Why is Private Lending So Popular?

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Abstract

Non-bank lending to small- and medium-sized firms — i.e., private credit — has exploded over the past two decades. To explore the rise in its popularity, we focus on Business Development Companies (BDCs), which comprise a large fraction of the total private debt market and for which we can observe detailed information on portfolio investments. Although many have noted that BDC investments substitute for bank financing in the wake of post-crisis credit tightening, BDCs operate in meaningfully different ways from traditional lenders. BDCs do not merely make alternative bank loans: they offer a complex combination of securities to companies, spanning the debt/equity spectrum. This allows private lenders to tailor contracts to the risk profiles of individual firms. The growth of the asset class is tied directly to this contractual complexity, which is associated with higher interest rates and values at the loan level, yet lower market risk than traditional private equity. By blending lending with traditional private equity investments, the supply of capital is tailored to a growing retail investor segment.

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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 it 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 argument. For example, Davydiuk, Marchuk, and Rosen (2024) show that Business Development Company (BDC) private credit investment activity increased more in areas that were hit harder by negative credit shocks.[1] 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 EBITDA (often negative) 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 (Acharya, Cetorelli, and Tuckman (2024)).[2]

In this paper we argue that this narrative is incomplete because it overlooks two important supply-side considerations. The first is that private lenders do not invest like banks. Rather than making risky bank loans, they operate from a much larger contracting space. In short, private lending is as much "alt-" private equity as it is "alt-" banking. This leads directly to the second consideration, which relates to capital formation in the private lending market. In particular, because private lending blends traditional PE-like investment with shorter-duration, loan-like investments, it addresses some of the liquidity problems that have historically preventing non-institutional investors from allocating to private equity (Carroll (2024)). This makes private lending especially attractive to individual investors, who account for about 50% of global AUM, but only 16% of AUM in alternative assets (Skolnik (2023)). As such, individual investors are widely understood among industry observers to constitute an important new source of capital for private markets.

[1] We provided greater detail on BDCs, which also constitute our analysis sample, below.

[2] See, for example, Roulet (2024) or Cortes et al. (2024)). While default rates have been low in recent years, loss given default is considerably higher in private credit than in other types of lending (Cai and Haque (2024)).

Patterns in fundraising around the world help underscore the importance of these supply-side considerations. 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 totalled over $1.3 trillion in Western Europe from 2015-2024, comparable to the $1.8 trillion raised in North America (Private Debt Investor, 2024). At the same time, looking across banks, BDCs, and PE in the US, non-institutional ownership in banks has dropped considerably, while non-institutional ownership in BDCs has grown since the GFC. The aggregate growth in AUM of private equity and private lending are almost perfectly correlated. In short, the growing popularity of private lending is as much about the overall growth of the private equity market in general as it is about the retreat of banks from certain types of lending activity.

In the first part of the paper, we provide a framework for measuring the degree of non-bank investment activity, and we quantify the degree to which private credit departs from traditional bank lending. Our framework stresses two important distinctions between traditional bank lending and private lending: (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. To quantify the degree to which private lending relies on these non-bank features, we turn to publicly traded BDCs, which as we discuss in detail below, are closed-end funds that invest in small- and medium-sized companies. They represent about one-third of all BDC capital and around 10% of overall AUM in the private lending market.

Because publicly traded BDCs are required to file 10-K reports, we can observe their investment holdings through their Schedule of Investments. While most prior research has focused on the loan portfolios of BDCs, our data allow us to measure and evaluate BDC's non-loan investment activity in tandem with its lending. In contrast to a standard loan contract, BDCs invest with a basket of securities that allows them to generate investment returns through current yield, capital appreciation (i.e., negative amortization), and equity exposure.[3] Each of these is significant in its own right. Roughly 10% of investments involve PIK interest. Around one-quarter of the securities held in a BDC schedule of investments are equity securities. These run the gamut from preferred equity (which frequently involve accrued dividends, akin to PIK interest), to common equity, to warrants. Indeed, like private equity sponsors, they sometimes hold preferred equity and common equity in the same portfolio company.[4] In our data, only 3% of BDC-years do not

[3]As we show below when we describe the investment holdings data in greater detail, one can think of a private equity investment as a combination of a coupon bond, a zero-coupon bond, and a claim on common equity.

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

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, BDC's hold about half of their portfolio in "non-bank-like" investments.[5]

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 their investment. The data suggest that this is not the case. To test for this, we examine BDC-portfolio company relationships in the year of inception and compare these to later years. At inception, around 14% of deals contain equity. This grows to around 16% after inception, suggesting that while there is certainly evidence of work-outs occurring, they account for at most a small fraction of the total equity usage. The strategic complexity we observe largely appears at contract initiation, not 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 and non-traditional PE-like investment activity. Of course, the proportions of these two activities vary from BDC to BDC and over time. Block et al. (2024) and Jang (2024) have shown that much of this bank-like activity goes to provide debt financing for private equity-sponsored transactions. Our data allow us to distinguish between BDCs that are affiliated with larger private equity organizations from those that are stand-alone organizations. PE-affiliated BDCs look more like traditional lenders, presumably because they disproportionately service PE-sponsored transactions, while PE-unaffiliated skew more towards PE-like activity. We exploit this distinction, along with other measures of investment activity, in the remainder of our analysis below.[6]

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. In the second part of the paper, we explore the implications of complexity for the risk and return of BDCs. To do this, we first look at interest rate spreads, security values, and losses as a function of complexity. Consistent with the hypothesis that more complex securities are used to finance riskier portfolio companies, we find that 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 BDCs using complexity to invest in riskier clients (to whom they charge higher rates): by pairing their debt investments with equity investments, BDCs capture more of

[5]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)). Davydiuk et al. (2024) studies the coincidence of debt and equity investment from BDCs, but their focus is on the governance implications for companies that receive financing.

[6]Many 10-K filings report that PE-affiliated BDCs source deal flow through their connections to their parent PE companies.

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.

This raises natural questions about the risk and return of this type of investing compared to alternatives. To explore these questions, we estimate factor loadings from Fama-French asset-pricing regressions for BDCs, banks, and publicly traded private equity firms, and we compare them.[7] This exercise is motivated by the hypothesis that if a BDC is engaging in investment activity that resembles a bank, albeit with potentially higher risk, then its factor loadings should resemble those of banks because its business activity should generate cash flows with similar correlations to underlying risk factors. The key finding from this part of our analysis is that the returns to publicly traded BDCs look much more like those of private equity firms than banks. The betas are indeed higher for BDCs than banks, and sit between banks and PE firms. But more pertinently, the factor loadings on size and book-to-market are much more dispersed for banks than either for BDCs or PE firms. BDCs and PE firms load similarly on size and book-to-market in a manner that highlights their focus on small, value firms. The distribution of factor loadings suggest that BDCs essentially offer risk exposures that resemble a weighted average of banks and PE firms.

How does the use of complexity affect the performance of the BDCs themselves? One natural hypothesis is that BDCs that use more complex securities are riskier, because they serve riskier portfolio companies. Of course, the link between loan-level risk characteristics and BDC-level risk is a function of the monitoring, screening, and portfolio formation of the BDC. Simple portfolio diversification across borrowers could decouple the risk of an average loan from the risks of the BDC as a whole. Indeed, when we relate complexity to factor loadings, we see limited evidence that BDCs with more complex investment portfolios on average are associated with higher betas. Complexity is, however, correlated with size and book-to-market in a manner consistent with certain investment strategies being tailored disproportionately to small, value-tilted firms.

Given that BDCs have both investment activity and cash flows to investors that appear to resemble a mix of traditional lending and private equity investment, we posit that capital supply to the BDCs themselves might arise from investors who desire exposure to upside but who have less ability to bear the liquidity risk associated with traditional private equity investment. Namely, we hypothesize that individual investors — as opposed to large institutional ones — are important sources of capital for BDCs. We explore this using 13F filings, through which we measure the share of each BDC's stock that is owned by institutional investors. We find two striking patterns. First, while banks have witnessed a sharp increase in institutional holdings since the GFC, BDCs on average have experienced a decrease in

[7] Benchmarking against a publicly traded private equity index is inappropriate for this purpose because many such indices include BDCs in the index construction. For our comparison, we focus on Apollo, Ares, Blackstone, Brookfield, Carlyle, EQT, KKR, and TPG.

institutional holdings over this same time period to around 25% on average in 2023. Meanwhile, publicly traded private equity firms have maintained high institutional ownership around 50%. These patterns indicate that non-institutional investors are playing an increasingly large role in capital formation in private credit. Second, we show that it is precisely the BDCs that are conducting more non-bank-like investments who are attracting these non-institutional investors.

In the final part of our paper, we consider what our findings imply for how regulators approach non-bank financial intermediation. Because the current emphasis stresses the role of private credit as an alternative to traditional bank lending, a natural regulatory focus is on how private lending creates systemic vulnerabilities for the global financial system. 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 suggest that this regulatory focus is short-sighted because it largely ignores the fact that many private credit firms are substantially different from banks and so may not respond to bank-like regulation. Furthermore, this focus ignores the fact that private credit is increasingly funded by individual investors, suggesting that vulnerabilities of the market may actually play out through household balance sheet and retirement savings channels. To explore these issues, we study a bank-like regulatory shock in 2018 that loosened leverage limits for BDCs, allowing them to go from 50/50 debt/equity to a debt/equity ratio of 2:1. In an event study framework, we find that it is precisely the more bank-like BDCs that respond this type of regulation, while those that conduct more PE-like investments themselves are less responsive. Because these more PE-like BDCs are those whose capital supply stems more from individual investors, this also suggests that bank-like regulation may have disproportionately less impact on the BDCs whose shareholders are more vulnerable.

This paper adds to a rapidly growing literature that examines non-bank lending. The closest papers are Chernenko, Ialenti, and Scharfstein (2025), Davydiuk et al. (2024), and Flanagan, Erel, and Weisbach (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, 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. Finally, Flanagan, Erel, and Weisbach (2025) examines 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.

This paper also connects to a broader literature that examines cashflow-based lending and other types of non-bank financial intermediation. Lian and Ma (2021) shows that around 80% of borrowing by non-financial firms in the US takes the form of cashflow-based loans, and Benmelech, Kumar, and Rajan (2024) shows that secured lending from banks declined throughout the 20th century. Jang (2024) shows 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 cashflow-based lending.

The balance of the paper is as follows. We begin by offering an analytical framework to guide our empirical work. This is presented in Section 1, which also provides broader institutional details about the private lending market. Section 2 describes the data and provides some background on Business Development Companies. This section also presents basic stylized facts about the complexity of BDC investment activity. Section 3 relates complexity to interest rate spreads and BDC-level performance measures. Section 4 explores the risk characteristics of BDCs versus banks and publicly traded PE, while Section 5 explores the rise of non-institutional investors as capital suppliers to BDCs. Section 6 explores the expansion of debt capacity after the 2018 legislative change. Section 7 concludes.

1 Analytical framework

This section develops a framework for situating private lending between private equity and traditional bank loans. We offer a template that expresses a private lending investment in terms of its current yield, the appreciation or amortization of principal, and the exchange of principal for equity in the firm.

1.1 Beyond traditional bank loans as benchmarks

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. Figure 1(a) provides a payoff diagram for the liquidation value of this baseline security for a zero-amortization loan. The key element of this figure is that upon liquidation, the loan has priority over the equity up to the face value of the debt, but has a fixed payoff above that value.

Insert Figure 1 here

In some settings, compensation for the risk of the project requires an interest rate that exceeds the firm's immediate capacity to repay. Consider a project that requires an asset costing \$A to finance at an interest rate r and generates expected cash flows of $f_0(1+g)^t$ for $t \in [0,T]$. The NPV of the project is given by $\sum_0^T (f_0(1+g)^t - rA)$. Even if the overall project is positive NPV, projects with high growth rates can have sustained periods in which $rA > f_0(1+g)^t$. Similarly, projects with high volatility may face a high probability that $rA > f_0(1+g)^j$ in some period j, even if the expected cash flow in any given period exceeds the required return rA. 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. Figure 1(b) depicts the payoff diagram to a security that offers deferred interest that accumulates unpaid, adding to the outstanding face value of the security. 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 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. For example, consider the case above and that the investment amount \$A and required return r generate cash flow obligations that exceeds the available current free operating cash (i.e, $rA > f_0(1+g)^t$). One investment strategy is to lend the entire amount \$A and offer a lower cash interest payment r_c such that $f_0(1+g)^t > r_cA$ with the remaining $(r-r_c)A$ accumulating as unpaid interest, increasing the outstanding principal balance each period. An equivalent strategy is to lend a smaller amount $K < A$ at a rate of r and invest the remaining $A-K$ in the form of a preferred equity security that earns an accrued dividend payable at liquidation, where the dividend rate equates the cash flows of the two securities.

The second contractual innovation is to receive equity in connection with debt investments, either in the form of common equity or warrants. In contrast to deferred interest payments, common equity and warrants provide direct exposure to the underlying value of the firm. Figure 1(c) illustrates the payoff diagram for a portfolio of securities that blend a standard loan, PIK interest, and exposure to the underlying.

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. Or to put it differently, while a bank assesses the risk of the loan, the private lender assesses three parameters: the risk of the loan, how much of the return is deferred, and whether the return of investment principal is indexed against the initial investment amount or against the value of the underlying assets of the firm in question. 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.

1.2 Illustrations

The contractual levers laid out above can be seen broadly across a wide range of private market settings. From a contingent claims standpoint, nearly all private equity securities, from those used in venture capital, to growth equity, to mezzanine lending, to leveraged buyout activity, belong to this same family of securities. This differences between the settings merely guide how the tradeoffs between the contractual levers are determined.

Venture Capital: Most venture capital investments are structured as convertible preferred equity (Kaplan and Strömberg (2003)).[8] The VC investor supplies an amount of funding and in exchange receives a security with the following key properties: accrued dividend, liquidation preference, and conversion rights to common equity. Accrued dividends are a form of negative amortization, like PIK interest. Relatedly, the liquidation preference, generally stated as "times money," indicates that upon a qualified liquidation event, this security is paid a preferred return of X times the original investment amount, plus accrued dividends, before other investors junior in seniority to this security receive any payment. For example, a security with a 2X liquidation preference and a d% accrued dividend would be entitled to receive $\$2I(1+d)^t$ before any junior claimants received a portion of the liquidation if the security holder were paid out as a preferred shareholder.

The venture investor generally also has the right to convert their preferred equity to common equity, allowing them to receive a pro-rata share of the total payout associated with the liquidation event. Figure 1(d) illustrates how convertibility affects the liquidation payoff of this security. This right is important because many preferred equity

[8] Angel investments and other early-stage investments in the US are typically structured using securities that convert to the security used in the next round of financing, so the insights here apply to those investments as well.

securities have a cap on the total distribution that the security holder receives. Thus, VC investors have an option on the exchange of principal; they can receive repayment indexed against the principal value through a liquidation preference, or they can receive repayment indexed against the value of the underlying asset through the exchange of principal. The back-loading of return is attractive in investment settings where current cash needs are high due to heavy investment needs, while an option on the exchange of principal reflects the heavy right-skewness of VC investments.

Growth Equity: Growth equity is typically extended to mature companies that wish to expand. Because they may not be as cash-constrained traditional early-stage firms, there is greater scope for current yield to figure into their security design. Nevertheless they have similar features regarding capital appreciation and the exchange of return on principal for equity participation.

PIK interest and Debt-financing in PE deals: In standard leveraged buyout transactions, the private equity sponsor typically arranges a debt package that blends amortizing loans with non-amortizing loans that feature a balloon payment at the end of the loan (so-called term loan A and term loan B). By varying the amount of total financing that goes into the amortizing versus the non-amortizing loan, the private equity security package has a great deal of flexibility over the degree of amortization associated with the investment.

Mezzanine loans: Highly levered transactions may include mezzanine loans or seller loans, which often contain PIK interest. The general idea is that the mezzanine security commands a higher return because it is higher risk. At the same time, because it is accompanying other debt investments that each have their own interest, the firm may have limited cash capacity, which gives rise to the use of PIK interest.

2 Data from BDC Schedules of Investments

In this section we turn from a broader discussion of the private lending market to the narrower set of firms for which we have data: publicly traded Business Development Companies (BDCs). In this section, we provide detailed information on all publicly traded BDCs' investments based on their 10-K filings. We begin with a discussion of the institutional background of the market. Then we turn to a description of the BDCs investments.

2.1 Institutional background

Originally created by Congress in 1980 through the Small Business Investment Incentive Act (SBIIA), Business Development Companies 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 (SEC, 2006).

Insert Figure 2 here

BDCs comprise a substantial fraction of the overall private credit market. Figure 2, taken from Roulet (2024), illustrates the growth of the industry as a whole. Today, around $1.5 trillion in AUM sit inside private credit vehicles, 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 standard practice in private equity. 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, BDCs effectively call all their equity capital through their initial public offering. They then typically invest the proceeds in liquid securities while they identify investment opportunities in line with the BDC's operating mandate.

Insert Figure 3 here

Figure 3 shows the growth of both public and private BDCs over time. 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. Perpetual-life BDCs first appeared in 2020.[9]

[9] A single perpetual-life BDC, the Blackstone Private Credit Fund, accounts for more than 1/3rd of the AUM of this new type of BDC. See

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*.[10] Moreover, they face no entity-level taxation provided that they pay out at least 90% of their taxable income to investors each year (Securities and Commission (2024); Horowitz and Gaines (2019)).

They 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 6, in 2018 the Small Business Credit Availability 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.

2.2 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 6, 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. Most BDCs trade at a discount most of the time, i.e., have ratios below 1, presumably reflecting in part the illiquid nature of their portfolios. (As we show below, significant portions of their investment portfolio are held in common stock, preferred stock, and warrants of portfolios, which presumably have limited liquidity.)

In order to better delineate quasi-banking from quasi-private equity, we also identify whether BDCs are affiliated

Berlin (2024) for more details.

[10] 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).

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.[11]

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.

2.3 Classifying securities into security types

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.

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.

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

Insert Table 2 here

Panel A of Table 2 summarizes these classifications, as well as average fair values, average interest rate spreads over 3-month LIBOR, and the rate at which PIK interest is present. 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 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 dollars; the median fair value (not reported in the table) is $1.38 million.

71% of all securities are debt securities, and 82% of the value of BDC's investments is in debt. Most of the remaining securities (24% of securities, 12% of value) is equity. Amongst debt securities, 51% of securities (and 73% of value) are senior secured; amongst equity securities, 49% of securities (and 68% of value) are common equity.

2.4 Measuring complexity

From the analytical framework laid out above, we can think of private investments as variants of turning three contractual levers: 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 offers potential capture of upside risk.

Panels B and C of Table 2 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 1.2 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.

PIK interest, conditional on having any debt securities, is common: at initiation 5% of companies with debt have at least some current PIK interest; this grows substantially over time as companies exercise the option embedded in many loan agreements. Again, this is common in higher-value relationships, where it begins at 11% at initiation and grows to over 16%. Equity is also common, with 23% of an average company's contract with a BDC being preferred or common equity or warrants at initiation (29% value-weighted) growing to 24% over time. This equity is frequently paired with debt: 14% of relationships feature both debt and equity of any kind at initiation; this too is more common in higher-value relationships, with the value-weighted rate rising to 23%, growing to 29% over time.

Appendix Tables A.1 and A.2 present similar statistics for PE-affiliated and PE-unaffiliated, respectively. While both PE-affiliated and unaffiliated BDCs invest in both debt and equity securities, PE-unaffiliated have a larger fraction of their value in company relationships that combine debt and equity: 33% of PE-unaffiliated BDCs fall into these relationships, while only 25% of PE-affiliated BDCs' do. Similarly, a larger fraction of PE-unaffiliated BDC's value (17%) lies in relationships with PIK interest compared to PE-affiliated (13%). 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.[12] While comparing Panels B and C clearly suggests that equity stakes are used as an ex post renegotiation tool in BDC-portfolio company relationships, Panel B illustrates that the bulk of the complexity we observe in the data is present

[12]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.

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.

2.5 Portfolio company sector

For over half of the reported investments, BDCs report the primary industry of 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 74% of securities (72% of companies).

Insert Figure 4 here

Figure 4 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.[13]

Two patterns are notable from Figure 4. First, BDCs invest across the sectoral distribution: we see non-neglible 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 real estate 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 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.

[13] 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.

2.6 Issuance and maturity dates

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.

3 The Strategic complexity of BDC investments

The investment-level data suggest that many BDC investments exhibit considerable complexity relative to standard loan agreements (Table 2). Based on the analytical framework sketched in Section 1, 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. We also examine BDC-level data for losses to connect the average spread to the probability of reporting loan losses.

3.1 Loan spreads

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

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

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.[14] 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 debt security ever has any PIK interest. We estimate this regression with several

[14] 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.

controls (summarized by $X_{ijts}\delta$), which include year, issuance year-year, maturity year-year, company sector-year and BDC-year fixed effects.[15] ε_{ijts} reflects noise.

Insert Table 3 here

Table 3 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.[16] 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 that 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.

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 in Section 1. 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 the 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 future yield is above one, not below it. Instead, PIK-loans cost about 175 basis points more, on average, to generate around

[15]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 effects; we include this distinction regardless in order to mirror an analysis discussed below.

[16]Our point estimate for common equity closes 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.

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 availability of the portfolio company to service the loan out of current proceeds.

The premia associated with complexity survive 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 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 more 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 current 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 4 here

We further explore the "cost" of deferring cash payments in Table 4. 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.[17] Similar to in Table 3, 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). In columns (3), (4), (7), and (8), we show that securities that have tripped their PIK toggles and are *also* receiving

[17] At origination, 79% of debt securities in Table 3 that *ever* have PIK interest currently have PIK.

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.

Insert Table 5 here

The analysis thus far shows how much additional spread is associated with various investment provisions, but how important are these for the overall value of a BDC portfolio? We examine this in Table 5 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 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.

3.2 Loan losses

Loan spreads could reflect the expected riskiness of the borrower, or they could instead reflect market power or value-added by the BDC, as explored in Davydiuk et al. (2024). To gauge whether higher spreads are associated with riskier loans, we measure whether the BDC reports losses at the firm-level, as well as the magnitude of those losses, and relate this to holding characteristics through BDC-year level regressions that mimic model (1).[18]

[18] We are not able to observe loan-level default rates or covenant breaches, as in Jang (2024).

Insert Table 6 here

Table 6 presents the findings. Columns (1) and (4) report a series of seven regressions in which the dependent variable is either an indicator for reporting a loss in a given year (column (1)) or log of the loss in nominal dollars (column (4)), and the independent variable is each row in isolation; the remaining columns pool these independent variables into single regressions.[19] All columns include year fixed effects, while columns (3) and (6) add BDC fixed effects in order to relate how changes in BDCs' portfolios over time predict their losses.

We find three results. First, 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 (typically) private companies. 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. Second, having larger fractions of companies receiving PIK interest is associated with higher (though not always statistically significant) rates of losses. This is intuitive, as companies paying PIK interest are likely riskier. Third, BDC fixed effects play large roles, reflecting that there are important BDC-level differences in both security design and the propensity to have (and to report) losses, a fact which presumably reflects sorting and matching across borrowers and BDCs.

4 Evidence from asset pricing regressions

Thus far the analysis has linked complexity at the investment level to spreads and losses. Given the large number of BDC-borrower relationships on average, it is natural to ask how these investment-level characteristics affect BDC-level risk and return, and how BDCs consequently compare to banks and PE firms. To explore these questions, we first estimate factor loadings for the publicly traded BDCs in our sample and then compare them to those of banks and publicly traded private equity firms. Then we explore how the complexity measured in the previous section relates to observed factor loadings and abnormal returns.

4.1 Look-ahead factor loadings for 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. 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

[19] In our pooled regressions, we omit as an independent variable the share of companies with both debt and equity, as we separate this variable on the basis on the type of equity.

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 7 here

Table 7 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)).[20] The abnormal return is statistically distinguishable from 0, while the market β is statistically discernible from 1 at conventional levels. For comparison purposes, Damodaran (2025) reports an average β for money-center banks at 0.88 and for regional banks at 0.52, while βs 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.

4.2 Comparing banks, BDCs, and private equity

To formalize the comparison with banks and private equity, we repeat the same look-ahead factor estimation for all such firms found in the intersection of the CRSP-Compustat monthly stock returns data between 2001 and 2023. We flag bank stocks by pulling all firms with a three-digit SIC code of 602.[21] For publicly traded private equity firms, we use the returns of the following 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).[22]

Insert Figure 5 here

[20]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.

[21]See `https://siccode.com/sic-code/602/commercial-banks`.

[22]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.

Figure 5 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.[23] Taken together, these patterns clearly suggest that BDCs are not simply alternative banks, as their cash flows to equity holders tell a different story. Instead, BDCs appear to operate as a hybrid of banks and private equity, which we explore in the remainder of the paper.

4.3 Complexity and performance

Given that BDCs appear to use complexity in order to invest in riskier companies, how does this translate into the performance of the BDCs themselves? On the one hand, if more complexity means more risk, BDCs that use more complex securities may be riskier. On the other hand, if the BDCs that use more complexity are also monitoring, screening, and forming their portfolios differently — like private equity firms, for instance — then the predictions for risk are less clear-cut. In addition, BDCs are presumably not making investments in isolation, but rather, building a portfolio of investments, which in turn creates scope for the organizational structure of the BDC itself to generate diversification. In addition, to the extent that BDCs are behaving like private equity organizations, this complexity may itself by associated with higher returns. To explore these issues, we link the portfolio holdings of the BDCs to the factor loadings studied in Section 4. In Section A.2, we provide complementary evidence based on exploring the closed end fund discount (price-to-NAV) as a function of the observed complexity.

How do factor loadings vary with BDC portfolios? If complexity is used in settings when portfolio companies are too risky for traditional bank loans, we would expect greater complexity to predict larger factor loadings. Pushing against this is the diversification that is achieved at the BDC portfolio level across industries, geographies and investment settings. On the other hand, if complexity is a sign that the BDCs invests like a traditional private equity investor, then in the light of the evidence suggesting that private equity investments outperform public investments (Robinson

[23] We find robust patterns across several variants of thse 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. Figure A.4 splits the sample on pre- and post-2018.

and Sensoy (2016), Harris, Jenkinson, and Kaplan (2014)) we may expect higher risk-adjusted returns.

In the interest of staying parsimonious and maintaining statistical power, we consider two simple notions of complexity based on our analytical framework in Section 1: when debt is paired with either PIK and/or preferred equity (i.e., accrual of payments) and when debt is paired with either common equity and/or warrants (i.e., exposure to the underlying). We focus on the Fama-French Three-Factor estimates and estimate the following model:

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

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.

For each factor (alpha, beta, HML, and SMB), we estimate two versions of model (2). First, we estimate separate models for to two key regressors separately with year and BDC fixed effects (γ_t and γ_j) as the only controls. These separate models characterize the pair-wise correlations between factors and each portfolio characteristic, residualizing against common time trends and average BDC patterns.[24] Second, we estimate a pooled model with all regressors, which gives us conditional correlations. For both versions, we cluster standard errors at the BDC level, to account for the fact that factor estimates are correlated over time within in a BDC due to the rolling window estimation.

Insert Table 8 here

Table 8 presents the results. First, consider risk-adjusted returns captured by the three-factor alpha (columns (1) and (2)). When BDCs' portfolios feature more complex securities, the implications for alphas depends on the nature of the complexity. When BDCs combine debt with deferred payments (via PIK or preferred equity), this tends to predict higher alphas. On the other hand, when BDCs combine debt with exposure to the underlying (via common equity or warrants), this tends to predict lower alphas. This latter patterns indicates that there may be a payoff cost to featuring particularly PE-like investments, though it is worth noting that these alpha estimates are net of management

[24] As Figure A.5 shows, there is substantial variation in factor loading estimates within BDCs over time.

fees, meaning that they need not reflect the pure cash flows from the securities on their own.

Turning to risk captured by the three-factor betas, we see different patterns. While the estimates are largely noisy in the both separate and pooled specifications (columns (3) and (4)), we see some evidence of higher beta estimates when BDCs engage in more complex activity, particularly with deferred payments (PIK or preferred equity). This aligns with our previous findings that complexity is likely deployed for riskier borrowers.

The HML and SMB factor loadings further support this idea in columns (5)-(8). Most notably, we observe higher HML loadings when BDCs charge more often combine debt and common equity or warrants, suggesting that this complexity may be deployed to lend to value firms, as traditional PE firms may do. Meanwhile, we observe generally lower SMB loadings when BDCs engage in combining debt with common equity or warrants, consistent with these tools being used when targeting (relatively) larger firms.

5 Capital formation in the private lending market

The factor loadings for BDCs appear as though the cash flows from BDC investments resemble a mix of traditional lending and private equity investment. We posit that this mix may be attractive to individual investors for whom traditional private equity may be too risky from a liquidity point-of-view and consequently argue that non-institutional investors may play an important role in capital formation in the private lending market. To explore this, we turn to institutional holdings data to see how the composition of ownership of bank stocks, publicly traded PE firms, and BDCs has changed over time.[25] This is motivated in part by the surge in interest in the private equity industry in accessing retail investor market.

Insert Figure 6 here

Panel (a) of Figure 6 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 higher still 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 sample period, average institutional holdings for banks were at or above that of private equity firms, while the average

[25] We measure the proportion of shares held by institutional investors, as reported in 13F filings; we source this data from LSEG.

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.

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.

To complete our argument that the non-institutional investors that supply capital to BDCs may be attracted to BDCs' PE-like activity, we analyze in which BDCs these investors disproportionately invest. To do this, we estimate versions of model (2) in which we predict the ownership share of institutional investors based on the investment activity of the BDC. As for Table 8, we estimate separate and pooled regressions in order to consider the measures of complexity separately and jointly. Unlike in the case of the factor regressions, 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 9 here

Table 9 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 6 that publicly traded PE firms tend to have high institutional ownership rates.[26] 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

[26]Note that most of the PE affiliates are not part of the small group of publicly traded PE firms covered in Figure 6. Instead, their affiliates are large asset management funds that have PE arms.

tend to have more non-institutional investors.

In short, individual investors are an important source of capital in this market and seem to have flown disproportionately to the BDCs engaging less bank-like activity. This matters for two reasons. First, these patterns highlight the way in which private credit may be successful at attracting retail investors in a way that traditional private equity cannot be. Second, they highlight the stakeholders in this market in a way that we argue should inform policy; regulators may want to consider the vulnerabilities of private credit not just arising through any spillovers to the larger financial system but also to households who directly supply capital.

6 The role of regulation: Event study evidence

In our final piece of analysis, we exploit a regulatory shock in order to further explore which BDCs respond to bank-like regulation. Namely, we consider a 2018 regulatory change that allowed BDCs to increase their leverage. Prior to this regulation, BDCs were only allowed to raise capital with a 1:1 debt-to-equity ratio; afterwards, this ratio rose to 2:1.

We hypothesize that this policy change should matter more — i.e., affect capital structuring behavior — for more bank-like BDCs for whom leverage limits were binding. These bank-like BDCs, who we argue are often supporting PE-sponsored transactions, likely had 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 several 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 the complex securities discussed in Section 1 (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 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 7 here

Figure 7 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 in 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. In other words, the bank-like regulation disproportionately impacted the bank-like BDCs. Because these BDCs are also disproportionately owned by institutional investors (Table 9), this regulation additionally had heterogeneous impacts across investor types.

7 Conclusion

The dramatic growth of private lending as an alternative to traditional banking has not only challenged our understanding of bank functioning, it has raised serious questions about the potential risks that this new type of financial intermediation poses for the broader financial system. In this paper, we use data from publicly traded Business Development Companies to better understand how this type of non-bank financial intermediation operates and what its operations entail for shareholders.

A common narrative for the rise in private lending is that banks, facing increased regulatory scrutiny in the wake of the global financial crisis, withdrew from lending to small- and medium-sized businesses. The maintained assumption in this narrative is that this vacuum was filled by *lending* from private, non-bank institutions. It stands to reason, then, that because this lending is largely unregulated and serves firms that in many cases would not meet traditional bank lending criteria, this new form of intermediation potentially poses risks to the safety of our financial system.

In this paper we challenge the idea that these non-bank financial institutions should be thought of as lenders. Our central argument is that private lenders do not simply lend money to unbankable firms; they invest in ways that banks cannot. They deploy a complicated array of securities, and in any given deal they hold both debt and equity. This hybrid investment strategy is essential for understanding both the growth of private lending as an asset class, and how this segment of the capital market functions in general.

Private equity investments, across the entire investment spectrum ranging from early-stage venture capital to buyout to real estate and infrastructure, can be understood from a contingent-claims perspective as investments that earn returns through three mechanisms: current return on principal, deferred return on principal, and exposure to the underlying assets of the portfolio company. How these levers are set in any given transaction is a function of the particular investment setting (VC versus buyout versus something else), as well as the liquidity needs of both the portfolio company in question and the capital provider in question. When viewed through this lens, our analysis illustrates that private lending sits within the broad spectrum of investment activities that all fall under the umbrella of "Private Equity." Understanding private lending through this lens extends our understanding of this emerging asset class and helps to reframe discussions surrounding the systemic risk exposure associated with the changing bank and non-bank financing landscape. Rather than viewing private lending as an alternative to regulated banking, it is more accurate to view it as an alternative to traditional private equity.

The rise of private lending is also connected to the growth in non-traditional investors to private equity. Publicly traded BDCs offer non-accredited investors access to private equity-like investment vehicles. Numerous industry observers and participants have noted that there has been a huge growth in the interest of accessing retail investors with private equity products. One reason for the growth of private lending is that with the higher current yield relative to other types of private equity investment, private lending is well suited to investors with lower liquidity tolerance. Understanding the general equilibrium implications of this growth for investors is an important question for future research.

Important policy implications emerge from reframing non-bank financial intermediation as private equity oriented towards a growing class of retail investors. One is that it may not be optimal to lower capital requirements for banks just because we see non-bank institutions stepping into the space. Relatedly, applying regulations designed for banking institutions to the private credit market may produce unintended consequences by focusing on the wrong sets of risks and behavior. Exploring the regulatory implications of private lender's hybrid position as lenders and PE firms is an important question for policy makers.

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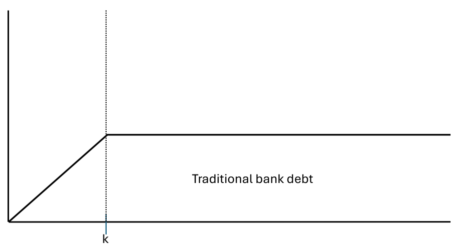
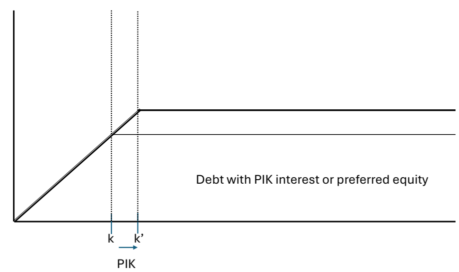
Figure 1: Payoff diagrams for alternative investment strategies

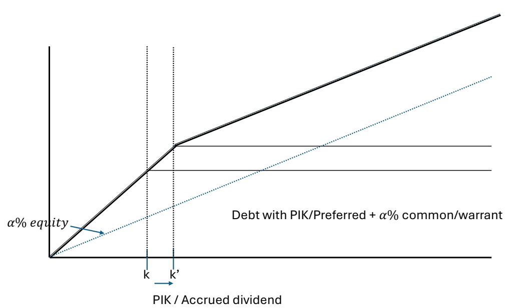
(a) Traditional debt



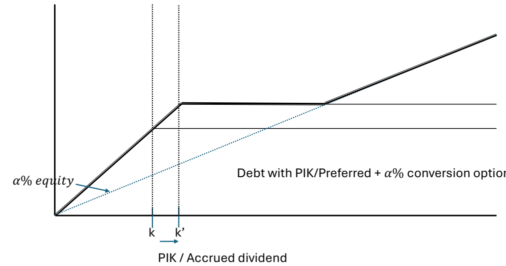
(b) Debt + PIK/accrued dividends



(c) Debt + PIK + common/warrants

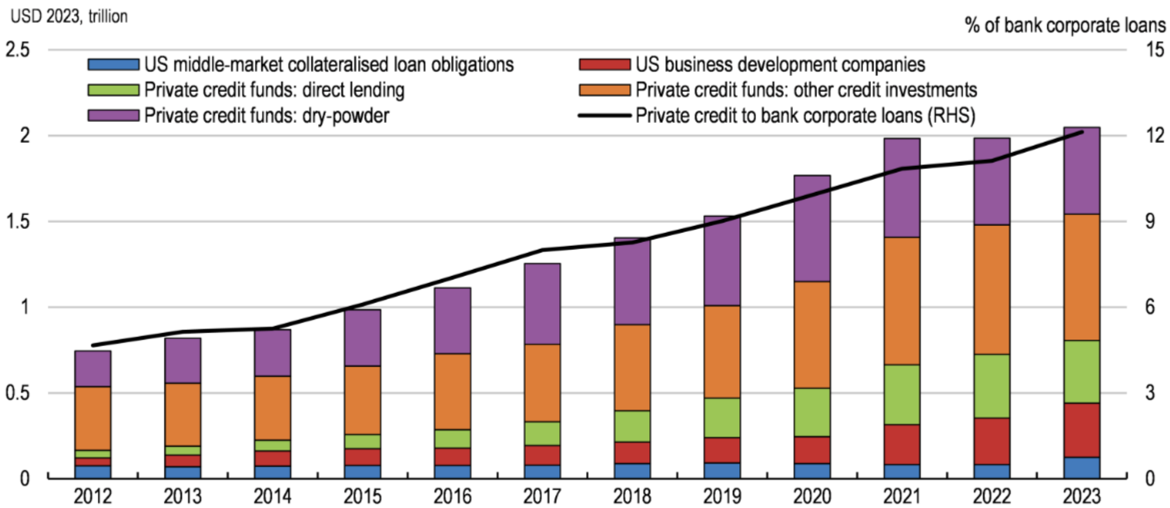


(d) Convertible debt



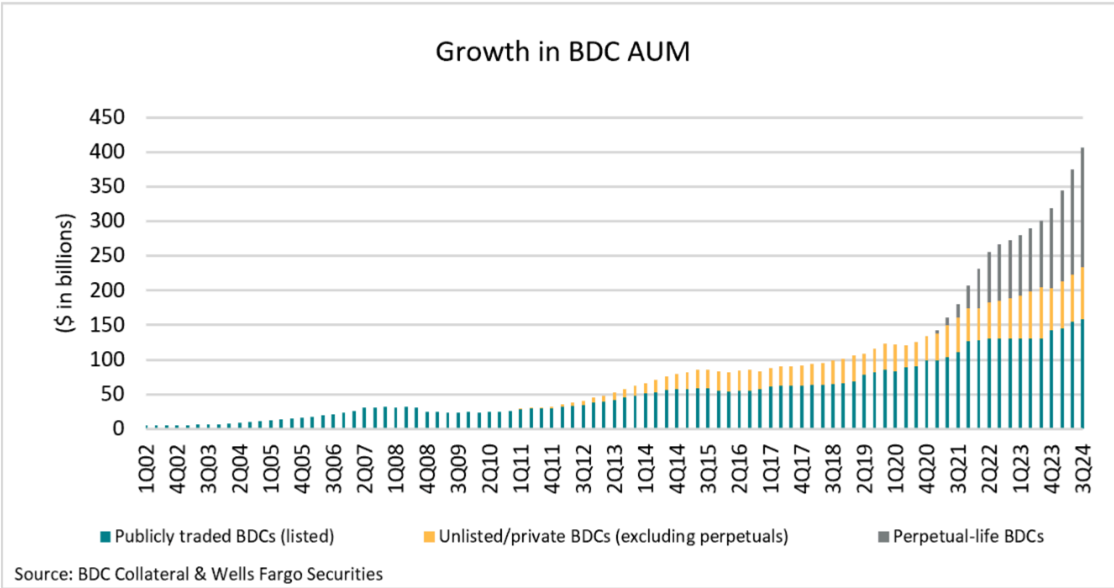
This figure presents payoffs to alternative investment strategies, as discussed in Section 1.

Figure 2: The growth of non-bank lending to small and medium-sized businesses



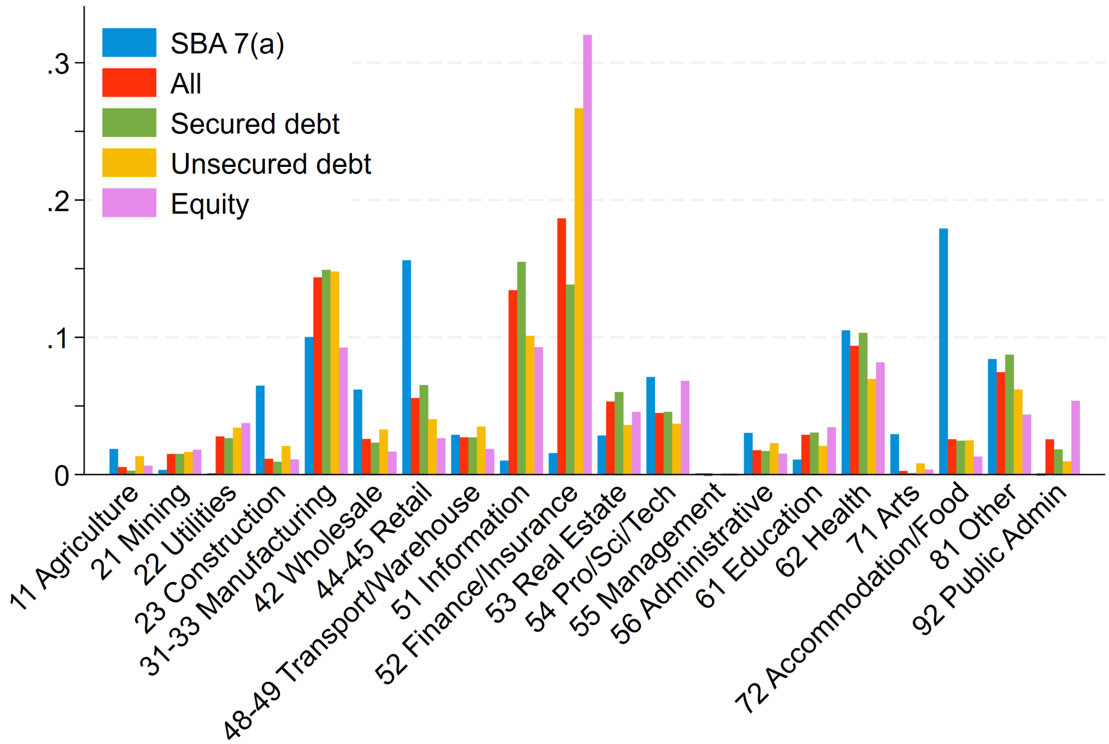
This graph is taken from Roulet (2024).

Figure 3: The growth in BDC assets under management over time



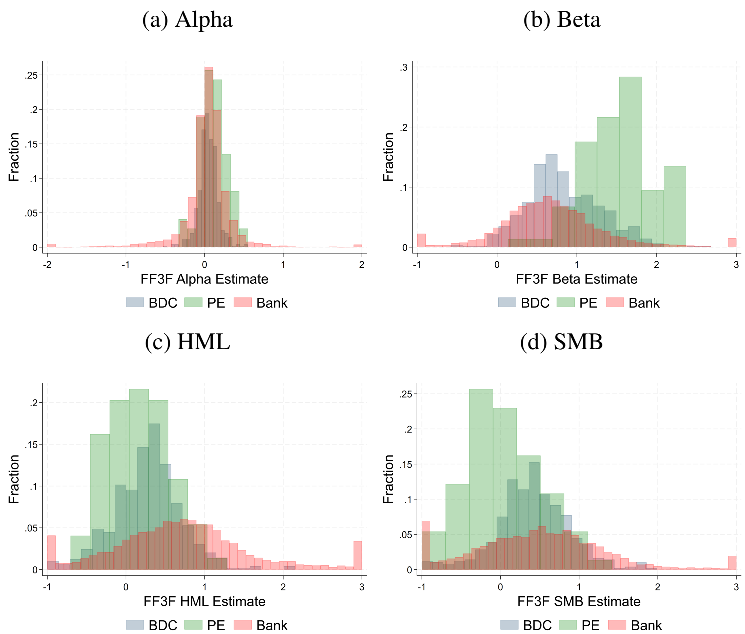
This graph is taken from Berlin (2024) using data from BDC Collateral and Wells Fargo Securities.

Figure 4: 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.

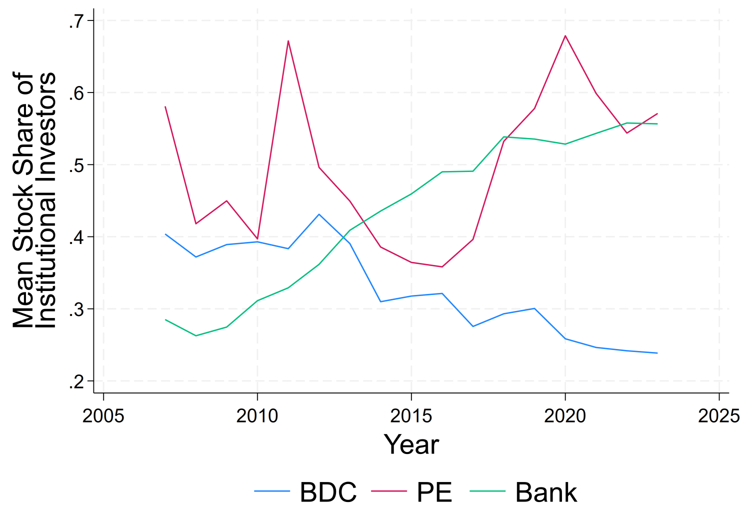
Figure 5: Fama-French Three-Factor Model estimates: BDCs vs. PE vs. banks



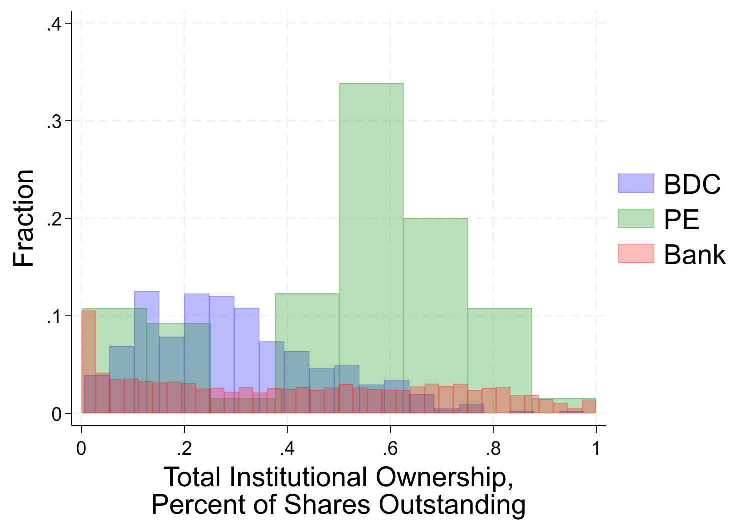
This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, compared to PE and banks.
T-tests for equality of group unweighted means:
Alpha: H_0: BDC (0.046) = PE (0.111) $\rightarrow$ p($\neq$) = 0.003**. H_0: BDC = Bank (0.035) $\rightarrow$ p($\neq$) = 0.082*
Beta: H_0: BDC (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 6: Institutional versus retail investor ownership in BDCs vs. PE and banks

(a) Trends



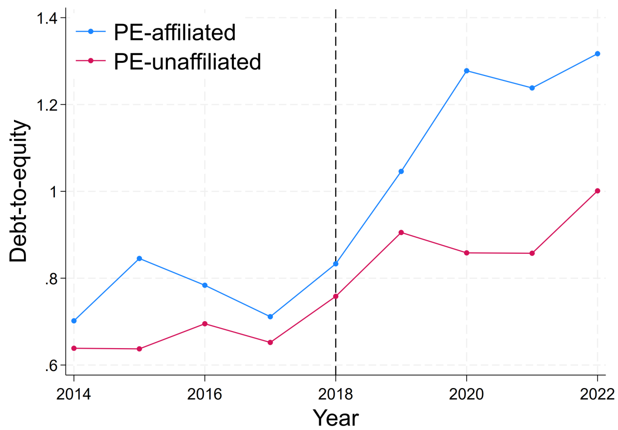
(b) Distributions



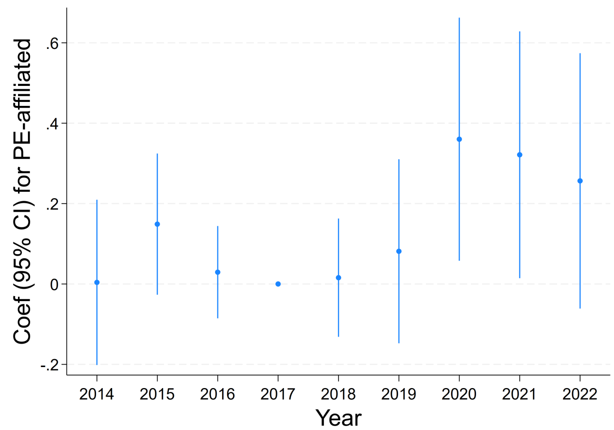
This figure presents patterns of institutional ownership in BDCs, compared to PE and banks. Panel (a) shows the trends in institutional ownership, based on unweighted-average institutional ownership shares. Panel (b) presents histograms of the institutional ownership shares for 2007-2023. Note that we 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, sourced from LSEG.

Figure 7: Event study analysis

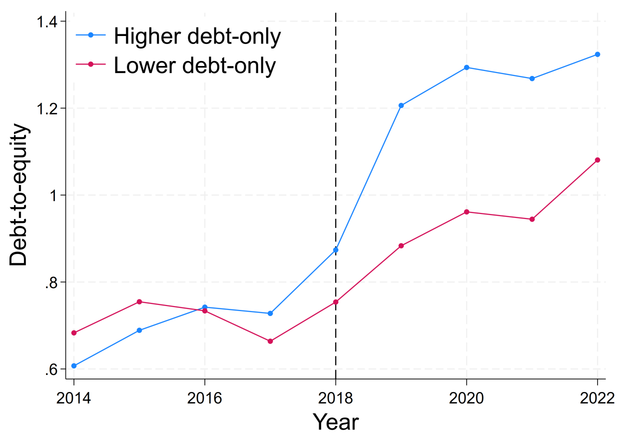
(a) Averages by PE-affiliation



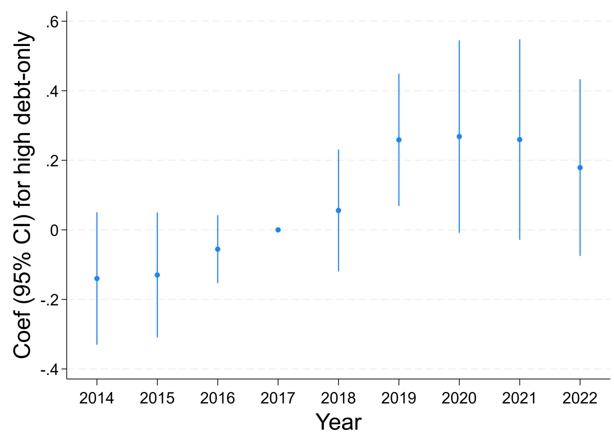
(b) Event study by PE-affiliation



(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: Characteristics of securities, BDC-company relationships, and 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)	8.59	9.78	419.74
Debt	0.71	0.74	0.82
Senior secured debt	0.36	0.36	0.60
Other secured debt	0.05	0.06	0.05
Unsecured debt	0.30	0.32	0.17
Interest rate spread	7.58	7.65	7.84
Has PIK interest (given debt)	0.08	0.08	0.12
Equity	0.24	0.21	0.12
Common equity	0.12	0.10	0.08
Preferred equity	0.06	0.06	0.03
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 equity	0.23	0.22	0.29
Has both secured and unsecured debt	0.02	0.02	0.04
Has both debt and equity	0.14	0.14	0.23
Has both preferred and common	0.02	0.02	0.03
Has both debt, pref, and common	0.01	0.01	0.02
Has both debt and warrants	0.06	0.06	0.06
Has PIK interest (given debt)	0.05	0.05	0.11
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 equity	0.34	0.32	0.36
Has both secured and unsecured debt	0.03	0.03	0.07
Has both debt and equity	0.17	0.18	0.29
Has both preferred and common	0.03	0.03	0.04
Has both debt, pref, and common	0.02	0.02	0.03
Has both debt and warrants	0.05	0.05	0.05
Has PIK interest (given debt)	0.09	0.09	0.16
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 3: 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	-0.462***	-1.252***	-0.434***	-1.248***	-0.239***	-0.792***	-0.211***	-0.788***
	(0.040)	(0.049)	(0.040)	(0.049)	(0.043)	(0.055)	(0.043)	(0.055)
Any common equity	0.957***	0.434***	1.165***	0.553***	0.832***	0.244***	1.044***	0.378***
	(0.049)	(0.042)	(0.052)	(0.045)	(0.052)	(0.047)	(0.056)	(0.051)
Any preferred equity	1.199***	0.478***	1.802***	0.834***	1.249***	0.512***	1.863***	0.911***
	(0.069)	(0.063)	(0.088)	(0.081)	(0.075)	(0.071)	(0.095)	(0.091)
Any warrants	1.802***	0.846***	1.801***	0.840***	1.808***	0.778***	1.807***	0.772***
	(0.066)	(0.068)	(0.066)	(0.068)	(0.071)	(0.077)	(0.071)	(0.077)
Ever has PIK interest	1.748***	1.210***	1.739***	1.206***	-2.024***	-2.555***	-2.032***	-2.559***
	(0.056)	(0.050)	(0.056)	(0.050)	(0.061)	(0.056)	(0.061)	(0.056)
Any preferred × any common			-1.575***	-0.826***			-1.605***	-0.925***
			(0.142)	(0.118)			(0.153)	(0.133)
Constant	7.160***	7.992***	7.113***	7.972***	7.005***	7.673***	6.958***	7.651***
	(0.036)	(0.040)	(0.037)	(0.040)	(0.039)	(0.045)	(0.040)	(0.046)
R^2	0.31	0.62	0.31	0.63	0.25	0.56	0.26	0.56
Mean Outcome	7.32	7.32	7.32	7.32	6.95	6.95	6.95	6.95
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	25,160	25,160	25,160	25,160	25,160	25,160	25,160	25,160

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 4: 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	-1.522***	-1.266***	-1.518***	-1.261***	-0.721***	0.290**	-0.762***	0.257*
	(0.087)	(0.101)	(0.088)	(0.102)	(0.121)	(0.144)	(0.121)	(0.144)
Any common equity	0.183**	0.145*	0.124	0.087	-0.981***	-1.106***	-0.445***	-0.692***
	(0.081)	(0.085)	(0.115)	(0.116)	(0.111)	(0.121)	(0.158)	(0.165)
Any preferred equity	0.299***	0.365***	0.277**	0.341***	-0.006	-0.023	0.189	0.142
	(0.109)	(0.112)	(0.113)	(0.117)	(0.151)	(0.160)	(0.156)	(0.166)
Any warrants	0.436***	0.472***	0.385***	0.423***	-0.257*	0.322*	0.210	0.673***
	(0.111)	(0.118)	(0.132)	(0.135)	(0.153)	(0.168)	(0.182)	(0.192)
Has PIK interest	1.818***	1.749***	1.765***	1.697***	-2.871***	-2.832***	-2.385***	-2.466***
	(0.096)	(0.091)	(0.121)	(0.114)	(0.132)	(0.129)	(0.167)	(0.162)
Has PIK interest and equity			0.099	0.098			-0.902***	-0.694***
			(0.138)	(0.131)			(0.190)	(0.187)
Constant	8.726***	8.600***	8.757***	8.630***	8.577***	7.805***	8.294***	7.593***
	(0.123)	(0.125)	(0.130)	(0.131)	(0.170)	(0.177)	(0.180)	(0.186)
R^2	0.26	0.54	0.26	0.54	0.21	0.48	0.22	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	7,732	7,732	7,732	7,732	7,732	7,732	7,732	7,732

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 5: The Value of complexity

Dependent variable:	Log(Total value of securities)					
	Separate			Pooled		
	(1)	(2)	(3)	(4)	(5)	(6)
Has secured debt	2.384*** (0.037)	1.254*** (0.041)	1.438*** (0.059)	2.235*** (0.036)	1.101*** (0.040)	0.902*** (0.055)
Has debt + common equity	1.563*** (0.049)	0.768*** (0.039)	0.900*** (0.054)	0.864*** (0.052)	0.537*** (0.041)	0.583*** (0.056)
Has debt + preferred equity	1.268*** (0.065)	0.761*** (0.050)	0.835*** (0.066)	0.672*** (0.074)	0.429*** (0.053)	0.355*** (0.068)
Has debt + warrants	0.791*** (0.054)	1.161*** (0.059)	1.952*** (0.096)	0.378*** (0.058)	0.809*** (0.058)	1.575*** (0.095)
Has debt with PIK interest	1.318*** (0.052)	0.552*** (0.043)	0.376*** (0.039)	0.514*** (0.052)	0.197*** (0.042)	0.102*** (0.035)
R^2				0.40	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	62,444	62,444	62,444	62,444	62,444	62,444

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 6: 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 w/ 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 7: 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 8: Factor correlations with complexity

Dependent variable:	Alpha (FF3F)		Beta (FF3F)		HML		SMB	
Regression type:	Separate	Pooled	Separate	Pooled	Separate	Pooled	Separate	Pooled
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share companies with debt	0.048	0.162*	0.716**	0.525	0.299	0.025	0.056	0.332
+ PIK or preferred	(0.108)	(0.083)	(0.340)	(0.337)	(0.242)	(0.306)	(0.394)	(0.392)
Share companies with debt	-0.290***	-0.323***	0.649	0.541	0.781***	0.776**	-0.714*	-0.782**
+ common or warrant	(0.096)	(0.094)	(0.404)	(0.387)	(0.276)	(0.311)	(0.406)	(0.381)
R^2		0.67		0.82		0.73		0.55
Mean Outcome	0.08	0.08	0.87	0.87	0.31	0.31	0.32	0.32
Year FEs	X	X	X	X	X	X	X	X
BDC FEs	X	X	X	X	X	X	X	X
N	484	484	484	484	484	484	484	484

Notes: This table presents value-weighted regression estimates of estimated alphas, betas, HML, and SMB factors from Fama-French Three-Factor Models on BDC-year value-weighted portfolio characteristics. Alphas are annualized by multiplying by 12. Odd columns present estimates from *separate* regressions of factors on individual portfolio characteristics; even columns present estimates from pooled regressions. Constants are not reported. Observations are weighted by BDC AUM. 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.

Table 9: 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 + PIK or preferred	-0.279	-0.190*	-0.066	0.004	-0.299***	-0.200**
	(0.181)	(0.094)	(0.090)	(0.088)	(0.064)	(0.090)
Share companies with debt + common or warrant	-0.090	0.052	-0.166	-0.167	-0.133***	0.028
	(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.

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 interested 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 with 6-digit NAICS industry titles, and then aggregate to 2-digit sectors. We perform this match using the Stata program "matchit," matching on bigrams; we keep the top match for each reported industry with a Jaccard similarity score exceeding 0.4. Before doing this match, we drop from both industry lists the string "ties" (appearing in words like "utilities" and "facilities") and the string "services," in order to avoid matching disproportionately on these strings. After this match, we manually code some unmatched industries. 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 74% of observations.

A.1.2 Other data from 10-Ks

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 Complexity and BDCs' price-to-NAV

In this section, we study BDC performance as measured by their price-to-NAV ratios. We leverage two features of publicly traded BDCs. First, BDCs are closed end funds, their price can trade well below or above their net asset values (NAV), depending on investors' valuations, making the price-to-NAV ratio a relevant valuation metric. Second, BDCs face mandatory payout rules that require them to distribute at least 90% of their taxable income to shareholders in order to maintain pass-through status for taxes.

To build up intuition of what a price-to-NAV ratio captures for a BDC, consider a standard dividend discount model of stock price per share:

$$\frac{P}{NAV} = \frac{\frac{D_1}{r-g}}{NAV} = \frac{\frac{D_1}{NAV}}{r-g}, \tag{A.1}$$

where D_1 is expected dividends next year, r is the cost of capital, and g is the growth rate.

Because of the mandatory payout rules, dividends should be closely linked to the BDC's net income. Taking logs, this means that we have

$$\log\left(\frac{P}{NAV}\right) \approx \log\left(\frac{\text{Net income}_1}{NAV}\right) - \log(r) + \log(g), \tag{A.2}$$

where Net income_1 denotes expected net income next year. Furthermore, recall that a BDC's NAV (i.e., per share total assets net of total liabilities) is precisely capturing its portfolio of investments. A BDC's net income reflects its returns on those investments. Furthermore, its portfolio choices also likely affect its cost of capital r (as we saw in Table 8) and growth g.

Collectively, this means that a BDC's price-to-NAV reflects the performance of its portfolio. We use this insight in order to further characterize how complexity affects the portfolio's performance.

To do this, we estimate regressions similar to our factor loading models (2):

$$\log\left(\frac{P_{jt}}{NAV_{jt}}\right) = \alpha_0 + \beta_1 \text{Share of companies with both debt and PIK or preferred equity}_{jt} + \beta_2 \text{Share with both debt and common equity or warrants}_{jt} + \gamma_t + \gamma_j + \varepsilon_{jt}, \tag{A.3}$$

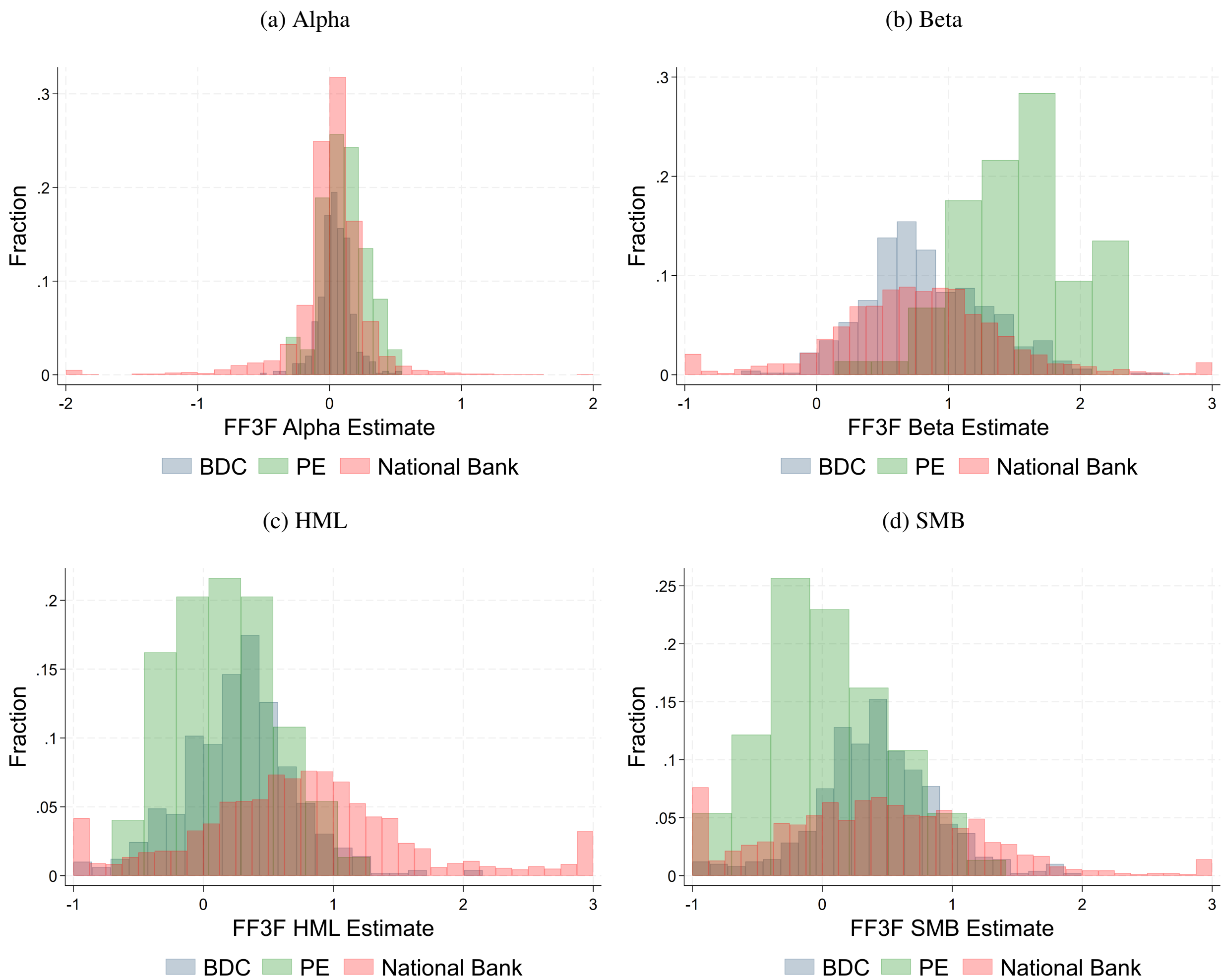
where j denotes a BDC and t a year. As with in model (2), we aggregate to the BDC-year level by taking value-weighted averages of BDC-company relationships each year. Note that the sample of BDC-years with available NAV values is slightly different from our other samples; here, we have 443 BDC-year pairs.

Table A.3 presents our estimates. In both separate and pooled versions, we find significant evidence that complexity — at least in terms of deferring payments via PIK or preferred equity — is valued by investors, generating a smaller discount to NAV.

A.3 Additional Tables

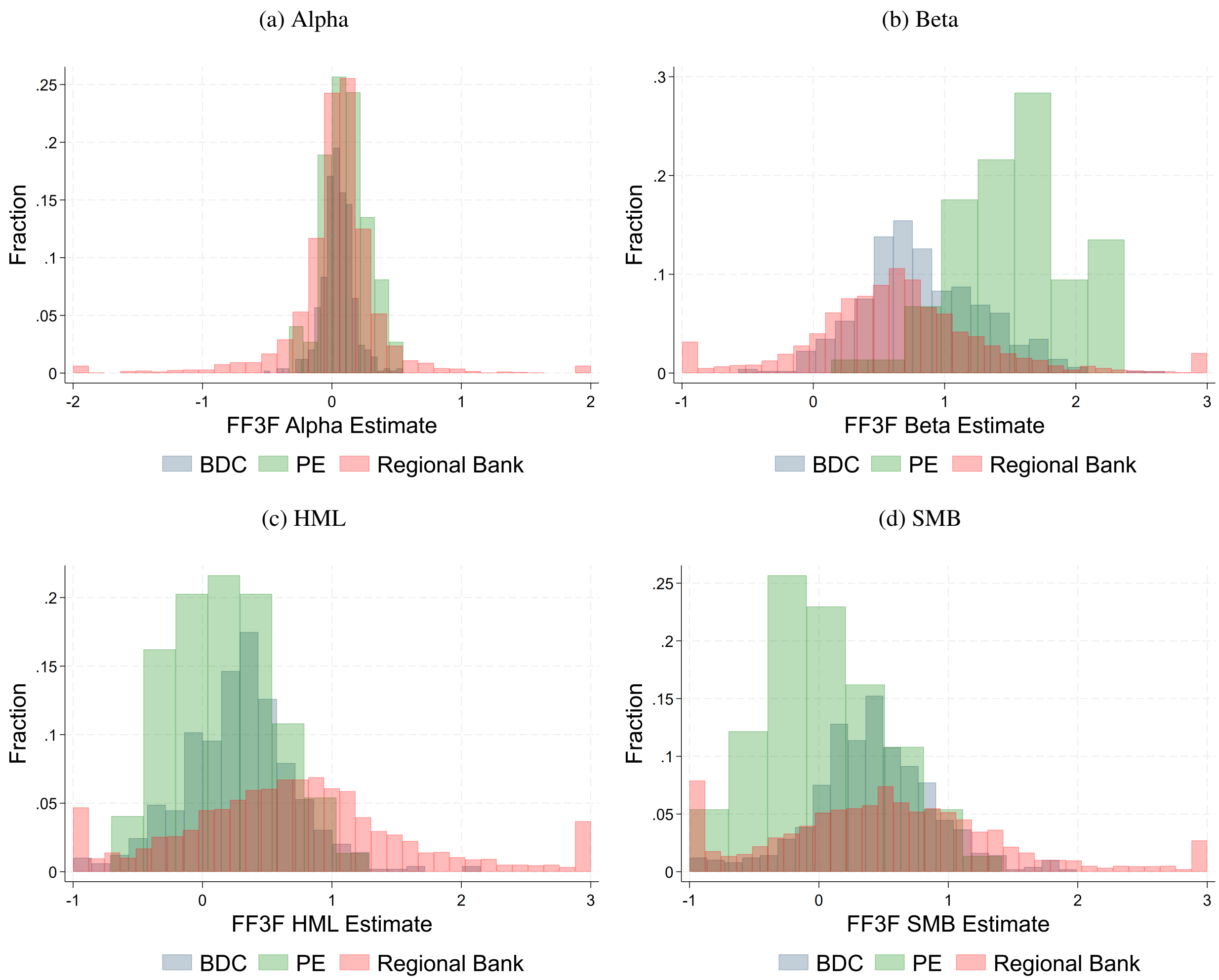
This section contains additional robustness tables.

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).

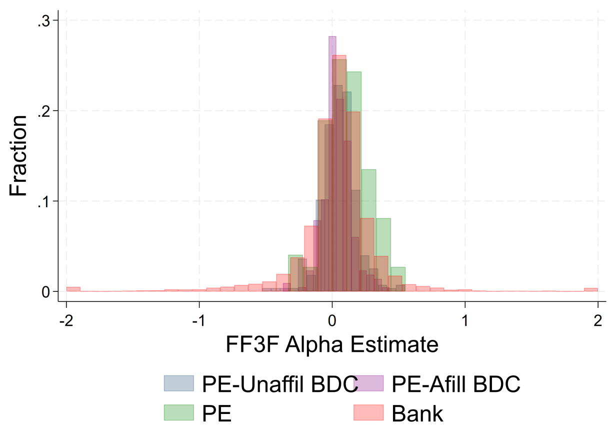
Figure A.2: Fama-French Three-Factor Model estimates: BDC vs. PE vs. Regional banks



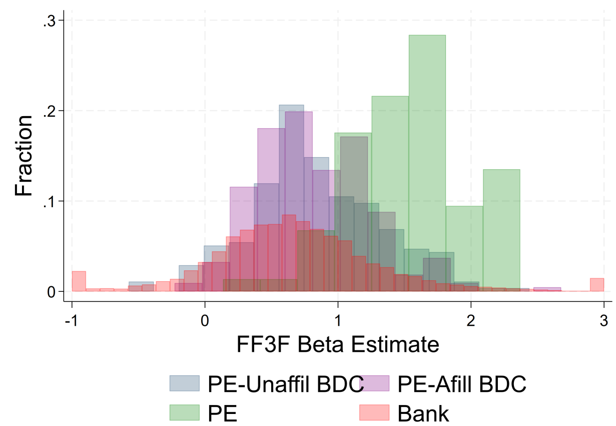
This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, compared to PE and regional banks (SIC code 6022).

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

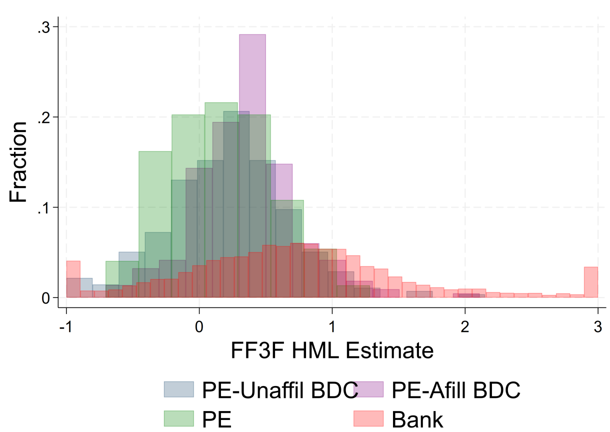
(a) Alpha



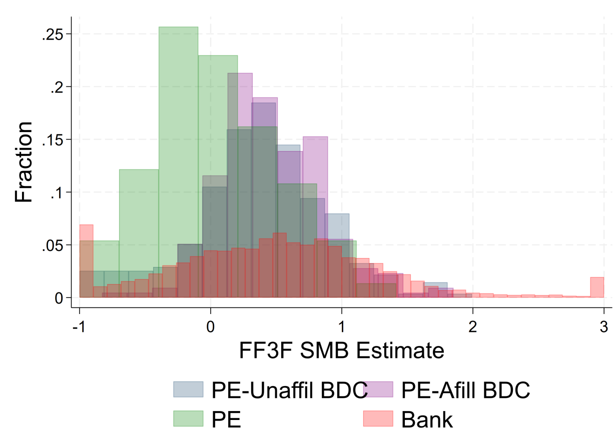
(b) Beta



(c) HML



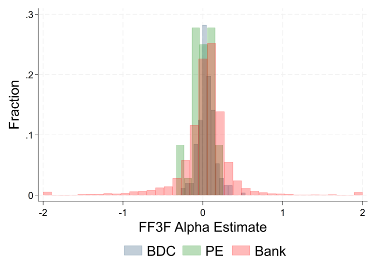
(d) SMB



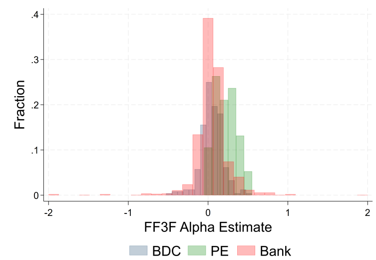
This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, split on PE-affiliation, compared to PE and banks.

Figure A.4: Fama-French Three-Factor Model estimates: BDCs vs. PE vs. banks, pre- and post-2018

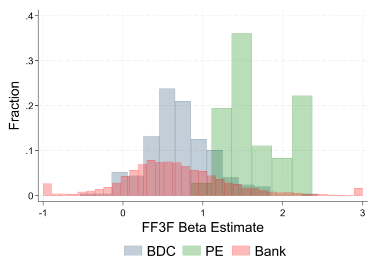
(a) Alpha, pre-2018



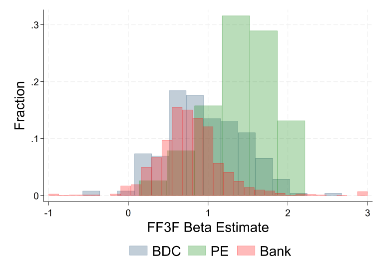
(b) Alpha, post-2018



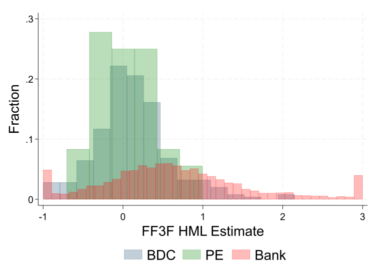
(c) Beta, pre-2018



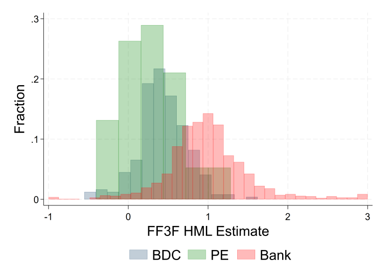
(d) Beta, pre-2018



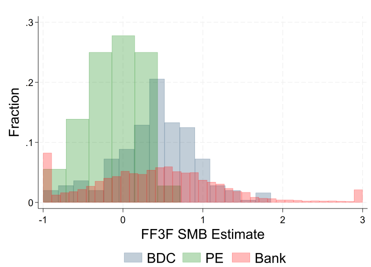
(e) HML, pre-2018



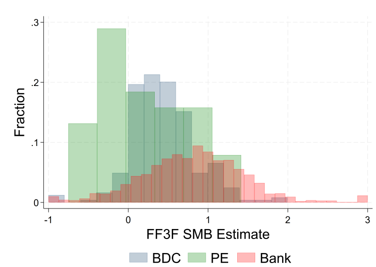
(f) HML, post-2018



(g) SMB, pre-2018

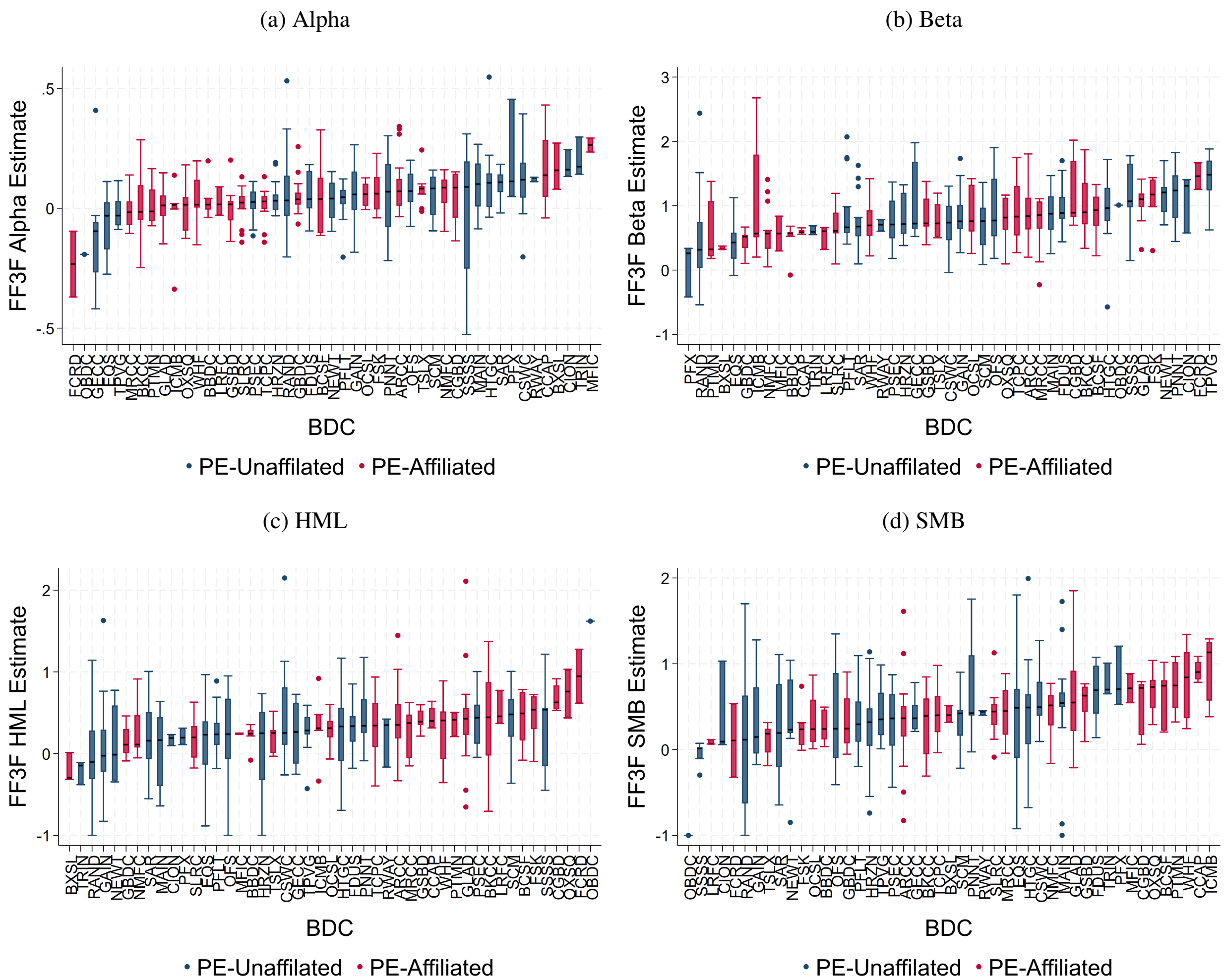


(h) SMB, post-2018



This figure presents histograms of Fama-French Three-Factor Model estimates for BDCs, compared to PE and banks, pre- and post-2018.

Figure A.5: Fama-French Three-Factor Model estimates: Within- and between-BDC variation



This figure presents box-and-whisker plots for factor estimates, by BDC. For each factor, BDCs are ordered by their median estimate value of that factor loading.

Table A.1: Characteristics of securities, BDC-company relationships, and BDCs 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
Debt	0.69	0.72	0.82
Senior secured debt	0.49	0.50	0.63
Other secured debt	0.04	0.05	0.03
Unsecured debt	0.16	0.17	0.16
Interest rate spread	7.64	7.69	7.93
Has PIK interest (given debt)	0.11	0.11	0.10
Equity	0.21	0.19	0.11
Common equity	0.14	0.12	0.07
Preferred equity	0.05	0.04	0.02
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 BDC-company relationships (i.e., BDC-year-company level)			
Fair value (millions)	21.96	22.89	701.31
Number of securities	1.92	1.94	2.32
Number of security types	1.27	1.28	1.36
Share debt	0.73	0.76	0.77
Share equity	0.20	0.17	0.15
Has debt	0.81	0.83	0.87
Has equity	0.30	0.29	0.32
Has both secured and unsecured debt	0.03	0.03	0.05
Has both debt and equity	0.17	0.17	0.25
Has both preferred and common	0.03	0.03	0.03
Has both debt, pref, and common	0.02	0.02	0.03
Has both debt and warrants	0.03	0.03	0.03
Has PIK interest (given debt)	0.12	0.12	0.13
N	33,585	32,503	32,503

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.2: Characteristics of securities, BDC-company relationships, and BDCs 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
Debt	0.72	0.75	0.83
Senior secured debt	0.21	0.20	0.53
Other secured debt	0.06	0.06	0.09
Unsecured debt	0.45	0.48	0.21
Interest rate spread	7.49	7.58	7.64
Has PIK interest (given debt)	0.04	0.04	0.14
Equity	0.27	0.24	0.14
Common equity	0.10	0.09	0.10
Preferred equity	0.07	0.07	0.03
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 BDC-company relationships (i.e., BDC-year-company level)			
Fair value (millions)	8.47	8.74	117.45
Number of securities	1.55	1.56	2.23
Number of security types	1.23	1.24	1.50
Share debt	0.77	0.80	0.77
Share equity	0.22	0.20	0.21
Has debt	0.85	0.86	0.91
Has equity	0.31	0.29	0.41
Has both secured and unsecured debt	0.02	0.02	0.09
Has both debt and equity	0.16	0.16	0.33
Has both preferred and common	0.02	0.02	0.03
Has both debt, pref, and common	0.01	0.01	0.03
Has both debt and warrants	0.07	0.07	0.10
Has PIK interest (given debt)	0.05	0.05	0.17
N	38,412	37,226	37,226

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.3: P/NAV correlations with complexity

Dependent variable:	Log(P/NAV)	
Regression type:	Separate	Pooled
	(1)	(2)
Share companies with debt + PIK or preferred	0.476**	0.541**
	(0.239)	(0.231)
Share companies with debt + common or warrant	0.115	-0.123
	(0.129)	(0.081)
R^2		0.82
Mean Outcome	0.86	0.86
Year FEs	X	X
BDC FEs	X	X
N	443	443

Notes: This table presents value-weighted regression estimates of log Price-to-NAV on BDC-year value-weighted portfolio characteristics. Column (1) presents estimates from *separate* regression of price-to-NAV on individual portfolio characteristics; Column (2) presents estimates from a pooled regression. Constants are not reported. Standard errors are clustered at the BDC level. * for p<.10, ** for p<.05, and *** for p<.01.