefore trace the dynamic response of PIK use with local projections,

$$y_{lk,t+h} = \beta_h \,\mathrm{PIK}_{lkt} + \textstyle\sum_{j=0}^{4} \phi_{hj}\, y_{lk,t-j} + \gamma_h' X_{lkt} + \mathrm{FEs} + e_{lk,t+h}, \qquad h = 1, \ldots, 8, \tag{5}$$

and plot $\{\beta_h\}$ in Figure 3. For NonAccrual and Fair/Par the adverse response is *persistent*, remaining significant beyond two years. Valuation dispersion is more transient,

[28] BDC × YearQtr effects matter because PIK activity may correlate with lender risk appetite or funding constraints that also shape valuation practice; Borrower × BDC effects absorb endogenous matching.

[29] BDC managers acknowledge the subjectivity in valuations of PIK loans. Kennedy Lewis Capital Corp's 2024 annual report notes that "PIK instruments may have unreliable valuations because the accruals require judgments about collectability of the deferred payments and the value of any associated collateral."

converging back to zero by $h \approx 6$; because estimates are public, lenders appear to learn from, or impose discipline on, one another's valuations. Note that as discussed above the forbearance problem may be the *worst* among single-lender borrowers, for whom no cross-lender comparison exists, so the documented multi-lender dispersion is likely a lower bound.

The negatively predictable loan values deserve some discussion. In efficient markets the loan's current price should contain all available information and under risk-neutrality reflect loan's expected future payoff. With positive risk premium, the current price should be even lower than future expected payoff. Thus the observed pattern where PIK use adds information about future payoffs that is not yet incorporated in the contemporanous loan values is in stark contrast to these market primitives. Instead, the absence of any post-PIK recovery or stabilization is more consistent with BDCs' slow realization of losses predicted under inefficient forbearance.

Sponsorship dampens the negative predictive power of PIK (P4). Prediction P4 states that a sponsor's equity-injection capacity raises W, shrinking the hidden wedge $R - W$ and, in the limit, moving loans from forbearance to efficient continuation region. We add PIK $\times$ *PE Sponsored* interaction to equation (4) to test this. Table 6 shows that the PE sponsorship roughly halves both the post-PIK non-accrual effect and the Fair/Par decline, exactly the attenuation P4 predicts.[30] We also add other interaction terms for robustness. However, unlike *PE sponsored*, other variables, except *Dual-holding* in columns (2) and (5), do not have statistically significant influence on the slope of the deteriorating trend following PIK use.

Figure 4 visualize these results by plotting the average loan value and nonaccrual proability around first time PIK use for loans of both PE sponsored and non-sponsored firms. The average loan value declines and non-accrual rises in the quarters around first PIK use and continue to deteriorate afterward, without reversal, with some attenuation for PE-sponsored borrowers. The fact that the deterioration of credit conditions, measured

[30]We do not observe equity injections directly, but PE owners are documented to inject equity in distress(Hotchkiss et al., 2021; Jang, 2024) and to negotiate injection clauses against debt amendments such as PIK; sponsor engagement also substitutes for lender monitoring (Haque et al., 2023).

by declining average loan value and increasing non-accrual rate, starts typically already slightly before the PIK is first used, suggests that PIK is more likely to be a symptom rather than a cause of a firm's difficulties. This is consistent also with the model. Importantly, we see a clear underreaction in loan prices before and after the information event of PIK use suggesting that BDCs are slow to mark down these valuation losses, which we have shown are predictable.[31]

Consistent with P4, the PE sponsorship attenuates this gradual deterioriation after PIK use but does not eliminate as the potential equity injection will remove only the forbearance at the margin. Together, the results in Tables 5 and 6, and in Figures 3 and 4 all support the view that some inefficient forbearance occurs among PIK users.

6.2 Cross-sectional test: PIK and model-implied loan outcomes

The panel tests capture short-term dynamics around PIK use but not the terminal outcomes for loans that ever PIK relative to those that never do. We therefore turn to a cross-sectional design that exploits initial loan characteristics at origination and a three-way taxonomy of PIK use.[32] PIK Notes capture loans where interest deferral is a permanent component of the spread and thus priced and screened at origination. PIK Toggles capture loans where the borrower holds an option to switch into PIK during the loan's life, so activation reveals information that arrives after origination. Never-PIK loans serve as the reference category. Within PIK Toggles, we further distinguish loans that activate the toggle at origination (ex-ante PIK) from those that activate it only post-origination (ex-post PIK), which is the object most closely linked to forbearance in the model.[33]

[31] The gradual decline in loan value could in principle also arise through a stream of (negative) news arrival that lender gradually learns and immediately incorporates into reported valuations. However, this explanation would suggest that lenders are unaware of the negative information content in PIK because otherwise they could refine their valuation estimates using the PIK signal. As BDC managers are sophisticated investors that have all the same public information about firms as the we—the econometricians—and much additional private information, this framing of the managers as dumb (but perfectly honest) seems implausible.

[32] The taxonomy is consistent with the BDC reporting structure described in Section 3.

[33] As in the panel analysis, we define post-origination activation as the first quarter in which the PIK spread is strictly positive after the origination quarter.

6.2.1 Specification

We estimate variants of a single cross-sectional regression,

$$y_{lk,T} \;=\; \beta_1\, PIK_{lk}^{(1)} \;+\; \beta_2\, PIK_{lk}^{(2)} \;+\; \gamma' \mathbf{X}_{lk,\tau} \;+\; FEs \;+\; \varepsilon_{lk,T}, \tag{6}$$

where τ is the loan's origination quarter (the first quarter the loan appears in the sample) and T is the exit quarter. The outcome $y_{lk,T}$ is either $NonAccrual_{lk,T}$, an indicator for nonaccrual status at exit, or $I(Fair/Par_{lk,T} < 0.8)$, an indicator for exiting with a fair value below 80% of par. Controls are measured at origination and are identical to those in Section 6.1.

Spec.	$PIK^{(1)}$	$PIK^{(2)}$	Sample
A	Note	Toggle (ever)	Full
B	Toggle (at-orig.)	Toggle (post-orig.)	Toggles only
C	Note	Toggle (at-orig.)	Full

Specification A contrasts PIK Notes and ever-toggles with never-PIK loans. Specification B drops the PIK notes to isolate the timing of PIK toggle activation. Specification C addresses an econometric subtlety: post-origination toggle activation is unobservable at τ, so from the perspective of an origination-time forecaster these loans are observationally identical to never-PIK loans. Pooling them in the omitted category isolates the predictive power of PIK information available at origination.

6.2.2 Results

Table 7 reports the estimates. Our cross-sectional tests provide one clean conclusion: post-origination PIK-toggle activation is the only PIK variant that robustly predicts adverse exit outcomes. PIK Notes and at-origination toggles, both priced under ex-ante information, do not.

Notes, ever-toggles, and never-PIK. Panel A shows that loans that ever use a PIK toggle are 14–16 percentage points more likely to exit in nonaccrual and 15–17

percentage points more likely to exit below 80% of par. These magnitudes are large relative to unconditional rates of roughly 4% (nonaccrual) and 5–6% (low valuation), and are stable across origination controls and more demanding fixed effects (year-quarter × industry, year-quarter × BDC). PIK Notes are also associated with worse outcomes, but the effects are an order of magnitude smaller—4–5 pp for nonaccrual and 3–5 pp for the low-valuation outcome, with the latter less robust, consistent with interest deferral that is largely anticipated and priced at origination rather than driven by ex-post forbearance.

Toggle timing. Restricting the sample to PIK-Toggle loans, the adverse outcomes in Panel A are concentrated in post-origination activations (Panel B). Post-origination toggle use raises the probability of nonaccrual at exit by 16–18 pp and the probability of a sub-80% exit by 17–20 pp, with point estimates essentially unchanged across specifications. By contrast, at-origination toggles show much weaker outcome differences: without controls, 7 pp (nonaccrual) and 4 pp (low valuation); once origination controls are included, the coefficients fall to 3–4 pp and 2–3 pp and lose statistical significance. Conditional on observable loan and borrower characteristics, at-origination PIK use does not predict worse exit outcomes, which is consistent with the model's view that ex-ante PIK terms are incorporated into pricing, whereas ex-post PIK activation under forbearance pools liquidity shocks and latent insolvency and therefore carries genuinely negative information.

What was knowable at origination. When post-origination toggle activations are pooled into the omitted category (Panel C), the predictive content of PIK information observable at origination is limited. PIK Notes and at-origination toggles enter positively in the most parsimonious specification (coefficients of roughly 3 and 5 pp for non-accrual), but both become small and statistically insignificant once origination controls are added and remain so under the saturated fixed effect structure; the same pattern holds for the low-valuation outcome.

Overall, not all forms of PIK carry the same informational content. The strongest and most robust predictor of adverse exit outcomes is toggle activation that occurs after origination, when the lender's information set has updated and PIK can be used to postpone recognizing a loss. This pattern aligns with the model's prediction that forbearance is pri-

marily driven by ex-post PIK on impaired loans. PIK Notes and at-origination toggles are largely anticipated and priced into the original lending decision and carry little additional predictive power once observable loan and borrower characteristics are controlled for.

Panels A and B of Table 7 show that different contractual PIK forms line up with interpretation that at origination when the future state is uncertain the ex-ante contract design is free from lender's discretionary continuation decision, whereas with PIK toggles that are exercised post-origination, the risk of inefficient forbearance exists. Panel C then shows that, once we control for standard loan characteristics at origination (introduced in columns 2 and 5), simply knowing that a contract contains PIK terms at $t = 0$ does not by itself predict worse exit outcomes: the additional predictive content comes from the ex-post decision to activate PIK.

These results are consistent with P5 of the model that predicts that PIK notes, and PIK toggles that are in place at origination, tend to experience better termination outcomes than post-origination toggled PIK loans. In the model, this prediction follows from the simple fact that post-origination toggle use reveals that firm faces a state L in $t = 1$ predicting worse eventual loan outcomes, while $t = 0$ PIK user loans also pool in the loans that experience state H. As highlighted in Panel C of Table 3, confirming this prediction does not necessarily imply forbearance. Nonetheless, the result illustrates important heterogeneity in PIK that investors can use to draw predictions about eventual loan outcomes.

6.3 Deferred interest and other restructuring tools

Distressed loans are treated with two families of actions, that the model's actions map onto. *Deferral* actions keep the debt claim alive and postpone resolution: PIK postpones the coupon, a maturity extension postpones the principal. This is action P—the claim capitalizes and resolution moves forward in time. *Conversion* actions resolve the claim with more fundamental restructuring, such as the debt-to-equity swap, where the lender recognize the need for recapitalization: this is action N, the analogue of recognizing default

and some losses at value R while shielding the firm from further losses. Prediction P6 (Appendix B.8) separates the scenarios on the frequency and sequencing of observable actions, which are tested below.

We construct two new indicator variables. *Maturity Extension* equals one if the loan's remaining maturity increases or remains the same quarter-over-quarter. *Debt-to-Equity Swap* equals one if a BDC's debt claim on a borrower decreases while its equity ownership simultaneously increases.[34] We then study final exit values and document whether loans experience one or more of these restructuring events during the loan life cycle, as well as the order in which the tools are first used.

Table 8 reports the prevalence, co-occurrence, and sequencing of PIK, maturity extensions, and debt-to-equity swaps across three terminal loan value buckets: *severely impaired* (Fair/Par < 0.5), *partially impaired* ($0.5 \leq$ Fair/Par < 0.8), and *par-exit* (Fair/Par ≥ 0.8).

Prevalence and co-occurrence across exit values. Three patterns stand out in Panel A of Table 8. First, distress indicators concentrate sharply in the impaired buckets: non-accrual at exit, ever-PIK use, and active PIK at exit all decline monotonically as Fair/Par rises. Second, maturity extensions track impairment but debt-to-equity swaps do not—extensions occur in 44.7%/33.3%/24.9% of loans across the three buckets, while swaps are essentially flat at 15.9%/11.6%/11.7%. Third, conditional on PIK use, maturity extensions dominate swaps in every bucket (54.1% vs. 23.8% in the lowest; 53.2% vs. 17.3% in the intermediate; 37.5% vs. 20.5% in the highest), with differences of 30, 36, and 17 percentage points, all statistically significant. While the first pattern would be consistent with both inefficient forbearance, and efficient continuation, the second and third pattern shift the evidence more in favor of extend-and-pretend type of forbearance rather than efficient restructuring. Overall, it seems that when PIK is used on impaired loans, it is mostly coupled with continued exposure rather than with recognition, reinforcing the

[34]Interpreting debt-to-equity swaps as restructuring events requires caution because such swaps can arise for different reasons. Some conversions reflect the exercise of options embedded in convertible debt or equity kickers, and are more likely when the equity option is in the money. Others occur in distress, when the borrower delevers by converting debt into equity. Distressed restructurings should occur late in the loan life cycle, after other relief such as PIK or maturity extensions; opportunistic option exercises should occur earlier, before signs of distress. The sequencing evidence below uses this distinction.

forbearance interpretation.

Duration. Impaired loans stay outstanding longer. Loans exiting below 0.5 Fair/Par remain in the sample for 50.4 months on average, compared with 42.3 months for partially impaired loans and 30.3 months for par-exit loans. Relative to original maturity, the ratio of time in sample to time-to-maturity at origination is 1.17, 0.80, and 0.54 across the three buckets—severely impaired loans systematically outlive their contractual horizon.[35]

Sequencing of PIK and maturity extensions. Among loans with both PIK and a maturity extension, PIK generally comes first. First PIK use precedes the first maturity extension by 5.5 months in the severely impaired bucket (31.3 vs. 36.8 months) and by 7.2 months in the par-exit bucket (24.8 vs. 32.0 months); the two events nearly coincide in the partially impaired bucket (35.9 vs. 35.2 months). This ordering is consistent with PIK serving as an initial cash-flow relief mechanism that is subsequently reinforced by contractual maturity relief.

Sequencing of PIK and debt-to-equity swaps. The ordering reverses for debt-to-equity swaps in the impaired buckets. In the severely impaired bucket, the first swap occurs after 26 months versus 31 months for first PIK use; in the partially impaired bucket, 29.4 versus 37.3 months, with the difference positive and statistically significant in the severely impaired bucket. Among par-exit loans, however, PIK comes first (22 vs. 26 months). This split is what we would expect if swaps in healthy exits reflect opportunistic, in-the-money option exercise—occurring late, after coupon payments have been collected—while swaps in (eventually) impaired loans reflect lender's opportunistic conversion behavior before becoming aware of the loan's issues and then switching to deferring interest and principal.

Together, the dominance of maturity extensions over debt-to-equity swaps and their typical sequencing support the P6 and the forbearance hypothesis in the model: discretionary PIK postpones loss recognition in state L through repeated maturity and interest deferrals rather than recapitalizing distressed borrowers or recognizing default when

[35] In Online Appendix Table A3, we support these results using survival analysis and a hazard model, which reveals that using PIK in the previous period lowers the probability of an early repayment, consistent with the view that PIK is often coupled with maturity extensions that prolong the holding period of distressed firms.

$W < R$.

7 BDC funding, and stock market valuation

The theoretical framework makes predictions not only about loan-level dynamics but also about how a BDC's own financiers respond to its PIK exposure. Table 3 records two of them. Prediction P7 states that bank borrowing is decreasing in PIK exposure: because banks lend against a borrowing base and cannot verify the BDC's marks, they discipline PIK accumulation through eligibility limits, so that under forbearance a BDC's bank funding falls as PIK exposure rises (absence of forbearance, no such relationship arises). Prediction P8 states that the BDC's market-to-book ratio is decreasing in portfolio PIK toggle exposure: the outside financier F recognizes that some PIK loans are marked above true value ($m_1 = \widehat{V} > R > W$) and reprices BDC equity accordingly. Sections 7.1–7.3 take these two predictions to the data.

7.1 BDC capital structure

We first establish the prevalent featured of the BDC sector capital structure to understand what types of financiers can impose market discipline on BDCs. To obtain detailed funding-mix data, we merge BDC Collateral with CapitalIQ and the combined CRSP/Compustat database. Following Colla et al. (2013), we drop BDC-quarter observations for which total debt reported in BDC Collateral deviates by more than 10% from total debt reported in CapitalIQ. The matched sample contains 66 unique BDCs at quarterly frequency from 2012Q1 to 2024Q4, with detailed data on drawn and undrawn credit lines, term loans, bonds, and commercial paper issuance.

Figure 5, Panel A summarizes the aggregate BDC sector balance sheet in 2022Q4. Three features stand out, and each maps directly onto a precondition of the model's funding predictions. (i) BDC assets are almost entirely direct loans (98%), with negligible cash holdings (2%): BDCs are lending vehicles, not liquidity vehicles. With no inter-

nal cash buffer, a BDC that defers cash interest through PIK must absorb the resulting shortfall through external funding. (ii) The funding mix is roughly half equity (46%), one-third non-bank debt (32%, mainly bonds), and one-fifth bank debt, of which drawn credit lines dominate (21% drawn vs. 1% term loans). Because the bank-debt component is overwhelmingly committed credit lines rather than term debt, it is governed by borrowing-base eligibility rules. (iii) Off-balance-sheet undrawn bank credit lines (12% of assets) provide the principal contingent liquidity buffer, given the minimal cash reserves; whether BDCs can actually draw on this buffer as PIK exposure rises depends on the covenants set on the borrowing base (Prediction P7).

Panel B traces the funding mix of the typical BDC from 2012Q1 to 2024Q4. The dominant trend is a steady decline in the equity share, replaced by a roughly equal expansion of bank and non-bank debt. The Online Appendix Section 3.2 augments these results and shows that the larger and more leveraged BDCs tend to have larger PIK expsoure. Given these trends, increasing trends toward debt funding, next we study how the external debt financiers respond to increasing PIK exposure.

7.2 PIK usage and BDC capital structure

7.2.1 Specification and prediction

BDCs rely far more on credit lines than on cash for liquidity management, so the natural question is whether BDCs with higher deferred-interest exposure lean more or less on bank-committed facilities. The borrowing-base extension in the Appendix B.9 captures a typical contractual feature of these credit lines: assuming the bank recognize that BDC can offer excessive PIK, it caps performing-PIK collateral at a fixed share of the base. Without forbearance, PIK is benign and the cap never binds, so bank funding is unrelated or increasing in PIK exposure. With forbearance, by contrast, the lender wants to forbear loans beyond the in-base allowance and doing so requires moving the marginal forborne loan off the borrowing base, where it must be financed with costlier non-bank capital. The result is a negative relationship between PIK exposure and bank funding, Prediction P7

in Panel C of Table 3. We test this by estimating

$$y_{l,t} = \beta_1 \,\text{PIK Usage Share}_{l,t} + \gamma' X_{l,t-1} + \alpha_l + \alpha_t + \varepsilon_{l,t}, \tag{7}$$

where $y_{l,t}$ is either Bank Debt Share (bank debt as a share of total debt) or Credit Line Usage (drawn over total committed lines); PIK Usage Share$_{l,t}$ is the par-value-weighted share of BDC l's portfolio companies paying any interest in kind in quarter t;[36] $X_{l,t-1}$ collects one-period-lagged BDC controls (log fund size, leverage, cash share, profitability, log fund age); and α_l, α_t are BDC and year-quarter fixed effects.[37] Because PIK Usage Share is measured on a 0–1 scale, reported coefficients correspond to a full-sample shift; a 1 percentage-point change scales the coefficient by 0.01. No forbearance predicts $\beta_1 \geq 0$; while the forbearance predicts $\beta_1 < 0$. The visibly negative co-movement between aggregate PIK usage and aggregate credit-line usage in Figure 5 provides early evidence of this (negative) relationship, that we report next also within an individual BDC-level.

7.2.2 Results

Baseline. Table 9, Panel A reports the baseline estimates. Across all specifications, PIK Usage Share enters significantly negatively for both outcomes, rejecting the $\beta_1 = 0$, the null of no forbearance. In the most saturated specifications, with BDC and year-quarter fixed effects, at column 3 for Bank Debt Share and column 6 for Credit Line Usage, a 1 percentage-point increase in PIK usage is associated with a 0.51 pp reduction in the bank debt share and a 0.38 pp reduction in credit-line utilization, both significant at the 1% level. BDCs do not draw on bank credit to absorb PIK-induced cash shortfalls; they pull back instead, which is the sign P7 predicts under forbearance.

Robustness. Panel B adds controls for portfolio quality—the non-accrual share and

[36] We focus on contemporaneous correlation as this aligns with the mechanism we describe below, but the results would be similar using lagged PIK usage.

[37] BDCs with high versus low PIK usage differ in observable fund characteristics (Online Appendix Section 3.2, Table A6 Panel B), which is why BDC fixed effects and time-varying controls are essential. Mistopoulou and Steffen (2026) likewise emphasize the role of BDC fixed effects in explaining funding decisions.

the portfolio-level fair-to-par ratio, separately and jointly. The coefficient on PIK Usage Share is essentially unchanged at ≈ -0.51 for Bank Debt Share and ≈ -0.38 for Credit Line Usage, and remains significant at the 1% level. The portfolio quality controls themselves are small and statistically insignificant. This matters for the model interpretation: the negative association is the footprint of forborne PIK loans leaving the borrowing base, not a generic response to contemporaneous distress, which the non-accrual and fair-value controls already absorb.

Mechanism. The contractual explanation is the one assumed by the model. We hand-collect bank credit-line agreements from BDCs' 8-K and 8-K/A filings (Online Appendix Section 1.4) and find that explicit caps on permissible PIK exposure appear in approximately 88% of debt agreements among BDCs with credit lines outstanding.[38] BDC investment portfolios, or designated subsets, serve as collateral for bank debt, and contracts impose haircuts or eligibility limits on PIK-bearing positions. The Ares Capital agreement, for instance, limits PIK loans to 10% of eligible loan assets (Online Appendix 1.4).[39] Elevated PIK usage therefore mechanically erodes the borrowing base, restricting new borrowing or triggering paydown of existing debt. The contractual design insulates the banking sector from PIK risk by pushing the burden of deferred interest back onto BDC equity holders.

Funding mix. The model is explicit that the borrowing-base covenant is a *soft* constraint: a BDC with access to alternative funding can partly escape the cap, and the covenant by pushing the marginal PIK loan off the bank-financed part of the balance sheet, while replacing it with other funding. The data match this case directly. In Online Appendix 2.6 (Table A7), PIK Usage Share is uncorrelated with both the debt-to-assets ratio and the cash-to-assets ratio, while the bank-debt-to-assets share declines as before: BDCs with elevated PIK exposure neither delever nor run down cash but they substitute non-bank for bank debt, holding total leverage fixed. This matches the soft-quota mechanism (see Appendix B.9) and implies that cap does not curb PIK usage but only

[38] 88% is likely a lower bound; some agreements may contain PIK-related language that our web crawler does not capture.

[39] These caps are the empirical counterpart of the model's eligibility share introduced in Appendix B.9.

reallocates the exposure from bank to non-bank financing.

Portfolio choice. In Table A7 of the Online Appendix we further examine whether BDCs with higher PIK usage differ systematically in their investment and lending behavior and show that BDCs relying more heavily on PIK tend to concentrate their portfolios into fewer but larger investments. They also reallocate lending away from non-PIK borrowers toward those using PIK features and move down the capital stack away from first-lien positions toward subordinated debt.

7.3 PIK Usage and BDC Stock Market Valuation

7.3.1 Specification and prediction

The borrowing-base covenant pushes the residual PIK risk back onto BDC equity holders, so the final test asks whether the equity market prices it. Prediction P8 states that if PIK lending is influenced by forbearance, a BDC portfolio's stock market implied valuation should be decreasing in its portfolio's PIK exposure. The model is precise about why PIK exposure should matter. Proposition 9 in the Appendix B.10, reports that book value and true value diverge only on forborne loans, carried at the inflated mark $\widehat{V}$ but worth $W < \widehat{V}$. On the forbearance band, the per-loan over-marking is $\omega(W) = (\widehat{V} - W)\,\mathbf{1}\{R - B < W < R\}$. Thus the market value (MVA) to book value (BVA) of assets that reflects this at the portfolio level is

$$\text{MVA/BVA} = 1 - \frac{\pi_L \int_{R-B}^{R} (\widehat{V} - W)\, dG(W)}{V_N^p}, \tag{8}$$

The numerator in the second term on the right hand side is the aggregate over-marking on the forbearance band $(R-B, R)$, so MVA/BVA equals 1 without forbearance (no forborne loans, or honest marks with $\omega = 0$) and falls below 1 only under forbearance. Moreover, as we saw above, the forbearance should be most pronounced among PIK toggles, rather than among PIK notes, which motivates us to test if this asymmetry also appear in stock pricing of public BDCs.

When taking this prediction to data we use two valuation proxies denoted as MV/BV.

First, is the BDC's Price/NAV (i.e. market-to-book ratio of *equity*). This would be the correct meausure only for unleveraged BDCs but it is a clean measure of stock market pricing. Second is the BDC's market-to-book ratio of *assets*, MVA/BVA, the theoretically correct measure. However, when calculating the MVA, we do not observe the market value of debt so we use the book value of debt as its proxy.[40] We estimate, on the sample of publicly traded BDCs,

$$(\text{MV/BV})_{l,t+1} = \beta_1 \, \text{PIK}^{(1)}_{l,t} + \beta_2 \, \text{PIK}^{(2)}_{l,t} + \gamma' X_{l,t} + \alpha_l + \alpha_t + \varepsilon_{l,t}, \tag{9}$$

in two variants. Variant (a) uses a single aggregate measure, $\text{PIK}^{(1)}$ = PIK Usage Share (and omits $\text{PIK}^{(2)}$); variant (b) decomposes it into $\text{PIK}^{(1)}$ = PIK Toggle Usage Share and $\text{PIK}^{(2)}$ = PIK Note Usage Share. The outcome is either of the one-quarter-ahead MV/BV ratio, relating current portfolio PIK activity to subsequent market value relative to the accounting value.[41] Controls $X_{l,t}$ include log fund size, leverage, profitability, cash holdings, fund age, and non-accrual exposure; all specifications include calendar-quarter fixed effects α_t to absorb aggregate market conditions, and the most saturated specification adds BDC fixed effects α_l, identifying β_1 and β_2 from within-BDC time variation. No forbearance predicts $\beta_1 = \beta_2 = 0$; while forbearance scenario predicts a negative coefficients coming primarily from PIK toggle exposure [42]

7.3.2 Results

We start with Price/NAV as the dependent variable. Column 1 of Table 10 pools all PIK use into a single aggregate share. The coefficient is small, economically close to zero relative to the sample-mean Price/NAV of 0.89, and statistically insignificant. At the

[40] So $MVA = MVE + BVD$. MVE is the market value of equity. BVD is the book value of debt.

[41] The one-quarter-lag postulates that the information about previous quarter PIK exposure has been released and has become incorporated into the stock pricing by the end of next quarter.

[42] The predicted sign of PIK note coefficient depends on the modelling choices. In the purposely simplified baseline model of Section 4 the ordering is $\beta_T < \beta_N \leq 0$. However, once we relax some of the model's restricting assumptions (like no-discounting) the ordering becomes $\beta_T < 0 < \beta_N$. This is shown in the Online Appendix OA3 that introduces a model extension with agent-specfic time discounting. This extension maintains P1-P7 and refines P8 to account for the potential asymmetry in coefficient signs.

aggregate level, equity investors therefore assign no uniform discount or premium to PIK exposure.

Interestingly, once PIK Usage Share is split into Toggles and Notes, the two components carry opposite signs. PIK Toggle Share enters significantly negatively in every specification. The within-BDC estimate implies that a 10 percentage-point increase in toggle usage is associated with a 3.1 percentage-point lower next-quarter Price/NAV—an economically meaningful discount against the sample mean of 0.89. Simultaneously, PIK Note Share enters significantly positively across the same specifications. The within-BDC estimate implies a 10 percentage-point increase in note usage maps to a 5.8 percentage-point higher next-quarter Price/NAV, and the positive sign survives controls for size, leverage, profitability, cash, fund age, non-accrual exposure, and BDC fixed effects.

Columns (5)-(6) use MVA/BVA as alternative dependent variable and produce very similar results: PIK Usage Share has independently no explanatory power on portfolio valuation but when decomposed into PIK Toggle share and PIK Note share the opposite-signed effects appear.[43]

Together with the bank-funding evidence, these results show that both senior lenders (via borrowing-base covenants, P7) and equity investors (via market-to-book ratio, P8) view post-origination PIK exposure unfavorably and seek to discipline the lender's actions. Overall, both results provide strong evidence that the forbearance is widespread empirically in private credit.

8 Conclusion

This paper examines whether Payment-in-Kind provisions facilitate efficient liquidity management or instead enable forbearance in private credit markets. Building on the predictions of simple theoretical framework and using a new loan-level dataset on BDC lending, we find stronger support for the forbearance interpretation. PIK usage follows credit

[43]We show in the Table A8 in the Online Appendix that when decomposing the PIK Toggle usage further into post-origination–and at-origination PIK Toggle usage, it is the post-origination PIK toggle use that is the primary driver of the negative sign.

deterioration, predicts persistent non-accrual status and fair-value declines, and is most informative when activated after origination. Rather than being paired primarily with formal restructurings, PIK is more often associated with maturity extensions that postpone resolution. At the BDC level, high PIK exposure is viewed unfavorably by the financiers. Banks appear to restrict funding to PIK-heavy BDCs, while public equity investors discount BDCs with greater PIK-Toggle exposure. These findings show how forbearance can arise in private credit not through bank capital constraints, but through contractual features that allow lenders to defer cash payments, extend maturities, and delay loss recognition.

There are different directions for future research. Our evidence stops at the loan and at the BDC that holds it, and three questions follow from where it stops. The first is what forbearance does to the borrower. PIK'd loans do not recover on average, but we do not observe the operating performance of the private firms behind them, so we cannot yet separate the borrower for whom deferral buys a genuine recovery from the one it merely keeps alive. Linking PIK activation to borrower investment, employment, and eventual survival requires firm-level data that private-credit borrowers do not disclose and is the natural next step. The second is external validity. BDCs are the segment of private credit that files. The mechanism we document should, if anything, operate more freely in more opaque private credit structures where valuation scrutiny is weaker. The third is the credit cycle. Our sample spans a decade whose only broad stress was the brief COVID shock, while PIK toggles have since become a standard feature in the private credit market. Because forbearance defers recognition without removing risk, a synchronized recognition event in an economic downturn could turn accumulated deferral into massive write-downs.

Our results have direct implications for supervisors building out the monitoring of non-bank credit. As banks protect themselves contractually, the exposure that PIK forbearance creates sits with non-bank capital, often with retail investors. That is, monitoring PIK means looking at where PIK is held, not at bank balance sheets. Two implications follow directly. First, private credit portfolios require independent valuation as forbearance incentivizes over-reporting. Second, firm's PIK usage, and in particular their post-origination

toggle activation, is a leading indicator of deterioration that supervisors can construct from existing filings.

References

Acharya, V. V., L. Borchert, M. Jager, and S. Steffen (2021a): "Kicking the can down the road: government interventions in the European banking sector," *Review of Financial Studies*, 34, 4090–4131.

Acharya, V. V., N. Cetorelli, and B. Tuckman (2026): "Where do banks end and NBFIs begin?" *The Review of Corporate Finance Studies*, cfag012.

Acharya, V. V., T. Eisert, C. Eufinger, and C. Hirsch (2019): "Whatever it takes: The real effects of unconventional monetary policy," *Review of Financial Studies*, 32, 3366–3411.

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

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

Acharya, V. V., S. Lenzu, and O. Wang (2021b): *Zombie lending and policy traps*, 29606, National Bureau of Economic Research.

Acharya, V. V. and S. Steffen (2020): "The risk of being a fallen angel and the corporate dash for cash in the midst of COVID," *Review of Corporate Finance Studies*, 9, 430–471.

Albuquerque, B. and C. Mao (2025): "The zombie lending channel of monetary policy," *Management Science*.

Balloch, C. and J. Gonzalez-Uribe (2021): "Leverage Limits in Good and Bad Times," *London School of Economics Working paper*.

Baron, M., L. Laeven, J. Pénasse, and Y. Usenko (2026): "Permanent capital losses after banking crises," *The Quarterly Journal of Economics*, 141, 667–732.

Barry, J. W., M. Campello, J. R. Graham, and Y. Ma (2022): "Corporate flexibility in a time of crisis," *Journal of Financial Economics*, 144, 780–806.

Bhanot, K., A. Mello, and Y. Wu (2026): "Payment-in-Kind (PIK) Debt," *Available at SSRN 5562158*.

Blattner, L., L. Farinha, and F. Rebelo (2023): "When losses turn into loans: The cost of weak banks," *American Economic Review*, 113, 1600–1641.

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

Bonaimé, A. A., K. W. Hankins, and J. Harford (2014): "Financial flexibility, risk management, and payout choice," *Review of Financial Studies*, 27, 1074–1101.

Bruche, M. and G. Llobet (2014): "Preventing zombie lending," *Review of Financial Studies*, 27, 923–956.

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

Caballero, R. J., T. Hoshi, and A. K. Kashyap (2008): "Zombie lending and depressed restructuring in Japan," *American Economic Review*, 98, 1943–1977.

Campello, M., J. R. Graham, and C. R. Harvey (2010): "The real effects of financial constraints: Evidence from a financial crisis," *Journal of Financial Economics*, 97, 470–487.

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

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

Crosignani, M. and S. Prazad (2024): "Extend-and-Pretend in the U.S. CRE Market," *Working Paper*.

Daniel, N. D., C. Fang, and G. Nini (2026): "Sophisticated Price Inflation in Private Credit Funds," *Working Paper*.

Davydiuk, T., I. Erel, W. Jiang, and T. Marchuk (2024a): "Common Investors Across the Capital Structure: Private Debt Funds as Dual Holders," *Fisher College of Business Working Paper*.

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

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

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

Fahlenbrach, R., K. Rageth, and R. M. Stulz (2021): "How valuable is financial flexibility when revenue stops? Evidence from the COVID-19 crisis," *Review of Financial Studies*, 34, 5474–5521.

Faria-e Castro, M., P. Paul, and J. M. Sánchez (2024): "Evergreening," *Journal of Financial Economics*, 153, 103778.

Favara, G., C. Minoiu, and A. Perez-Orive (2024): "Zombie lending to US firms," .

Fleckenstein, Q., M. Gopal, G. Gutiérrez, and S. Hillenbrand (2025): "Nonbank lending and credit cyclicality," *Review of Financial Studies*.

Gamba, A. and A. Triantis (2008): "The value of financial flexibility," *Journal of Finance*, 63, 2263–2296.

Gatev, E. and P. E. Strahan (2006): "Banks' advantage in hedging liquidity risk: Theory and evidence from the commercial paper market," *The journal of finance*, 61, 867–892.

Giambona, E., A. Kumar, and G. M. Phillips (2025): "Hedging, Contract Enforceability, and Competition," *Review of Financial Studies*, 38, 2034–2087.

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

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

Haque, S., Y. S. Jang, and S. Mayer (2022): "Private equity and corporate borrowing constraints: Evidence from loan level data," *Working Paper 4294228*.

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

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

Haque, S., S. Mayer, and T. Wang (2023): "How Private Equity Fuels Non-Bank Lending," *Federal Reserve Board Working paper*.

Holmstrom, B. and J. Tirole (1997): "Financial intermediation, loanable funds, and the real sector," *Quarterly Journal of Economics*, 112, 663–691.

Hotchkiss, E. S., D. C. Smith, and P. Strömberg (2021): "Private equity and the resolution of financial distress," *Review of Corporate Finance Studies*, 10, 694–747.

Hu, Y. and F. Varas (2021): "A theory of zombie lending," *Journal of Finance*, 76, 1813–1867.

Irani, R. M., R. Iyer, R. R. Meisenzahl, and J.-L. Peydro (2021): "The rise of shadow banking: Evidence from capital regulation," *Review of Financial Studies*, 34, 2181–2235.

Ivashina, V. (2025): "Private Credit: What Do We Know?" *Annual Review of Financial Economics*, 18.

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

Jang, Y. S., D. Kim, and A. Sufi (2025): "The Lending Technology of Direct Lenders in Private Credit," *Working Paper*.

Jang, Y. S. and G. Kim (2025): "Valuation Discipline in Private Credit," *Working Paper*.

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

Kashyap, A. K., R. Rajan, and J. C. Stein (2002): "Banks as liquidity providers: An explanation for the coexistence of lending and deposit-taking," *The Journal of finance*, 57, 33–73.

Mistopoulou, E. and S. Steffen (2026): "The Funding Structure of Direct Lenders," *Working Paper*.

Peek, J. and E. S. Rosengren (2005): "Unnatural selection: Perverse incentives and the misallocation of credit in Japan," *American Economic Review*, 95, 1144–1166.

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

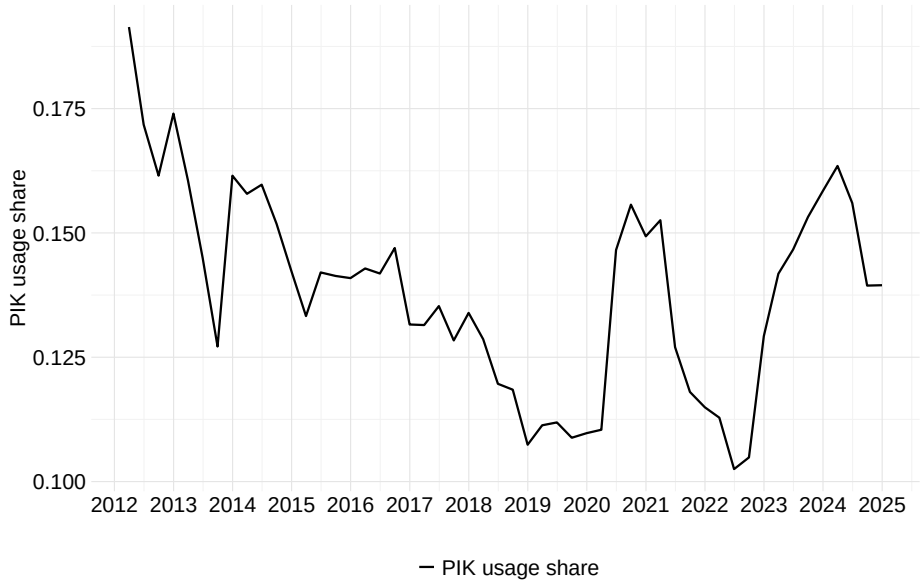
Robinson, D. T. and M. Wallskog (2025): "Why is Private Lending So Popular?" *Working Paper 5433596*.

Zawadowski, A. and R. A. Albuquerque (2025): "Private Credit: Risks and Benefits of a Maturity Wall," *Working Paper 5189740*.

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 2024Q4 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

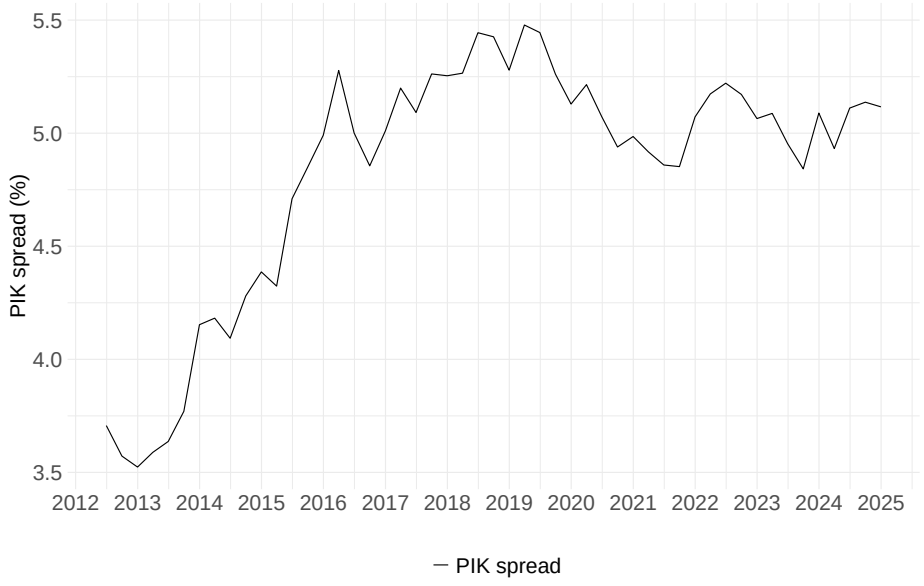
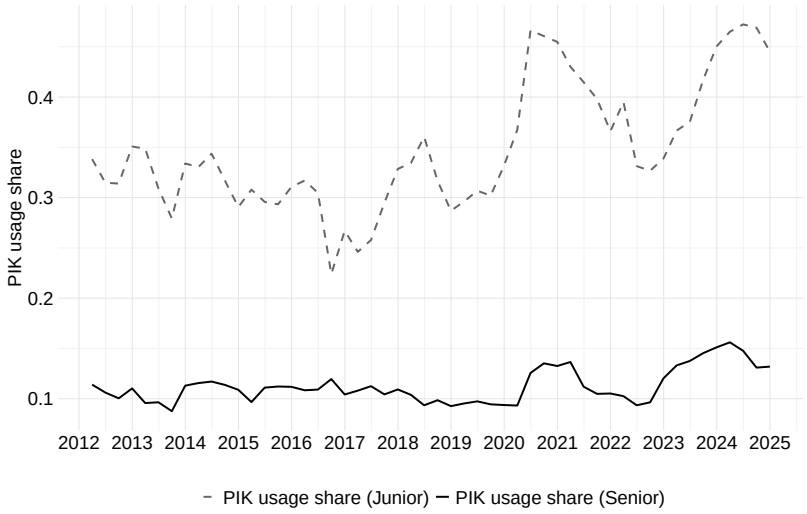


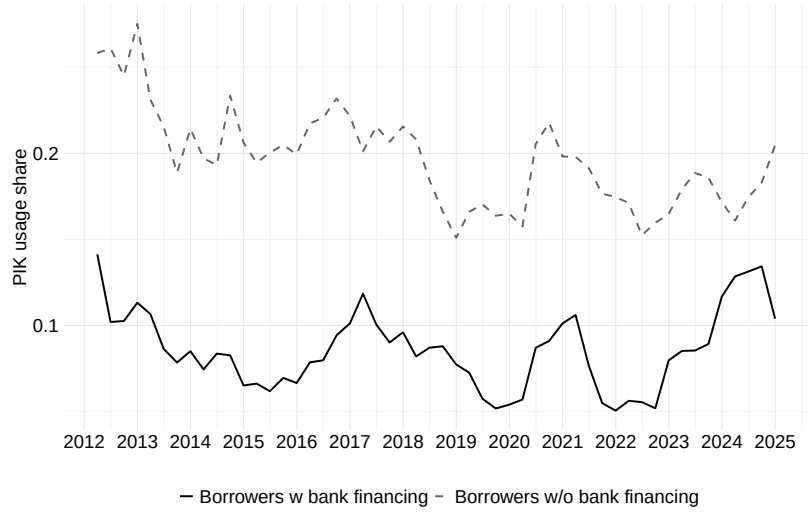
Figure 2: Heterogeneity in PIK users

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 2024Q4 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



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

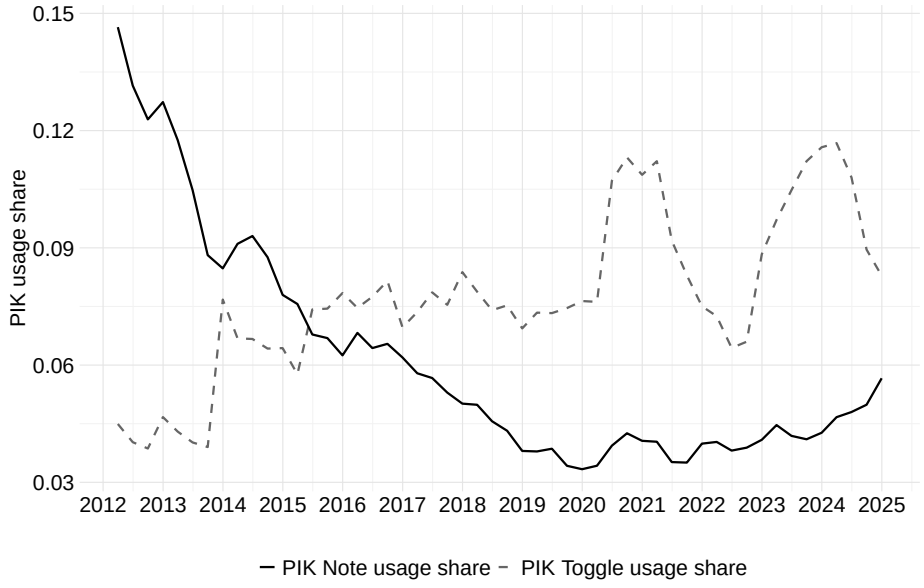


Figure 3: Impulse response functions

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

$$y_{lk,t+h} = \beta_h PIK_{lkt} + \sum_{j=0}^{4} \phi_{hj}\, y_{lk,t-j} + \gamma_h' X_{lkt} + FE + e_{lk,t+h}$$

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.

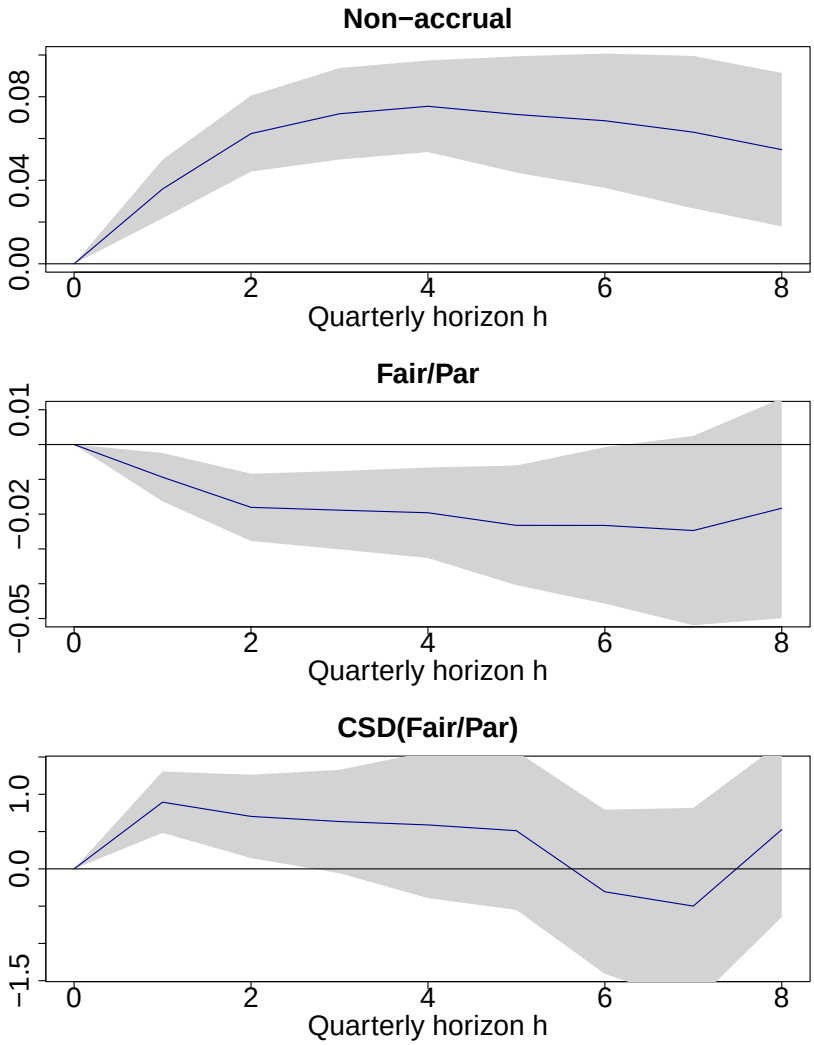
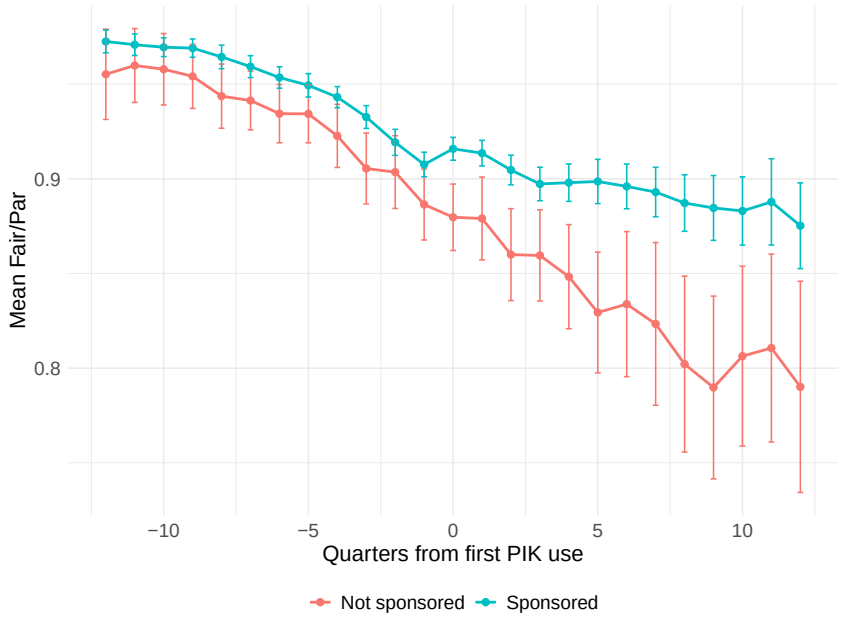


Figure 4: PE Sponsors and PIK use

Figure 4 shows the mean Fair/Par-ratio and nonaccrual status of a PE sponsored and nonsponsored firm around PIK usage. For each PIK toggle loan, we identify the first date PIK was used and then track the Fair/Par-ratio and nonaccrual status of the loan in the quarters before and after the date. Then we calculate the cross-sectional average of Fair/Par-ratio (Panel A) and nonaccrual status (Panel B) in each date, within each borrower type, where the dates are identified relative to the first PIK use quarter, and plot them with 95% confidence intervals.

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



Panel B - Non-accrual rate around first time of PIK use

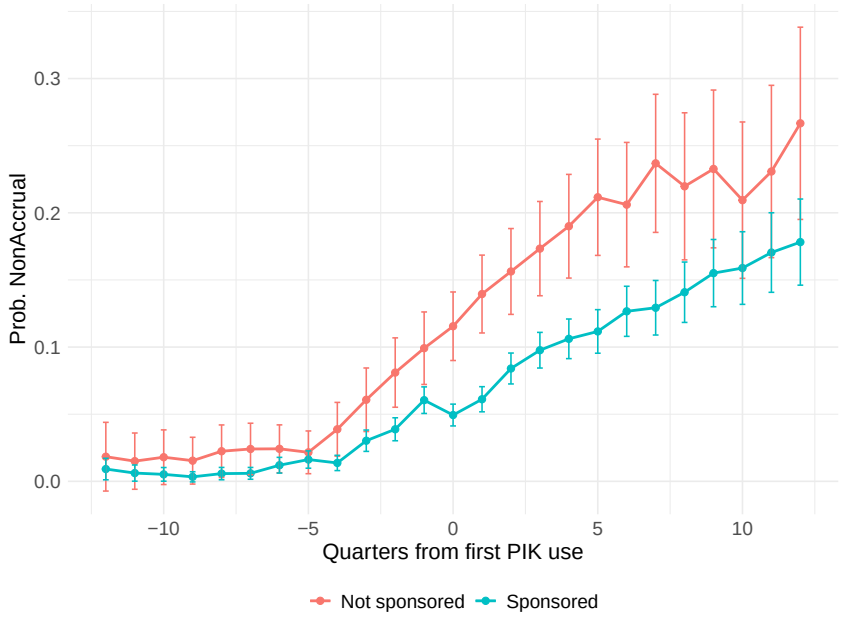
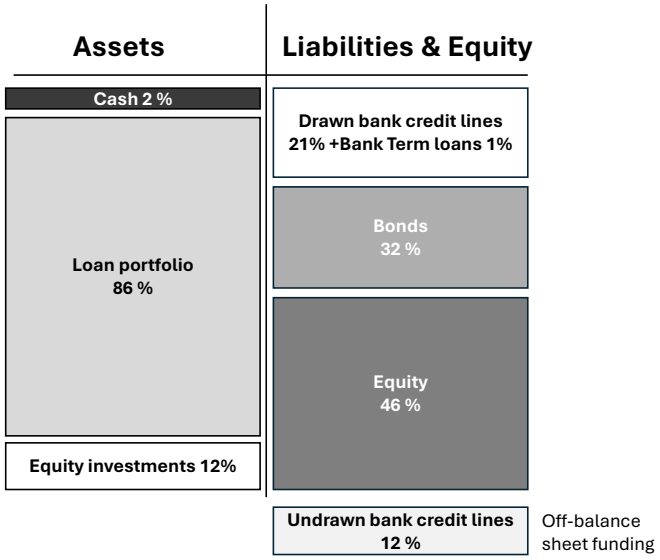


Figure 5: BDC capital structure

Panel A of Figure 5 shows the aggregated BDC sector's balance sheet components (all relative to total assets) as of 2022Q4 for a subset of 66 BDCs identified in Capital IQ. Panel B shows the average share of different debt structure items relative to total assets across all BDCs' balance sheets over the 2012Q1 to 2024Q4 period.

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



Panel B - BDC debt capital structure

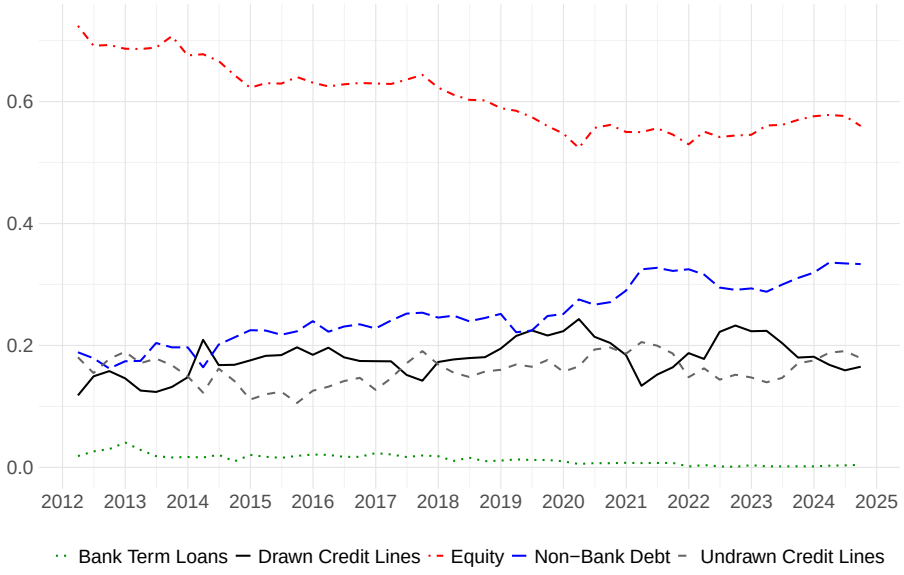


Figure 6: Credit line usage and PIK usage

Figure 6 shows the time-series of avearge drawn credit lines relative to both undrawn and drawn credit lines in BDC portfolios (*Credit line usage*) and the PIK usage share among the universe of BDC loans in the sample (*PIK usage share*).

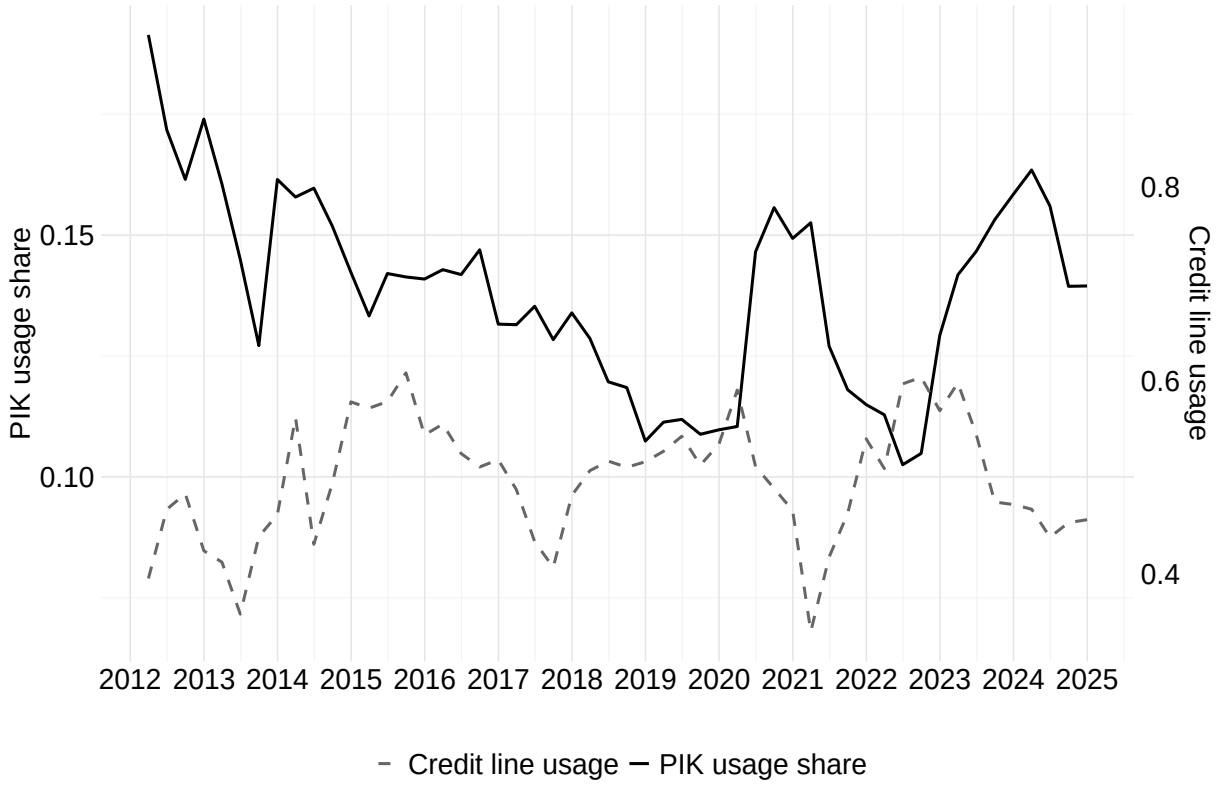


Table 1: Use of Deferred Interest (PIK) in BDC reporting

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

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. The sample period in Panel A ranges from 2012Q1 to 2024Q4. All statistics are based on all available loan observations, except *PIK spread*, which is calculated from observations where the PIK spread is above zero. Panel B shows cross-sectional loan characteristics for the sample of loans whose full history we can track from origination to exit. Panel B excludes loans that appear in the sample for less than 4 periods, loans that originate before 2012Q2 or whose sample exit date coincides with the lender's sample exit date, loans that have $Fair/Par < 0.97$ or have nonaccrual status at the loan 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.	Pctl(25)	Median	Pctl(75)
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
All-in-spread (%)	318,366	6.24	1.99	5.25	6.00	7.25
Base rate (%)	318,366	2.95	2.12	0.65	2.80	5.09
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
Cost value ($ million)	382,236	16.40	39.05	2.36	6.93	17.00
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	225,385	0.50	0.50	0	1	1
Number of BDC-lenders	382,239	4.07	4.75	1	2	5

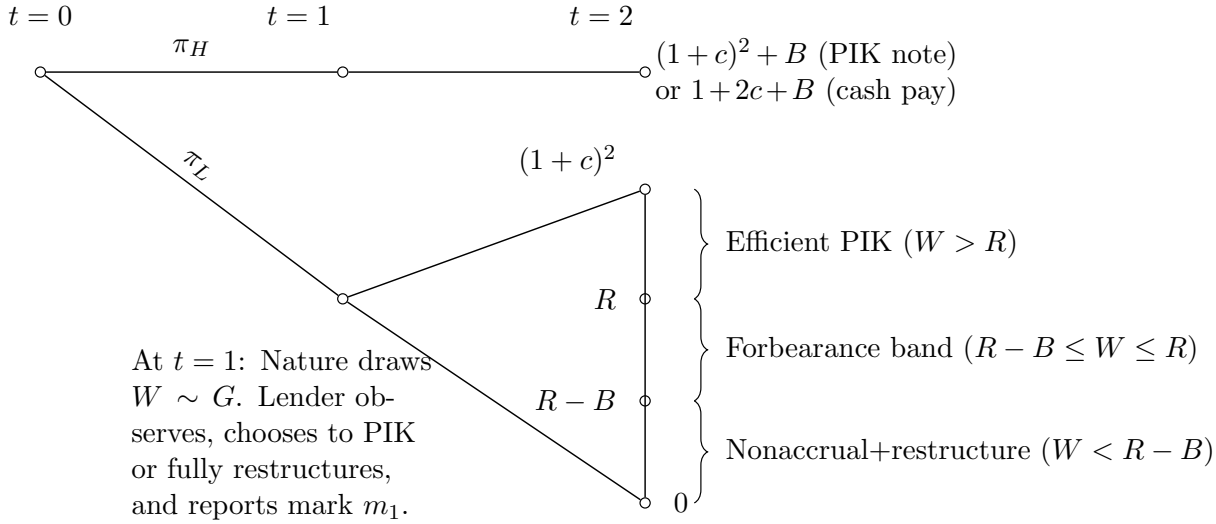
Panel B: PIK type differences

Variable	No PIK Used	PIK-toggle	PIK-note	Diff No-Toggle	Diff No-Note
Observations	11641	1452	543		
First Lien Senior Secured (%)	86.1	88.7	56.4	-2.6 (0.9)	29.8 (2.2)
Fixed rate (%)	9.6	16.0	57.8	-6.4 (1.0)	-48.2 (2.1)
Par value ($ million)	14.65	20.37	18.22	-5.72 (1.45)	-3.57 (1.87)
Time-to-maturity (Months)	65.23	60.55	59.95	4.68 (0.49)	5.28 (0.99)
All-in-yield (%)	8.4	9.2	12.0	-0.7 (0.1)	-3.6 (0.1)
Avg Cash Spread (%)	6.2	6.2	6.0	0.0 (0.1)	0.3 (0.2)
Avg PIK Spread (%)	0.0	1.8	4.7	-1.8 (0.1)	-4.7 (0.2)
Number of BDCs	4.19	3.63	2.92	0.56 (0.12)	1.27 (0.16)
Multiple BDCs (%)	72.9	67.3	49.0	5.6 (1.3)	23.9 (2.2)
Bank financing (%)	57.1	40.8	33.1	16.3 (1.4)	24.0 (2.1)
PE Sponsored (%)	88.2	88.2	77.5	-0.1 (0.9)	10.6 (1.8)
Dual Holding (%)	14.4	26.1	50.1	-11.7 (1.2)	-35.7 (2.2)
I(Fair/Par<80%) (at exit) (%)	4.3	22.2	10.8	-17.9 (1.1)	-6.5 (1.4)
Nonaccrual (at exit) (%)	2.2	19.7	9.7	-17.6 (1.1)	-7.5 (1.3)
Maturity extension (%)	24.5	50.8	23.0	-26.3 (1.4)	1.5 (1.9)
Debt-to-Equity Swap (%)	11.0	26.4	16.0	-15.4 (1.2)	-5.0 (1.6)
Share of time using PIK (%)	0.0	41.2	100.0	-41.2 (0.7)	-100.0 (0.0)

Table 3: Model summary

Panel A presents the stages of the game. State H is the healthy firm, which services its coupon in cash (or in-kind with special case of PIK note). In state L the borrower is cash-short and the loan's continuation recovery is a draw $W \sim G$ on $[0, (1+c)^2]$. Panel B shows lender payoffs per unit of original face and a private benefit B from non-recognition; in L the lender PIKs iff $W > R - B$. Panel C shows the predictions with or without forbearance with the empirical outcome in bold.

Panel A: The stages of the game and lender payoffs



Panel B: Lender payoffs from different actions

State \ Action	C (cash)	P (PIK w/out non-accrual)	N (non-accrual)
H (lender observes)	$1 + 2c + B$ *(played)*	$(1+c)^2 + B$ *(note only)*	R
L (lender action)	n/a *(infeasible)*	$W + B$ (PIK iff $W > R - B$)	R

Panel C: Testable predictions

	Observable	No forbearance	Forbearance
P1	Private benefit proxy, like higher management fees, is associated with higher likelihood of reporting PIK.	no	**yes**
P2	Predictable decline in loan's Fair/Par after PIK	no	**yes**
P3	Cross-BDC dispersion in loan's Fair/Par after PIK use	low	**high**
P4	PE sponsor's equity injection lowers the predictable Fair/Par decline after PIK	no	**yes**
P5	Loans with PIK in place at origination have better terminal outcomes than loans that activate toggle later	**yes**	**yes**
P6	Loans that exit impaired have used payment deferral rather than recapitalization, and exit later.	no	**yes**
P7	BDCs' bank borrowing is decreasing in PIK exposure	no	**yes**
P8	BDC market-to-book decreasing in PIK-toggle exposure; toggle exposure priced below note exposure	no	**yes**

Table 4: Determinants of PIK usage

This table shows the results from OLS regression of loan's i) PIK use, ii) PIK use without nonaccrual, and iii) PIK use with non-accrual, on a proxy of loan's overvaluation and various loan characteristics. The sample spans the 2012Q1 to 2024Q4 period. $PIK_{lk,t}$ 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. This is further decomposed to those loans that are simultanously non-accual and those that are not. We include the following BDC level controls: *Ln(Assets)*, *Leverage*, profitability (*ROE*), *Cash Share*, and *Ln(Fund Age)* and *Type* of BDC, and standardized *Base fee* rate all measured at t. The sample excludes PIK Notes and internally managed BDCs that do not report fee data. We include different fixed effect combinations. *BDC* refers to the identity of the BDC (Lender). *YearQtr* refers to the calendar quarter e.g. 2022Q4. *Industry* refers to the industry of the borrower. *Seniority* refers to loan seniority. *LoanType* refers to security class e.g. Term Loan, Revolver etc. All variables are defined in Appendix A. 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:	PIK_{lkt}		PIK w/o NonAccrual$_{lkt}$		PIK w/ NonAccrual$_{lkt}$	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
Managerial Incentives						
Inc. incentive fee rate (std)$_{lt}$	2.26**	3.16***	1.74*	2.38***	0.52**	0.78***
	(1.11)	(0.85)	(0.87)	(0.70)	(0.25)	(0.18)
Hurdle rate (std)$_{lt}$		0.68		0.54		0.14
		(0.56)		(0.49)		(0.12)
Inc. incentive fee rate (std)$_{lt}$						
× Hurdle rate (std)$_{lt}$		1.01***		0.74**		0.28***
		(0.35)		(0.30)		(0.07)
Loan Terms						
Ln(Loan Size$_{lkt}$)	0.79***	0.68**	0.60***	0.51**	0.19	0.16
	(0.27)	(0.25)	(0.21)	(0.20)	(0.12)	(0.11)
Ln(Time-to-Maturity$_{lkt}$)	-4.03***	-4.23***	-1.86***	-2.00***	-2.17***	-2.23***
	(0.78)	(0.72)	(0.60)	(0.57)	(0.42)	(0.41)
Effec. Base rate$_{lkt}$	-14.42	-12.15	-23.25	-21.81	8.83	9.66
	(47.72)	(51.98)	(44.24)	(46.93)	(17.24)	(17.88)
Fixed rate loan$_{lkt}$	15.92***	16.86***	13.15***	13.82***	2.77***	3.03***
	(4.48)	(4.58)	(4.11)	(4.19)	(0.68)	(0.71)
All-in-spread$_{lk\tau}$	84.28***	89.33***	78.50***	82.18***	5.78	7.15
	(30.91)	(30.41)	(27.32)	(27.00)	(7.73)	(7.66)
Ownership						
Dual holding$_{blt}$	1.92**	1.68*	3.08***	2.90***	-1.16***	-1.22***
	(0.93)	(0.93)	(1.01)	(1.01)	(0.26)	(0.26)
PE Sponsored$_{bt}$	2.66**	2.29*	2.71**	2.44**	-0.05	-0.16
	(1.14)	(1.16)	(1.05)	(1.05)	(0.33)	(0.33)
Lending Relationships						
Ln(Number of BDCs)$_{bt}$	0.06	0.07	0.17	0.17	-0.11	-0.10
	(0.50)	(0.50)	(0.48)	(0.48)	(0.12)	(0.11)
Bank financing$_{bt}$	-2.39***	-2.40***	-2.13***	-2.13***	-0.27	-0.27
	(0.76)	(0.77)	(0.67)	(0.67)	(0.20)	(0.20)
BDC controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects						
YearQtr-Industry	Yes	Yes	Yes	Yes	Yes	Yes
Seniority	Yes	Yes	Yes	Yes	Yes	Yes
LoanType	Yes	Yes	Yes	Yes	Yes	Yes
Fit statistics						
Observations	126,379	126,379	126,379	126,379	126,379	126,379
Adjusted R^2	0.12	0.12	0.09	0.09	0.06	0.06
Dependent variable mean	6.44	6.44	5.51	5.51	0.92	0.92

Table 5: Predictive regressions: PIK and loan outcomes

Panel A 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 2012Q1-2024Q4. $NonAccrual_{lk,t+1}$ is an indicator variable that takes a value of one if the loan is reported as non-accrual for period $t+1$. $Fair/Par_{lk,t+1}$ is the valuation of the loan k at time $t+1$. $CSD(Fair/Par)_{bk,t+1}$ 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 different lenders at the same time are considered similar if they are issued by the same borrower, have the same seniority, and are of 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 the lagged dependent variable at time t as control and also the other control variables from Table 4. 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. All variables are defined in Appendix A. 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***	0.68***	0.71***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.16)	(0.17)
Loan controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects						
YearQtr	Yes		Yes		Yes	
Borrower	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
Fit statistics						
Observations	184,783	184,536	183,334	183,082	117,385	116,897
Adjusted R^2	0.73	0.73	0.82	0.82	0.44	0.46
Dependent variable mean	0.03	0.03	0.95	0.95	1.41	1.40

Table 6: 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 2012Q1-2024Q4. $NonAccrual_{lkt}$ ($NonAccrual_{lk,t+1}$)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 all related control variables shown in Table 4 and the lagged dependent variable. 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. All variables are defined in Appendix A. 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***	0.08***	0.14***	-0.03***	-0.03***	-0.05
	(0.01)	(0.01)	(0.04)	(0.01)	(0.01)	(0.03)
PIK$_{lkt}$ × PE Sponsored$_{bt}$	-0.02**	-0.02**	-0.07***	0.02***	0.02***	0.04*
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)
PIK$_{lkt}$ × Maturity$_{lkt}$		-0.01	-0.01		0.00	0.00
		(0.00)	(0.01)		(0.00)	(0.01)
PIK$_{lkt}$ × Dual holding$_{blt}$		-0.03***	-0.01		0.01***	0.01
		(0.01)	(0.01)		(0.00)	(0.01)
PIK$_{lkt}$ × Loan Size$_{lkt}$		0.00	0.00		0.00	0.00
		(0.00)	(0.00)		(0.00)	(0.00)
Loan controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects						
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
Fit statistics						
Observations	184,783	184,783	137,658	183,334	183,334	136,103
Adjusted R^2	0.73	0.73	0.88	0.82	0.82	0.88
Dependent variable mean	0.03	0.03	0.03	0.95	0.95	0.95

Table 7: Difference in loan outcomes among loan types

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 that have occurred after 2012Q1 and have exited the sample. $NonAccrual_{lk,T}$ is an indicator variable that takes a value of one if the loan exits the sample at nonaccrual status at date T, 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 (i.e. always use PIK), and zero otherwise. $PIKToggle_{lk}(at\,orig.)$ is a subset of PIK-Toggle loans that used PIK already at origination. $PIKToggle_{lk}(post-orig.)$ is a subset of PIK-Toggle loans that used PIK only later. Panels A and C are based on the full sample, while Panel B excludes PIK notes. The omitted loan class to which the tabulated coefficients are compared against is loans that never use PIK in Panels A and B, and loans that never use PIK *or* loans that use PIK only at some later date in Panel C. 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, $ln(Numlenders)$ with all control variables measured at origination date τ. 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: PIK Note and PIK Toggle (Full sample)

Dependent Variables:	NonAccrual$_{lk,T}$			I(Fair/Par$_{lk,T}$ < 0.8)		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK Toggle$_{lk}$	0.14***	0.16***	0.15***	0.15***	0.17***	0.17***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
PIK Note$_{lk}$	0.05***	0.04**	0.05***	0.03**	0.03	0.05**
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Loan controls		Yes	Yes		Yes	Yes
Fixed-effects						
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
Fit statistics						
Observations	24,150	13,387	12,523	24,146	13,384	12,520
Adjusted R^2	0.08	0.10	0.20	0.07	0.08	0.15
Dependent variable mean	0.04	0.04	0.04	0.05	0.06	0.06

Panel B: PIK Toggle use at origination and post-origination (Excl. PIK-notes)

Dependent Variables:	$\text{NonAccrual}_{lk,T}$			$\text{I(Fair/Par}_{lk,T} < 0.8)$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK Toggle_{lk} (post-orig.)	0.16***	0.18***	0.17***	0.17***	0.20***	0.19***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
PIK Toggle_{lk} (at orig.)	0.07***	0.04	0.03	0.04**	0.02	0.03
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Loan controls		Yes	Yes		Yes	Yes
Fixed-effects						
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
Fit statistics						
Observations	23,204	12,851	11,957	23,200	12,848	11,954
Adjusted R^2	0.08	0.11	0.22	0.08	0.09	0.17
Dependent variable mean	0.03	0.04	0.04	0.05	0.06	0.06

Panel C: PIK Toggle at origination and PIK Note (Full sample)

Dependent Variables:	$\text{NonAccrual}_{lk,T}$			$\text{I(Fair/Par}_{lk,T} < 0.8)$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK Note_{lk}	0.03***	0.01	0.01	0.01	-0.01	0.00
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
PIK Toggle_{lk} (at orig.)	0.05***	0.01	-0.01	0.03	-0.01	-0.01
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)
Loan controls		Yes	Yes		Yes	Yes
Fixed-effects						
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
Fit statistics						
Observations	24,150	13,387	12,523	24,146	13,384	12,520
Adjusted R^2	0.02	0.05	0.15	0.03	0.04	0.11
Dependent variable mean	0.04	0.04	0.04	0.05	0.06	0.06

Table 8: Is PIK used with maturity extensions, and debt-to-equity swaps?

Columns are bins of the fair value to par (Fair/Par) ratio at the terminal observation date for each loan among the exited loans sample. Row percentages are within-column shares. *Share of total exits*: fraction of all exited loans falling in that bin. *Non-accrual at exit*: loan classified as non-accrual at the last observation date. *PIK at exit*: loan was actively accruing PIK interest at the terminal date. *PIK*: loan paid payment-in-kind interest at any point during its holding period. *D-E swap*: debt-to-equity conversion occurred at any point during the holding period. *Maturity extension*: loan maturity was extended at any point during the holding period. Rows labelled "PIK and ..." report the share of loans that used both instruments during the loan's life. Rows of the form "X | PIK" are conditional shares, computed as the joint share divided by the unconditional PIK share within each column. *Months to first...* rows give the average time in sample (months) at which the event first occurs, restricted to the indicated subsample. Standard errors in parentheses. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

	Fair/Par at exit				
	[0, .5)	[.5, .8)	$\geq .8$	Mean diff. (1)–(3)	(SE)
Panel A: Prevalence of events					
N	691	631	22824	–	–
Share of total exits (%)	2.9	2.6	94.5	–	–
Non-accrual at exit (%)	79.5	35	0.4	79.0***	(1.5)
PIK at exit (%)	37.3	26	9.2	28.2***	(1.9)
PIK (%)	49.8	34.9	12.8	36.9***	(1.9)
Debt-to-equity swap (%)	15.9	11.6	11.7	4.2***	(1.4)
Maturity extension (%)	44.7	33.3	24.9	19.8***	(1.9)
PIK and Maturity extension (%)	26.9	18.5	4.8	22.1***	(1.7)
PIK and D-E swap (%)	11.9	6	2.6	9.2***	(1.2)
Maturity extension | PIK (%) (A)	54.1	53.2	37.6	16.5***	(2.8)
D-E swap | PIK (%) (B)	23.8	17.3	20.5	3.3	(2.4)
A − B	30.2***	35.9***	17.0***	13.2***	(3.3)
	(3.1)	(3.7)	(1.0)		
Panel B: Length and sequencing of events					
Time in sample (months)	50.4	42.3	30.3	20.07***	(1.02)
Time in sample / time-to-maturity at orig.	1.17	0.8	0.54	0.64***	(0.08)
Months to first PIK use | PIK	25.5	30	16.6	8.90***	(1.21)
Months to first Mat. ext. | Mat. ext.	32.4	31.3	25.6	6.74***	(1.12)
Months to first D-E swap | D-E swap	26.1	22.5	17.8	8.37***	(1.69)
Months to first PIK use | PIK & Mat. ext. (C)	31.3	35.9	24.8	6.50***	(1.90)
Months to first Mat. ext. | PIK & Mat. ext. (D)	36.8	35.2	32	4.87***	(1.52)
C − D	-5.53***	0.69	-7.16***	1.63	(2.01)
	(1.88)	(2.67)	(0.69)		
Months to first PIK use | PIK & D-E swap (E)	31	37.3	22	9.01***	(2.32)
Months to first D-E swap | PIK & D-E swap (F)	26	29.4	26	-0.08	(2.06)
E − F	4.96*	7.89	-4.16***	9.13***	(2.71)
	(2.51)	(5.45)	(1.02)		

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 committed credit lines. *PIK usage share* is the par-value weighted share of portfolio companies currently paying some portion of interest in kind. We include the following BDC level controls: *Ln(Assets)*, *Leverage*, profitability (*ROE*), *Cash Share*, and *Ln(Fund Age)* all measured at $t-1$. Robustness results include the portfolio-average $Fair/Par$ and $Non\,accrual\,share$ at time t as controls. We do not show 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).

Panel A: Baseline

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
Fixed-effects						
YearQtr		Yes	Yes		Yes	Yes
BDC			Yes			Yes
Fit statistics						
Observations	1,783	1,622	1,621	1,714	1,563	1,562
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

Panel B: Robustness

Dependent Variables:	Bank debt share$_{l,t}$			CL usage$_{l,t}$		
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK usage share$_{lt}$	-0.51***	-0.51***	-0.51***	-0.38***	-0.38***	-0.38***
	(0.10)	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)
Non accrual share$_{lt}$	-0.01		0.11	-0.16		-0.17
	(0.28)		(0.32)	(0.25)		(0.27)
Fair/Par$_{lt}$		0.20	0.25		0.07	-0.01
		(0.34)	(0.38)		(0.28)	(0.30)
BDC controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed-effects						
YearQtr	Yes	Yes	Yes	Yes	Yes	Yes
BDC	Yes	Yes	Yes	Yes	Yes	Yes
Fit statistics						
Observations	1,621	1,621	1,621	1,562	1,562	1,562
Adjusted R^2	0.71	0.71	0.71	0.42	0.42	0.42
Dependent variable mean	0.44	0.44	0.44	0.50	0.50	0.50

Table 10: PIK Usage and BDC stock market valuation

This table shows the results from OLS regressions of BDC's market-value-to-book-value on *PIK usage share* and its components. *Price/NAV* (columns 1-4) is the BDC's stock market value relative to net asset value i.e. market-to-book ratio of equity. *MVA/BVA* (columns 5-6) is the BDC's market value of assets (MVA) relative to book value of assets (BVA). MVA is approximated as the sum of market value of equity and book value of debt. *PIK usage share* is the par-value weighted share of portfolio companies currently paying some proportion of interest rate in-kind. *PIK Toggle usage share* is the value-weighted number of loans in which borrowers use the PIK option, relative to all loans in a given quarter, while *PIK Note usage share* is the value-weighted number of PIK Note loans relative to all loans in a given quarter. We include the following BDC level controls: *Ln(Assets)*, *Leverage*, profitability (*ROE*), *Cash Share*, and *Ln(Fund Age)* and $Non\,accrual\,share$ all measured at t. 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:		Price/NAV$_{l,t+1}$			MVA/BVA$_{l,t+1}$	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Variables						
PIK usage share$_{lt}$	0.05				0.05	
	(0.17)				(0.11)	
PIK Toggle usage share$_{lt}$		-0.57***	-0.53***	-0.31**		-0.22**
		(0.20)	(0.16)	(0.15)		(0.08)
PIK Note usage share$_{lt}$		0.39*	0.43**	0.58***		0.33***
		(0.22)	(0.18)	(0.20)		(0.11)
BDC controls			Yes	Yes		Yes
Fixed-effects						
YearQtr	Yes	Yes	Yes	Yes	Yes	Yes
BDC				Yes		Yes
Fit statistics						
Observations	1,918	1,918	1,751	1,747	1,918	1,747
Adjusted R^2	0.11	0.16	0.32	0.54	0.07	0.63
Dependent variable mean	0.89	0.89	0.89	0.88	0.92	0.92

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.	Loan	LSEG
All-in-spread	All-in-yield - effective base rate	Loan	LSEG
Assets	BDC's total assets (millions USD)	Lender	LSEG
Bank debt share	Bank debt$_t$/Total Liabilities$_t$	Lender	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	Pitchbook
Base mgmt fee	BDC management fee charged on gross assets. When (rarely) it is reported on net assets, we multiply the fee percent with the BDC's equity-ratio to make rates comparable. Standardized to have (0,1) mean-variance.	Lender	SEC Edgar
BDC Type	Factor variable describing one of three BDC types: 1) traded, 2) non-traded finite-life, 3) nontraded perpertual-life.	Lender	SEC Edgar
Cash share	Cash/Total Assets	Lender	LSEG
Cash spread	Cash spread for the loan over the base rate.	Loan	LSEG
CSD(Fair/Par)	Cross-sectional standard deviation of $Fair/Par$ across lenders of loans sharing the same borrower, seniority, and loan type.	Loan	LSEG
CL usage	Drawn credit lines/(Drawn+Undrawn credit lines)	Lender	CapitalIQ
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	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	LSEG
Effective base rate	max{Base rate, Interest rate floor}.	Loan	LSEG
Fair/Par (loan)	Loan's fair value to par value ratio	Loan	LSEG
Fair/Par (BDC)	Size-weighted average fair value to par value ratio in the loan portfolio.	Lender	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 tests, measured at loan's last observation date.	Loan	LSEG
Fixed-rate loan	Indicator variable that takes the value of one if the loan is tied to a fixed rate.	Loan	LSEG
Fund Age	Age of the fund in years.	Lender	CapitalIQ
Hurdle rate	Hurdle rate for the income incentive fee contract. Standardized to have (0,1) mean-variance.	Lender	SEC Edgar
Income incentive fee rate	Income incentive fee rate charged on pre-incentive fee net investment income after hurdle rate and catch-up. Standardized to have (0,1) mean-variance.	Lender	SEC Edgar
Leverage ratio	Total Liabilities/Total Assets	Lender	LSEG
Ln(Loan size)	Natural logarithm of the loan's par value	Loan	LSEG
Ln(Num-of-BDCs)	Natural logarithm of the number of BDC-lenders of the borrower.	Borrower	LSEG
Ln(Time-to-matur.)	Natural logarithm of the remaining time to maturity	Loan	LSEG
Maturity Extension	Indicator variable that takes a value of one if the loan's remaining $time\text{-}to\text{-}maturity_{t-1} \leq time\text{-}to\text{-}maturity_t$, and zero otherwise. In the cross-sectional test, the variable takes the value of one if maturity is ever extended after origination.	Loan	LSEG
MVA/BVA	(Market value of equity + book value of debt)/(Book value of assets)	Lender	LSEG
Non-accrual	An indicator variable that takes a value of one if the loan is reported to be non-accrual, and zero otherwise. In cross-sectional tests, this is measured at the last observation date for that loan.	Loan	LSEG
Non-accrual share	Non-accrual loan share of the total cost value of portfolio investments.	Lender	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	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	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	LSEG
PIK spread	PIK spread for the loans that use PIK, zero otherwise.	Loan	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	LSEG
PIK-Toggle(at-orig)	PIK-Toggle but for loans that used PIK at origination.	Loan	LSEG
PIK-Toggle(post orig)	PIK-Toggle but for loans that did not use PIK at origination.	Loan	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	LSEG

PIK Note usage share	Par-value weighted share of loans in the BDC's portfolio that are paying some proportion of the interest rate "in-kind" and classified as PIK Notes.	Lender	LSEG
PIK Toggle usage share	Par-value weighted share of loans in the BDC's portfolio that are paying some proportion of the interest rate "in-kind" and classified as PIK toggles.	Lender	LSEG
Price/NAV	BDC's stock price / net asset value per share	Lender	LSEG
ROE	Return on equity$_t$=Net income$_t$/Book Equity$_{t-1}$	Lender	CapitalIQ

B Model Appendix

This appendix proves the results of Section 4, where the low state L carries a continuation-recovery draw $W \sim G$ on $[0,(1+c)^2]$ and forbearance is the band $W \in (\widehat{w}, R)$ with $\widehat{w} \equiv R-B$. Throughout, a forborne loan is carried at a performing mark $\widehat{V} \in (R,(1+c)^2]$ that overstates its true recovery $W < R$.

B.1 Consent and the cutoff (Propositions 1 and 2)

Consent. Under limited liability the borrower's $t = 2$ equity is $\max\{0, \text{firm value} - \text{claim}\} \geq 0$ under continuation and 0 under recognition ($R < 1$). In L the borrower therefore weakly prefers PIK, strictly when continuation leaves positive equity. In H the borrower is healthy and pays cash, so the consent question does not arise. Hence the lender's offer is decisive. □

Cutoff. Abstracting from PIK notes, in H the borrower pays cash and the loan performs; by the contract form (a toggle is untriggered absent a shortfall) the lender does not PIK a healthy borrower, so $a(\mathsf{H}) = \text{C}$. For a distressed loan with recovery W, PIK yields $W + B$ (the loan is kept performing, so B is collected and the lender recovers W at $t = 2$) and non-accrual yields R, so $\text{P} \succ \text{N} \iff W + B > R \iff W > \widehat{w} = R - B$. The planner, excluding B, continues iff $W > R$; the two rules agree except on $W \in (\widehat{w}, R)$, where the lender continues and the planner recognizes. This is the forbearance band, with per-loan deadweight loss $R - W > 0$ and aggregate loss $\pi_{\mathsf{L}} \int_{\widehat{w}}^{R} (R - W)\, dG(W)$. The case of PIK

notes is analogous, except the borrower always uses PIK. □

B.2 Equilibrium

A Perefect Bayesian Equilibrium (PBE) of the $t = 1$ game is a lender strategy $\big(a(\cdot), m_1(\cdot)\big)$ maximizing (1) given F's schedule, beliefs from Bayes' rule, and competitive pricing $\mathbb{E}[\text{recovery} \mid \text{report}]$. Recovery is mark-free, so B is collected iff $m_1 > R$; the lender marks truthfully when the truthful value is itself performing and departs from it only to keep alive a loan it prefers not to recognize. Hence healthy loans at V_{H}, efficiently continued loans ($W > R$) at W, forborne loans ($\widehat{w} < W < R$) at $\widehat{V}$, and recognized loans ($W < \widehat{w}$) at R. Since F's price does not enter U_L, so for each (s, W) the action is dominant and the equilibrium outcome is unique on the path. No forbearance occurs when no loan with $W < R$ is PIK'd ($B = 0$ or no mass in $(\widehat{w}, R)$) otherwise forbearance occur.

B.3 Private benefit and PIK use (Prediction 1)

The private benefit B is the primitive that generates every departure from first-best in the model, yet it is not directly observed. Its most immediate footprint is on the recognition margin itself. In distress (state L) the lender keeps the loan performing when $W > \widehat{w} = R - B$, so the conditional probability of the PIK action is

$$\Pr(P \mid \mathsf{L}) = \Pr(W > R - B) = 1 - G(R - B), \qquad \frac{\partial \Pr(P \mid \mathsf{L})}{\partial B} = g(R - B) \geq 0,$$

strictly positive wherever G places mass in the forbearance band $(R - B, R)$. A larger private benefit lowers the recognition cutoff $\widehat{w}$ and pulls more distressed loans out of non-accrual and into the performing-PIK pool.

B.4 Over-marking and mark dynamics (Prediction 2)

A PIK'd distressed loan is carried at $t = 1$ at m_1 and resolves at $t = 2$ at $m_2 = W$, its true continuation recovery; H loans resolve at $(1+c)^2$ and are carried at $(1+c)^2$. Write the distressed PIK'd set as $\{W > \widehat{w}\}$, with the *forbearance band* $(\widehat{w}, R) \subseteq \{W > \widehat{w}\}$ carried above truth.

Proposition 4 (Fair-value mark dynamics (Prediction 2))**.** *The expected revision of a PIK'd loan's mark is*

$$\mathbb{E}[m_2 - m_1] = \begin{cases} 0 & \textit{No forbearance (a martingale),} \\ -\dfrac{\pi_{\mathsf{L}} \displaystyle\int_{\widehat{w}}^{R} \left(\widehat{V} - W\right) dG(W)}{\Pi_{\text{pool}}} < 0 & \textit{Forbearance,} \end{cases}$$

where Π_{pool} *is the PIK pool mass (*$\pi_{\mathsf{L}}[1-G(\widehat{w})]$ *for a toggle,* $\pi_{\mathsf{H}} + \pi_{\mathsf{L}}[1-G(\widehat{w})]$ *for a note). A predictable post-PIK decline arises only under forbearance, generated entirely by the band* $(\widehat{w}, R)$*; the efficiently continued loans (*$W > R$*, marked truthfully) and the healthy* H *loans contribute zero drift. .*

Proof. Each PIK'd loan satisfies $\mathbb{E}[m_2 \mid m_1] =$ its true recovery: $(1+c)^2$ for H and for distressed loans with $W > R$ (both marked truthfully), and W for the band, marked at $\widehat{V} > W$. Averaging over the pool, only the band contributes a nonzero drift $\int_{\widehat{w}}^{R}(W - \widehat{V})\, dG < 0$ scaled by $\pi_{\mathsf{L}}/\Pi_{\text{pool}}$; in No forbearance the band is empty and the drift is zero. □

B.5 Cross-lender dispersion (Prediction 3)

Consider many BDCs j holding the same distressed loan with recovery $W \in (0, R)$ (recognition efficient), with idiosyncratic private benefits $B_j \sim G_B$. BDC j forbears, carrying the loan at $\widehat{V} > R > W$, iff $R - B_j < W$, i.e. $B_j > R - W$, and otherwise recognizes at R.

Proposition 5 (Cross-sectional dispersion)**.** *The cross-lender mark takes R with probability $q = G_B(R - W)$ and $\widehat{V}$ otherwise, so* $\mathrm{Var}(m_1) = q(1-q)(\widehat{V} - R)^2$*, strictly positive iff the loan-specific threshold $R - W$ is interior to* $\mathrm{supp}(G_B)$ *(some lenders forbear, others recognize), zero if all recognize or all forbear, and maximized at $q = \frac{1}{2}$. Healthy* H *loans pay cash and carry no dispersion.*

Proof. Holding $(W, R, \widehat{V})$ fixed and varying $B_j \sim G_B$, the mark is two-point on $\{R, \widehat{V}\}$ with $\Pr(R) = \Pr(B_j \leq R - W) = G_B(R - W)$; its variance is $q(1-q)(\widehat{V} - R)^2$, positive iff $0 < q < 1$. □

B.6 Sponsor equity injections (Prediction 4)

Model a private-equity sponsor as a capacity to inject equity into a distressed portfolio firm at $t = 1$, raising the lender's continuation recovery from W to $W + \delta$ with $\delta \geq 0$ (the infusion cures the shortfall and lifts the $t = 2$ collection). The cutoff rule applies to the post-injection recovery, so the loan's position relative to the band shifts.

Proposition 6 (Sponsor injections attenuate the markdown)**.** *For a loan that would be forborne absent the sponsor ($\widehat{w} < W < R$, carried at $\widehat{V}$), an injection $\delta \geq 0$ yields a predictable markdown*

$$\mathbb{E}[m_2 - m_1] = \begin{cases} -\big(\widehat{V} - (W + \delta)\big) & \text{if } W + \delta < R \text{ (still forborne)}, \\ 0 & \text{if } W + \delta \geq R \text{ (lifted to efficient continuation).} \end{cases}$$

In both cases the decline is weakly smaller (in magnitude) than the unsponsored $\widehat{V} - W$, strictly so for $\delta > 0$. Hence the post-PIK Fair/Par decline is attenuated for sponsor-backed borrowers and concentrated among non-sponsored ones; the empirical PIK-by-sponsor interaction is positive.

Proof. The lender continues iff $W+\delta > \widehat{w}$ and the planner iff $W+\delta > R$. If $\widehat{w} < W+\delta < R$ the loan stays forborne, carried at $\widehat{V}$ and resolving at $W+\delta$, so the drift is $W+\delta-\widehat{V}$, with magnitude $\widehat{V}-(W+\delta) < \widehat{V}-W$. If $W+\delta \geq R$ the loan is honestly marked at $W+\delta \geq R$ (performing), with zero drift. Both are weakly less negative than $-(\widehat{V}-W)$. □

A sponsor's injection capacity therefore shrinks the realized loss and, when it lifts W above R, moves the loan from forbearance to efficient continuation; it mitigates bad outcomes even where PIK still occurs, rather than inducing forbearance.

B.7 Notes versus toggles (Prediction 5)

The empirical test classifies a loan by its origination contract (a note (PIK from $t = 0$) or a toggle (a PIK option exercised later)) and, restricting the sample to loans observed PIK'ing at $t = 1$, asks how the $t = 0$ label predicts outcomes. The comparison rests on a single difference: when the PIK decision is taken, and hence what observing PIK at $t = 1$ reveals about the state.

At origination PIK is a $t = 0$ object; post-origination PIK toggle's activation is a $t = 1$ signal. A note capitalizes in every state, so seeing a note PIK at $t = 1$ conveys no news: a PIK'ing note is still the ex-ante loan, healthy with probability π_{H} and distressed with probability π_{L}. A toggle instead capitalizes only on a coupon shortfall, which arises only in the low state, so a toggle activating at $t = 1$ is an information event that reveals L. Conditioning on PIK use at $t = 1$, a note therefore carries the $t = 0$ prior, whereas a toggle activation is conditioned on the low state. To formalize this, let $\bar{W}_{\mathsf{L}} \equiv \mathbb{E}[\,W \mid \mathsf{L},\ W > \widehat{w}\,]$ be the average recovery of a distressed loan that is kept alive—the value of a loan revealed to be in the low state at $t = 1$. A PIK'ing toggle is in L for certain, so its expected recovery is exactly $\bar{W}_{\mathsf{L}}$. A PIK'ing note is the healthy loan (recovery $(1+c)^2$) with probability π_{H}

and a continued distressed loan (recovery $\bar{W}_{\mathsf{L}}$) otherwise, so

$$\mathbb{E}[\,\text{recovery} \mid \text{PIK}, \text{toggle}\,] \;=\; \bar{W}_{\mathsf{L}} \;<\; \underbrace{\frac{\pi_{\mathsf{H}}\,(1+c)^2 + \pi_{\mathsf{L}}\big[1 - G(\widehat{w})\big]\,\bar{W}_{\mathsf{L}}}{\pi_{\mathsf{H}} + \pi_{\mathsf{L}}\big[1 - G(\widehat{w})\big]}}_{\mathbb{E}[\,\text{recovery} \mid \text{PIK}, \text{note}\,]}, \tag{10}$$

The inequality holds because a distressed loan recovers no more than par, $\bar{W}_{\mathsf{L}} \leq (1+c)^2$, and strictly less whenever surviving distressed loans do not all recover in full. The wedge is the healthy mass π_{H} that the note blends in and the toggle rules out, meaning that it arises also in the case where there is no forbearance.

B.8 Deferral versus conversion (Prediction 6)

The lender's action set admits also the following interpretation. Action P is the *deferral bundle*: the unpaid coupon capitalizes into the claim and resolution is postponed—PIK defers the coupon, and the accompanying maturity extension defers the principal; both keep the debt claim alive and the loan performing. Action N is *conversion*: the debt claim is exchanged for a restructured position worth R—the debt-to-equity swap is its empirical form—and the loss is recognized. Relabeling the $t = 1$ choice in state L as deferral versus conversion changes nothing in the analysis: payoffs are $W + B$ and R, and the cutoff remains $\widehat{w} = R - B$. The relabeling has observable content because the two regimes assign the instruments to different loans.

Proposition 7 (Impaired exits carry deferral, not conversion)**.** *(i) Without forbearance ($B = 0$), every distressed loan with $W < R$ is converted at $t = 1$ and resolves at R; terminal values are bounded below by R, and deferral appears only on efficiently continued loans ($W > R$), which resolve above R. (ii) Under forbearance ($B > 0$), every loan in the band $(\widehat{w}, R)$ carries the deferral bundle, is never converted, and resolves at $W < R$; exits below R have mass $\pi_{\mathsf{L}}\big[G(R) - G(\widehat{w})\big] > 0$ and every one of them exhibits deferral*

and no conversion. (iii) Deferred band loans resolve at $t = 2$ while converted loans resolve at $t = 1$: under forbearance, eventually-impaired loans remain outstanding strictly longer than a recognizing lender would allow.

Proof. Follows from Proposition 2. The continuation set is $\{W > \widehat{w}\}$; conversion delivers R at $t = 1$. With $B = 0$ the continuation set is $\{W > R\}$, so any loan resolving below R would have to be a continued loan with $W < R$, of which there are none; converted loans resolve at exactly R. With $B > 0$ the band is continued—deferred, not converted—and resolves at $W \in (\widehat{w}, R)$. Timing is by construction. □

Empirical counterpart. The restructuring value R is unobserved and heterogeneous across loans, so the level statement in (i) —that no exit falls below R absent forbearance— is not directly testable: a converted loan can itself resolve at a low fair value. The testable content is the *instrument mix and timing conditional on terminal impairment.* Without forbearance, loans that end impaired are the low-W loans, which are converted (swapped, placed on non-accrual) early and spend little of their life under deferral; deferral concentrates on loans that exit near par. Under forbearance the assignment inverts on the band: PIK and maturity extensions cluster on loans that later exit impaired, conversion is avoided, and the loans outlive their contractual horizon because deferral is what keeps them outstanding (Proposition 7(iii)).

B.9 PIK quota and the bank-borrowing margin (Prediction 7)

Augment the game with a stage-0 cap $Q \in [0, 1]$ on the share of the portfolio carried as performing-PIK, enforced by the borrowing base. Healthy H loans pay cash and are eligible collateral but are not performing-PIK, so they consume no cap and lie outside the rationing problem. The cap rations PIK across distressed loans. Relative to recognition

at R, granting PIK to a distressed loan with recovery W yields the net gain

$$g(W) = W + B - R = W - \widehat{w},$$

strictly increasing in W: continuing is most valuable on the highest-recovery loans.

Proposition 8 (PIK rationing and the first-best cap)**.** *Under the cap Q the lender fills capacity greedily in decreasing order of W, PIK'ing $\{W > w(Q)\}$ for a cutoff $w(Q)$ that falls as Q rises, and recognizing the rest—recognition is directed first to the lowest-W, largest-wedge loans. The welfare-optimal cap sets $w(Q^*) = R$, so*

$$Q^* = \pi_{\mathsf{L}}\big[1 - G(R)\big],$$

recognizing exactly the loans with $W < R$ and continuing those with $W > R$, an aggregate quantity that conditions only on G. A cap below Q^* recognizes efficiently continued loans; above it leaves forbearance.

Proof. U_L is additively separable; writing each loan as its recognition value plus $g(W)\mathbf{1}\{\text{PIK'd}\}$, maximizing $\int g\, d\mu$ subject to PIK'd mass $\leq Q$ is a continuous knapsack with unit weight, so capacity goes to the highest-g, hence highest-W, loans. Welfare per distressed loan (excluding B) is W if continued and R if recognized, so lowering Q changes welfare by $(R - w(Q))$ at the cutoff: positive while $w < R$, negative once $w > R$. The optimum sets $w(Q^*) = R$, matching the continued mass $\pi_{\mathsf{L}}[1 - G(R)]$. □

The soft quota and the lender's balance-sheet space. The BDC funds its loans with senior bank debt, drawn against a borrowing base (eligible collateral times an advance rate $a \in (0, 1]$), and with costlier non-bank capital (unsecured notes, equity). Performing-PIK loans count toward the base, whereas recognized (non-accrual) loans are ineligible. A concentration covenant caps performing-PIK collateral at a share Q of the base. The

covenant restricts how much PIK exposure the base will finance. Once the cap is reached an additional loan can still be kept performing, but only off the pledged base, funded with non-bank capital.

Let P be the BDC's performing-PIK exposure, the covenant's own object, split into an in-base part P_b (pledged, cheaply bank-funded) and an off-base part P_e (funded with a strictly convex non-bank premium $C(P_e) = \frac{k}{2}P_e^2$ over bank funding), $P = P_b + P_e$. The concentration covenant is a ceiling on pledged PIK, $P_b \leq \bar{Q}$ (a share Q of the base). Loans are continued greedily in decreasing order of recovery—the highest-W (benign) loans first, then the forbearance band—so the marginal continued loan at exposure P yields $g(P) = W(P) + B - R$, decreasing in P as lower-recovery, more deeply forborne loans are reached. The lender solves

$$\max_{P_b,\, P_e \geq 0} \int_0^{P_b+P_e} g(x)\, dx - \tfrac{k}{2}P_e^2 \qquad \text{s.t.} \qquad P_b \leq \bar{Q},$$

with Lagrangian $\mathcal{L} = \int_0^P g(x)\, dx - \frac{k}{2}P_e^2 + \lambda(\bar{Q} - P_b)$. When the cap binds ($\lambda > 0$, hence $P_b = \bar{Q}$) the first-order conditions are

$$\lambda = g(P^*) > 0, \qquad k\, P_e^* = g(P^*) = W(P^*) + B - R :$$

the lender exhausts the cheap pledged capacity and then carries the rest off-base until the marginal loan's continuation gain equals the marginal non-bank premium. The cap therefore leaves total forbearance only weakly reduced but pushes the marginal forborne loan off the base.

The balance sheet gets adjusted. Let $s_b \equiv D_b/(D_b + D_n)$ be the bank-funded debt share—the object of Prediction 6. Bank debt is tied to in-base eligible collateral, $D_b = a\,(E_0 + P_b)$, with E_0 the non-PIK eligible base. When the cap binds, $P_b = \bar{Q}$ is frozen and

every additional unit of PIK exposure is carried off-base and non-bank funded:

$$\frac{\partial D_b}{\partial P} = 0, \qquad \frac{\partial D_n}{\partial P} = 1 \qquad \Longrightarrow \qquad \frac{\partial s_b}{\partial P} = -\frac{D_b}{(D_b + D_n)^2} \; < \; 0.$$

Bank funding falls as a share of the balance sheet, displaced one-for-one at the margin by costlier non-bank capital: this is the negative slope $\beta_1 < 0$ of Prediction 6. The sign is specific to a binding cap. When the cap is slack, there is no forbearance, as only the best performin loans are performed. In this scenario the marginal PIK loan is pledged as collateral and raises bank capacity, $\partial D_b/\partial P = a > 0$; the forced substitution disappears and PIK exposure no longer depresses bank funding ($\beta_1 > 0$). When the optimally set cap binds and there is more PIK lending that designed by the bank, there is going to be forbearance. The strictly negative comovement between PIK exposure and bank funding is thus a forbearance phenomenon.

B.10 Portfolio PIK intensity and market-to-book ratio (Prediction 8)

Since $a(\mathsf{H}) = \mathrm{C}$ (under a toggle) and distressed loans PIK iff $W > \widehat{w}$, the *toggle* (activated-PIK) intensity is $\Pi_K = \pi_{\mathsf{L}}[1 - G(\widehat{w})]$. Under a PIK note, which capitalizes in every state, the intensity adds the healthy share, $\Pi_K^{\text{note}} = \pi_{\mathsf{H}} + \pi_{\mathsf{L}}[1 - G(\widehat{w})]$: at full deployment the note share reflects the ex-ante contract mix rather than time-t news, and its forbearance wedge is diluted by the honestly marked healthy pool. The reported asset value per portfolio loan is

$$V_N^{\mathrm{p}} = \pi_{\mathsf{H}} V_{\mathsf{H}} + \pi_{\mathsf{L}}\, \mathbb{E}[m_{\mathsf{L}}(W)], \qquad \mathbb{E}[m_{\mathsf{L}}(W)] = \int_R^{(1+c)^2} W \, dG + \int_{\widehat{w}}^{R} \widehat{V} \, dG + \int_0^{\widehat{w}} R \, dG, \quad (11)$$

where V_{H} ($= 1 + 2c$ cash, $(1+c)^2$ note) is the honestly-marked healthy value carrying no wedge. The only gap between reported book value and true value is the over-marking $(\widehat{V} - W)\,\mathbf{1}\{\widehat{w} < W < R\}$ on the forbearance band. With a continuum of ex-ante identical loans, we can value the BDC portfolio, and use the BDC's stock price discount relative its book asset value to measure the implied overvaluation.

Proposition 9 (PIK intensity and the MVA/BVA discount)**.** *The portfolio market-to-book value of assets (MVA/BVA) is*

$$\text{MVA/BVA} = 1 - \frac{\pi_{\mathsf{L}} \displaystyle\int_{\widehat{w}}^{R} \left(\widehat{V} - W\right) dG(W)}{V_N^{\mathrm{p}}},$$

equal to 1 *in No forbearance case and strictly below* 1 *in the forbearance case. The common healthy term* $\pi_{\mathsf{H}} V_{\mathsf{H}}$ *enters numerator and denominator alike, diluting the discount toward one without changing its sign. The discount is increasing in the forborne band mass* $G(R) - G(\widehat{w})$ *and the over-mark; it loads on ex-post toggle exposure, which Bayes-updates the realized shock.*

Proof. Reported and true value coincide on every loan except the forbearance band: H loans worth V_{H}; efficiently continued distressed loans ($W > R$) worth W; recognized distressed loans ($W < \widehat{w}$) worth R; only forborne loans ($\widehat{w} < W < R$) are carried at $\widehat{V}$ but worth W. Integrating the wedge $(\widehat{V} - W)$ over the band and dividing by V_N^{p} gives the ratio; in "No forbearance" case the band is empty. □

Two implications follow for equation (9). First, the discount loads on the toggle share. Second, the baseline restricts the note-share coefficient only weakly: the note bucket carries the diluted wedge, so its coefficient lies between the toggle coefficient and zero, and the baseline is silent on forces that would price note exposure *positively*. Online Appendix OA.3 supplies one such force. With lender-specific discounting ($\beta_L < \beta_F$), each bucket's

market-to-book is $q_j = r(1 - d_j)$, where $r = \beta_F/\beta_L > 1$ is a duration premium common to deferred-payment claims and d_j the bucket's hidden-loss share, with $0 \leq d_N < d_T$ by healthy dilution. Relative to the current-pay benchmark, the note coefficient nets the full duration premium against the diluted wedge and the toggle coefficient nets a smaller premium against the full band wedge. Without forbearance $d_T = d_N = 0$ and the two coefficients in Table 10 Column 2 coincide ($\beta_T = \beta_N = 0$); with forbearance the asymmetric effect with $\beta_T < 0$ and $\beta_N > 0$ arise with reasonable parameter values.

B.11 Endogenous over-marking: pinning down $\widehat{V}$

So far the lender is indifferent across performing marks and $\widehat{V}$ is indeterminate. We can endogenize it through a trade-off between reporting benefit and detection. The manager's benefit from carrying a forborne loan at mark $m > R$ rises with the reported value, $b(m) = \eta\,(m - R)$ with $\eta > 0$, but a larger over-mark is more likely to be exposed. The over-mark is caught at $t = 2$ with probability increasing in the gap $m - W$, an expected penalty $\frac{\kappa}{2}(m - W)^2$ with $\kappa > 0$ (convex, so gross misstatements are caught nearly surely). The manager chooses $m \in (R, (1 + c)^2]$ to maximize $\eta(m - R) - \frac{\kappa}{2}(m - W)^2$.[44]

Proposition 10 (Optimal over-mark)**.** *The optimal forbearance mark is*

$$\widehat{V}(W) = \min\left\{(1 + c)^2,\ W + \tfrac{\eta}{\kappa}\right\},$$

so the over-mark $\widehat{V} - W = \eta/\kappa$ is constant across forborne loans until the par cap binds: increasing in the marginal reporting benefit η and decreasing in the detection-cost curvature κ. Opacity (low κ: lender-produced marks in private credit) yields a large over-mark; market-referenced marks (high κ) shrink it toward zero. The induced reduced-form forbearance benefit, the maximized agency value entering the cutoff $\widehat{w} = R - B$,

[44] As the penalty can also be interpreted as the costs of increased BDC stock price discount that are a direct result of overmarking, this allows the fund's stock market pricing to impact loan reporting of BDC.

is $B = \eta^2/\big(2\kappa(1+\eta)\big)$.

Proof. $\eta(m-R)-\frac{\kappa}{2}(m-W)^2$ is strictly concave with first-order condition $\eta-\kappa(m-W)=0$, giving $m^* = W+\eta/\kappa$, capped at $(1+c)^2$. The forborne payoff is then $W+\eta(m^*-R)-\frac{\kappa}{2}(m^*-W)^2 = W(1+\eta)-\eta R+\eta^2/(2\kappa)$; setting it above the recognition value R yields $W > R-\eta^2/\big(2\kappa(1+\eta)\big)$, i.e. the cutoff $\widehat{w} = R-B$ with $B=\eta^2/\big(2\kappa(1+\eta)\big)$.[45] □

[45] The constant over-mark $\widehat{V}-W=\eta/\kappa$ makes the predictable markdown of Proposition 4 equal to the over-mark η/κ scaled by the forborne share of the PIK pool.