NBER WORKING PAPER SERIES

WHY IS PRIVATE LENDING SO POPULAR?

David T. Robinson
Melanie Wallskog

Working Paper 34617
http://www.nber.org/papers/w34617

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
January 2026

We received no outside funding for this project and have no material financial relationships to disclose. Thanks to Radhika Patel for research assistance and to seminar participants at Boston University, University of Cambridge, University of Chicago Private Firm Symposium, Columbia, Duke, the Federal Reserve Bank of Chicago, the Finance, Organizations, and Markets (FOM) Research group, Harvard Business School, the Stockholm School of Economics, and Yale SOM for helpful comments. We are especially grateful to Alvin Chen, Nuno Clara, Victoria Ivashina, Bob Lyons, Per Strömberg, Tetiana Davydiuk, Tatyana Marchuk, Constantine Yannelis, and Lucy White for helpful comments. All errors are our own. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Why is Private lending so Popular?
David T. Robinson and Melanie Wallskog
NBER Working Paper No. 34617
January 2026
JEL No. G1, G23, G24

ABSTRACT

Private lending has exploded over the past two decades. To explore its rise, we focus on Business Development Companies (BDCs). We show that their growth is intimately connected to growth in private equity. Many BDCs are directly connected to large private equity organizations, and their compensation structures mirror those in private equity. BDCs not only provide debt for PE-sponsored deals, they make PE-like investments themselves involving deferred interest, preferred equity, and exposure to underlying assets. Understanding private lending's connections to private equity is especially salient for the rapidly growing retail investor segment and has important implications for regulation.

David T. Robinson
Duke University
Fuqua School of Business
and NBER
davidr@duke.edu

Melanie Wallskog
Duke University
Fuqua School of Business
melanie.wallskog@duke.edu

The private credit market — once a niche segment of the broader alternative asset market — has grown dramatically over the last twenty years. Before the global financial crisis, the market represented around $100 billion in assets under management (AUM), while today there is over $1.3 trillion in AUM in private credit funds (Burgiss/MSCI (2025)). Why has private lending grown so dramatically?

The prevailing narrative centers around the fact that private lending has substituted for traditional bank financing, particularly as banks have faced stiffer capital requirements in the wake of the global financial crisis (GFC). There is ample evidence to support this view. For example, Davydiuk, Marchuk, and Rosen (2024) show that Business Development Company (BDC) investment activity increased more in areas that were hit harder by negative credit shocks. Similarly, Gopal and Schnabl (2022) show that fintech lenders expanded more in areas that faced more extreme banking contractions. These findings suggest that, in the face of persistent demand for capital from small- and medium-sized firms, private lenders have expanded into the vacuum created by the withdrawal of traditional banks.

Private lenders appear willing to lend where banks would typically not. Chernenko, Erel, and Prilmeier (2022) find that companies receiving credit from private lenders tend to have significantly lower (often negative) EBITDA than firms receiving bank loans, and tend to have higher leverage than traditionally bankable firms. Jang (2024) shows that private loans have more covenants and are more likely to experience covenant breaches than typical bank loans. This has led to growing concern that this type of lending poses risks to the financial system, as private lenders rely on substantial leverage from banks (see Acharya, Cetorelli, and Tuckman (2024), Roulet (2024) or Cortes et al. (2024)). While historical default rates have been low in private credit, loss given default is considerably higher than in other types of lending (Cai and Haque (2024)).[1]

In this paper, we argue that this narrative is incomplete because it overlooks the fact that the growth of private credit is intimately connected to the broader growth of private equity. The goal of this paper is to demonstrate that connection and explore its implications for investors, policymakers, and regulators.[2] To do this, we focus empirically on publicly traded Business Development Companies (BDCs), which represent an important component of the overall market and which operate under a common regulatory and liquidity framework (discussed in detail below).

[1] Chernenko, Ialenti, and Scharfstein (2025) offer an important alternative perspective on this point. They point out that BDCs are much better capitalized than banks, and provide conditions based on risk-capital charges under which a bank would prefer to lend to an intermediary than to the underlying firm itself. Likewise, Jang, Kim, and Sufi (2025) discuss differences in the lending technology between banks and private lenders. We discuss our relation to these papers below.

[2] Patterns of fundraising across the globe also illustrate this. Private lending has grown dramatically in markets like the United Kingdom and Western Europe, which operate under a different bank-regulatory framework than the US. Private debt funds raised by UK-based fund managers were $15.8 billion in 2008 and have grown to $257.9 billion at the end of 2023 (Lee (2024)). Overall fundraising activity for private credit strategies totaled over $1.5 trillion in Western Europe from 2015-2025, comparable to the $2.1 trillion raised in North America (Private Debt Investor (2025)). On a separate note, recent work by Haque, Mayer, and Stefanescu (2024) has argued that private debt can actually serve as complement to some bank activity, namely credit lines, suggesting that viewing private lending as a substitute for traditional bank lending may be incomplete.

We provide three types of evidence linking private lending and private equity. First, many private credit firms have explicit connections to larger private equity sponsors. For example, large, well-known private equity firms such as TPG, Apollo, Carlyle, Ares, and Blue Owl all operate direct lending practices. Second, their compensation practices and incentive structures mirror those found in private equity firms. For example, private lenders typically charge management fees tied to the assets under management that they control, and they earn performance fees that closely resemble the carried interest that is common throughout private equity. Not only are the performance fees similar in scale to what is observed in private equity (typically 10-20% of net returns), we also see familiar provisions such as preferred returns, carried interest catchups, and other measures common in private equity limited partner agreements.

Finally, the investment behavior of private lenders reflects its connections to private equity investment activity. While previous work has shown that a large amount of private lending provides debt financing for leveraged buyouts (see Block et al. (2024) and Jang (2024)), in this paper we show that private lenders also make directly originated investments in companies using securities that differ from traditional bank loans in two key respects: (1) the reliance on negative amortization (Paid-in-Kind, or PIK, interest), in which deferred interest payments add to the outstanding balance of the loan; and, (2) the use of common equity, preferred equity, and warrants alongside traditional loans. These "PE-like" investments are disproportionately used to facilitate investments in situations which lie outside the scope of traditional bank lending.

To quantify the degree to which private lending investment activities rely on these non-bank features, we turn to the Schedule of Investments reported by publicly traded BDCs. While most prior research has focused on the loan portfolios of BDCs, we specifically incorporate and analyze BDCs' non-loan investment activity in tandem with its lending. Around 10% of all securities involve negative amortization, either through PIK interest on loans or through preferred equity. Nearly twenty percent of securities involve exposure to the underlying asset, either as common equity or warrants. Indeed, like private equity sponsors, they sometimes hold preferred equity and common equity in the same portfolio company.[3] In our data, only 3% of BDC-years do not have *some* equity in the Schedule of Investments. Thus, BDCs do not simply extend cash flow-based loans through flexible and carefully managed loan covenants; they make use of a broader security design space than traditional lenders. On average, BDCs hold about half of their portfolio in "non-bank-like" investments.[4]

[3] See Jenkinson, Kim, and Weisbach (2021) for a description of a typical sponsor equity position in a portfolio company.

[4] In the US, banks are generally forbidden from holding common equity in non-financial firms, and in other jurisdictions, the rates of equity ownership are low even when it is not explicitly forbidden (Berlin (2000)). Munday et al. (2018) provide an overview of the private credit market, highlighting how private credit funds' structures allow for contract features uncommon to traditional loans, including equity. Davydiuk et al. (2024) study the coincidence of debt and equity investment from BDCs, but their focus is on the governance implications for companies that receive financing.

One natural interpretation of these findings is that they reflect work-outs: high-risk loans that defaulted, leading the lender to renegotiate into an equity position in order to recover a portion of their investment. The data suggest that this is not the primary driver for what we observe. To test for this, we examine BDC-portfolio company relationships in the year of inception and compare these to later years. At inception, around 15% of deals contain equity. This grows to around 24% after inception, suggesting that while there is certainly evidence of work-outs occurring, they account for only a portion of the total equity usage. The strategic complexity we observe largely appears at contract initiation, not simply as a mechanism for the ex post resolution of financial distress.

This part of the paper demonstrates that private lending is a hybrid of traditional lending, often in support of PE-sponsored transactions (Block et al. (2024)), and non-traditional, PE-like investment activity. Of course, the proportions of these two activities vary across BDCs and over time. We use the term *complexity* to capture the tendency for BDCs to invest through a bundle of securities that blend interest, capital appreciation, and exposure to the underlying assets of the portfolio company. Spreads are substantially higher for BDC-portfolio company relationships that involve complex security features like PIK interest and preferred or common equity. These gaps hold after conditioning on other contract features, company characteristics, and even BDC-year fixed effects. These patterns are consistent with the hypothesis that BDCs use complexity to invest in riskier clients, to whom they charge higher rates: by investing through complex security packages that pair debt investments with equity investments, BDCs capture more of the upside of the investment and so are willing to take on these deals. These results suggest that BDCs use strategic complexity to take risks that traditional lenders cannot take.

To summarize the first part of the paper, private lending mirrors private equity in several key respects. Often private lending firms are directly connected to private equity funds; unlike banks, they compensate investment professionals in the same manner as private equity firms; they invest using complex security baskets that blend traditional loans with negative amortization and exposure to underlying assets; and, they tend to do this more in situations that lie outside the scope of traditional borrowing.

In the second part of the paper, we explore the implications of this for investors, regulators, and policymakers. This is motivated by two observations. One is the growing interest in opening up private equity to retail investors, especially to investment through 401(k) retirement savings vehicles.[5] The second is the observation that the hybrid securities used in private credit offer a liquidity profile that is potentially more desirable for retail investors than that found in standard private equity investments, which can tie up investment capital for lengthy (and indeed, indeterminate) periods of time.

[5]This is perhaps best exemplified through the Executive Order issued August 7, 2025, titled "Democratizing Access to Alternative Assets for 401(k) Investors."

We begin by exploring the rise of non-institutional ownership among publicly traded BDCs by examining 13F filings. While banks have witnessed a sharp increase in institutional holdings since the GFC, BDCs on average have experienced a decrease in institutional holdings over this same time period, with institutional ownership sitting around 25% on average in 2023. This trend indicates that retail investors are playing an increasingly large role in supplying equity capital to publicly traded BDCs.

The rising importance of retail investors in this market raises natural questions about the relationship between fees and performance among publicly traded BDCs. This is especially true given the tension between results in the mutual fund literature, which finds clear evidence that high fee funds underperform (Carhart (1997), Fama and French (2010), Barber, Odean, and Zheng (2005)), and the private equity literature (Robinson and Sensoy (2013)). To study this relationship, we estimate factor loadings from Fama-French asset-pricing regressions and relate them to management fees. We find that fees are negatively related to abnormal returns, and positively related to beta. This stands in stark contrast to Robinson and Sensoy (2013), who find no relationship between fees and net-of-fee performance among a large sample of institutional closed-end, draw-down funds in venture capital and buyout. These results suggest caution in extrapolating historical evidence from prior work in private equity to new vehicles designed to attract retail investment.

Because the traditional narrative around the rise of private credit stresses its role as an alternative to traditional bank lending, a natural regulatory focus has been on how private lending creates systemic vulnerabilities for the global financial system. Our analysis suggests that understanding private credit through the lens of consumer financial protection is also important. This is especially salient given that BDCs engage in two distinct business activities to varying degrees: providing debt in PE-sponsored transactions and making direct investments in small and medium-sized companies using hybrid securities. These distinct activities suggest that a one-size-fits-all regulatory framework may not fit all BDCs equally. To illustrate this, we exploit a natural experiment arising from a regulatory change that relaxed the leverage limits of BDCs in 2018. BDCs that tilt more towards bank-like lending expanded to a greater degree than BDCs that tilt more towards PE-investment focused activity. This event study evidence illustrates the importance of considering the underlying investment activity of BDCs when designing policy.

Finally, to assess how much of the growth in private lending owes to its PE-like attributes, we decompose the overall sector growth according to these two types of activities. We find that around 70% of the overall growth in the market has been from larger, PE-affiliated BDCs who appear primarily to support PE-sponsored transactions. Thus, providing debt to LBOs likely accounts for a majority of the overall rise in private lending's popularity. Among non

PE-affiliated BDCs, we find that the bulk of the recent growth in AUM occurs in BDCs with more complex investment portfolios. In other words, both "PE channels" contribute significantly to the rising popularity of BDCs.

This paper adds to a rapidly growing literature that examines non-bank lending. Recent papers include Chernenko, Ialenti, and Scharfstein (2025), Davydiuk et al. (2024), Flanagan, Erel, and Weisbach (2025), Jang, Kim, and Sufi (2025), and Rintamäki and Steffen (2025). Chernenko, Ialenti, and Scharfstein (2025) argue that lax regulation is an unlikely cause of the rise of BDCs because most BDCs are more highly capitalized than the banks that provide them leverage, and that bank capital requirements make lending to BDCs more attractive than lending directly to small- and medium-sized firms themselves. Our work adds to theirs by showing that private lenders do not simply recycle the leverage they receive from banks; instead, they transform it into securities that banks do not offer, and they tailor these securities to the specifics of the companies in which they invest. Davydiuk et al. (2024) also examine the use of debt and equity in BDC investment activity; however, they focus on the implications of dual holding for the portfolio companies that receive debt/equity investments, and not on how this strategic flexibility affects BDC growth and performance. Flanagan, Erel, and Weisbach (2025) examine the risk and return of private debt. They price the cash flows that limited partners (LPs) receive from investing in a broad class of private debt vehicles and show that these cash flows only generate abnormal performance when benchmarked against debt factors, not when equity factors are included. Our work is complementary: we demonstrate the active use of equity-like investment vehicles, whereas their data do not allow them to observe how the private credit investors generate the cash flows that LPs receive. Rintamäki and Steffen (2025) explore the role of PIK interest in allowing risky borrowers to manage liquidity shortfalls. Jang, Kim, and Sufi (2025) compare direct lending to traditional banks and other financial institutions in terms of how collateral claims are structured, geographical proximity to borrowers, and other factors known to describe traditional bank lending.

This paper also connects to a broader literature that examines cash flow-based lending and other types of non-bank financial intermediation. Lian and Ma (2021) show that around 80% of borrowing by non-financial firms in the US takes the form of cash flow-based loans, and Benmelech, Kumar, and Rajan (2024) describe how secured lending from banks declined throughout the 20th century. Jang (2024) show how covenant renegotiation for many private lenders is a key element of their monitoring and oversight of businesses. Our work shows how the use of complex (non-debt) securities, not just the reliance on loan covenants, accompanies the rise of cash flow-based lending.

The balance of the paper is as follows. We begin by providing institutional details for BDCs, including their affiliation to larger private equity organizations and their compensation structure, in Section 1. Section 2 describes the

Schedule of Investments data and presents facts about the complexity of BDC investment activity. Section 3 relates complexity to interest rate spreads and BDC-level performance measures. Section 4 explores issues related to retail access, while Section 5 explores how changes in BDC investment activity relate to the market's growth. Section 6 concludes.

1 Business Development Companies and the growth of private capital markets

This section provides an overview of Business Development Companies (BDCs) and explores their role in the broader private credit market. We begin with institutional detail on the structure and operations of BDCs. Then we explore their growth over time, as measured by SEC registrations. Finally, we explore the set of publicly-traded BDCs, which comprise the bulk of our sample in the remainder of the paper.

1.1 Background

Originally created by Congress in 1980 through the Small Business Investment Incentive Act (SBIIA), BDCs were at first designed to stimulate funding and provide managerial and technical support to small, growth-oriented companies. Although the original intention was to create a sort of publicly traded venture capital firm, most BDCs instead make income-generating loans to middle-market firms. To comply with the SBIIA, a BDC must invest at least 70% of its total assets in investments that meet the definition of a "qualified investment" according to Section 55(a) of the Investment Company Act. This essentially defines qualifying investments as those made in domestic operating companies with unlisted shares, as well as follow-on investments in companies that were unlisted at the time of the BDC's initial investment. Companies with unlisted shares include private companies as well as companies with shares that trade over the counter, companies that are too small to be listed on public exchanges (US Securities and Exchange Commission (2006)).

BDCs comprise a substantial fraction of the overall private credit market. As Roulet (2024) illustrates, around $1.5 trillion in AUM sits inside private credit vehicles today, with another $500 billion in committed but undrawn capital, so-called dry powder, available for further investment. Around $1 trillion of this sits in private credit funds that are not classified as BDCs.

For the most part, BDCs are structured as closed-end funds, and can be either private or publicly listed. For private BDCs, this means that they raise capital commitments from limited partners and draw down these capital commitments as investment opportunities arise, similar to the way in which traditional private equity funds operate. Like traditional private equity funds, BDCs charge management fees on gross assets and earn performance fees based on exceeding

pre-specified net returns (1.5-2% management fee and 15-20% carried interest for publicly traded entities).

For publicly traded BDCs — the focus of our analysis — capital formation differs from that of traditional closed-end, drawdown funds in private equity and venture capital. Whereas a traditional private equity fund would raise capital commitments at the beginning of the fund and then call the committed capital as investment opportunities arose, publicly traded BDCs effectively call all their equity capital through their initial public offering (IPO). They then typically invest the proceeds in liquid securities while they identify investment opportunities in line with the BDC's operating mandate. Publicly traded BDCs also differ from other non-publicly traded BDCs in this regard. Some non-public BDCs do not operate as closed-end funds; i.e., they offer investors the opportunity to redeem at net asset value.[6] Because BDCs differ in important ways depending on whether they are public, non-public finite-life or non-public evergreen funds, we restrict our analysis to the set of publicly traded BDCs, where we can be sure that the same liquidity conventions apply uniformly to all funds in the sample.

Public and private BDCs have grown dramatically over the last twenty years. Berlin (2024) reports that total lending as a fraction of bank lending has effectively tripled since the global financial crisis and currently stands at around 12% of corporate loan volume. As of 2024, there was about $400 billion in capital in the BDC market, of which approximately $150 billion is held in publicly traded BDCs. Another $75 billion sits inside private, non-traded investment vehicles, structured analogously to traditional private equity funds (see Robinson and Sensoy (2013) or Metrick and Yasuda (2010) for further details), while the remainder sits in perpetual-life BDCs, which first appeared in 2020. (A single perpetual-life BDC, the Blackstone Private Credit Fund, accounts for more than one-third of the AUM of this new type of BDC. See Berlin (2024) for more details.)

One reason for the appeal of BDCs, relative to other types of private credit funds, is their tax treatment (Horowitz and Gaines (2019)). A BDC is structured as a corporation for US federal income tax purposes, but can elect to be treated as a regulated investment company, thereby shielding its investors from *effectively connected income* and *unrelated business tax income*.[7] Moreover, they face no entity-level taxation provided that they pay out at least 90% of their taxable income to investors each year (US Securities and Exchange Commission (2024); Horowitz and Gaines (2019)).

BDCs can also utilize leverage at the fund level. Initially, they were allowed to take on up to one-times leverage (i.e. an asset-coverage ratio of 2.0). As we discuss in detail in Section 4, in 2018 the Small Business Credit Availability

[6] For example, see Saini, Azhar, and Binnie (2025).

[7] According to the IRS, when a foreign person engages in a trade or business in the United States, all income from sources within the United States connected with the conduct of that trade or business is considered to be Effectively Connected Income (ECI).

Act allowed BDCs to decrease their asset coverage ratio to 1.5. BDCs rely on significant amounts of leverage, but as Chernenko, Ialenti, and Scharfstein (2025) has shown, they are generally much better capitalized than the banks that might have otherwise made loans to similar businesses.

1.2 Publicly traded BDCs

Table 1 provides descriptive statistics at the BDC level for the BDCs in our sample. In total, we have 677 BDC-years, an unbalanced panel of 53 BDCs beginning in 2001 and ending in 2023. We further divide these BDCs into two groups based on whether their ownership can be connected to a private equity firm. These are reported separately in Panels B and C.

Insert Table 1 here

The average BDC holds about $1.5 billion in assets under management, but the spread in size across BDCs is large and there is considerable right-skewness. The largest BDC holds almost $30 billion in AUM, and the median BDC holds around $640 million in AUM. On average, BDCs hold debt to total assets of 0.4, reflecting the fact that for much of the sample period they were contractually bound to be below 0.5. As we show in Section 4, leverage ratios expand after 2018 for many, but not all, of the BDCs in our sample.

Because BDCs are closed-end funds, their price to NAV ratios offer an indication of how the market values their investment performance. On average, BDCs trade at about 93% of stated NAV. Presumably this in part reflects the illiquid nature of their portfolios, but as we show below, significant portions of their investment portfolio are held in common stock, preferred stock, and warrants of portfolio companies. Given that many of these companies are private, this potentially introduces measurement error in NAV relative to what we would observe examining the P/NAV of a closed-end mutual fund (Lee, Shleifer, and Thaler, 1991).

In order to better delineate quasi-banking from quasi-private equity, we also identify whether BDCs are affiliated with PE firms. As Block et al. (2024) and Jang (2024) have shown, many BDCs operate in close coordination with a private equity organization. We manually classify BDCs based on their profiles on Yahoo Finance and their self-descriptions on their websites, as of 2025, to determine whether they are connected to a private equity organization. Ultimately, BDCs generate deal activity either by sourcing their own transactions or participating alongside private equity sponsors. Our working assumption, corroborated by descriptive statistics, is that PE-affiliation is likely to correlate with a higher fraction of PE-sourced deals.[8]

[8] BDCs received exemptive relief from related-party co-investment restrictions that might otherwise prohibit them from investing alongside their

Comparing Panels B and C, the average PE-affiliated BDC is more than twice as large as the average PE-unaffiliated BDC, and the largest BDCs are affiliated with PE parent firms. Average leverage (at the BDC level) is similar for both types of BDCs.

Finally, the average BDC exhibits significant diversification across targets, especially relative to a typical private equity fund, which might hold investments in around a dozen portfolio companies (Robinson and Sensoy (2013)). The average BDC is invested in over 100 portfolio companies with nearly 200 securities total. While this exhibits significant variation across BDCs, the low values are recorded in years in which the BDC is first launched, before it has deployed most of the capital it has raised.

1.3 Compensation practices at BDCs

Private equity funds, which historically have focused on venture capital, leveraged buyout, or growth equity investing, typically collect a combination of management fees and carried interest. Management fees are generally expressed as a percentage of committed capital (often 2%) at the fund's inception and through its investment period, sometimes converting to either a lower percentage or a basis of invested capital later in the fund's life. Carried interest is a performance fee that historically has most commonly been 20% of net profits. These conventions are expressed as "2 and 20" (see Robinson and Sensoy (2013) or Metrick and Yasuda (2010)).

The public filings of BDCs shed light on their fees, allowing us to compare the fee arrangements to standard private equity firms. We report key metrics in Table 2.[9] These are presented at the BDC-year level, although there is relatively little variation over time for most BDCs.

Insert Table 2 here

Overall, the average management fee is 1.68% of assets under management. On average, PE-affiliated BDCs charge lower management fees than unaffiliated BDCs, although the highest fees (at 2.5% of AUM) are found in PE-affiliated BDCs. Funds generally charge fees based on *gross* assets under management, which includes leverage (US Securities and Exchange Commission, 2024). In some instances, funds report their effective base management fee as a percentage of common stock. These effective fees average over 3%, making some BDCs considerably more expensive than traditional buyout or venture capital funds that are accessible to institutional investors, in which management fees are

affiliated PE firm. 10-K filings clearly indicate that more generally, PE-affiliated firms rely on their relationships with their PE parent organizations to identify and source deals in ways that unaffiliated BDCs do not appear to do.

[9] We collect data on fees from BDCs' annual 10-Ks; these are available for "externally-managed" BDCs, which constitute the vast majority of BDCs.

based on equity capital (Robinson and Sensoy, 2013).[10]

Although the Investment Advisers Act of 1940 generally prohibits registered investment advisers from charging performance fees based on capital gains unless their clients are "qualified clients," Congress created a special statutory regime for Business Development Companies in the 1980 amendments to the Investment Company Act. Under this regime, BDCs are expressly permitted to pay their advisers incentive fees based on income and realized capital gains, notwithstanding the general prohibition in Section 205(a)(1) of the Advisers Act. In a traditional private equity closed-end fund, carried interest would either be paid on the net profit associated with the exit of a specific investment (deal-by-deal, or *American*, carry) or on the cumulative net return of the entire fund (whole-fund, or *European*, carry).[11] For BDCs, incentive fees are generally paid as a fraction of cumulative net investment income, which is akin to a whole-fund carried interest regime.

This is reported as "Carry rate" in Table 2. Nearly all BDCs charge a 20% incentive fee. Like many buyout funds, they are only entitled to earn this incentive fee if their net investment income exceeds a hurdle rate. This hurdle varies from 6% to 10%, but averages around 7%, very close to the standard 8% in buyout funds.

Finally, limited partnership agreements in private equity have traditionally specified a *catch-up* provision. This is a region of accelerated profit-sharing that compensates the investment manager for the lost incentive fees over the segment of returns that went to meet the hurdle. Robinson and Sensoy (2013) describe these provisions as a standard part of private equity compensation arrangements, one that can have important incentive consequences. This type of arrangement effectively partitions the space of returns into three regions: over the range $r \in [0, hurdle]$ the manager earns no incentive fee; in the range $r \in (hurdle, catchup]$ the manager earns accelerated incentive fees (sometimes 100% of net profits); and in the range $r > catchup$ the manager earns the standard incentive fee, typically 20%. Table 2 shows that 487 out of 543 observations report a catch-up rate during which the BDC manager earns accelerated carried interest.

In sum, the compensation structure of Business Development Companies closely mirrors that of traditional private equity closed-end funds, but with some important differences. BDCs typically charge management fees similar to private equity funds, but these fees are often calculated on gross assets under management rather than on equity capital. Thus, the effective fees in publicly traded BDCs are considerably higher than those paid by institutional investors in traditional private equity closed-end funds. Like these traditional vehicles, the BDC manager also charges

[10] The large magnitude of these effective fees is not a reflection of who reports these fees (i.e., selection of high-fee BDCs); the average base management fee for cases in which we also observe these effective fees is 1.60%.

[11] See Hüther et al. (2020) for details on the differences in carried interest pay-out regimes.

a performance fee, akin both in magnitude and structure to the carried interest commonly charged in private equity.

2 Evidence from BDC Schedules of Investments

In order to characterize the investment behavior of BDCs, we leverage their detailed reporting. Namely, in each 10-K's Schedule of Investments, each BDC provides information on each outstanding investment they have, the portfolio company's name and industry, the type of investment (e.g., "term loan A," "warrant," etc.), and an estimated fair value of the security, as well as investment terms like interest rates and maturity dates for debt investments. These data form the heart of our analysis. We refer to each entry in these Schedules as a security. Across all years and BDCs, we observe 124,190 securities spanning 17,914 portfolio companies from 2001 to the end of our sample in 2023. Section A.1 provides details of our data construction.

2.1 A framework for classifying securities

To guide our understanding of the investment behavior of BDCs, this sub-section discusses a simple framework for classifying securities based on their payoff structure and cash-flow dynamics. In a standard lending relationship, a firm needs to borrow to finance a project that generates positive cash flow. The standard bank lending technology is to offer a loan that generates cash obligations associated with interest and possible amortization of principal. Jang, Kim, and Sufi (2025) explore how the lending technology of direct lenders differs from this, especially in terms of how collateral is focused and how monitoring and loan origination occur. We focus instead on how security design differs between traditional lenders and private lending.

In some settings, compensation for the risk of the project requires an expected return that exceeds the firm's immediate capacity to repay. While loan covenants can address these situations to some extent, information frictions and other issues mean that a standard bank loan requiring interest plus amortization of principal is ill-suited to finance many projects of this nature.

Two contractual innovations relative to standard bank loans facilitate investment in these settings. One is to defer interest payments. This can be achieved by attaching Paid-in-Kind (PIK) interest to the loan, or by attaching a security to the loan that earns accrued dividends, such as preferred equity. From a contingent claims perspective (ignoring the tax distinctions between equity and debt), preferred equity with an accruing dividend generates the same payoff at liquidation as a loan with PIK interest; they both involve receiving a capped upside that grows with the amount of accrual. In other words, preferred equity does not vary with the underlying asset value beyond the point at which the accrued dividend is satisfied.

The second contractual innovation is to receive equity in connection with debt investments, either in the form of common equity or warrants.[12] In the United States, banks are generally prohibited from holding equity in their borrowers Berlin (2000). In contrast to deferred interest payments, common equity and warrants provide direct exposure to the underlying value of the firm. While cash-flow based lending focuses collateral on the going-concern value of the firm (Jang, Kim, and Sufi (2025)), this offers exposure to the going-concern value of the firm in all states of nature, not just in the state of default.

Thus, whereas a bank typically has one contractual lever in a standard lending relationship in addition to the term of the loan (i.e., the interest rate), a private lender has three: the current yield the security offers (whether through interest or dividend), the capital appreciation associated with the security, and the security's exposure to the underlying assets of the firm. The standard "textbook" debt and equity securities are knife-edge cases of these securities that pull only one of the levers. However, most securities used in private market transactions blend elements of all three to varying degrees.

2.2 Classifying securities into security types

Given this classification framework, we turn to our Schedules of Investments data. We classify each security into one of seven security types. First, we classify securities according to whether they are debt or equity. Then, for debt securities, we further distinguish between senior secured, non-senior secured, and unsecured debt. For equity, we distinguish between preferred equity, common equity, and warrants. In a number of cases, the schedule of investments list "units" instead of shares: we classify these as either common or preferred equity depending on how the units are described. A small number of BDCs provide lending arrangements that are tied to other values, such as royalty income; we bin these in an "other" category.

Insert Table 3 here

Panel A of Table 3 summarizes these classifications, as well as average fair values and average interest rate spreads over the 3-month LIBOR. We organize the classifications based on the structure of cash flows, as discussed above; namely, we distinguish between securities that emphasize current yield (i.e., debt without PIK interest), securities that feature deferred income (i.e., debt with PIK interest and preferred equity), and securities that create exposure to the underlying value of the companies (i.e., common equity and warrants). Columns (1) and (2) present unweighted averages, while column (3) presents value-weighted averages, where values represent the fair value of a security in a

[12] Davydiuk et al. (2024) explores the dual ownership of debt and equity by BDCs and argues that this facilitates better monitoring and oversight of portfolio companies.

given year; not all securities have a reported value, and so column (2) repeats column (1)'s unweighted averages on the sample of securities with reported values, i.e., those in column (3). This weighting matters: while the average fair value of securities is large ($8.6 million), the distribution is skewed, with the value-weighted average fair value being over $400 million; the median fair value (not reported in the table) is $1.38 million.

The majority of securities (65% of securities, 73% of value) are debt securities without any deferred income (PIK); among these, the majority (33% of all securities, 54% of all value) are senior secured debt, though unsecured debt is also common (28% of all securities, 14% of all value). Yet, other types of securities are also common: 11% of securities (12% of value) feature deferred income, while 18% of securities (9% of value) feature exposure to the underlying value; we discuss the usages of these securities as complex investments below. Note that some of the equity securities are holding investments in investment companies rather than equity investments in small- and mid-sized companies; below, we focus on cases in which we observe equity securities *alongside* debt securities, as this increases the likelihood that these are true equity investments in companies.

2.3 Measuring complexity

From the analytical framework laid out above, we can think of private investments that operate along three contractual dimensions: the current yield the security offers, the capital appreciation associated with the security, and the security's exposure to the underlying asset of the firm. We characterize how BDCs use "complexity" by measuring to what degree they diverge from a standard bank-like secured loan, i.e., from a loan with a relatively low interest rate, positive amortization (i.e., principal paydown), and no upside risk from asset valuation growth.

Specifically, we consider several alternative features. To speak to the overall risk of a debt security, we consider the role of collateral (i.e., whether the debt is secured) as well as the presence of PIK interest, both of which are likely to be attractive for cash-constrained borrower firms. The presence of PIK interest additionally means negative amortization, with the principal growing as the loan matures. Beyond debt, we consider the presence of equity investments. These equity investments, particularly when paired with debt, indicate a complex payoff structure for BDCs. For example, when a BDC invests preferred equity, they defer dividends in a way that effectively creates negative amortization like PIK interest. In addition to preferred equity, common equity and warrants offer potential capture of upside risk.

Panels B and C of Table 3 report the results. Panel B presents average characteristics of BDC-portfolio company relationships in the initial year of the relationship, at contract initiation, while Panel C presents the same statistics in the years after the relationship is initiated. Like Panel A, columns (1) and (2) present unweighted averages, while

column (3) presents value-weighted averages.

Relationships display a considerable amount of complexity, both at initiation and as the relationship ages. On average, portfolio companies have 1.58 securities with a BDC in the initial year; this expands to 1.80 on average after initiation, presumably reflecting the renegotiation that occurs as portfolio companies experience financial distress. These span 1.20 security types on average, growing to 1.27 after initiation. Perhaps unsurprisingly, higher value relationships feature more securities: value-weighted, the average number of securities is 2.4, while the number of security types is 1.43.

Deferred income is common: at initiation, 8% of companies have debt with PIK interest and/or preferred equity, and this grows substantially over time as companies exercise the option embedded in many loan agreements. Again, this is common in higher-value relationships, where on a value basis the share of companies with debt and deferred income begins at 14% at initiation and grows to over 19%. Exposure to the underlying value of the companies is also common, with 12% of companies having both debt and common equity and/or warrants at origination (20% when value-weighted), with this growing to 15% (25% value-weighted) post-origination.

Appendix Tables A.2 and A.3 present similar statistics for PE-affiliated and PE-unaffiliated, respectively. While both PE-affiliated and unaffiliated BDCs invest in all types of securities, PE-affiliated BDCs' securities tend to be much larger and their relationships with companies tend to be less complex. For instance, on a value-weighted basis, 17% of new relationships between PE-unaffiliated BDCs and companies feature both debt and deferred income, while only 13% of those between PE-affiliated BDCs and companies do. Similarly, 24% of new relationships (value-weighted) of PE-unaffiliated BDCs feature debt and exposure to the underlying value of the companies, while only 18% of PE-affiliated BDCs' new relationships do. These patterns are consistent with our understanding that PE-affiliated BDCs more often support PE-sponsored transactions, in which case the "need" for complexity may be smaller.

One natural interpretation of the presence of equity- and PIK-like features in loan agreements is that they arise through negotiation in the shadow of covenant breaches that are associated with financial distress, as one would expect when lending to higher-risk borrowers. Indeed, Roberts and Sufi (2009) show that as much as 90% of private credit arrangements with publicly traded companies are renegotiated during the life of the agreement (though rarely for default or covenant breach). In our data, the average duration of a relationship prior to 2019 is around four years.[13] While comparing Panels B and C clearly suggests that equity stakes are used as an ex post renegotiation tool in BDC-

[13] Untabulated results available from the authors. The year 2019 is four years prior to the end of the sample. Note that, while the sample sizes in Panels B and C would suggest that around one third of the sample occurs in the initiation year and thus the average contract duration would be around three years, the right-truncation of our sample leads to censoring that makes this implied duration too short.

portfolio company relationships, Panel B illustrates that the bulk of the complexity we observe in the data is present at the time of contract initiation. This shows that the strategic complexity we document is not merely arising because BDCs have greater flexibility to renegotiate poorly performing loans; they are designing securities ex ante to blend debt and equity features, as is common in private equity.

2.4 Portfolio company sector

For over half of the reported investments, BDCs report the primary industry of the portfolio company's main activity. We aggregate these industries to 2-digit NAICS sectors. We additionally homogenize a company's sector over time and BDCs by assigning to all securities of a company the company's most-often reported sector. This allows us to also fill in a large fraction of unreported sectors, as some companies only have industries reported in particular years or with particular BDCs. At the end of this process, we have sector classifications for 70% of securities (66% of companies).

Insert Figure 1 here

Figure 1 presents the distribution of securities across sectors, value-weighted, both for all securities as well as secured debt, unsecured debt, and equity securities separately. For contrast, we also provide the sectoral distribution of SBA 7(a) loans over the same time window for reference; these loans are government-backed small business loans and so approximately reflect the types of small- and mid-size businesses seeking loans in the U.S.[14]

Two patterns are notable from Figure 1. First, BDCs invest across the sectoral distribution: we see non-negligible investments in nearly all sectors of the U.S. economy. This suggests that BDCs are not niche players in the private investment space; instead, they serve as capital sources for a variety of firms.

Second, despite this broad coverage, BDCs do invest in a somewhat different client base than SBA-backed banks. For example, we see relatively more value going towards manufacturing, information, finance and insurance, and health firms and less going to construction, retail trade, and accommodation and food services. Note that a large gap appears in investment in finance and insurance firms, with a large value-weighted fraction of unsecured debt and equity investments flowing towards that sector; we caution that much of this investment may not be in typical borrowing firms (i.e., small- and mid-sized companies), but instead in other investment companies. We view this as likely reflecting BDCs temporarily investing capital in other investment vehicles as a holding space as they wait for investment opportunities; recall that these publicly traded BDCs are structured as closed-end funds, meaning that they

[14] We aggregate 2001-2023 SBA 7(a) loans by sector, weighted by the gross approval loan sizes. Source: https://data.sba.gov/dataset/7-a-504-foia, accessed April 16, 2025.

raise much of their capital in an initial IPO, and so may seek temporary places to hold their capital before they are ready to properly deploy it.

3 Complexity and investment-level spreads

The investment-level data suggest that many BDC investments exhibit considerable complexity relative to standard loan agreements (Table 3). Based on the analytical framework sketched above, we hypothesize that this complexity is generally used to finance riskier portfolio companies. In this section, we provide evidence supporting this hypothesis: namely, debt securities that are part of complex investments — i.e., those paired with equity or featuring PIK interest — are charged higher interest rate spreads. These complex investments comprise a meaningful share of BDCs' value-weighted portfolios.

3.1 Loan spreads

We estimate the correlations between interest rate spreads at loan origination and contract features through a simple linear regression model:

$$\begin{aligned}\text{Interest rate spread over LIBOR}_{ijts} = \alpha_0 &+ \beta_1 \text{Secured}_{ijts} + \beta_2 \text{Any common equity}_{ijt} \\ &+ \beta_3 \text{Any preferred equity}_{ijt} + \beta_4 \text{Any warrants}_{ijt} \\ &+ \beta_5 \text{Ever has PIK interest}_{ijt} \\ &+ X_{ijts}\delta + \varepsilon_{ijts},\end{aligned} \tag{1}$$

where i is a portfolio company, j is a BDC, t is a year, and s is a particular debt security that is issued in year t. The dependent variable is the spread over the 3-month LIBOR interest rate, either overall (cash plus PIK) or only cash.[15] We consider a variety of contract and company features as regressors, including an indicator for whether the debt is secured, indicators for whether the debt appears alongside any common equity, preferred equity, or warrants, as well an indicator for whether the company's debt ever has any PIK interest.[16] We estimate this regression with several controls (summarized by $X_{ijts}\delta$), which include year, issuance year-year, maturity year-year, company sector-year and BDC-year fixed effects.[17] ε_{ijts} reflects noise.

[15] We merge in the 3-month LIBOR rate at the year-month level, where we take the month to match the issuance month. Note that we do not always observe PIK rates, even when the presence of PIK interest is indicated; we omit those observations from these regressions.

[16] It is difficult in the Schedule of Investments data to consistently follow particular securities over time for a given company, so we pool all debt securities for each company-BDC relationship and flag whether there is ever any PIK interest.

[17] Note that, since we restrict to debt securities that are issued in the current year, issuance year-year fixed effects are collinear with year fixed

Insert Table 4 here

Table 4 presents our findings. In column (1), we estimate model (1) with year fixed effects and find evidence indicating that complex security packages are more common among riskier borrowers. Namely, while secured debt carries a 46 basis point lower average spread than unsecured debt (the omitted group), the spreads on complex debt packages are large. The spreads on debt securities paired with common equity are 96 basis points higher, all else equal, while those paired with preferred equity are 120 basis points higher.[18] Warrants are particularly "expensive" — debt securities paired with them face 180 basis point higher spreads, on average. A large premium is associated also with PIK interest, at 175 basis point higher spreads on average, all else equal. There is no causal interpretation to attach to these results; we are not comparing strategically complex security bundles to counterfactual, unchosen contracts with fewer PE-like features. Borrowers are no doubt sorting into the most attractive securities available to them. Instead, these interest rate spreads arise in equilibrium as a reflection of the riskiness of the borrower and the availability of outside options. The results are consistent with complex contracts being deployed with riskier firms to whom BDCs charge higher rates. Note that, by virtue of only having spreads for debt securities, these analyses ignore equity investments that are not paired with debt securities; nevertheless, we see in Appendix Table A.4 that BDCs that generally invest more equity also tend to charge higher rates on their debt investments.

The fact that the average spread associated with common equity is lower than the spread associated with preferred equity is consistent with the analytical framework discussed above. Holding constant the distribution of expected asset values for a given borrower, because common equity offers a claim on the underlying asset value of the borrower whereas preferred equity generally does not, a larger fraction of the total return from the securities package is available to a common equity holder. Of course, these are cross-sectional correlations, reflecting both this effect as well as the fact that firms are sorting into common equity versus preferred equity based on their expected asset values.

These patterns largely persist when we consider only the cash spread in column (5), except for the obvious fact that securities with PIK interest tend to have lower cash rates. This result is not mechanical, however: it could have been the case that the pool of borrowers accessing PIK securities was so much riskier than the non-PIK pool that they faced higher average cash spreads. Or it could also have been the case that the rate of substitution between current and

effects; we include this distinction regardless in order to mirror an analysis discussed below. We label each security's issuance year as the investment or acquisition date given for a security or, if that is not reported, the first year a company has the specific investment name (e.g., "Class A units" or "First lien senior secured loan") with a given BDC. For debt securities, we use reported maturity dates to capture maturity years; in rare instances in which multiple dates are given, we take the earlier one.

[18] Our point estimate for common equity closely matches Davydiuk et al. (2024), who argue that part of this excess premium owes to governance spillovers associated with pairing debt and equity in the same entity.

future yield is above one, not below it. Instead, PIK-loans cost about 175 basis points more, on average, to generate around a 200 basis point reduction in cash interest. This is consistent with PIK being offered to cash-constrained firms, or in settings where the required return exceeds the ability of the portfolio company to service the loan out of current proceeds.

The premia associated with complexity survive when controlling for other contract features, including issuance- and maturity-year by year, company sector-year, and BDC-year fixed effects, in columns (2) and (6). Note that with BDC-year fixed effects, the identifying variation comes from contracts of different complexity within the same BDC in a given year receiving different equilibrium interest rate spreads. The coefficients on equity and PIK interest indicators largely attenuate — suggesting that some variation seen in earlier columns is accounted for by some BDCs generally offering more complexity and charging higher spreads, for instance because they may attract riskier borrowers or exert more market power — but largely remain. For example, with BDC-year fixed effects, debt securities with any PIK interest have 120 basis point higher overall spreads on average.

In columns (3), (4), (7), and (8), we consider to what degree equity combinations that closer mimic private equity transactions — namely, adding *both* preferred and common equity alongside the debt — correlate with spreads. We do this by adding as a covariate the interaction between the indicators for having any preferred equity and having any common equity alongside the debt. While having preferred and common equity on their own continues to exhibit large premia, having both attenuates this premium. This may reflect BDCs deploying this private equity-like security design to high expected growth companies who are currently cash-constrained; in other words, the combination of preferred and common equity reflects a deferment of payments towards the future, akin to PIK interest, in a way that marginally reduces current spreads.

Insert Table 5 here

We further explore the "cost" of deferring cash payments in Table 5. In this analysis, we consider all years for a debt security (i.e., not just at origination), conditional on the security at some point accruing PIK interest. We re-estimate model (1), replacing as the indicator for whether a security ever faces PIK interest with an indicator for whether the security *currently* has PIK interest — that is, whether the security has tripped its PIK toggle, perhaps because they can no longer afford to pay cash interest.[19] Similar to in Table 4, we find large premia for deferring payments. In particular, we see large positive overall spreads and large negative cash spreads on currently having PIK interest: when the PIK toggle is tripped, cash payments decrease and overall rates increase (through PIK interest).

[19] At origination, 79% of debt securities in Table 4 that *ever* have PIK interest currently have PIK.

In columns (3), (4), (7), and (8), we show that securities that have tripped their PIK toggles and are *also* receiving equity investments pay particularly large premia in terms of their overall spread, consistent with an overall large cost to deferring cash payments. Again, these patterns reflect an equilibrium in which BDCs appear willing to invest in riskier companies if they can in turn charge higher rates or gain more future upside.

It is worth noting that these spreads could reflect not just the riskiness of the borrowers but also the market power or value-added of the BDC, as explored in Davydiuk et al. (2024). In Table A.5, we conduct BDC-year level regressions examining the relationship between BDC investment behavior and the probability and size of BDCs' reported losses. We find that the use of deferred income, namely PIK interest, is associated with higher rates and sizes of losses, consistent with these investments being deployed for riskier borrowers.[20]

3.2 Deal size

How important are these complex investments for the overall value of a BDC portfolio? While our summary statistics in Table 3 already demonstrated that complex investments tend to have disproportionate value — the value-weighted share of BDC-company relationships exceeded the security-weighted share — we formalize this point here.

Insert Table 6 here

We examine this in Table 6 by regressing the total reported fair value of all securities — i.e., the portfolio of investments associated with a particular BDC-company pair in a given year — on characteristics of the BDC-company relationship. To do this, we adapt model (1) to data at the BDC-company-year level. In other words, the dependent variable is the size of an investment relationship between a BDC and an individual portfolio company in a given year. We observe how the amount of capital deployed in a given portfolio company varies as a function of deal characteristics, controlling for different types of fixed effects. In columns (1)-(3), we report regressions in which we consider characteristics separately; in the remaining columns, we report regressions in which we consider characteristics jointly.

Broadly speaking, these regressions reveal that complexity tends to be associated with larger deal sizes relative to the omitted category, which is plain-vanilla, unsecured debt. This holds true when comparing across companies within a BDC-year (with the inclusion of BDC-year fixed effects) and when comparing across time within a BDC-company relationship (with the inclusion of BDC-company fixed effects). It is worth noting that is not just complex relationships

[20] We are not able to observe loan-level default rates or covenant breaches, as in Jang (2024). Interestingly, we find that BDCs that more often combine debt with equity appear to have lower loss rates. This could reflect a timing effect: i.e., if equity payouts have not yet happened, there may be no losses; this could also reflect nebulous reporting, as losses on equity require a valuation of private companies, which comprise the bulk of BDC clients. It could also reflect a real benefit to equity investments: by offering companies securities that allowed deferred payment, BDCs may enable companies to grow and succeed.

that are larger and valuable; BDCs also report secured debt to have high value. This may reflect secured debt being deployed towards larger, safer borrowers (or, when borrowers have become larger or safer). Collectively, we take these patterns as evidence that complexity is not a small part of BDCs' portfolios; instead, complex, PE-like packages of securities occupy large fractions of overall assets under management. They are not used in fringe cases, but instead make up significant portions of the BDCs' overall investments over time.

4 Implications for retail access to private equity

In this section, we explore the implications of our findings for the shareholders of BDCs. First, we show that these shareholders are increasingly retail investors. This fact is important in light of the growing interest in expanding access to alternative assets to retail investors, interest which has culminated in a recent Executive Order directing government agencies to review and update financial regulations around alternative assets.[21] Then we turn to the relationship between fees and performance to understand better the implications for retail investors.

4.1 The rise of non-institutional ownership of BDCs

We consider institutional holdings data to see how the composition of ownership of publicly traded BDCs has changed over time. For each BDC-year, we measure the proportion of shares held by institutional investors, as reported in 13F filings; we source this data from LSEG. For comparison purposes, we also track ownership of bank stocks, and publicly traded PE firms over time.[22]

Insert Figure 3 here

Panel (a) of Figure 3 reports average institutional ownership over time by firm type (bank/BDC/PE). Note that the earliest a PE firm in our sample IPOs is in 2007 (Blackstone), so we truncate the sample there.

In 2007, about 29% of the shares outstanding in the average bank were owned by institutional investors. Institutional ownership was higher for BDCs at around 40% and even higher for private equity firms, at roughly 58%. Private equity firms' institutional ownership remains high throughout the sample period, with noted spikes occurring with the public listing of Apollo and EQT. In contrast, bank institutional ownership has steadily climbed, especially beginning after the GFC, while institutional ownership of BDCs has steadily dropped following the GFC. By the end of the

[21] The Executive Order was signed on August 7, 2025, and is titled "Democratizing Access to Alternative Assets for 401(k) Investors." The full text of the Order can be found here: https://www.whitehouse.gov/presidential-actions/executive-orders/.

[22] Banks are firms with three-digit SIC industry codes of 602. We consider the 8 publicly traded private equity firms (with IPO dates in parentheses): Blackstone (2007), KKR (2010), Apollo (2011), Carlyle (2012), Ares (2014), EQT (2020), Brookfield (2022), and TPG (2022). Note EQT publicly listed on the Stockholm Nasdaq exchange a year earlier, and a predecessor to Brookfield Asset Management listed in Toronto in 1997, but we use the data from the NYSE/Nasdaq CRSP files.

sample period, average institutional holdings for banks were at or above that of private equity firms, while the average institutional ownership of BDCs has dropped to around 25%. This suggests that as banks migrated out of lending to small and medium-sized businesses, their retail investor base contemporaneously shifted out of bank holdings and towards the types of institutions that were filling the void left behind.

Not all of the downward trend in institutional ownership for BDCs necessarily reflects a conscious activity by retail investors. As Davydiuk, Marchuk, and Rosen (2024) argue, BDCs became excluded from the S&P 500 and Russell stock indexes in 2014 (spurred by the SEC's "Acquired Fund Fees and Expenses" disclosure requirements change in 2006), which led to a mechanical decrease from 2013 to 2014 in institutional ownership via these indexes. Nonetheless, we show that this decline in BDC institutional ownership has continued; today there is an overwhelming presence of non-institutional owners in BDCs.[23] Regardless of the source of these trends, the fact still stands: the modal owner of a BDC is *not* a large institutional owner, and consequently the incidence of BDC activity may largely be felt by individual investors.

Panel (b) plots the distributions of institutional ownerships share (pooling across years) for BDCs, banks, and private equity. Consistent with the trends in average institutional ownership seen in panel (a), BDCs have markedly lower institutional ownership shares than private equity, further supporting this idea that BDCs may disproportionately raise capital from retail investors.

Finally, we ask which BDCs attract more retail investment. To do this, estimate model (2) in which we correlate institutional ownership shares with two parsimonious notions of complexity based on our analytical framework laid out above: when debt is paired with either PIK and/or preferred equity (i.e., deferred income) and when debt is paired with either common equity and/or warrants (i.e., exposure to the underlying).

$$\begin{aligned}\text{Share of stock owned by institutional investors}_{jt} = \alpha_0 \\ &+ \beta_1 \text{Share of companies with both debt and PIK or preferred equity}_{jt} \\ &+ \beta_2 \text{Share with both debt and common equity or warrants}_{jt} \\ &+ \gamma_t + \gamma_j + \varepsilon_{jt},\end{aligned} \tag{2}$$

[23] The analysis in Davydiuk, Marchuk, and Rosen (2024) ends in 2017, up until which point their and our Figure 3 panel (a) show relatively flat ownership patterns following the index exclusion. Extending our analysis to 2023, we document a continued decline in institutional ownership.

where j is a BDC and t is a year. We aggregate to the BDC-year level by first collapsing across all securities a portfolio company has with a BDC in a given year, flagging the presence of any PIK interest and different security types and summing up the fair values; then, we take value-weighted averages across these company-level characteristics at the BDC-year level. That is, the share variables on the right hand side of model (2) capture the fraction of value a BDC invests in company relationships that feature complexity.We estimate separate and pooled regressions to consider the measures of complexity separately and jointly. We additionally consider specifications without BDC fixed effects. Doing this allows us to compare across BDCs (where much of the variation in ownership lies) and allows us to add an additional covariate: the PE-affiliation of the BDC, which is collinear with BDC fixed effects.

Insert Table 7 here

Table 7 presents our estimates. In columns (1) and (2), we omit BDC fixed effects and so leverage variation both within and across BDCs. We find that PE-affiliation is a strong predictor of institutional ownership. This may reflect common ownership between the BDC and its PE affiliate; recall from Figure 3 that publicly traded PE firms tend to have high institutional ownership rates.[24] While the estimates are noisy (due to clustering at the BDC level), we also find suggestive evidence that PE-like activity (i.e., complex investments) is associated with lower institutional ownership — and, in turn, likely higher individual investment. These patterns remain noisy when we include BDC fixed effects in columns (3) and (4).

In columns (5) and (6), we sharpen our analysis by taking a simple snapshot: ownership and investment activity in 2023. While this disallows the inclusion of BDC and year fixed effects, it also allows us to skip clustering standard errors, as we now just have one cross section and so no autocorrelation in the outcome. Here, patterns are stark: PE-affiliated BDCs tend to be more institutionally-owned, while those that engage in more complex, PE-like investments tend to have more non-institutional investors.[25]

4.2 Fees and performance

In light of the rising importance of retail investors for publicly traded BDCs, a natural question concerns the relation between fees and performance in this asset class. This is especially important given prior work in both the mutual fund literature and the private equity literature. We begin by developing risk-adjusted performance measures

[24] Note that most of the PE affiliates are not part of the small group of publicly traded PE firms covered in Figure 3. Instead, their affiliates are large asset management funds that have PE arms.

[25] The estimates are economically meaningful. For instance, in column (5), our estimate imply that a BDC with a one standard deviation (12 percentage point) higher share of companies with deferred income would have a 12% lower institutional ownership rate, relative to the mean; a BDC with a one standard deviation (19 percentage point) higher share of companies with exposure to the underlying asset would have a 9% lower rate.

of BDCs and comparing these measures to those of publicly traded banks and private equity. Then we relate fees to performance as well as to the level of non-institutional ownership in a given BDC.

4.2.1 Measuring BDC investment performance

In order to examine how BDC complex investment practices and fees vary with BDC-level performance, we consider the stock returns of the BDCs. We start by estimating three-year, rolling-window market and Fama-French three-factor models for our sample of BDCs between 2001 and 2023, using monthly stock returns from CRSP-Compustat. Because we are interested in understanding how the cash flow characteristics of the investment portfolio of a BDC affect the riskiness of the BDC's equity, we estimate look-ahead factor loadings. That is, for each BDC in a given year, we estimate factor loadings based on up to the next thirty-six months of monthly stock returns data (including the given year). This allows us to relate a factor loading at time t with the anticipated cash flows of the investment portfolio it is holding at that point in time.

Insert Table 8 here

Table 8 presents summary statistics of our estimated factor loadings. From our market model regressions, we obtain a small (unweighted) average estimated (annualized) alpha of 0.062 and an average estimated market beta of 0.968 (columns (1) and (2)).[26] The abnormal return is statistically distinguishable from 0, while the market beta is statistically discernible from 1 at conventional levels. For comparison purposes, Damodaran (2025) reports an average beta for money-center banks at 0.88 and for regional banks at 0.52, while beta for publicly traded private equity firms are reported in the 1.3-1.6 range.

Turning to Fama-French three-factor estimates allows us to account for the fact that the targets of many private equity transactions look like small, value stocks (see, for example, Stafford (2021)). Again, these estimates are unweighted, in contrast to the figures summarized below. Here we see similar results (columns (3)-(6)). Controlling for value and size, the average beta drops to 0.866, while the HML and SMB factor loadings are positive and statistically different from zero. This is consistent with the average BDC-year level portfolio containing small, value stocks. In addition, we estimate a positive average alpha of 0.082, which is statistically significantly different from 0 at the 1% level. This suggests that after controlling for the tendency of BDCs to invest in small, value stocks, they earn positive abnormal returns.

[26] Note that in much of our paper, we refer to the market beta as simply "beta" and the coefficients on HML and SMB factors as the HML and SMB factor loadings, respectively.

4.2.2 Comparing banks, BDCs, and private equity

Before turning to the relationship between BDC performance and fees, we leverage these performance measures to further illustrate that BDCs appear to operate as hybrids of banks and private equity. To do this, we repeat the same look-ahead factor estimation for the publicly traded banks and private equity studied in Section 4.1.

Insert Figure 2 here

Figure 2 presents the comparisons of estimates from the Fama-French three-factor models, generally highlighting that BDCs sit between banks and private equity in their cash flows. BDCs, banks, and private equity all have distributions of alpha estimates clustered around 0: the unweighted mean estimated alpha for BDCs is 0.046, while banks and private equity have mean alpha estimates of 0.11 and 0.035, respectively. Similarly, the estimated betas for BDCs, on average 0.832, sit midway between those of banks (on average 0.679) and publicly traded private equity (on average 1.520), with the means statistically significantly different. Again, we see estimated HML and SMB loadings for BDCs sitting between banks and private equity: banks, BDCs, and private equity have average HML loading estimates of 0.720, 0.278, and 0.168, respectively, and average SMB loading estimates of 0.491, 0.417, and 0.039, respectively.[27] Taken together, these patterns clearly suggest that BDCs are not simply alternative banks, as their cash flows to equity holders tell a different story.

4.2.3 Fees and performance

We relate fees and performance across BDCs in Table 9, which presents OLS regressions of base management fees on our estimated Fama-French 3-factor loadings, as well as on measures of retail ownership.

Insert Table 9 here

Column (1) reports regressions of fees on 3-factor abnormal returns. In Panel A, we use only the 2023 data and find a strong, negative correlation. In Panel B, we include the entire panel and cluster at the BDC-level. Here we find a statistically significant, negative correlation between fees and abnormal returns. In sample, BDCs that charge higher base management fees earn lower risk-adjusted abnormal returns.

In the remaining columns, we regress base management fees on the individual factors. Higher fees are associated with higher betas, higher loadings on HML, and higher loadings on SMB, though we have lower statistical significance

[27] We find robust patterns across several variants of these plots. In Figures A.1 and A.2 we separately compare BDCs to national and regional banks, respectively, while in Figure A.3 we split BDCs on their PE-affiliation.

for HML and SMB.[28] Thus, higher fee funds appear to invest in higher beta investments, and they resemble small, value stocks.

These findings stand in stark contrast to other work relating fees to net-of-fee performance in private equity. Robinson and Sensoy (2013), in particular, regress a measure of private equity fund performance on fees and find no relation between management fees and net-of-fee performance.[29] Their results indicate that, historically, traditional private equity closed-end drawdown funds with higher headline fees generated higher gross-of-fee performance sufficient to justify their higher fees. This does not appear to be the case among publicly traded BDCs.[30]

In column (5), we relate fees to institutional ownership. In Panel A there is a strong and statistically significant negative relation between fees and institutional ownership — i.e., retail investors sort (in equilibrium) into higher fee funds. In Panel B, when we use the entire panel and cluster at the BDC-level, we see greater magnitudes, but we lose statistical precision due to the persistence in fees over time.

5 Regulatory considerations

In the previous section, we explored the implications of heterogeneous BDC investment behavior for retail investing activity. In this section, we explore the implications of this heterogeneity for regulatory efforts in this market. Because observers of private credit have stressed its role as "shadow banking," a natural regulatory focus has been on how private lending creates systemic vulnerabilities for the global financial system and what should be done about it. For example, in its discussion of market-based lending, the Bank of England's 2024 Financial Stability Report states, "The work of international and domestic regulators to develop appropriate policy responses to address the risks of excessive leverage is therefore important. [...] encourages authorities globally to take action to reduce the vulnerabilities through internationally coordinated policy reforms."

Our findings highlight the heterogeneity of private credit investment activity, with some BDCs behaving more like traditional banks — likely in support of PE buyouts (Block et al. (2024)) — while others make complex, PE-like investments themselves. This heterogeneity implies that a bank-focused regulatory approach may be incomplete; in other words, a one-size-fits-all banking-style regulatory framework may only catch part of the market.

To illustrate this point, we exploit a 2018 regulatory change that allowed BDCs to increase their leverage. Prior

[28] We generally have lower statistical power in our full sample regressions in Panel B, where clustering standard errors at the firm level is necessary due to autocorrelation.

[29] Their performance measure is the net of fee Public Market Equivalent developed by Kaplan and Schoar (2005), which essentially divides the present value of net-of-fee distributions of the fund by the present value of paid-in capital to the fund.

[30] In Table A.6, we show that BDCs with higher average complexity generally have higher fees, which is consistent with the fees scaling in proportion to the due diligence efforts and other expenses faced by BDCs.

to this regulation, BDCs were required to maintain a 1:1 debt-to-equity ratio. Afterwards, this ratio rose to 2:1.[31] We hypothesize that this bank-style policy change should matter more — i.e., affect capital structuring behavior — for more bank-like BDCs. These bank-like BDCs, who we argue are often supporting PE-sponsored transactions, likely have relatively plentiful opportunities for investments, given the size of the existing PE market; that is, bank-like BDCs have scalable activities that are limited by borrowing constraints. More PE-like BDCs, on the other hand, arguably face a different set of binding constraints for their investments, as they likely engage in more deal searching on their own; we hypothesize that these PE-like BDCs are less responsive to the bank-like leverage regulation. We test this hypothesis by analyzing the borrowing behavior of BDCs after the 2018 policy change, by proxies for BDCs' bank-tilt, where we expect the BDCs engaging more in more bank-like investments to increase their leverage more after 2018.

We consider two proxies for bank-tilt: whether a BDC is PE-affiliated and whether a high share of a BDC's company relationships involve only "plain" debt (i.e., with neither PIK interest nor any equity). For the first proxy, we assume that a relatively large part of PE-affiliated BDCs business involves supporting PE-sponsored transactions and consequently act more as alternatives to banks than PE-unaffiliated BDCs. For the second proxy, we assume that if a smaller fraction of a BDC's transactions involve complex securities (i.e., combining debt with PIK interest or equity), then they too are more likely bank alternatives. Note that our measure of PE-affiliation is fixed over time, whereas we use pre-policy 2017 plain debt-only shares in order to categorize BDCs before the policy may have an effect on BDC behavior. We say a BDC has a higher plain debt-only share if their 2017 value-weighted share of companies receiving only debt falls in the top quartile, i.e., more than 64%. These two proxies are positively correlated (correlation of 0.36) but identify distinct sets of BDCs.

For both proxies, we measure how BDC borrowing changes following the policy, both by plotting the average debt-to-equity ratios over time and by formalizing the comparisons in an event study of the following form:

$$\text{Debt-to-equity}_{jt} = \alpha + \sum_{2014 \leq y \leq 2022, \neq 2017} \text{Bank-tilt proxy}_j \times \mathbf{1}\{t = y\}\delta_y + \gamma_j + \gamma_t + \varepsilon_{jt} \tag{3}$$

where j is a BDC and t is a year, and we measure the gap in debt-to-equity ratios between BDCs that we characterize as bank alternatives and those we do not before and after the 2018 policy through coefficients γ_y. We include BDC and year fixed effects and cluster standard errors at the BDC-level. ε_{jt} reflects idiosyncratic error. In order to remove

[31] Note that the change was not immediate, as each BDC had to either seek board or shareholder approval in order to take advantage of the policy change. Below, we document a semi-gradual impact of the policy on leverage ratios in an event study.

the impact of sample composition effects, for both the average patterns and the event study analyses we consider the 33 BDCs for whom we have debt-to-equity measures every year between 2014 and 2022.

Insert Figure 4 here

Figure 4 presents our results. Before the 2018 policies, both PE-affiliated and unaffiliated BDCs, as well as BDCs with higher and lower debt-only shares, had relatively similar average leverage, with average debt-to-equity ratios largely falling between 0.6 and 0.8 (panels (a) and (c)). Recall the pre-2018 regulation set the maximum debt-to-equity ratio at 1, meaning that many BDCs were not borrowing at the maximum. Following the policy change in 2018, all groups increase their leverage, on average, but remain below the 2:1 new maximum ratio. Yet, the BDCs that see the larger increases are those we identify as more like banks, namely those that are PE-affiliated or those who predominantly invested only debt into companies. Whereas PE-unaffiliated BDCs see an increase in average debt-to-equity ratio from 0.64 in 2014 to 1.00 in 2022, PE-affiliated BDCs' average ratio nearly doubled from 0.70 to 1.32. Similarly, while BDCs that offered more than just debt in at least two-thirds of their deals (value-weighted) had an increase in average debt-to-equity from 0.68 to 1.08, those who were predominantly debt-only experienced an increase from 0.61 to 1.32. (Again, note that despite the similarity of the figures, our two proxies capture only partially-overlapping sets of BDCs.)

These patterns are formalized in our event studies in panels (b) and (d), where we see parallel pre-trends followed by relative leverage increases for our bank-tilted BDCs. Following regulation that allowed BDCs to borrow more, that opportunity was taken up disproportionately by the bank-like BDCs who likely predominantly support PE-sponsored transactions. The remaining BDCs saw substantially smaller leverage increases, which we posit is because they are themselves engaging in private equity, whose less-scalable nature limited these BDCs' capacity to expand.[32] In other words, the bank-like regulation disproportionately impacted the bank-like BDCs, suggesting that the heterogeneity in BDC investment behavior should be considered when designing regulation. Because these BDCs are also disproportionately owned by institutional investors (Table 7), this regulation additionally had heterogeneous impacts across investor types.

[32] In Figure A.4, we show that this leverage increase may have indeed allowed the bank-like BDCs to grow faster; while this analysis is noisier, we observe suggestive evidence that bank-like BDCs expanded the number of companies in which they invest following the policy, relative to PE-like BDCs.

6 Conclusion

In this paper we argue that to understand the growth of private lending, it is important to understand how it is connected to the growth in private equity. Private lenders do not simply lend money to unbankable firms; they invest in ways that banks cannot, but that are commonplace in traditional private equity investing. They also support private equity activity by providing the debt portion of private-equity sponsored transactions.

Through a simple accounting exercise, we can decompose the growth in AUM of BDCs into growth coming from traditional bank-like activity versus activity that either involves complex lending or is in service of private equity itself. The majority of growth in AUM for BDCs in our data appears through PE-affiliated BDCs. From 2001 to 2023, PE-affiliated BDCs' AUM growth accounts for 70% of aggregate AUM growth. If we restrict attention to PE-unaffiliated BDCs, and split BDCs based on whether a majority of their AUM is deployed in relationships that involve complex investments, we find that AUM growth is strongest for BDCs actively engaging in this complex, non-bank activity. For example, from 2001 to 2023, more complex PE-unaffiliated BDCs accounted for 56% of the aggregate AUM growth for PE-unaffiliated BDCs; in the last decade alone (from 2014 to 2023), this share rises to 76%. Thus, both connections to private equity are important for understand why private lending has become so popular.

Understanding its growth through the rise of private equity has implications for regulation. Beyond the idea that non-bank-like BDC activity may not respond to banking-style regulation, there is also the possibility that more bank-like BDCs may be poised to handle default risk better than traditional banks. For instance, consider the role of private credit in providing debt in PE-sponsored deals. Historically, banks have originated the debt packages that supported PE-transactions. But rather than hold these loans on their books, they have then sold these in the secondary market to hedge funds and other groups like collateralized loan obligations (CLO) managers, who hold pools of loans and then securitize them further, selling tranches to insurance companies, hedge funds, and other investors. This in turn meant that when a default occurred, it could have been challenging to bring all the creditors to the table to facilitate a restructuring because the owners of the debt were various and operated with different incentives. To the extent that this activity is being replaced by hold-to-maturity lending by actors who are closely connected to the PE sponsors themselves — like PE-affiliated BDCs — this may facilitate easier renegotiation in times of distress and thus may attenuate, rather than exacerbate, the effects of any economic downturn.

The changing composition of who owns the equity behind private lending is also worth careful consideration, especially in light of the growing interest in allowing retail investors to access alternative assets via retirement savings funds. As alternative assets are increasingly held in retail hands, the repercussions of any default may play out not

through systemic risk to the banking system itself, but rather through the household balance sheet. This suggests that the appropriate regulatory posture towards private credit should focus on systemic spillovers that are perhaps distinct from those thought to be paramount in macro-prudential bank regulation. Understanding the net effects of these channels is an important question for ongoing research.

References

Acharya, Viral V, Nicola Cetorelli, and Bruce Tuckman. 2024. "Where Do Banks End and NBFIs Begin?" Tech. rep., National Bureau of Economic Research.

Barber, Brad M., Terrance Odean, and Lu Zheng. 2005. "Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows." *Journal of Business* 78 (6):2095–2120.

Benmelech, Efraim, Nitish Kumar, and Raghuram Rajan. 2024. "The decline of secured debt." *The Journal of Finance* 79 (1):35–93.

Berlin, Andrew. 2024. "BDC Quarterly Wrap: 3Q24." Tech. rep., LSTA.

Berlin, Mitchell. 2000. "Why Don't Banks Take Stock?" *Federal Reserve Bank of Philadelphia Business Review* .

Block, Joern, Young Soo Jang, Steven N Kaplan, and Anna Schulze. 2024. "A survey of private debt funds." *The Review of Corporate Finance Studies* 13 (2):335–383.

Burgiss/MSCI. 2025. "Private Capital Universe." Last accessed 15 December, 2025.

Cai, Fang and Sharjil Haque. 2024. "Private Credit: Characteristics and Risks." Tech. rep., The Federal Reserve Board of Governors.

Carhart, Mark M. 1997. "On Persistence in Mutual Fund Performance." *Journal of Finance* 52 (1):57–82.

Chernenko, Sergey, Isil Erel, and Robert Prilmeier. 2022. "Why do firms borrow directly from nonbanks?" *The Review of Financial Studies* 35 (11):4902–4947.

Chernenko, Sergey, Robert Ialenti, and David S Scharfstein. 2025. "Bank capital and the growth of private credit." Tech. rep., Available at SSRN 5097437.

Cortes, Fabio, Mohamed Diaby, Caio Ferreira, Nila Khanolkar, Harrison Samuel Kraus, Benjamin Mosk, Natalia Novikova, Nobuyasu Sugimoto, and Dmitry Yakovlev. 2024. "The Rise and Risks of Private Credit." Tech. rep., International Monetary Fund.

Damodaran, Aswath. 2025. "Damodaran Online." URL https://pages.stern.nyu.edu/~adamodar/. Last accessed 15 December, 2025.

Davydiuk, Tetiana, Isil Erel, Wei Jiang, and Tatyana Marchuk. 2024. "Common Investors Across the Capital Structure: Private Debt Funds as Dual Holders." Tech. Rep. 2024-21, Fisher College of Business WP.

Davydiuk, Tetiana, Tatyana Marchuk, and Samuel Rosen. 2024. "Direct lenders in the US middle market." *Journal of Financial Economics* 162:103946.

Fama, Eugene F. and Kenneth R. French. 2010. "Luck versus Skill in the Cross-Section of Mutual Fund Returns." *Journal of Finance* 65 (5):1915–1947.

Flanagan, Thomas, Isil Erel, and Michael Weisbach. 2025. "Risk adjusting the returns to private debt funds." Tech. rep., Ohio State University.

Gopal, Manasa and Philipp Schnabl. 2022. "The rise of finance companies and fintech lenders in small business lending." *The Review of Financial Studies* 35 (11):4859–4901.

Haque, Sharjil, Simon Mayer, and Irina Stefanescu. 2024. "Private debt versus bank debt in corporate borrowing." In *Proceedings of the EUROFIDAI-ESSEC Paris December Finance Meeting*.

Horowitz, Richard and Jonathan Gaines. 2019. "The Growth of Private BDCs." *The Investment Lawyer* 26 (4):1–9.

Hüther, Niklas, David T. Robinson, Sönke Sievers, and Thomas Hartmann-Wendels. 2020. "Paying for Performance in Private Equity: Evidence from Venture Capital Partnerships." *Management Science* 66 (4).

Jang, Young Soo. 2024. "Are Direct Lenders More Like Banks or Arm's-Length Investors?" *Available at SSRN 4529656* .

Jang, YoungSoo, Dasol Kim, and Amir Sufi. 2025. "The Lending Technology of Direct Lenders in Private Credit." Tech. rep., University of Chicago.

Jenkinson, Tim, Hyeik Kim, and Michael S. Weisbach. 2021. "Buyouts: A Primer." Tech. rep., NBER Working Paper No. w29502. URL https://ssrn.com/abstract=3968725.

Kaplan, Steven N. and Antoinette Schoar. 2005. "Private Equity Performance: Returns, Persistence and Capital Flows." *Journal of Finance* 60 (4).

Lee, Charles, Andrei Shleifer, and Richard Thaler. 1991. "Investor Sentiment and the Closed-End Fund Puzzle." *Journal of Finance* 46 (1):75–109.

Lee, Nicole. 2024. "Private Debt's Steady Rise in the UK." Tech. rep., British Venture Capital Association.

Lian, Chen and Yueran Ma. 2021. "Anatomy of corporate borrowing constraints." *The Quarterly Journal of Economics* 136 (1):229–291.

Metrick, Andrew and Ayako Yasuda. 2010. "The economics of private equity funds." *The Review of Financial Studies* 23 (6):2303–2341.

Munday, Shawn, Wendy Hu, Tobias True, and Jian Zhang. 2018. "Performance of Private Credit Funds: A First Look." *The Journal of Alternative Investments* 21 (2):31–51.

Private Debt Investor. 2025. "Amount raised by funds holding a final close between 2015 and 2025 ($bn)." URL https://www.privatedebtinvestor.com/database/live-fundraising-chart. Last accessed 15 December, 2025.

Rintamäki, Paul and Sascha Steffen. 2025. "PIK Now and Pay Later-How Deferred Interest Reshapes Private Credit." *Available at SSRN* .

Roberts, Michael and Amir Sufi. 2009. "Renegotiation of financial contracts: Evidence from private credit agreements." *Journal of Financial Economics* 93 (2).

Robinson, David T and Berk A Sensoy. 2013. "Do private equity fund managers earn their fees? Compensation, ownership, and cash flow performance." *The Review of Financial Studies* 26 (11):2760–2797.

Roulet, Caroline. 2024. "The rise of private credit markets: A threat to financial stability?" Tech. rep., Organization of Economic Cooperation and Development.

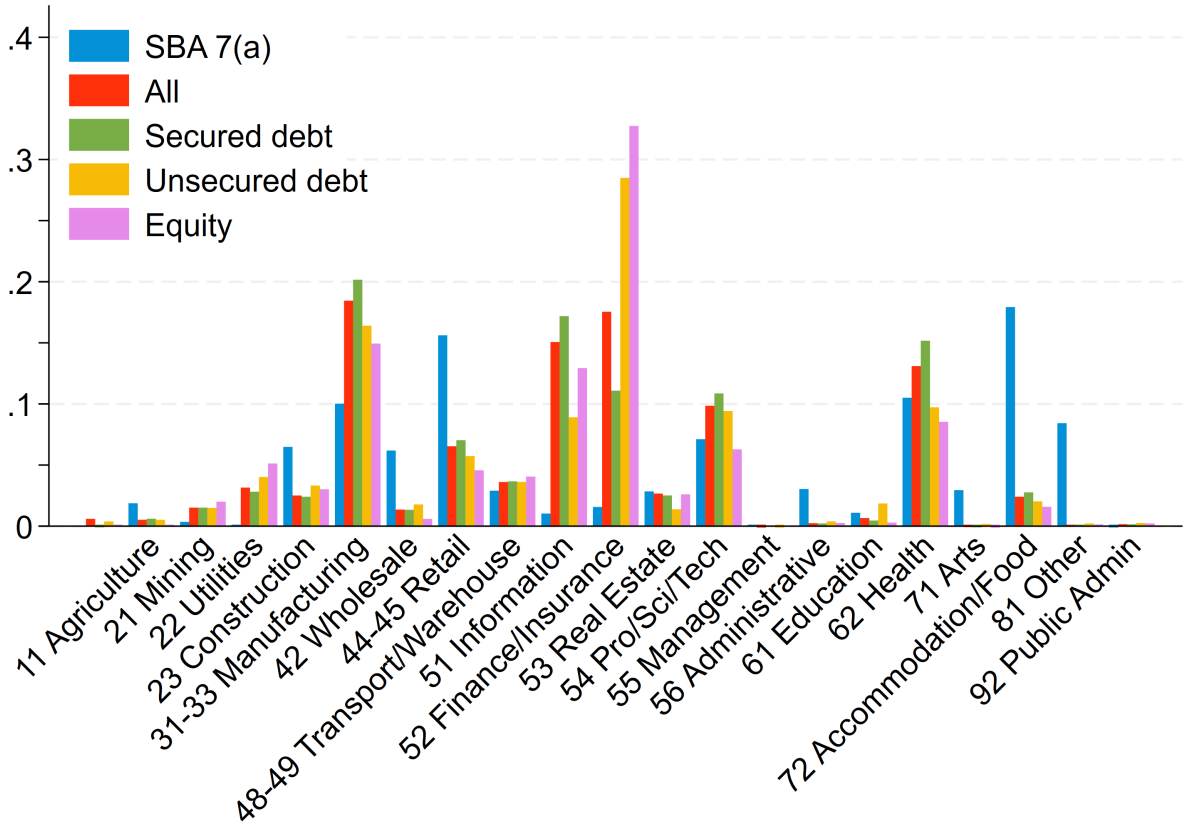
Saini, Manya, Saeed Azhar, and Isla Binnie. 2025. "Blue Owl Axes Private Credit Merger After Market Upset." Tech. rep., Reuters.

Stafford, Erik. 2021. "Replicating Private Equity with Value Investing, Homemade Leverage, and Hold-to-Maturity Accounting." *The Review of Financial Studies* 35 (1):299–342. URL https://doi.org/10.1093/rfs/hhab020.

US Securities and Exchange Commission. 2006. "17 CFR Part 270 [Release No. IC-27538; File No. S7-37-04], RIN 3235-AJ31, Definition of Eligible Portfolio Company under the Investment Company Act of 1940."

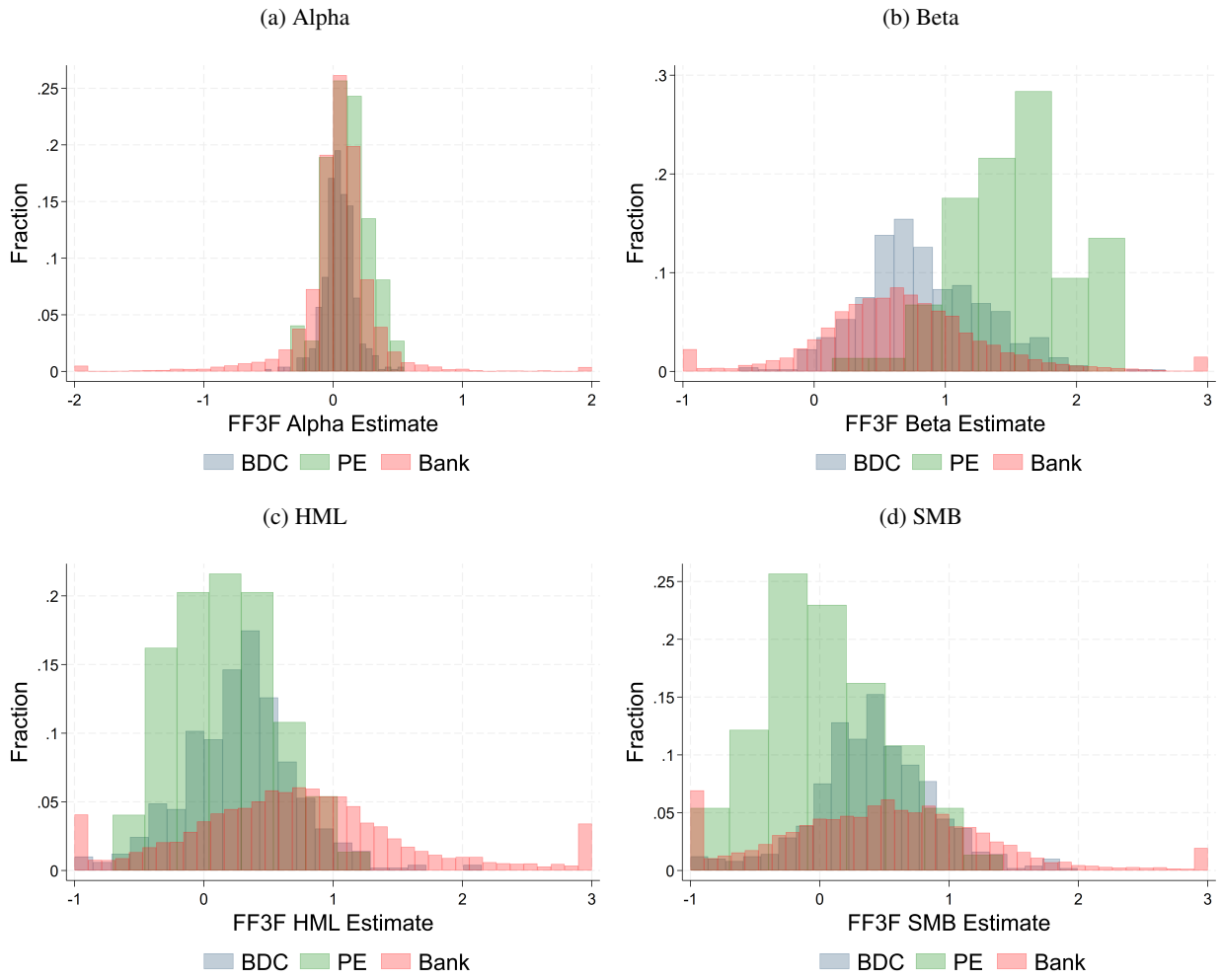
———. 2024. "Publicly Traded Business Development Companies (BDCs): Investor Bulletin." Tech. rep., US Securities and Exchange Commission.

Figure 1: Sectoral distribution of investments



This figure presents the value-weighted sectoral distribution of all securities, secured debt, unsecured debt, and equity, as well as of SBA 7(a) loans in our sample window (2001-2023), for reference. Securities at portfolio companies with unknown sectors are omitted.

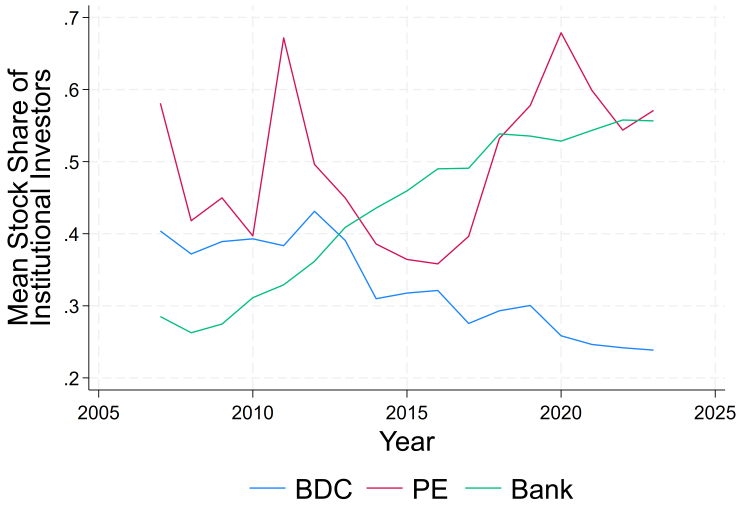
Figure 2: Fama-French Three-Factor Model estimates: BDCs vs. PE vs. banks



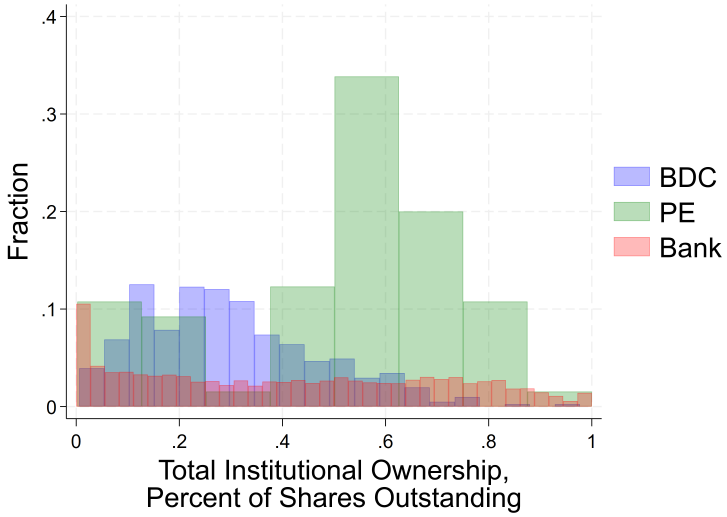
This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, compared to PE and banks. T-tests for equality of group unweighted means:
Alpha: H_0: BDC (0.046) = PE (0.111) $\rightarrow$ p($\neq$) = 0.003**. H_0: BDC = Bank (0.035) $\rightarrow$ p($\neq$) = 0.082*
Beta: H_0: BDC (0.832) = PE (1.520) $\rightarrow$ p($\neq$) = 0.000***. H_0: BDC = Bank (0.679) $\rightarrow$ p($\neq$) = 0.000***
HML: H_0: BDC (0.278) = PE (0.168) $\rightarrow$ p($\neq$) = 0.032**. H_0: BDC = Bank (0.720) $\rightarrow$ p($\neq$) = 0.000***
SMB: H_0: BDC (0.417) = PE (0.039) $\rightarrow$ p($\neq$) = 0.000***. H_0: BDC = Bank (0.491) $\rightarrow$ p($\neq$) = 0.002***
* for p<.10, ** for p<.05, and *** for p<.01.

Figure 3: Institutional versus retail investor ownership in BDCs vs. PE and banks

(a) Trends



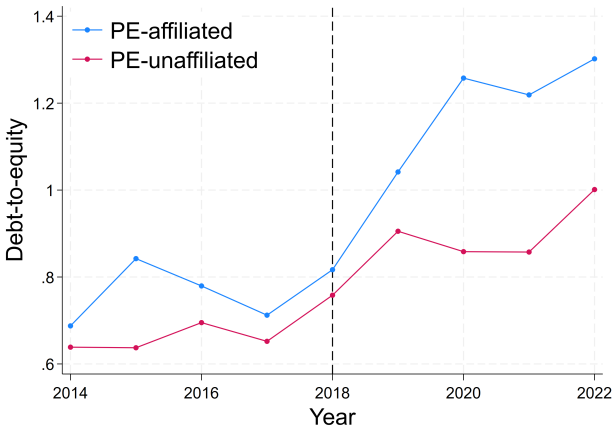
(b) Distributions



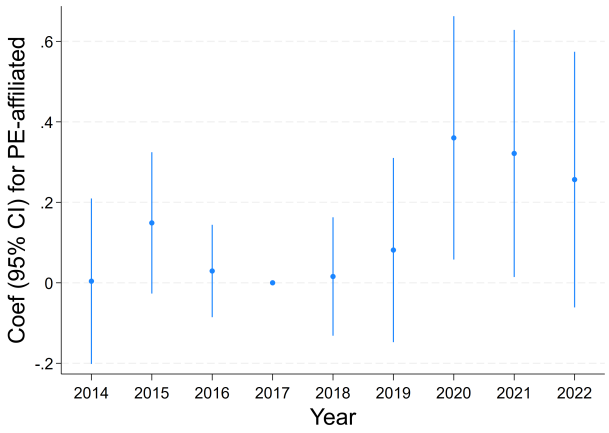
This figure presents patterns of institutional ownership in BDCs, compared to PE and banks. Panel (a) shows the trends in institutional ownership, based on unweighted-average institutional ownership shares. Panel (b) presents histograms of the institutional ownership shares for 2007-2023. Note that we start in 2007 to match the first IPO data for the publicly traded PE firms we study. Institutional ownership rates are sourced from 13F filings organized by LSEG.

Figure 4: Event study analysis of 2018 leverage policy

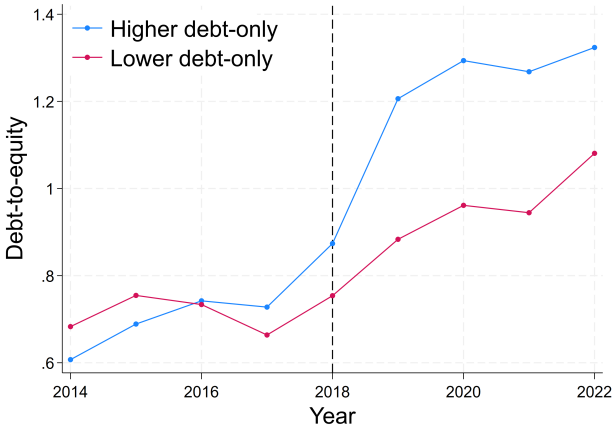
(a) Averages by PE-affiliation



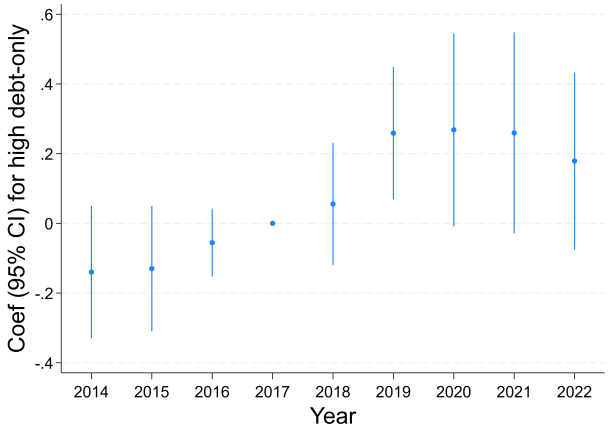
(b) Event study by PE-affiliation



(c) Averages by share of companies with only plain debt



(d) Event study by share of companies with plain debt



This figure presents patterns of BDCs' leverage before and after a 2018 policy that allowed BDCs to increase their debt-to-equity ratios to 2:1. Panels (a) and (b) compare BDCs by PE affiliation, while panels (c) and (d) compare BDCs by the 2017 fraction of their investments (value-weighted) that involve only "plain" debt (i.e., no PIK or equity), splitting at the 75th percentile (i.e., 64% of companies receiving only debt securities). Panels (a) and (c) show trends (raw averages), while panels (b) and (d) present event study estimates, where the treated BDCs are the PE-affiliated and high only-debt share ones, respectively. The event studies include year and BDC fixed effects and standard errors clustered at the BDC-level. Analyses conducted on subsample of 33 BDCs with balanced leverage data from 2014 through 2022 (N = 297).

Table 1: Summary statistics of BDCs

	N	Mean	Median	StdDev	Min	Max
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All BDCs						
AUM (millions)	677	1569.89	639.09	3072.79	0.52	29668.70
Leverage	559	0.39	0.43	0.18	0.00	0.69
P/NAV	559	0.93	0.91	0.24	0.31	1.80
# Portfolio companies	677	106.35	67.00	231.20	2.00	3259.00
# Securities	677	183.44	109.00	296.83	2.00	3813.00
Panel B: PE-affiliated BDCs						
AUM (millions)	351	2101.13	1009.08	3813.73	16.13	29668.70
Leverage	278	0.42	0.45	0.16	0.00	0.66
P/NAV	278	0.95	0.95	0.22	0.32	1.76
# Portfolio companies	351	95.68	81.00	68.20	7.00	472.00
# Securities	351	184.07	123.00	189.34	9.00	1427.00
Panel C: PE-unaffiliated BDCs						
AUM (millions)	326	997.92	451.97	1828.41	0.52	13010.34
Leverage	281	0.35	0.41	0.19	0.00	0.69
P/NAV	281	0.91	0.88	0.26	0.31	1.80
# Portfolio companies	326	117.83	52.50	325.46	2.00	3259.00
# Securities	326	182.77	93.00	380.34	2.00	3813.00

Notes: This table presents unweighted summary statistics at the BDC-year level.

Table 2: Summary statistics of BDCs' incentive fees

	N	Mean	Median	StdDev	Min	Max
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All BDCs						
Base management fee (%)	543	1.68	1.75	0.31	0.75	2.50
as percent of common stock (%)	117	3.32	3.13	0.92	1.48	5.96
Carry rate (%)	537	19.33	20.00	1.56	10.00	20.00
Hurdle rate (%)	537	7.31	7.00	0.79	6.00	10.00
Catch-up rate (%)	487	8.89	8.75	1.40	2.50	11.67
Panel B: PE-affiliated BDCs						
Base management fee (%)	325	1.64	1.50	0.30	0.75	2.50
as percent of common stock (%)	62	3.22	3.16	0.81	1.64	5.61
Carry rate (%)	321	19.19	20.00	1.67	10.00	20.00
Hurdle rate (%)	321	7.32	7.00	0.89	6.00	10.00
Catch-up rate (%)	285	8.90	8.75	1.02	6.67	10.31
Panel C: PE-unaffiliated BDCs						
Base management fee (%)	218	1.74	1.75	0.32	0.75	2.00
as percent of common stock (%)	55	3.44	3.10	1.01	1.48	5.96
Carry rate (%)	216	19.55	20.00	1.36	12.50	20.00
Hurdle rate (%)	216	7.29	7.00	0.62	6.00	8.00
Catch-up rate (%)	202	8.87	8.75	1.82	2.50	11.67

Notes: This table presents unweighted summary statistics at the BDC-year level, for BDC-year pairs in which management fees are described in the BDCs' 10-Ks.

Table 3: Characteristics of securities and BDC-company relationships

Sample:	All	Positive/non-missing value	
Weighting:	Unweighted	Unweighted	Value-weighted
	(1)	(2)	(3)
Panel A: Mean characteristics of securities (i.e., BDC-year-company-security level)			
Fair value (millions)	8.59	9.78	419.74
Interest rate spread on debt	7.58	7.65	7.84
Debt without PIK interest	0.65	0.68	0.73
Senior secured debt	0.33	0.32	0.54
Other secured debt	0.05	0.05	0.05
Unsecured debt	0.28	0.30	0.14
Deferred income	0.11	0.11	0.12
Debt with PIK interest	0.05	0.06	0.09
Preferred equity	0.06	0.06	0.03
Exposure to underlying	0.18	0.16	0.09
Common equity	0.12	0.10	0.08
Warrant	0.06	0.05	0.01
Other	0.05	0.05	0.06
N	124,190	109,353	109,353
Panel B: Mean characteristics of *new* BDC-company relationships (i.e., BDC-company level)			
Fair value (millions)	11.82	12.10	85.57
Number of securities	1.58	1.59	2.01
Number of security types	1.20	1.21	1.33
Share debt	0.82	0.83	0.80
Share equity	0.15	0.14	0.15
Has debt	0.88	0.89	0.90
Has debt + deferred income	0.08	0.08	0.14
Has debt + exposure to underlying	0.12	0.13	0.20
N	23,693	23,264	23,264
Panel C: Mean characteristics of *existing* BDC-company relationships (i.e., BDC-year-company level)			
Fair value (millions)	16.21	16.96	680.10
Number of securities	1.80	1.81	2.39
Number of security types	1.27	1.28	1.43
Share debt	0.72	0.75	0.76
Share equity	0.24	0.21	0.18
Has debt	0.80	0.83	0.88
Has debt + deferred income	0.12	0.12	0.19
Has debt + exposure to underlying	0.15	0.15	0.25
N	48,304	46,465	46,465

Notes: This table presents mean characteristics at different levels of the data. Columns (1) and (2) present unweighted averages, and Column (3) presents value-weighted averages. Columns (2) and (3) subset to securities with positive and non-missing value before taking averages.

Table 4: Interest rate spreads at origination and the cost of complexity

Dependent variable:	Overall spread				Cash spread			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Secured	-0.459***	-1.256***	-0.431***	-1.252***	-0.236***	-0.773***	-0.207***	-0.768***
	(0.040)	(0.049)	(0.040)	(0.049)	(0.043)	(0.055)	(0.043)	(0.055)
Any common equity	0.956***	0.412***	1.165***	0.544***	0.830***	0.229***	1.043***	0.374***
	(0.049)	(0.042)	(0.052)	(0.045)	(0.053)	(0.047)	(0.056)	(0.051)
Any preferred equity	1.204***	0.455***	1.806***	0.847***	1.253***	0.481***	1.867***	0.913***
	(0.069)	(0.063)	(0.088)	(0.081)	(0.075)	(0.071)	(0.095)	(0.091)
Any warrants	1.806***	0.855***	1.804***	0.851***	1.811***	0.777***	1.810***	0.773***
	(0.066)	(0.068)	(0.066)	(0.068)	(0.072)	(0.077)	(0.071)	(0.077)
Ever has PIK interest	1.749***	1.214***	1.740***	1.207***	-2.023***	-2.558***	-2.032***	-2.565***
	(0.056)	(0.050)	(0.056)	(0.050)	(0.061)	(0.056)	(0.061)	(0.056)
Any preferred × any common			-1.576***	-0.912***			-1.606***	-1.004***
			(0.142)	(0.117)			(0.153)	(0.132)
Constant	7.155***	7.996***	7.108***	7.975***	6.999***	7.661***	6.952***	7.637***
	(0.037)	(0.040)	(0.037)	(0.040)	(0.039)	(0.045)	(0.040)	(0.045)
R^2	0.31	0.63	0.31	0.63	0.25	0.56	0.26	0.56
Mean Outcome	7.32	7.32	7.32	7.32	6.94	6.94	6.94	6.94
Year FEs	X		X		X		X	
Issuance Year-Year FEs		X		X		X		X
Maturity Year-Year FEs		X		X		X		X
Sector-Year FEs		X		X		X		X
BDC-Year FEs		X		X		X		X
N	25,126	25,126	25,126	25,126	25,126	25,126	25,126	25,126

Notes: This table correlates interest rate spreads with security features, for debt securities at origination. In columns (1)-(4) the dependent variable is the overall spread, while in columns (5)-(8) the dependent variable is the cash portion of the spread. Spreads are calculated by subtracting the 3-month LIBOR rate from the interest rate. We say a debt security ever has PIK interest if we ever see the company accumulating PIK interest with the BDC. * for p<.10, ** for p<.05, and *** for p<.01.

Table 5: The Cost of deferring cash payments: Rates for companies with PIK interest

Dependent variable:	Overall spread				Cash spread			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Secured	-1.509***	-1.239***	-1.506***	-1.232***	-0.711***	0.304**	-0.752***	0.275*
	(0.088)	(0.102)	(0.088)	(0.102)	(0.121)	(0.145)	(0.121)	(0.145)
Any common equity	0.197**	0.204**	0.147	0.112	-0.970***	-1.126***	-0.417***	-0.751***
	(0.081)	(0.084)	(0.115)	(0.116)	(0.111)	(0.119)	(0.159)	(0.164)
Any preferred equity	0.298***	0.231**	0.280**	0.196*	-0.008	-0.201	0.193	-0.057
	(0.110)	(0.111)	(0.114)	(0.115)	(0.151)	(0.157)	(0.157)	(0.163)
Any warrants	0.430***	0.438***	0.387***	0.362***	-0.269*	0.219	0.211	0.532***
	(0.111)	(0.120)	(0.132)	(0.137)	(0.154)	(0.170)	(0.182)	(0.194)
Has PIK interest	1.823***	1.759***	1.778***	1.679***	-2.868***	-2.768***	-2.366***	-2.441***
	(0.096)	(0.091)	(0.122)	(0.114)	(0.133)	(0.128)	(0.168)	(0.162)
Has PIK interest and equity			0.084	0.152			-0.931***	-0.623***
			(0.138)	(0.132)			(0.191)	(0.187)
Constant	8.708***	8.575***	8.735***	8.621***	8.564***	7.791***	8.270***	7.601***
	(0.123)	(0.125)	(0.131)	(0.131)	(0.170)	(0.177)	(0.180)	(0.186)
R^2	0.25	0.53	0.25	0.53	0.21	0.48	0.21	0.48
Mean Outcome	9.27	9.27	9.27	9.27	5.39	5.39	5.39	5.39
Year FEs	X		X		X		X	
Issuance Year-Year FEs		X		X		X		X
Maturity Year-Year FEs		X		X		X		X
Sector-Year FEs		X		X		X		X
BDC-Year FEs		X		X		X		X
N	7,731	7,731	7,731	7,731	7,731	7,731	7,731	7,731

Notes: This table correlates interest rate spreads with security features, for debt securities that ever has PIK interest. In columns (1)-(4) the dependent variable is the overall spread, while in columns (5)-(8) the dependent variable is the cash portion of the spread. Spreads are calculated by subtracting the 3-month LIBOR rate from the interest rate. A security that currently has PIK interest has tripped its PIK toggle. * for p<.10, ** for p<.05, and *** for p<.01.

Table 6: The Value of complexity

Dependent variable:	Log(Total value of securities)					
	Separate			Pooled		
	(1)	(2)	(3)	(4)	(5)	(6)
Has secured debt	2.312***	1.260***	1.441***	2.169***	1.109***	0.904***
	(0.037)	(0.041)	(0.059)	(0.036)	(0.040)	(0.055)
Has debt + common equity	1.505***	0.769***	0.902***	0.824***	0.533***	0.582***
	(0.050)	(0.039)	(0.055)	(0.051)	(0.040)	(0.056)
Has debt + preferred equity	1.273***	0.758***	0.840***	0.687***	0.425***	0.364***
	(0.067)	(0.050)	(0.065)	(0.071)	(0.053)	(0.067)
Has debt + warrants	0.723***	1.169***	1.965***	0.300***	0.812***	1.584***
	(0.052)	(0.059)	(0.096)	(0.055)	(0.058)	(0.095)
Has debt with PIK interest	1.321***	0.562***	0.384***	0.537***	0.206***	0.110***
	(0.051)	(0.043)	(0.040)	(0.052)	(0.042)	(0.035)
R^2				0.43	0.69	0.94
Mean Outcome	14.67	14.67	14.67	14.67	14.67	14.67
Issuance Year-Year FEs	X	X	X	X	X	X
Sector-Year FEs	X	X	X	X	X	X
BDC-Year FEs		X	X	X	X	X
BDC-Company FEs			X			X
N	62,389	62,389	62,389	62,389	62,389	62,389

Notes: This table correlates the total value of all securities between a BDC and a company in a given year with the characteristics of those securities. Columns (1)-(3) present estimates from *separate* regressions of the outcomes on individual characteristics; the remaining columns present estimates from pooled regressions. Issuance year for a company at a BDC is the earliest issuance year of any security of theirs at the BDC. Constants are not reported. Standard errors are clustered at the company-level. * for p<.10, ** for p<.05, and *** for p<.01.

Table 7: Institutional ownership correlations with complexity

Dependent variable:	Stock Share of Institutional Investors					
Regression type:	Separate	Pooled	Separate	Pooled	Separate	Pooled
	(1)	(2)	(3)	(4)	(5)	(6)
PE-affiliated	0.166***	0.152***			0.143***	0.109***
	(0.032)	(0.022)			(0.023)	(0.026)
Share companies with debt	-0.279	-0.190*	-0.066	0.004	-0.299***	-0.200**
+ PIK or preferred	(0.181)	(0.094)	(0.090)	(0.088)	(0.064)	(0.090)
Share companies with debt	-0.090	0.052	-0.166	-0.167	-0.133***	0.028
+ common or warrant	(0.091)	(0.060)	(0.102)	(0.101)	(0.043)	(0.052)
R^2		0.63		0.85		0.56
Mean Outcome	0.32	0.32	0.32	0.32	0.29	0.29
Year FEs	X	X	X	X		
BDC FEs			X	X		
Sample	2001-2023	2001-2023	2001-2023	2001-2023	2023	2023
N	407	407	407	407	43	43

Notes: This table presents value-weighted regression estimates of the share of stock owned by institutional investors on BDC-year value-weighted portfolio characteristics. Odd columns present estimates from *separate* regressions of institutional ownership on individual BDC characteristics; even columns present estimates from pooled regressions. Columns (1)-(4) include all years in our sample, while columns (5) and (6) only cover 2023. Constants are not reported. Observations are weighted by BDC AUM. In columns (1)-(4) Standard errors are clustered at the BDC-level to account for mechanical autocorrelation in the dependent variables due to persistent ownership. * for p<.10, ** for p<.05, and *** for p<.01.

Table 8: Average factor estimates

	CAPM estimates		Fama-French Three-Factor Model estimates			
	(1) Alpha	(2) Beta	(3) Alpha	(4) Beta	(5) HML	(6) SMB
Mean	0.062	0.968	0.082	0.866	0.314	0.323
StdDev	0.119	0.374	0.098	0.395	0.300	0.328
N	490	490	490	490	490	490
Null hypothesis value	0	1	0	1	0	0
p(mean not equal to null value)	0.000	0.008	0.000	0.000	0.000	0.000

Notes: This table presents value-weighted summary statistics for estimated factors from market model and Fama-French three-factor model regressions. Factors are estimated at a yearly frequency, based on up to five forward years of monthly returns. Alphas are annualized by multiplying by 12. Underlying data in this table is at the BDC-year level, weighted by the BDC's AUM. The p-values are based on testing the mean value of the estimate against 1 for betas and 0 for all other parameters.

Table 9: Fees, performance, and institutional ownership

Dependent variable:	Alpha (FF3F)	Beta (FF3F)	HML	SMB	Institutional ownership share
	(1)	(2)	(3)	(4)	(5)
Panel A: 2023					
Base management fee (%)	-0.309***	0.453**	0.333	0.254	-0.216***
	(0.094)	(0.204)	(0.338)	(0.363)	(0.051)
R^2	0.23	0.12	0.03	0.01	0.34
Mean Outcome	0.19	0.36	0.08	0.56	0.29
N	38	38	38	38	36
Panel B: 2001-2023					
Base management fee (%)	-0.091**	0.114	0.206	0.234**	-0.240
	(0.039)	(0.136)	(0.124)	(0.094)	(0.145)
R^2	0.58	0.74	0.56	0.42	0.44
Mean Outcome	0.08	0.85	0.32	0.31	0.33
Year FEs	X	X	X	X	X
N	381	381	381	381	315

Notes: This table presents value-weighted regression estimates of BDC-year value-weighted portfolio characteristics, factor model estimates, and institutional ownership shares on base management fees. Base management fees are percents (i.e., between 0 and 100). Constants are not reported. Observations are weighted by BDC AUM. In Panel A, we focus on a snapshot in 2023. In Panel B, we include all years, include year fixed effects, and cluster standard errors at the BDC-level to account for mechanical autocorrelation in the dependent variables due to estimation over rolling window, but do not incorporate estimation noise from factor models. * for p<.10, ** for p<.05, and *** for p<.01.

A.1 Data appendix

This data appendix provides additional details on the construction of our data.

A.1.1 Data from the Schedule of Investments

We scrape data on BDCs' portfolios from their consolidated schedules of investments in their annual 10-K filings. These tables are not fully standardized across BDCs, or even within BDCs over time. Nonetheless, most schedules contain the same basic information. Namely, for each portfolio company, a BDC lists each security they hold (e.g., term loan, common equity, etc.), as well as some basic terms of the security (e.g., maturity date and interest rates for debt), as well as a BDC-determined fair value. For interest rates, sometimes BDCs report a current rate (e.g., 8%), while other times they explicitly report a spread over some reference rate; BDCs also sometimes report a PIK rate, or simply the presence of any PIK interest. Additionally, some BDCs report some description of the portfolio companies, most often their industry.

Throughout this paper, we prioritize using variables that are simplest to harmonize across 10-Ks. For example, we bin securities into "security types" (senior secured debt, non-senior secured debt, unsecured debt, common equity, preferred equity, warrants, and other). While some BDCs provide additional detail (e.g., term loan A vs. B), not all BDCs do. We aggregate to the security type-level to avoid mismeasurement due to BDCs reporting at different levels of specificity.

Similarly, we create a cleaned interest rate variable (as well as a spread over 3-month LIBOR) based on combining reported cash and PIK rates as well as spreads. Specifically, we do the following, sequentially. Throughout, we clean the reported rates and spreads to adjust for different reporting schemes; i.e., sometimes values are reported as decimals (e.g., 0.10), or percents (e.g., 10%), or basis points (e.g., 1000). We convert all values to percents.

1. If a debt security has a reported interest rate, use this rate. (Ignore if this rate is 0%.) This gives us 64% of our cleaned interest rate variable.

2. Otherwise, if both a cash and a PIK rate are reported, take the sum. (Skip if either the cash or PIK rate are 0 or 100; in these cases, we believe the 0 or 100 may refer to, e.g., 100% of interest being PIK). This gives us 3% of our cleaned interest rate variable.

3. Otherwise, if a cash rate is available, use this rate. (Ignore if this rate is 0 or greater than 50%; we believe these values may be incorrect or refer to the percent of interest that is cash). This gives us 12% of our cleaned interest

rate variable.

4. Otherwise, if a PIK rate is available, use this rate. (Ignore if this rate is 0 or greater than 50%). This gives us 3% of our cleaned interest rate variable.

5. If the cleaned interest rate at this point is low (below 2%) or high (above 30%) and there is a spread reported, or if we do not yet have a cleaned interest rate, we turn to spread information. We first apply 1, 3, 6, and 12 month LIBOR rates when each of those reference rates are given (if no month is specified, we use the 3 month rate, as that is most commonly reported). Note that we use the LIBOR rate as of the current year and the month matching the original issuance month of the security. Collectively, this gives us 16% of our cleaned interest rates. Then, we use current year SOFR rates for 2018 forward, if SOFR is the reported reference rate. This gives us 2% of our cleaned interest rates.

Note that we only have interest rates for 70% of debt securities. For all debt securities, we back out a cash rate equal to their interest rate net of the PIK rate.

We classify industries into 2-digit NAICS sectors. To do this, we fuzzy match reported industries (and company/business descriptions) with 6-digit NAICS industry titles, and then aggregate to 2-digit sectors. We perform this match using Python package fuzzywuzzy. After this match, we separately run an LLM analysis on the raw industry data to identify industries; we then analyze the mismatch between the fuzzy and LLM matches to inform us of in what types of cases the fuzzy match may incorrectly identify a sector. Given this insight, we take the fuzzy match output and manually recode some unmatched/mismatched industries based on keyword search. In particular, we recode firms as described in Table A.1 based on keywords.

Table A.1: Manual sector coding after fuzzy match

Order	Recode sector to:	If description includes any of the following keywords
1	51 Information	'software,' 'application,' 'saas,' 'platform,' 'app developer,' 'software developer,' 'software solution,' 'software maker,' 'software manufacturer,' 'computer program,' 'mobile app,' 'software publisher,' 'software vendor'
2	44-45 Retail Trade*	'retail,' 'store,' 'shop,' 'retailer,' 'outlet,' 'merchant,' 'marketer and distributor,' 'designer and distributor,' 'distributor of consumer,' 'specialty store,' 'retail chain'
3	31-33 Manufacturing	'manufacturer,' 'maker,' 'producer,' 'fabricator,' 'factory,' 'manufacturing,' 'produces,' 'production of,' 'fabrication'
4	62 Health Care and Social Assistance**	'healthcare,' 'health care,' 'medical service,' 'clinical,' 'hospital,' 'clinic,' 'dialysis,' 'laboratory services,' 'diagnostic services,' 'patient care,' 'nursing,' 'physician,' 'dental,' 'veterinary,' 'ambulance,' 'home health,' 'healthcare provider,' 'medical center'
5	31-33 Manufacturing	'medical device,' 'medical equipment,' 'medical product,' 'orthopedic,' 'surgical equipment,' 'diagnostic equipment,' 'healthcare product,' 'pharmaceutical,' 'medical supplies,' 'medical instrument,' 'medical technology' AND 'manufacturer,' 'maker,' 'producer,' 'fabricator,' 'production'
6	51 Information	'information technology,' 'it service,' 'technology service,' 'tech service,' 'data processing,' 'cloud service,' 'hosting service,' 'telecommunications,' 'internet service,' 'network service,' 'systems integration,' 'it consulting,' 'technology consulting,' 'data center'
7	54 Professional, Scientific, and Technical Services	'consulting,' 'consultant,' 'advisory,' 'professional service,' 'engineering service,' 'architectural service,' 'legal service,' 'accounting service,' 'management consulting,' 'technical consulting,' 'business consulting,' 'strategy consulting,' 'financial advisory'
8	72 Accommodation and Food Services	'restaurant,' 'hotel,' 'motel,' 'accommodation,' 'lodging,' 'food service,' 'catering,' 'hospitality,' 'inn,' 'resort,' 'cafe,' 'bar,' 'tavern,' 'fast food,' 'food services'
9	52 Finance and Insurance	'insurance,' 'reinsurance,' 'underwriting,' 'financial service,' 'banking,' 'investment,' 'asset management,' 'private equity,' 'venture capital,' 'lending,' 'loan,' 'mortgage,' 'credit,' 'financial advisory,' 'wealth management,' 'insurance company'
10	21 Mining	'coal,' 'mining,' 'oil extraction,' 'gas extraction,' 'quarrying,' 'drilling,' 'petroleum,' 'natural gas extraction,' 'mineral extraction,' 'mine operator'
11	48-49 Transportation and Warehousing	'transportation,' 'logistics,' 'shipping,' 'freight,' 'trucking,' 'airline,' 'aviation,' 'railroad,' 'courier,' 'delivery service,' 'warehousing and distribution,' 'transport service'
12	22 Utilities	'electric utility,' 'power generation,' 'water utility,' 'gas utility,' 'electricity,' 'power plant,' 'utility company,' 'energy generation,' 'power distribution,' 'electrical power'
13	53 Real Estate and Rental and Leasing	'real estate,' 'property management,' 'leasing,' 'rental,' 'landlord,' 'reit,' 'property development,' 'real estate investment'

Notes: This table documents the recoding we conduct for classifying company sectors; we code a company as belonging to a given sector if its industry description includes any of the words listed. We conduct this recoding in the order listed in the first column.

* Skip recoding if description includes any of the following: 'manufacturer and distributor,' 'producer and distributor,' 'wholesale distributor,' 'wholesaler.'

** Skip recoding if description includes any of the following: 'manufacturer,' 'device,' 'equipment manufacturer,' 'product manufacturer,' 'medical device,' 'medical equipment.'

Finally, we harmonize the sector variable within a company across all observations by taking the most common sector; this allows us to fill in the sector for some observations, as some BDCs do not consistently report industries over time, and some companies borrow from multiple BDCs. After all of this, we record a sector for 70% of observations.

A.1.2 Other data from 10-Ks

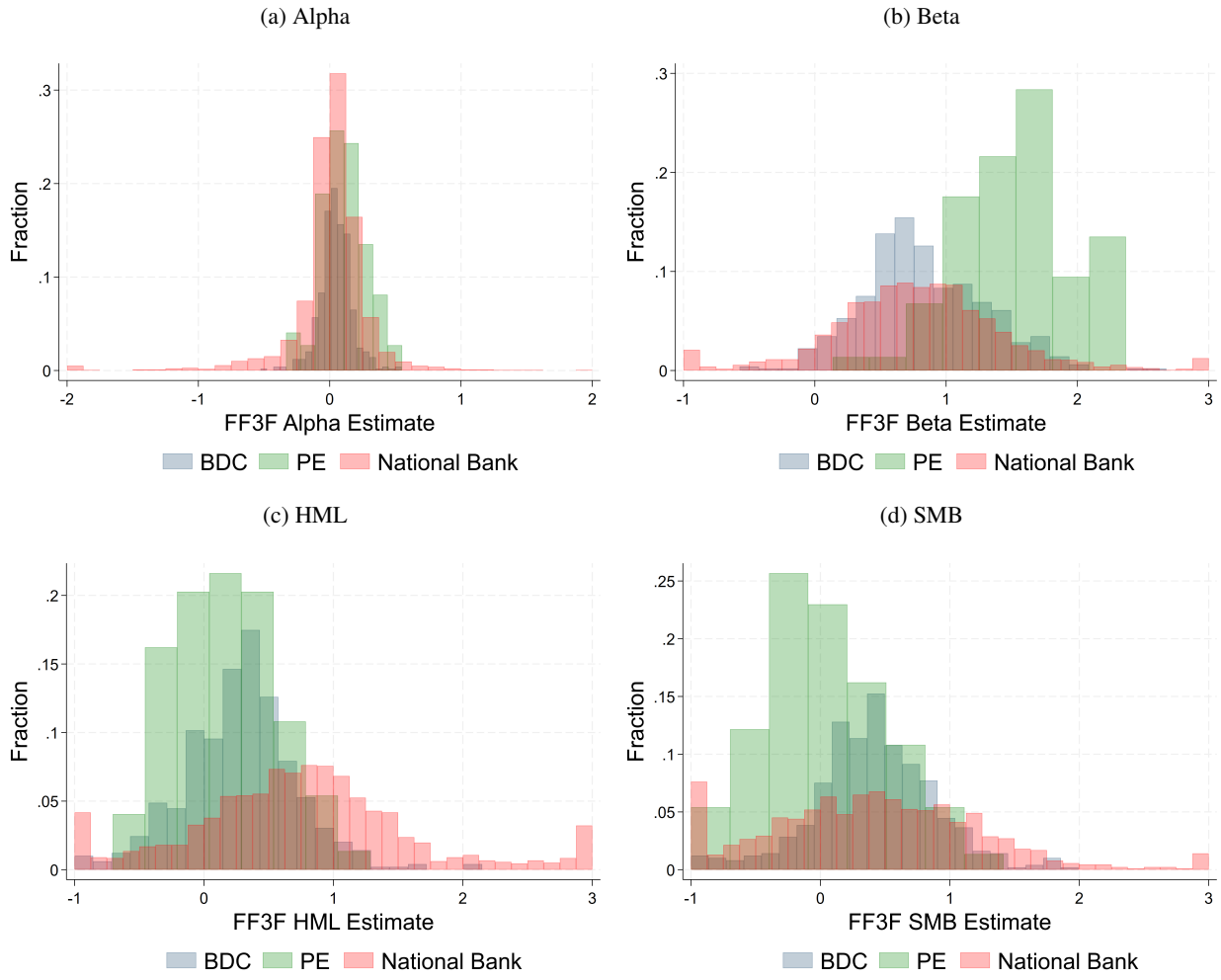
We collect management fees and incentive structures as described in the text of BDCs' 10-Ks. This was done through a combination of scraping through the WRDS SEC database, scraping the 10-Ks directly, and manual checking.

We collect data for gains (losses) on BDCs' portfolios from their consolidated statements of operations in their 10-K filings. These gains and losses include both realized and unrealized changes in value, across controlled and non-controlled investments, as well as affiliate and non-affiliate investments. Our measure is net of gains (losses) on foreign currency and other transactions. When a BDC does not separately report gains (losses) for investments, foreign currency, and other transactions, but instead reports only a combined figure for net realized and unrealized gains (losses), we record that aggregate amount as the gains (losses).

A.2 Additional figures and tables

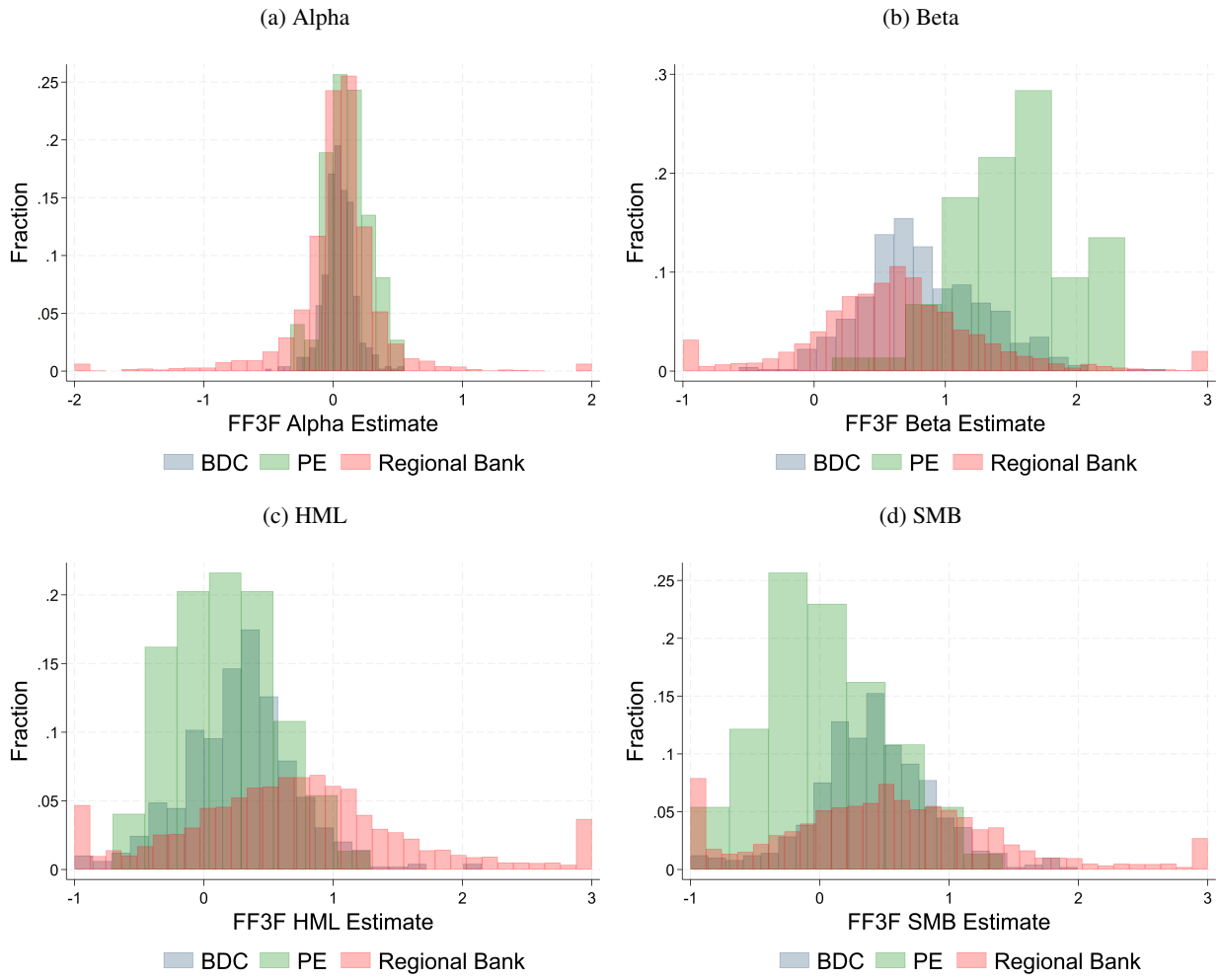
This section contains additional figures and tables.

Figure A.1: Fama-French Three-Factor Model estimates: BDC vs. PE vs. National banks



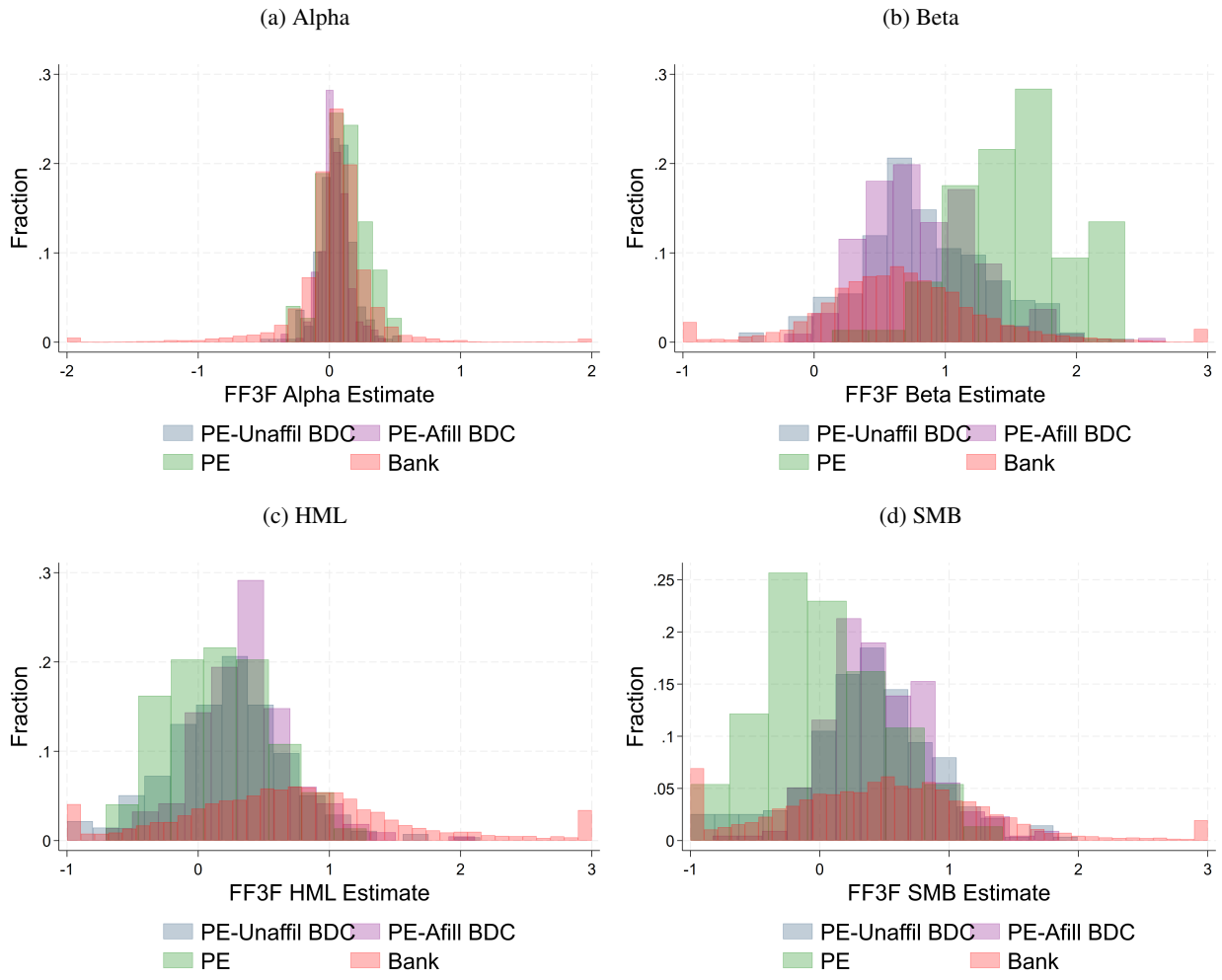
This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, compared to PE and national banks (SIC code 6021).

Figure A.2: Fama-French Three-Factor Model estimates: BDC vs. PE vs. Regional banks



This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, compared to PE and regional banks (SIC code 6022).

Figure A.3: Fama-French Three-Factor Model estimates: BDCs by PE-affiliation vs. PE vs. banks

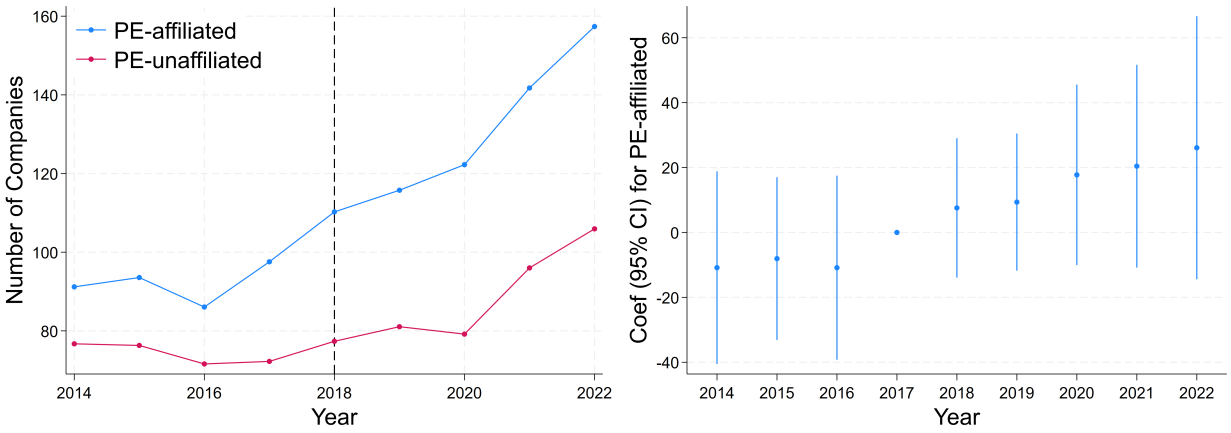


This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, split on PE-affiliation, compared to PE and banks.

Figure A.4: Event study analysis: Number of BDC-company relationships

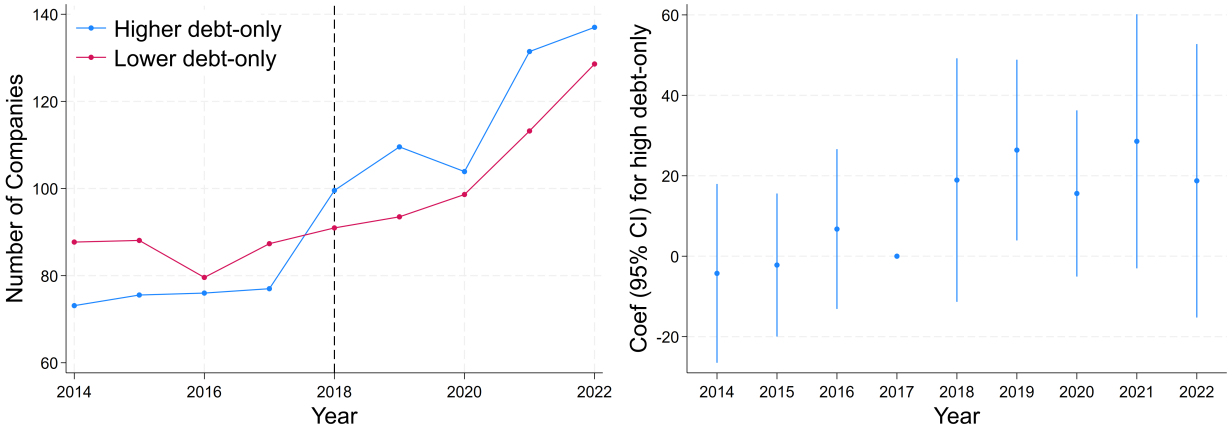
(a) Averages by PE-affiliation

(b) Event study by PE-affiliation



(c) Averages by share of companies with only plain debt

(d) Event study by share of companies with plain debt



This figure presents patterns of the number of companies in which BDC invests before and after a 2018 policy that allowed BDCs to increase their debt-to-equity ratios to 2:1. Panels (a) and (b) compare BDCs by PE affiliation, while panels (c) and (d) compare BDCs by the 2017 fraction of their investments (value-weighted) that involve only "plain" debt (i.e., no PIK or equity), splitting at the 75th percentile (i.e., 64% of companies receiving only debt securities). Panels (a) and (c) show trends (raw averages), while panels (b) and (d) present event study estimates, where the treated BDCs are the PE-affiliated and high only-debt share ones, respectively. The event studies include year and BDC fixed effects and standard errors clustered at the BDC-level. Analyses conducted on subsample of 33 BDCs with balanced leverage data from 2014 through 2022 (N = 297).

Table A.2: Characteristics of securities and BDC-company relationships for PE-affiliated BDCs

Sample:	All	Positive/non-missing value	
Weighting:	Unweighted	Unweighted	Value-weighted
	(1)	(2)	(3)
Panel A: Mean characteristics of securities (i.e., BDC-year-company-security level)			
Fair value (millions)	11.45	13.46	570.08
Interest rate spread on debt	7.64	7.69	7.93
Debt without PIK interest	0.62	0.64	0.73
Senior secured debt	0.45	0.46	0.58
Other secured debt	0.04	0.05	0.03
Unsecured debt	0.13	0.14	0.12
Deferred income	0.12	0.12	0.11
Debt with PIK interest	0.07	0.08	0.09
Preferred equity	0.05	0.04	0.02
Exposure to underlying	0.17	0.15	0.09
Common equity	0.14	0.12	0.07
Warrant	0.03	0.02	0.01
Other	0.10	0.09	0.08
N	64,607	55,270	55,270
Panel B: Mean characteristics of *new* BDC-company relationships (i.e., BDC-company level)			
Fair value (millions)	16.94	17.40	98.61
Number of securities	1.73	1.74	2.02
Number of security types	1.21	1.21	1.30
Share debt	0.80	0.81	0.79
Share equity	0.14	0.13	0.14
Has debt	0.86	0.87	0.88
Has debt + deferred income	0.09	0.09	0.13
Has debt + exposure to underlying	0.12	0.12	0.18
N	11,344	11,127	11,127
Panel C: Mean characteristics of *existing* BDC-company relationships (i.e., BDC-year-company level)			
Fair value (millions)	24.52	25.75	913.28
Number of securities	2.02	2.05	2.42
Number of security types	1.30	1.31	1.38
Share debt	0.70	0.73	0.77
Share equity	0.23	0.20	0.16
Has debt	0.79	0.81	0.87
Has debt + deferred income	0.15	0.15	0.16
Has debt + exposure to underlying	0.16	0.16	0.23
N	22,241	21,376	21,376

Notes: This table presents mean characteristics at different levels of the data for PE-affiliated BDCs. Columns (1) and (2) present unweighted averages, and Column (3) presents value-weighted averages. Columns (2) and (3) subset to securities with positive and non-missing value before taking averages.

Table A.3: Characteristics of securities and BDC-company relationships for PE-unaffiliated BDCs

Sample:	All	Positive/non-missing value	
Weighting:	Unweighted	Unweighted	Value-weighted
	(1)	(2)	(3)
Panel A: Mean characteristics of securities (i.e., BDC-year-company-security level)			
Fair value (millions)	5.49	6.02	75.94
Interest rate spread on debt	7.49	7.58	7.64
Debt without PIK interest	0.69	0.72	0.71
Senior secured debt	0.20	0.19	0.44
Other secured debt	0.06	0.06	0.09
Unsecured debt	0.44	0.47	0.19
Deferred income	0.11	0.10	0.15
Debt with PIK interest	0.03	0.03	0.12
Preferred equity	0.07	0.07	0.03
Exposure to underlying	0.20	0.17	0.11
Common equity	0.10	0.09	0.10
Warrant	0.10	0.08	0.01
Other	0.01	0.01	0.03
N	59,583	54,083	54,083
Panel B: Mean characteristics of *new* BDC-company relationships (i.e., BDC-company level)			
Fair value (millions)	7.11	7.23	56.82
Number of securities	1.45	1.45	1.98
Number of security types	1.20	1.20	1.39
Share debt	0.83	0.85	0.81
Share equity	0.16	0.15	0.17
Has debt	0.90	0.91	0.94
Has debt + deferred income	0.06	0.07	0.17
Has debt + exposure to underlying	0.13	0.13	0.24
N	12,349	12,137	12,137
Panel C: Mean characteristics of *existing* BDC-company relationships (i.e., BDC-year-company level)			
Fair value (millions)	9.12	9.47	139.85
Number of securities	1.60	1.61	2.32
Number of security types	1.25	1.25	1.54
Share debt	0.74	0.77	0.75
Share equity	0.25	0.22	0.22
Has debt	0.82	0.84	0.89
Has debt + deferred income	0.09	0.09	0.26
Has debt + exposure to underlying	0.14	0.14	0.29
N	26,063	25,089	25,089

Notes: This table presents mean characteristics at different levels of the data for PE-unaffiliated BDCs. Columns (1) and (2) present unweighted averages, and Column (3) presents value-weighted averages. Columns (2) and (3) subset to securities with positive and non-missing value before taking averages.

Table A.4: Interest rate spreads at origination and BDCs' equity investments

Dependent variable:	Overall spread		Cash spread	
	(1)	(2)	(3)	(4)
Share of securities at BDC that are equity	6.193***	6.391***	5.330***	4.856***
	(0.111)	(0.183)	(0.119)	(0.204)
Constant	6.024***	5.983***	5.828***	5.927***
	(0.028)	(0.041)	(0.031)	(0.045)
R^2	0.30	0.50	0.25	0.43
Mean Outcome	7.32	7.32	6.94	6.94
Year FEs	X		X	
Issuance Year-Year FEs		X		X
Maturity Year-Year FEs		X		X
Sector-Year FEs		X		X
BDC FEs		X		X
N	25,126	25,126	25,126	25,126

Notes: This table correlates interest rate spreads with the share of all securities the BDC holds in a given year that are equity, for debt securities at origination. In columns (1)-(4) the dependent variable is the overall spread, while in columns (5)-(8) the dependent variable is the cash portion of the spread. Spreads are calculated by subtracting the 3-month LIBOR rate from the interest rate. We say a debt security ever has PIK interest if we ever see the company accumulating PIK interest with the BDC. * for p<.10, ** for p<.05, and *** for p<.01.

Table A.5: BDC-level costs of complexity

Dependent variable:	Has a Loss			Log(Loss)		
	Separate	Pooled		Separate	Pooled	
	(1)	(2)	(3)	(4)	(5)	(6)
Mean company spread over LIBOR	-0.016	0.035	0.035	-0.231**	-0.335***	-0.090*
	(0.043)	(0.034)	(0.037)	(0.108)	(0.056)	(0.049)
Share companies with secured debt	0.507**	0.570**	-0.702***	1.815**	0.567	0.181
	(0.253)	(0.245)	(0.214)	(0.895)	(0.765)	(0.697)
Share companies with debt + equity	-0.371			-0.729		
	(0.238)			(0.840)		
Share companies with debt + common equity	-0.438	-0.694***	-0.413	0.376	2.601**	0.552
	(0.286)	(0.195)	(0.289)	(1.024)	(1.221)	(0.800)
Share companies with debt + preferred equity	-1.030*	-0.459	-1.410**	-3.201*	-1.776	3.119
	(0.549)	(0.675)	(0.533)	(1.779)	(1.183)	(2.505)
Share companies with debt + warrants	-0.178	0.018	-0.156	-3.683***	-3.158***	-0.570
	(0.309)	(0.173)	(0.954)	(0.898)	(0.703)	(1.383)
Share companies with debt + common + preferred	-2.088**	0.059	1.746	-3.680	-6.939	-0.469
	(1.038)	(1.276)	(1.087)	(3.968)	(4.564)	(3.907)
Share companies with PIK interest	0.265	0.342*	0.136	2.635***	2.743***	1.021
	(0.570)	(0.198)	(0.184)	(1.000)	(0.839)	(0.661)
R^2		0.55	0.66		0.68	0.86
Mean Outcome	0.62	0.62	0.62	18.86	18.86	18.86
Year FEs	X	X	X	X	X	X
BDC FEs			X			X
N	577	577	577	317	317	317

Notes: This table correlates whether a BDC reports a loss and the nominal value of that loss in a given year with its portfolio characteristics. Columns (1) and (4) present estimates from *separate* regressions of the outcomes on individual portfolio characteristics; the remaining columns present estimates from pooled regressions. Columns (4)-(6) restrict to BDC-years with reported losses. Constants are not reported. Standard errors are clustered at the BDC-level. * for p<.10, ** for p<.05, and *** for p<.01.

Table A.6: Complexity and fees

	Dependent variable: Base management fee					
	(1)	(2)	(3)	(4)	(5)	(6)
Share companies with debt	0.676*		1.000**	0.647***		0.748**
+ PIK or preferred	(0.394)		(0.468)	(0.209)		(0.346)
Share companies with debt		0.158	-0.306		0.281**	-0.078
+ common or warrant		(0.238)	(0.224)		(0.135)	(0.210)
R^2	0.30	0.15	0.34	0.21	0.11	0.22
Mean Outcome	1.54	1.54	1.54	1.50	1.50	1.50
Year FEs	X	X	X	X	X	X
Sample	2001-2023	2001-2023	2001-2023	2023	2023	2023
N	380	380	380	37	37	37

Notes: This table presents value-weighted regression estimates of base management fees on BDC-year value-weighted portfolio characteristics. Base management fees are percents (i.e., between 0 and 100). Constants are not reported. Observations are weighted by BDC AUM. In odd columns, standard errors are clustered at the BDC-level to account for mechanical autocorrelation in the dependent variables due to estimation over rolling window, but do not incorporate estimation noise from factor models. * for p<.10, ** for p<.05, and *** for p<.01.