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Private Debt – June 2024

Introduction

The relatively young asset class of private debt (PD) has garnered much attention recently. The California Public Employees' Retirement System (CalPERS), the largest U.S. public pension fund, made headlines in November 2021 when it announced addition of PD to its portfolio at 5% of assets under management (AUM).[1] In March 2024, CalPERS held PD assets valued at $12.3 billion and further raised its allocation to 8%, reflecting broader interest among pension funds.[2] The asset class has piqued the interest of other investors as well: over 90% of surveyed limited partners (LPs) reported that they plan on maintaining or increasing capital allocated to PD in early 2024.[3]

Heightened attention for PD reflects the impressive growth this asset class has witnessed since its emergence in the late 1990s. One of many types of private capital investments, PD consists of funds that provide loans to private and public companies, especially those in the middle market. It has risen to become the third largest private capital strategy in AUM (over $1.6 trillion as of June 30, 2023) behind only venture capital (VC) and buyout funds.[4] Much of this growth can be explained by the strong performance of PD, especially given its lower perceived risk relative to other private capital strategies. Moreover, PD has regularly outperformed bonds over the past decade, leading investors to consider it a potential alternative to fixed income investment.[5]

Given these trends, investors may be wondering what role PD could play in their own investment programs. This in-practice paper provides an overview of PD and the impact it could have on a portfolio. Our analysis begins with a definition of the asset class and a discussion of trends in fundraising. Next, we consider performance in comparison to both public and private capital asset classes before briefly describing allocation trends by investor type. We then explore how adding a PD allocation could help a

[1] "CalPERS bets on Private Equity and Debt as it grows past $500b," SWF, November 18, 2021, https://globalswf.com/news/calpers-bets-on-private-equity-and-debt-as-it-grows-past-500b; Annie Massa, Ye Xie, and John Gittelsohn, "Calpers Proposes Adding $25 Billion to Private-Equity Stake," Bloomberg, November 12, 2021, https://www.bloomberg.com/news/articles/2021-11-12/calpers-proposes-adding-25-billion-to-private-equity-stake.
[2] "CalPERS Will Increase Private Markets Investments," CalPERS News, March 19, 2024, https://www.calpers.ca.gov/page/newsroom/calpers-news/2024/calpers-will-increase-private-markets-investments; Shruti Singh, "Private Credit Attracts Billions From US Pension Plans," Bloomberg, December 18, 2023, https://www.bloomberg.com/news/articles/2023-12-18/calpers-other-us-public-pensions-pump-billions-into-private-credit.
[3] "Preqin Investor Outlook: Alternative Assets, H1 2024," Preqin, March 26, 2024.
[4] "Global Private Debt Report 2023 Annual," Pitchbook, March 20, 2024, https://pitchbook.com/news/reports/2023-annual-global-private-debt-report.
[5] Data from State Street, as of Q4 2023. We explore this result in the Performance Section.

portfolio realize benefits of diversification. Our analysis considers potential macroeconomic and market impacts on returns and concludes with several key takeaways.

Definition of Private Debt

PD falls under the umbrella of private capital and shares many features with other such assets, while remaining distinct in other ways. While private capital encompasses many types of assets that are not available for investment through public markets, investors most often think of two leading private market strategies: VC and buyouts. VC refers to funds that invest in the equity of high-growth (and high-risk) opportunities such as start-up companies and early-stage firms. Buyout funds invest in later-stage companies, usually taking majority control positions and seeking to carry out improvements. In both strategies, fund managers typically involve themselves with the operations of companies in their portfolio and offer advice rather than simply provide funding. Although PD is also a private capital asset class, it differs from others in two ways. First, PD consists of funds that provide debt financing to companies and usually hold these loans to maturity. Second, in comparison to VC and buyouts, managers of PD funds are typically less involved with the workings of their portfolio companies.

PD funds exist as partnerships in which investors provide capital for fund managers (called general partners, or GPs) to find credit opportunities and execute these deals. The LPs serve as passive investors, entrusting the GP to run the day-to-day operations of the fund. For this work, GPs usually receive around 1% of invested capital in management fees and 15% of returns in performance fees (referred to as carried interest, or "carry").[6] While these fees are higher than those seen for many public market products, they are still lower than the typical "two and twenty" fee structure seen in private equity (2% management fees and 20% carry).[7] While PD funds often require a minimum commitment of between $25,000 to $100,000, investment management firms like Blackstone and Mackenzie Investments have offered common shares with minimum investment requirements as low as $2,500 to $5,000.[8] Like other private capital asset classes, PD funds fully liquidate within eight to ten years, but some have terms as short as five years.[9] This makes PD generally more illiquid than public credit (e.g., publicly traded corporate bonds), but investors can expect to receive a premium in returns for this illiquidity. Nevertheless, the regular interest payments that PD funds receive on loans allow them to distribute returns more quickly and make these funds a more liquid option than other private capital asset classes, as we further examine in the Performance Section.

Despite similarities in how the funds are structured, PD funds differ from those of other private capital asset classes in many ways, such as in their approach to specialization. GPs in buyouts and VC often

[6] A management fee of 1% and carry of 15% are the medians reported in a survey of 58 direct lending firms. Source: "Cliffwater 2023 Study on Private Fund Fees & Expenses for Direct Lending, Cliffwater, April 18, 2023, https://cliffwater.com/files/cliffwaterfunds/data/pdfs/PrivateFundFeesExpensesForDirectLending2022.pdf.
[7] Ingo Stoff and Reiner Braun, "The Evolution of Private Equity Fund Terms Beyond 2 and 20," *Journal of Applied Corporate Finance* 26, no. 1 (2014): 65 – 75.
[8] Olivia Raimonde and Heather Perlberg, "Rich Investors Are Buying Risky Credit That Banks Won't Touch," Bloomberg, August 18, 2021, https://www.bloomberg.com/news/articles/2021-08-18/rich-investors-buying-risky-credit-from-private-equity-that-banks-wont-touch#xj4y7vzkg; Mark Burgess, "Mackenzie introduces interval private credit fund," Investment Executive, January 27, 2022, https://www.investmentexecutive.com/news/products/mackenzie-introduces-interval-private-credit-fund.
[9] Victor Leverett, "Private Debt – The Outlook for 2021: Is the Old New Again?" Campden FB, May 13, 2021, https://www.campdenfb.com/article/private-debt-outlook-2021-old-new-again.

focus their investment efforts on a few given industries, such as health care, energy, or technology. A deep understanding of an industry helps these GPs provide meaningful advice and enhance portfolio company operations. However, PD funds do not usually offer operational guidance for companies to which they lend (unless those companies are in distress) and are therefore less likely to focus strictly on a single sector.[10] Instead, PD funds differentiate themselves by following sub-strategies that offer investors different levels of risk and return. For example, direct lending funds are considered the "least risky" of PD sub-strategies, focusing on senior-tranche loans for small- to medium-sized companies.[11] By comparison, distressed lending funds provide funding to businesses that have filed for bankruptcy (or will be likely to do so soon) and therefore entail greater risk.[12]

The sources of returns associated with PD funds are also different from those of other private capital funds. VC and buyout GPs typically liquidate their investments by facilitating acquisitions of portfolio companies or taking these companies public. Since it usually takes time for businesses to increase in value enough to make "cashing in" worthwhile and for promising liquidation routes to materialize, VC and buyout funds typically register few to no returns for many years. PD funds, on the other hand, have various sources of returns that allow them to distribute capital more quickly. These include interest payments on loans, payments in kind (interest accrued and paid when the loan matures), transaction and origination fees, and termination fees incurred if a company repays its loans early.[13] As with other private capital strategies, PD investors must wait a few years to register greater cash inflows than outflows; however, we explore in the Performance Section how regular interest payments on loans allow PD funds to make distributions to investors more quickly than funds of other private capital asset classes.

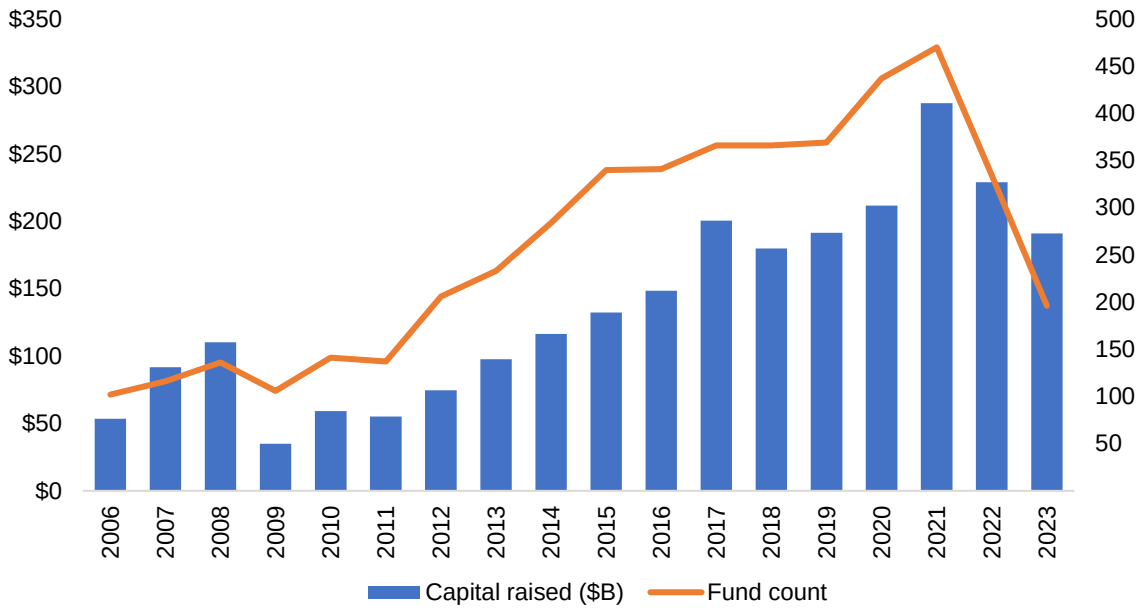
To summarize, while PD and other private capital funds are similar in fund structure, the former often specialize by strategy rather than by industry and distribute capital more quickly and regularly. With this background knowledge of PD funds established, we next consider trends in PD fundraising activity.

Fundraising and Recent Growth

The PD market has witnessed consistent fundraising growth since its emergence in the late 1990's with a clear acceleration taking place over the past decade. In 2021 alone, PD funds raised $287.5 billion globally – the highest single-year fundraising total on record.[14] Figure 1 represents the increase in capital raised as well as the number of funds raised annually. Notably, fundraising has fallen since 2021, reflecting macroeconomic forces that have reduced fundraising in private capital more broadly.

[10] Pascal Böni and Sophie Manigart, "Private Debt Fund Returns, Persistence, and Market Conditions," *Financial Analysts Journal* 78, no. 4 (2022): 121 - 144, http://dx.doi.org/10.2139/ssrn.3932484; Jorn H. Block, Young Soo Jang, Steven N. Kaplan, and Anna Schulze, "A Survey of Private Debt Funds," Working Paper No. w30868, National Bureau of Economic Research (Jan 2023), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4336493.
[11] Eli Talmor and Florin Vasvari, *Private Capital: Volume I – Funds* (New York: Private Capital Advisory Ltd, 2019).
[12] Ibid.
[13] Douglas Cumming, Grant Fleming, and Zhangxin (Frank) Liu, "The Returns to Private Debt: Primary Issuances vs. Secondary Acquisitions," *Financial Analysts Journal* 75, 1 (Jan 2019): 48-62, https://doi.org/10.1080/0015198X.2018.1547049.
[14] "Global Private Debt Report 2023 Annual," Pitchbook, March 20, 2024.

Figure 1. Global PD fundraising activity by year, 2006 – 2023[15]

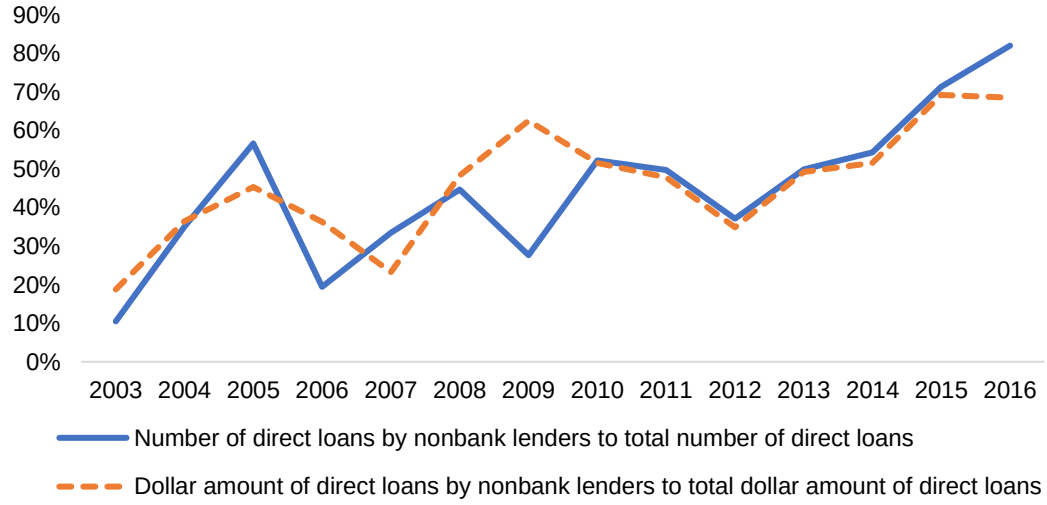


Source: "Global Private Debt Report 2023 Annual", Pitchbook, March 20, 2024.

This growth in PD can be attributed to confluence of factors, but broadly speaking, it boils down to two main drivers. First, given regulatory changes after the Global Financial Crisis (GFC), both the willingness and the ability of banks and traditional lenders to take on risk deteriorated significantly, increasing demand for non-bank sources of credit. Figure 2 plots both the dollar amount and number of direct loans by nonbank lenders (which includes PD funds) relative to all direct loans. The relative volume of nonbank direct loans more than doubled from less than 40% in 2012 to over 80% in 2016, suggesting banks become less prevalent in lending in this period.[16] Loumioti (2022) finds that direct lending by nonbank lenders increases when banks face greater regulatory pressures.[17] More specifically, Kim et al. (2017) recognizes the 2013 Interagency Leveraged Loan Guidance (and later clarifications) as important regulation that induced large banks to reduce issuance of leveraged loans, allowing nonbank lenders to gain market share.[18] These studies suggest regulation played an important role in the rapid increase in PD fundraising over the past decade.

[15] 2023 data is as of December 31, 2023.
[16] Maria Loumioti, "Direct Lending: The Determinants, Characteristics and Performance of Direct Loans," May 30, 2022, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3450841.
[17] Ibid.
[18] Sooji Kim, Matthew C. Plosser, and João A.C. Santos, "Macroprudential policy and the revolving door of risk: Lessons from leveraged lending guidance," *Journal of Financial Intermediation* 34 (April 2018): 17-31, https://www.sciencedirect.com/science/article/pii/S1042957318300172.

Figure 2: Direct lenders over time[19]



Source: Maria Loumioti, "Direct Lending: The Determinants, Characteristics and Performance of Direct Loans," May 30, 2022, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3450841.

The second main driver for PD growth is the fact that interest rates hovered near historic lows for much of the decade following the GFC. This posed challenges for many investors, but large institutional investors in particular faced considerable difficulty. These investors – including insurance companies, pension funds, etc. – often rely on fixed income investments for their lower-risk profile and predictable cash flows. With yields hovering near zero following the GFC, investors sought other investment opportunities that provided sufficient returns to cover their liabilities but that also had fixed-income characteristics (such as reliable income streams, comparatively lower risk than equity investments, and defined maturities). Thus, PD funds emerged as one source for investors to achieve these goals.

With the greater demand for private loans due to bank regulations and supply driven by low post-GFC interest rates, the PD market experienced high fundraising activity. Given this significant amount of capital, we next assess the asset class's performance.

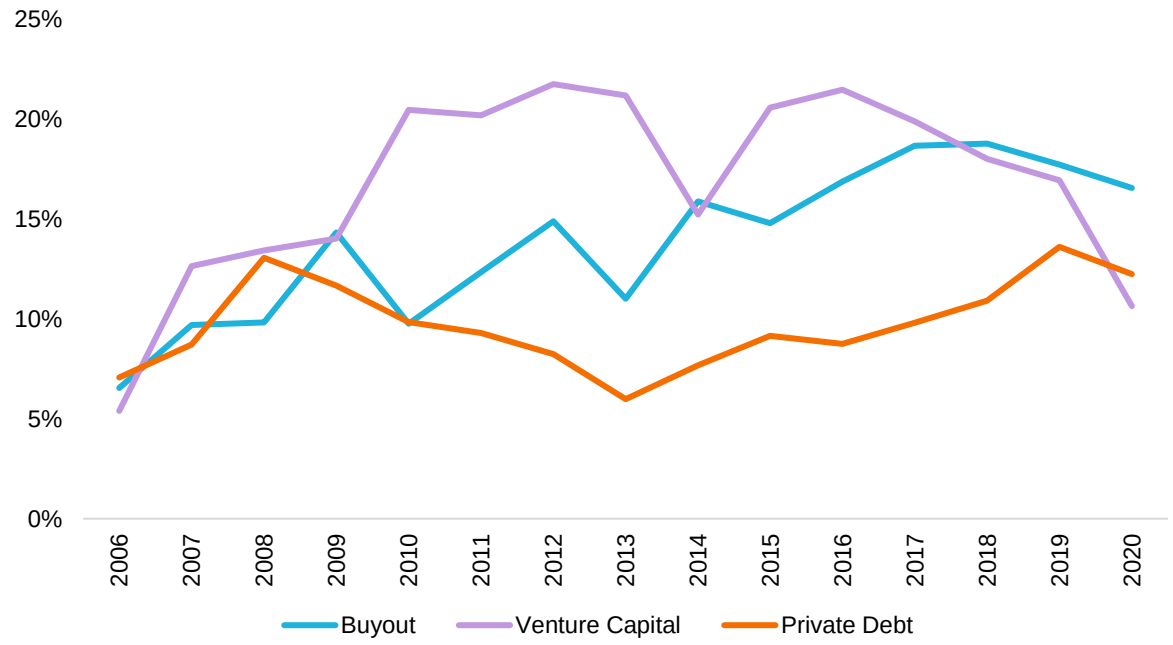
Performance

PD funds have seen relatively strong returns over the last several decades. Given the similarities between PD and other private capital asset classes in fund structure, investors typically measure PD performance with common private capital metrics. This section will use these metrics to understand PD performance compared to that of other private and public market asset classes. We find that relative to VC and buyouts, PD has historically achieved lower returns with correspondingly lower risk. However, PD returns have consistently exceeded those of fixed income investments of comparable risk.

[19] For simplicity, we reclassify the group that Loumioti calls "institutional investors" (private equity firms, investment management firms, hedge funds and insurance firms) as "nonbank lenders."

One of the most common private capital performance measurements is the internal rate of return (IRR). This metric hinges on the idea that income gained today is more valuable than the same amount gained a year from now. In other words, one can invest income today to accumulate value over the span of a year. According to data from State Street (Figure 3), the pooled IRR of PD has fluctuated around 10% for the past fifteen years.[20] The IRR of PD has generally trailed that of VC and buyouts, which aligns with the expectation that PD provides lower returns with lower risk.[21]

Figure 3: Pooled IRR among private capital assets by vintage year, 2006 – 2020

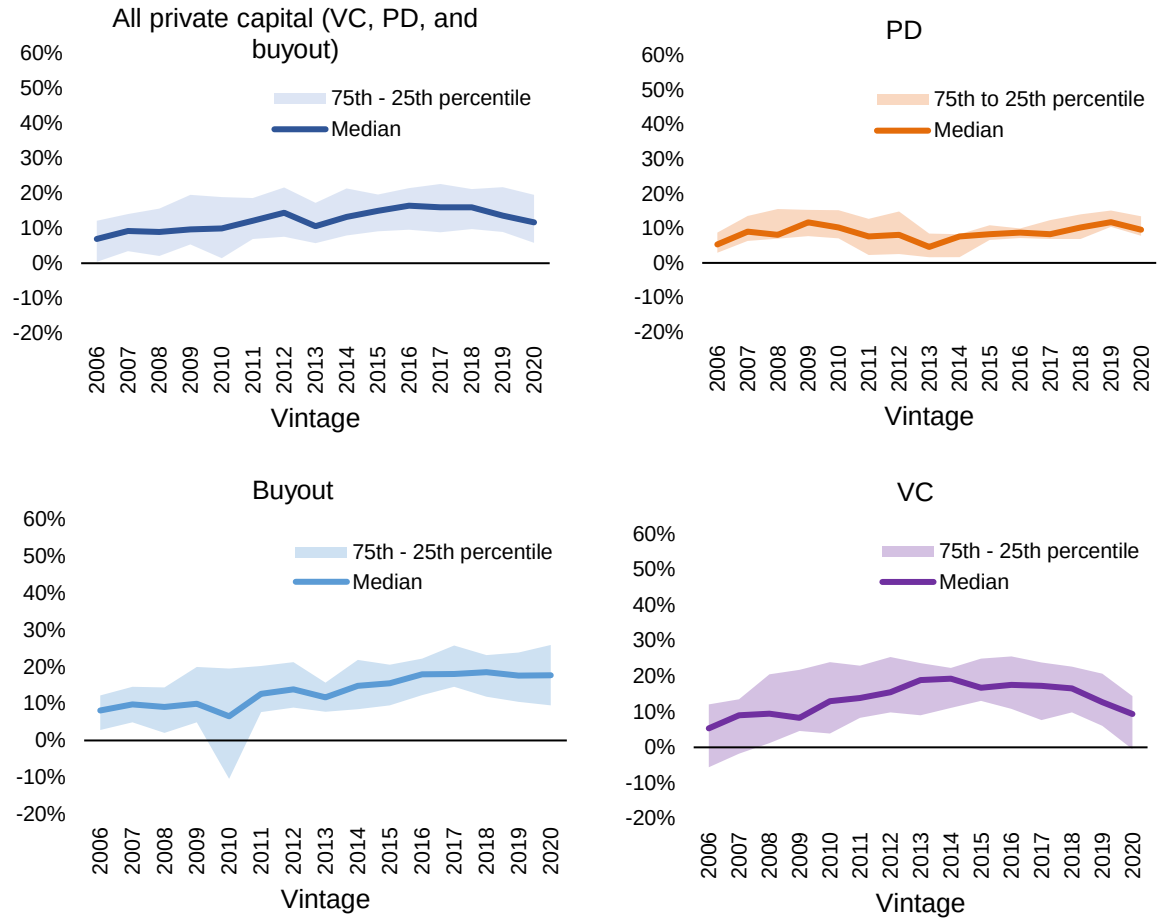


Source: State Street Global Markets, as of Q4 2023.

To expand on the idea of lower risk in PD, we consider the dispersion of returns among funds of the same strategy within a given vintage year (or the year a fund is formed). Figure 4 plots this dispersion and shows that the difference in returns between a high-performing fund (75th quartile) and low-performing fund (25th quartile) is less for PD than for buyouts and VC. From 2011 to 2020, the average difference between high- and low-performing funds was 6.6 percentage points for PD, 11.9 for buyouts, and 14.1 for VC. This suggests PD entails comparatively less risk and reinforces the view that it offers relatively predictable returns. Nevertheless, the considerable gap between high- and low-performing PD funds suggests fund choice is still important, as we discuss in the Macroeconomic and Market Considerations Section.

[20] A pooled IRR combines the cash flows of multiple funds into one, treating them as a single fund, and calculates a single IRR based on these combined cash flows.
[21] For this and following assessments of performance, we exclude funds with vintage years after 2020 because they are too recently established to generate meaningful returns.

Figure 4: Median IRR by vintage year with interquartile range

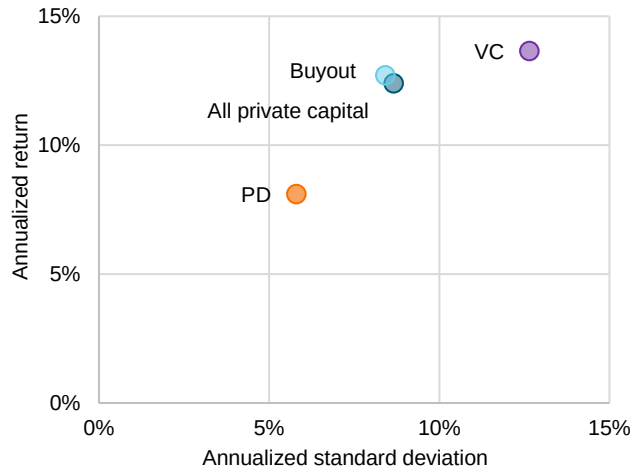


Source: State Street Global Markets, as of Q4 2023.

To consider the relationship between risk and returns in more detail, we compare annualized returns against annualized standard deviations, the latter of which is a common measure of risk in finance.[22] We calculate these metrics using the quarterly State Street Private Equity Index ("SSPEI"). Figure 5 plots these metrics for each asset class using data from the period Q1 2014 – Q4 2023 (the decade leading up to the most recently reported SSPEI value). PD exhibits an annualized return of 8.1% and the lowest annualized standard deviation of the strategies considered at 5.8%. Notably, buyouts feature a higher risk (8.4%) with a comparably greater return (12.7%) while the even higher risk of VC (12.7%) corresponds to an even greater return (13.7%). These results support the assumption that PD entails lower volatility than other private capital strategies at the cost of lower returns.

[22] A standard deviation represents variation around an average. In finance, a lower standard deviation suggests returns tend to be close to the average. A larger standard deviation represents greater risk.

Figure 5: Risk/return by private capital strategy, Q1 2014 – Q4 2023[23]



Strategy	Annualized std. dev.	Annualized return	Return per unit of risk[24]
All private capital	8.7%	12.4%	1.43
Buyout	8.4%	12.7%	1.51
VC	12.7%	13.7%	1.08
PD	5.8%	8.1%	1.40

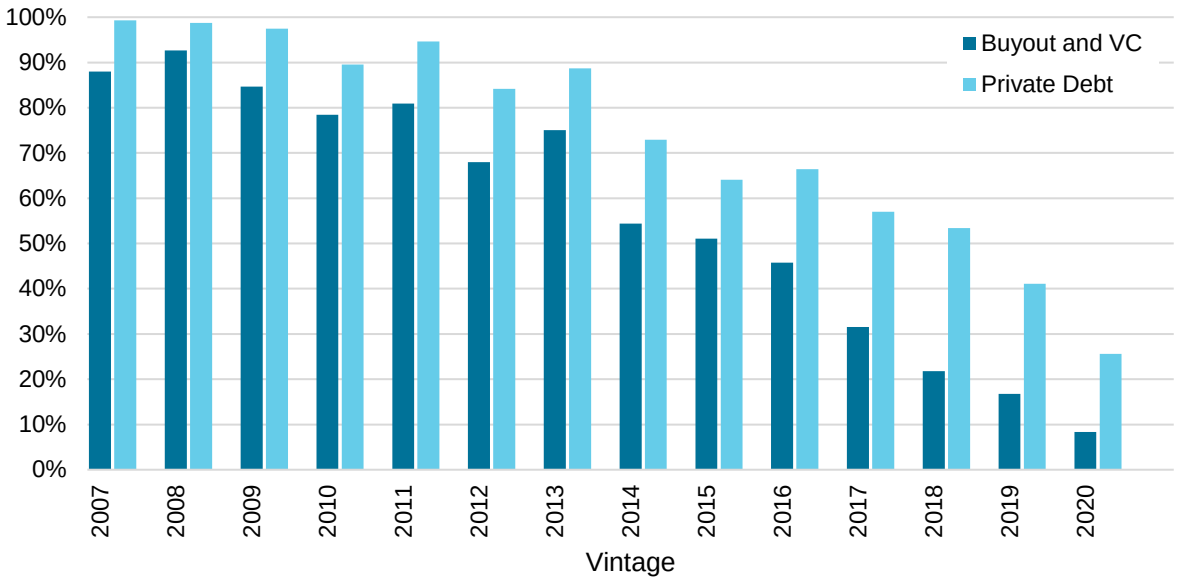
Source: State Street Global Markets, as of Q4 2023.

To explore whether PD funds return capital more quickly and routinely than other private capital asset classes, we look at returns by vintage year. Specifically, we focus on total value to paid-in capital (TVPI), which represents the multiple of money invested (MoM, or how many dollars of value a fund has generated for every dollar invested). This return can be decomposed into two constituent metrics: distributions to paid-in (DPI), or the portion of TVPI that GPs have actually distributed to LPs (realized returns); and residual value to paid-in (RVPI), or the portion of TVPI attributable to the value of outstanding investments (unrealized returns). By gauging the share of funds' TVPI that is represented by DPI, we can determine whether PD funds pay out returns at a faster rate than other funds.

Figure 6 uses State Street data to illustrate DPI as a share of TVPI (i.e., the share of realized returns) for PD and other private capital funds. This graph shows that for every vintage year, DPI constitutes a greater share of the TVPI for PD funds as compared to VC and buyout funds. In other words, PD fund managers return money more quickly than other private capital managers. While VC and buyout funds that closed in 2013 returned 75% of the TVPI to investors as of 2023 Q4, PD funds that closed that same year returned 89%. In this respect, PD is attractive for investors who seek to receive the returns from their investment in less time or worry that much of their investment will remain illiquid for over a decade. PD has provided the reliable cash flows that institutional investors with regular operating expenses or liabilities (such as pension funds and endowments) seek.

[23] "All private capital" serves as an aggregate of the three private capital asset classes.
[24] Return per unit of risk is calculated by dividing each strategy's annualized return by its respective annualized standard deviation.

Figure 6: Distribution to paid-in (DPI) as a share of total value to paid-in (TVPI)[25]



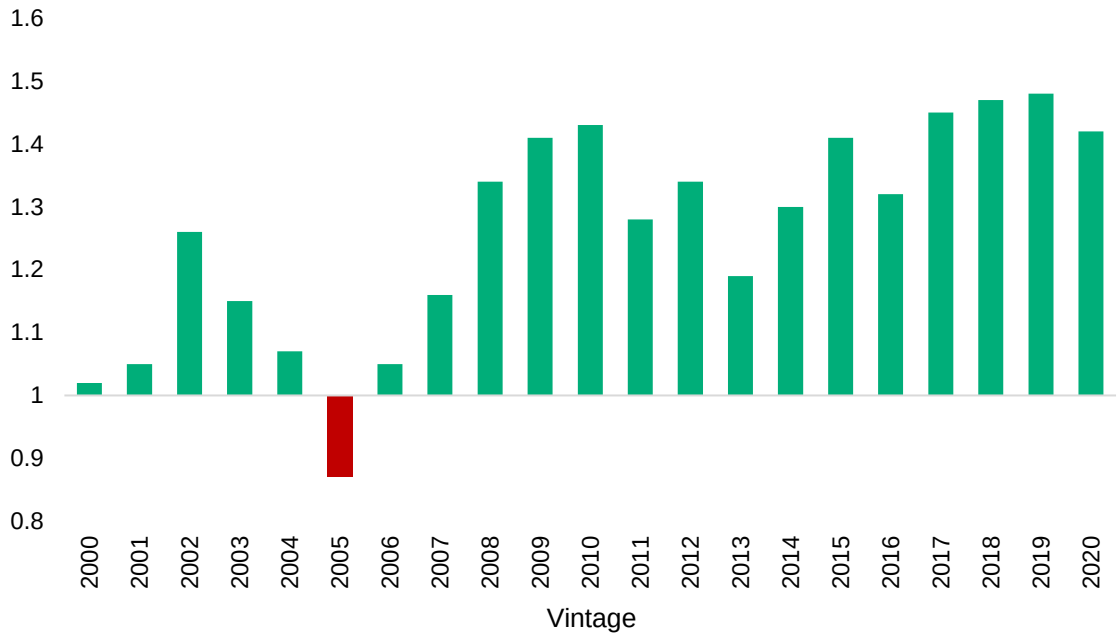
Source: State Street Global Markets, as of Q4 2023.

Beyond comparing its performance against that of other private capital asset classes, we can also benchmark PD performance against bond indexes. Private capital investors often use "public market equivalents" (PMEs) to compare the returns of a private fund against those that would have been generated from investing the same amounts in a public index over the same period instead.[26] One common method for computing PMEs is the Kaplan-Schoar approach, which calculates the ratio of private capital returns to public market returns.[27] The private asset outperforms the public asset if the ratio is greater than one but underperforms if the ratio is less than one.[28]

Figure 7 shows PMEs for PD funds calculated with State Street data against the Bloomberg Global Aggregate index (a bond index). The historical performance of PD compared to bonds has been impressive. Compared to the index, the PME is greater than one for almost all vintage years, lending credence to the notion that PD outperforms publicly traded bonds. This largely reflects the fact that low interest rates reduced returns for publicly traded bonds from 2009 to 2021, a point highlighted in the Fundraising and Recent Growth Section as a key factor in the growth of PD.

[25] For each vintage year, we take the mean of the TVPI and DPI multiples with equal weighing for the VC and buyout strategies (i.e., 50% VC and 50% buyout).
[26] Josh Lerner, Ann Leamon, and Felda Hardymon, Venture Capital, Private Equity, and the Financing of Entrepreneurship (New York: John Wiley & Sons, Inc., 2012).
[27] Steven Kaplan and Antoinette Schoar, "Private Equity Performance: Returns, Persistence, and Capital," Journal of Finance 60, no. 4 (2005): 1791- 1823.
[28] Ibid.

Figure 7: PMEs for PD funds, compared to the Bloomberg Global Aggregate index



Source: State Street Global Markets, as of Q4 2023; Bloomberg.

These analyses presented in this section suggest that PD provides lower returns than VC or buyouts, but also entails less risk. PD performance is usually superior to that of publicly traded bonds, which supports the view that PD can act as a private capital alternative to fixed income investments. The annualized 8.1% return of PD compares favorably to the low returns of fixed income over the same period, and PD returns materialize relatively quicker. Investors' interest in PD is understandable, given its performance and cash flow profile. To further explore trends in investment, we next consider allocations to the asset class.

Allocations by Investor Type

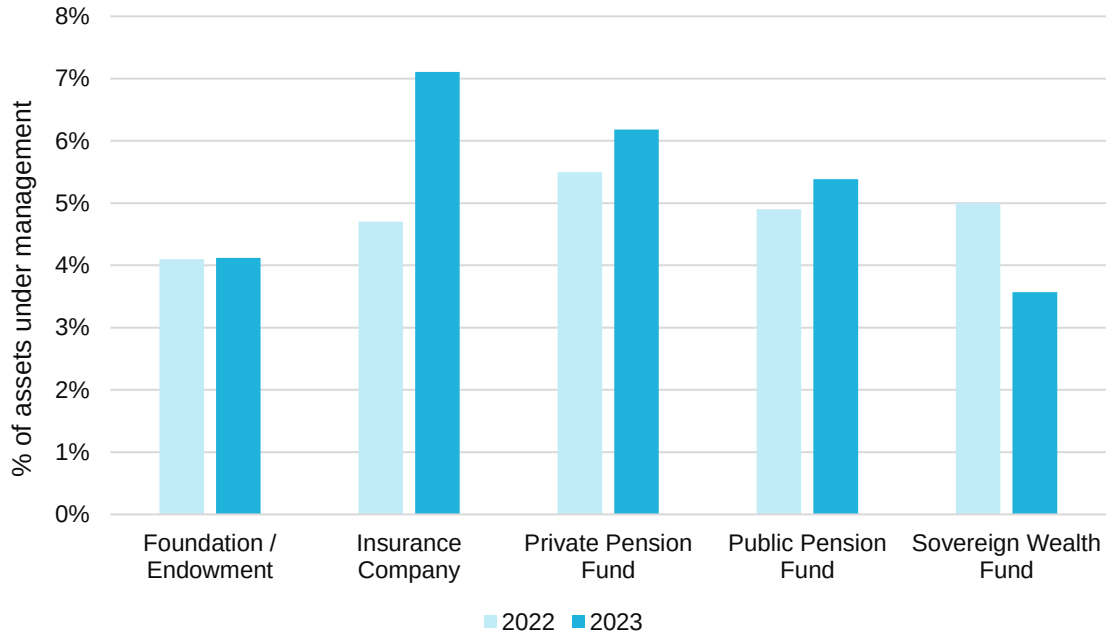
This section surveys the composition of PD investment by investor type and examines trends in PD allocations. We find that institutional investors such as private pension funds, attracted by the relatively quick, reliable returns as well as strong risk-adjusted performance, are the largest investors in PD.

Echoing the fundraising growth explored in the Fundraising and Recent Growth Section, investors' allocations to PD have recently been on the rise. Figure 8 shows the average allocation to PD as a percentage of AUM increased among insurance companies, public pension funds, and private pension funds from 2022 to 2023. The overall average across institution types in this survey was 5.28% in 2023.[29] Only sovereign wealth funds experienced a year-on-year decline in their PD allocation. Among these investor types, insurance companies and private pension funds contribute

[29] John Bakie and Wassyl Abdessemed, "Investor Report Full Year 2023," Private Debt Investor, March 1, 2024, https://media.privatedebtinvestor.com/uploads/2024/04/2023-full-year-investor-report-pdi-1.pdf.

the highest share of their AUM to PD.

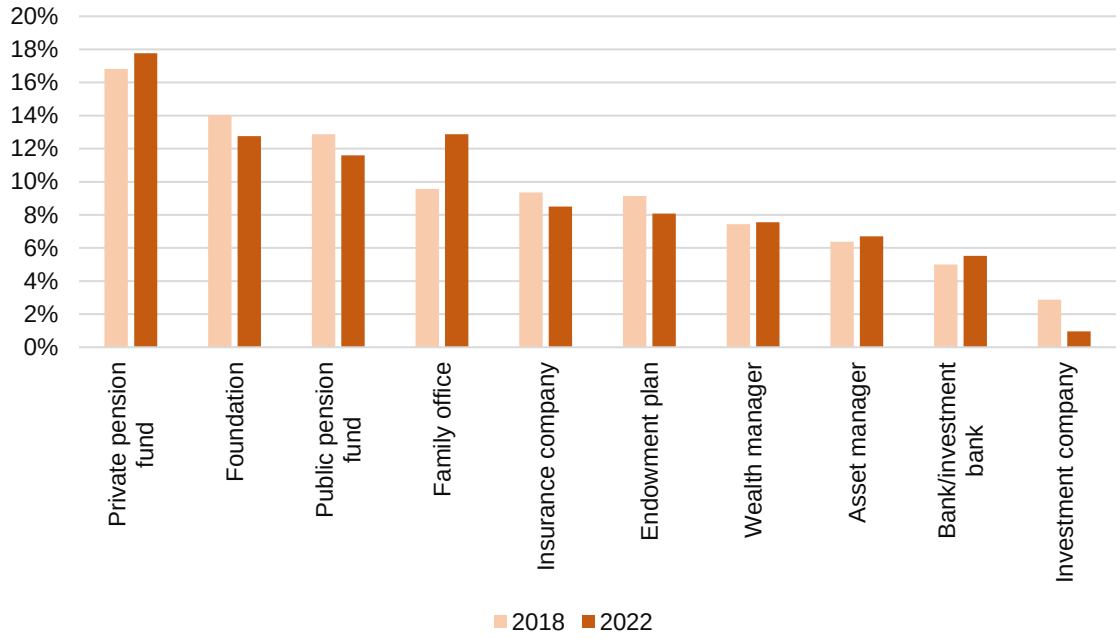
Figure 8: Average PD allocation by investor type



Source: Bakie and Abdessemed, "Investor Report Full Year 2023"; "Annual Review 2022," Private Debt Investor, March 1, 2023, https://www.privatedebtinvestor.com/download-pdis-2022-annual-review/.

Beyond investors' allocations to PD as a share of AUM, we can examine the composition of investors for the overall asset class. Reflecting their high average allocation shares to PD, private pension funds made up the largest share of total PD investment in 2022 at 18%, as seen in Figure 9. The cash flow requirements of pension funds help explain their prominence in PD given that these funds must regularly pay pensions to retired workers. Foundations and public pension funds were the next most influential investors.

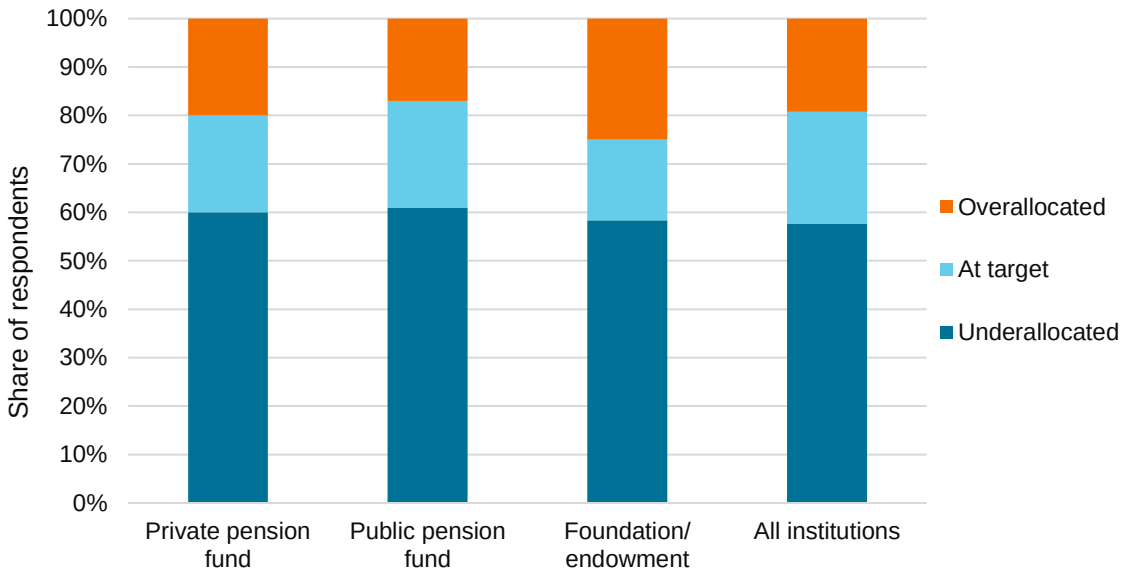
Figure 9: Share of investors in PD by type



Source: "Preqin Global Report 2023: Private Debt," Preqin, December 31, 2022, https://www.preqin.com/insights/insights/global-reports/2023-private-debt.

Moreover, survey results offer insight into how investors' allocations may continue to evolve. Figure 10 illustrates the share of respondents that are overallocated, at target, or underallocated to PD by investor type. Overall, 19% are overallocated to PD, suggesting they plan to invest less capital in the asset class. This share is particularly high among foundations and endowments at 25%. By comparison, nearly 60% of investors report they are underallocated, indicating they plan to invest more capital in the asset class. This share is largely similar across investor types. This suggests that, on balance, allocations to PD will likely continue to grow.

Figure 10: Investors' allocation status at the end of 2023, by investor type[30]



Source: Bakie and Abdessemed, "Investor Report Full Year 2023."

Past and prospective allocations to PD indicate that investors, particularly pension fund managers, find its quicker, more predictable distribution of returns attractive relative to other private capital asset classes. The high share of underallocated investors suggest the asset class will continue to grow going forward. With this context of current and future allocations, we explore the impact of increasing exposure to PD on portfolio diversification in the next section.

PD and Portfolio Diversification

Given the historical performance of the asset class and increasing popularity among institutional investors, new investors to the asset class may wonder how PD fits into their overall investment strategy. This section provides guidance on how an investor could incorporate a PD allocation into an existing portfolio and potentially reduce risk while increasing returns. We then analyze the correlations of PD returns with returns from other investment strategies to better understand their diversification potential.

Diversification is a common technique for minimizing risk, which involves investing in a variety of assets. Portfolios that consist of 60% allocation to public equities and 40% allocation to bonds (or the traditional "60/40 portfolio") have been historically popular in the search for diversification. By dividing capital between the two asset classes, investors hope to reduce risk. When equities perform poorly, bonds should experience higher returns to partially offset the losses. When bond returns are low, stock performance should bring about more positive gains for the portfolio. This reflects low correlations between these asset classes, indicating their values are less likely to increase or decrease in tandem. We consider correlations in greater depth later in this section.

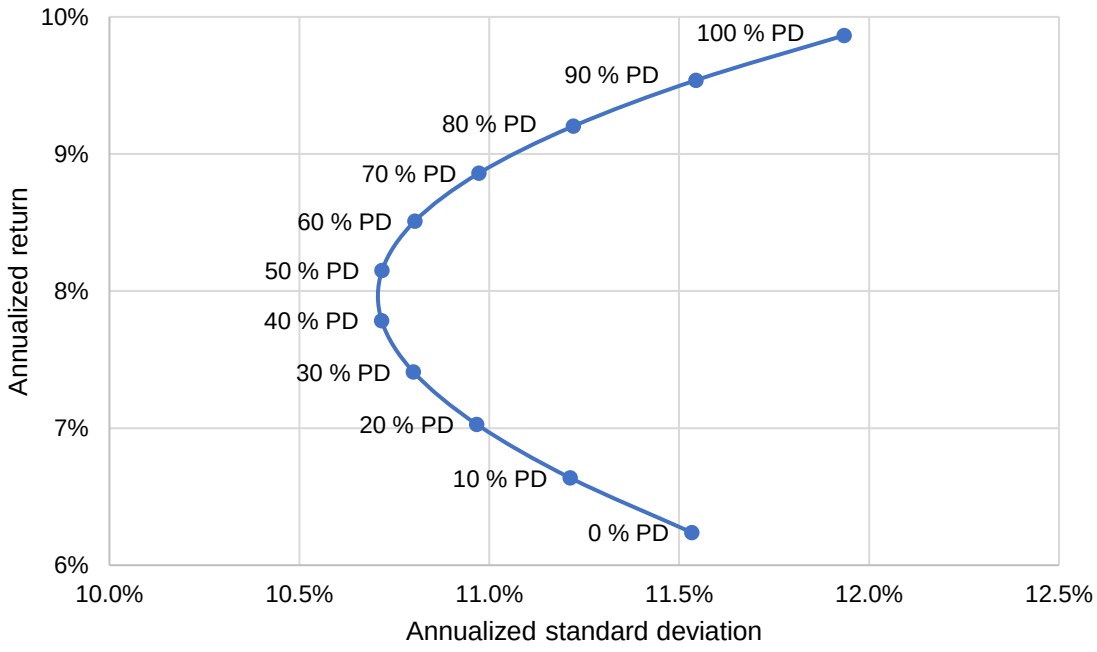
[30] The authors define "at target" as the investor's current allocation is within 0.5% of the target allocation.

To gauge the portfolio-level impact of an increase in PD exposure, we start with an extreme case: where PD is the only alternative to stocks and bonds. We first consider the classic portfolio with a 60% allocation to stocks and 40% allocation to bonds. We then incrementally increase the allocation to PD while proportionally reducing allocations to stocks and bonds. At a 50% PD allocation, for example, the allocation to stocks reduces to 30% (60% x 0.5) and allocation to bonds becomes 20% (40% x 0.5). For every level of exposure to PD, we calculate the annualized returns and annualized standard deviation in returns. We use the MSCI World Total Return Net index to represent public equities and the Bloomberg Global Aggregate Total Return Unhedged index for bonds.[31] We use State Street data for our PD index.[32] To combat the issue of infrequent and inconsistent reporting of private markets returns, we de-smooth the PD returns.[33]

Figure 11 shows how a portfolio's returns and standard deviation change as an investor increases their allocation to PD while lowering their allocation to public equities and bonds. The graph suggests that with a PD allocation between 0% and around 40%, the portfolio benefits from diversification: as capital allocation intensifies for PD (at the expense of stocks and bonds), the return increases while risk decreases. However, once PD allocations exceed 40%, additional expected returns carry greater risk and lose some of the benefits of diversification.

[31] Data on bonds from Bloomberg, accessed April 4, 2024, and data on stocks from Preqin Pro, accessed May 10, 2024.
[32] Data on PD from State Street, as of Q4 2023.
[33] Private capital often entails infrequent and inconsistent reporting relative to public market asset classes due to lower public scrutiny and less stringent reporting requirements. This leads to the "stale pricing problem" as outdated valuations in private capital persist despite undocumented changes in the asset's real value. This "smooths" out the volatility in the asset's real price and artificially lowers correlations between private and public markets. To illustrate, Welch and Stubben (2018) find the correlation between private equity returns and public market returns increased significantly after private equity funds moved from cost-based accounting to fair-value accounting. To de-smooth PD returns, we use a simple first-order autoregressive model, similar to Kinlaw, et al. (2013) and Kinlaw, et al. (2014).
Sources: Kyle Welch and Stephen Stubben, "Private Equity's Diversification Illusion: Evidence from Fair Value Accounting" (November 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2379170; William B Kinlaw, Mark Kritzman, and David Turkington, "Liquidity and Portfolio Choice: A Unified Approach," *The Journal of Portfolio Management* 39, 1 (2013): 19 – 27; William B Kinlaw, Mark Kritzman, and Jason Mao, "The Components of Private Equity Performance: Implications for Portfolio Choice," MIT Sloan Research Paper No. 5084 (February 2014).

Figure 11: Annualized standard deviation in returns vs. annualized return for portfolios comprising various stock, bond, and PD allocations[34]



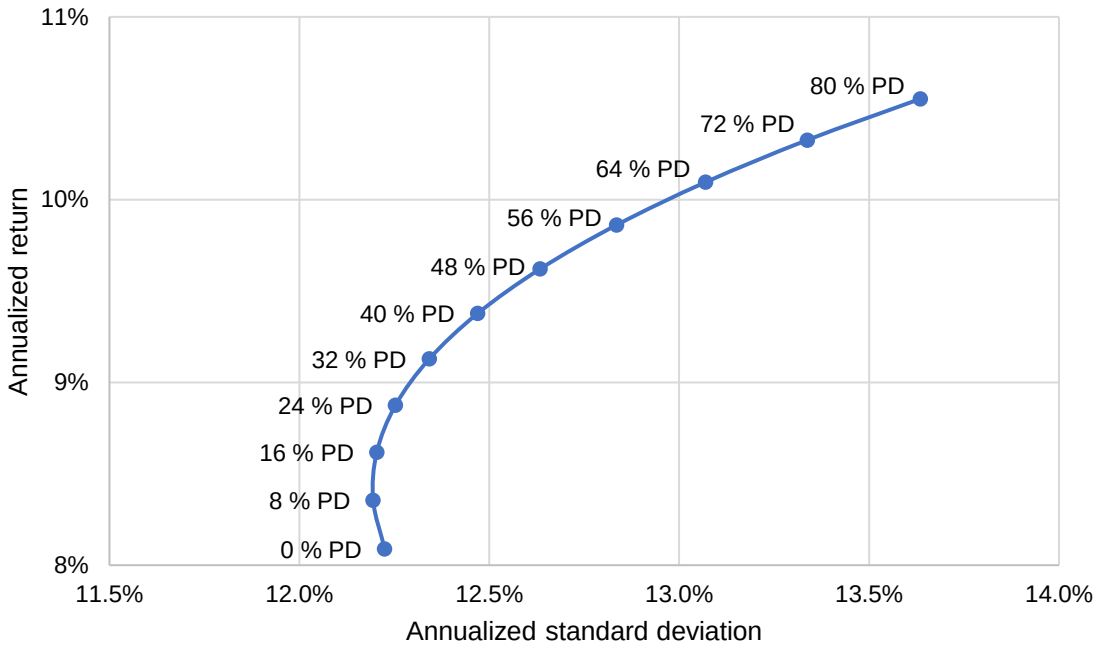
Source: Data on PD from State Street Global Markets, as of Q4 2023; bonds from Bloomberg, accessed April 4, 2024; and stocks from Preqin Pro, accessed May 10, 2024.

Second, we consider the role of PD in a portfolio that already includes private capital in the form of VC and buyout investments. To construct indexes for the latter two asset classes, we again use State Street data. Once again, we de-smooth the private markets return data. Our initial 0% PD portfolio features a 30% allocation to bonds, 50% to stocks, 10% to VC, and 10% to buyouts. As the PD allocation incrementally increases, we assume that the allocations to VC and buyouts remain fixed at 10% each while the concentration of stocks and bonds decreases proportionally.

Figure 12 illustrates how a portfolio's risk and returns change as an investor progressively shifts funds from public equities and bonds to PD but keeps the allocation to VC and buyouts fixed. As with the previous example, returns increase with greater allocation to PD, and risk decreases until around 10% PD allocation. This suggests that a portfolio that already includes other types of private market assets may also realize diversification benefits with a PD allocation.

[34] This analysis employs data from Q1 2001 to Q4 2023.

Figure 12: Annualized standard deviation in returns vs. annualized return for portfolios comprising various stock, bond, PD, VC, and buyout allocations



Source: Data on private capital from State Street Global Markets, as of Q4 2023; bonds from Bloomberg, accessed April 4, 2024; and stocks from Preqin Pro, accessed May 10, 2024.

While these examples are extreme, these allocation graphs underscore an important and general point: that PD can provide an important source of diversification for a given portfolio. The asset class could boost returns while reducing risk up to an allocation threshold of about 10-40% in the two stylized portfolios we consider. However, portfolios usually contain a greater variety of asset classes with distinct allocation strategies. To further explore the role of PD within a portfolio, we can examine correlations between PD and other asset classes.

Correlation is a main component of the diversification framework. Ranging from -1.0 to 1.0, a correlation indicates the directionality and strength of the relationship between two assets. Assets are "perfectly correlated" if they have a correlation of 1.0, which means that if one asset price changes, the second changes by the same amount in the same direction. Conversely, a correlation of -1.0 indicates the asset prices move by exactly the same amount, but in opposite directions: when one increases, the other decreases proportionally (and vice versa). Investors often seek to achieve diversification by minimizing asset correlations within their portfolio. The previously discussed traditional "60/40 split" of stocks and bonds proved historically popular in part due to the modest negative correlation between the two asset classes.[35]

[35] However, recent evidence suggests this correlation is changing. See, for instance, Junying Shen and Noah Weisberger, "US Stock-Bond Correlation: What are the Macroeconomic Drivers?" PGIM IAS (May 2021), https://ssrn.com/abstract=3855610.

Pairwise correlations between asset classes came to prominence in public market portfolio management, since public markets benefit from frequently updated, easily accessible asset prices. However, measuring correlations in private capital is more difficult due to infrequent and inconsistent reporting in the short run. To combat this problem, academics have focused instead on long-run performance when comparing public and private capital asset classes.[36] We take a similar long-term perspective in this analysis. We construct indexes for buyouts, VC, and PD using State Street data. As with the previous allocation analysis, we de-smooth the return data for these three private market asset classes.[37] We then gather the MSCI World TR, S&P 500 TR, and Russell 3000 TR indexes for stocks and the Bloomberg Global Aggregate TR Unhedged index for bonds. We restate each index on a quarterly basis and calculate pairwise correlations between returns for the asset classes over the last 15 years.

Table 1 records positive correlations among every asset class considered, but the strength of these correlations varies. Notably, PD returns are highly correlated with buyout returns. This is unsurprising given the important role PD has played in facilitating leveraged buyouts.[38] PD returns are also positively correlated with VC returns but less strongly than with buyout returns. The stronger correlation of PD with buyouts might reflect the middle-market, rather than early-stage, orientation of PD funding (as early-stage companies frequently lack the cash flow to provide returns quickly enough to satisfy PD lenders).

Table 1: Pairwise correlations among selected asset classes over the last 15 years

	Buyout	VC	PD	Bonds	MSCI	S&P 500	RUS 3000
Buyout	1						
VC	0.74	1					
PD	0.83	0.59	1				
Bonds	0.22	0.27	0.22	1			
MSCI	0.87	0.71	0.87	0.4	1		
S&P 500	0.85	0.7	0.83	0.31	0.98	1	
RUS 3000	0.87	0.73	0.86	0.33	0.97	0.98	1

Source: Data on private capital from State Street Global Markets, as of Q4 2023; bonds from Bloomberg, accessed April 4, 2024; and stocks from Preqin Pro, accessed May 10, 2024.

[36] Axelson et al. (2014) analyzes the correlation between private capital and public markets using data on buyout deals over more than a decade. Source: Ulf Axelson, Morten Sorensen, and Per Stromberg, "Alpha and Beta of Buyout Deals: A Jump CAPM for Long-Term Illiquid Investments," Unpublished Manuscript, Columbia University, November 2014.
[37] See footnote 33 for discussion of our de-smoothing model.
[38] Block et al., "A Survey of Private Debt Funds."

Turning to public markets, bond returns are the least correlated with returns of other asset classes, public or private. This suggests the traditional strategy of investing in bonds for diversification may still bear fruit. While many view PD as an alternative to bonds, the low correlation between returns of the two suggests they may be complements for the purpose of diversification. Notably, PD is also highly correlated with the three public market indexes considered. The credit market, explored further in the next section, may provide an explanation for this observation. This correlation analysis suggests portfolios concentrated with bonds and VC experience diversification benefits from PD to a greater extent than portfolios concentrated with buyout funds and stocks.[39]

These findings indicate that incorporating PD into a portfolio that consists of both public and private capital assets may provide diversification benefits and help with efficient portfolio construction. Nevertheless, one should keep in mind that the prior analysis of performance and diversification concerns historical data. While past performance has been strong, the following section considers how uncertainties in the macroeconomic climate could impact whether PD maintains this level of performance in the future.

Macroeconomic and Market Considerations

Although PD has performed well over the past two decades, it is important to note that substantial variation exists among PD funds, and performance often depends on forces outside of a fund's control. This section surveys academic research focused on macroeconomic and market concerns that might influence PD performance. We recognize a variety of factors that investors might consider before including an allocation to the asset class in their portfolios.

To begin, we observe that not all funds are created equal. As discussed in the Performance Section, we find an average dispersion in returns of 6.6 percentage points between high- and low-performing PD funds with vintage years between 2011 and 2020. The average top quartile fund achieved an IRR of 12.0% while the average bottom quartile fund achieved a lower IRR of 5.4%. Academic work, such as Munday et al. (2018) and Böni and Manigart (2022), also recognizes performance dispersion, which reflects the wider phenomenon of greater variance in returns among private capital funds compared to those in public markets.[40] Also familiar in the private capital literature is the finding that PD manager experience correlates positively with returns, suggesting the skills a GP possess play a role in enhancing returns.[41] This underscores that manager selection is important to PD, similar to buyout and VC strategies.

Among macroeconomic concerns, high inflation and interest rates are perhaps the most pertinent. As discussed earlier, PD emerged as a major investment strategy partly in response to low interest rates,

[39] Despite the many high correlations in Table 1, the "stale pricing problem" may still understate the strength of correlation between PD returns and those of other asset classes, particularly bonds. Investors should keep this caveat in mind.
[40] Böni and Manigart, "Private Debt Fund Returns"; Shawn Munday, Wendy Hu, Tobias True, and Jian Zhang, "Performance of Private Credit Funds: A First Look," *The Journal of Alternative Investments* 21, 2 (Fall 2018): 31-51, https://doi.org/10.3905/jai.2018.21.2.031.
[41] Cumming et al. (2019), "The Returns to Private Debt: Primary Issuances vs. Secondary Acquisitions."

and the current high-interest-rate environment, which began in 2022, marks the first significant test of the asset class after a decade of growth. Although the Performance Section suggests that PD funds continue to perform well, inconsistent reporting of private market returns means current returns data may not yet reflect the impact of higher rates.

Academic work has largely studied PD in the context of low interest rates, but research offers some guidance into how the asset class may respond to interest rate hikes. Fritsch et al. (2021) describes how rising interest rates could pose a risk to the asset class. By increasing yields for traditional fixed income investments, higher interest rates make PD comparatively less attractive as an alternative due to its higher risk profile.[42] The authors also recognize that most PD loans are issued on a floating-rate basis, meaning the interest charged to borrowers increases or decreases corresponding to changes in a benchmark rate (such as the Secured Overnight Financing Rate set by the U.S. Federal Reserve).[43] This could pose a risk to loan recipients, because borrowers may not have anticipated interest rate hikes, and higher interest payments might induce them to default on their loans.

While floating rates may disadvantage borrowers, many investors view this aspect of PD as advantageous. Blackstone investment strategists argue that floating rate loans effectively insulate investors from interest rate hikes.[44] As rates increase, previously issued bonds that are fixed at lower rates become less attractive compared to newly available bonds offering higher interest. By comparison, interest rate hikes do not reduce the value of floating rate loans because the interest they receive increases commensurately. Floating rate loans issued in the past should receive similar interest payments as those issued on the same terms now. Unless defaults become prevalent, it seems likely floating rates can mitigate negative effects of interest rate increases for PD funds.

While the ultimate relationship between interest rates and fund performance is largely speculative, academic works have more fully considered how credit markets shape fund performance. Böni and Manigart (2022) focus on the impact of credit markets on the following three factors:

- **Funding liquidity** – The TED spread, a common proxy for funding liquidity, represents the gap between the interest rates on interbank loans and on short-term U.S. government debt. When the spread increases, the market becomes less liquid, and banks reduce their supply of bank loans. A contraction in the TED spread benefits PD by inducing borrowers to terminate their contracts early in favor of securing a bank loan instead. In this process, PD funds receive early termination fees from the companies and can re-invest their returns, gaining further transaction and origination fees from new loans. Greater funding liquidity also allows funds to achieve returns by selling debt assets on the secondary market. The researchers find that PD funds perform better with a low TED spread (high funding liquidity) before a fund closes (or finishes fundraising). Moreover, a TED spread contraction (or an increase in funding liquidity)

[42] Laura Fritsch, Wayne Lim, Alexander Montag, and Martin C. Schmalz, "Direct Lending: Evidence from European and US Markets," *The Journal of Alternative Investments* 25, 1 (Summer 2022), https://doi.org/10.3905/jai.2021.1.150.
[43] Ibid.; "Understanding Private Credit," Goldman Sachs Asset Management Insights, October 20, 2022 https://www.gsam.com/content/gsam/us/en/advisors/market-insights/gsam-insights/2022/understanding-private-credit.html.
[44] Joe Zidle, and Dwight Scott, "Private Credit Investing in Rising Rate Environments," Blackstone, May 5, 2022, https://pws.blackstone.com/education-insights/article/private-credit-investing-in-rising-rate-environments/.

after the fund closes correlates with higher returns.[45] The authors' analysis also suggests the best-performing GPs can "time" the credit market and anticipate TED spread contractions, which may explain persistence in fund performance.[46]

- **Credit spreads** – The role of credit spreads, which are differences in yields between a U.S. Treasury bond and other bonds with higher credit risks but the same maturity, is more ambiguous. On one hand, a higher credit spread should allow PD managers to negotiate for higher interest payments from borrowers and increase returns. On the other hand, a higher credit spread may reduce funds' ability to profit from sales to secondary buyers and diminish returns. Debt assets are discounted in the secondary market due to the adverse selection risk (i.e., sellers may be offloading debt of firms with a high likelihood of default), and a higher credit spread may correspond with greater risk, necessitating a higher discount.[47] The authors ultimately find that credit spread contractions are negatively associated with fund performance.[48] Performance is generally better when credit spreads are high before a fund closes and expand after a fund closes.

- **Equity market volatility** – Periods of higher volatility in financial markets, measured using the VIX index, generally witness higher excess returns.[49] Böni and Manigart (2022) finds a positive relationship between volatility and PD returns, but only for volatility prior to a fund closing (rather than afterwards).[50] These findings are consistent with Cumming et al. (2019), which also finds a positive relationship between equity market volatility and PD returns.[51] These results suggest that in highly volatile conditions, PD funds can secure higher interest payments by capitalizing on higher risk premiums and the urgent loan needs of firms in financial distress.

Beyond credit markets, investors may be concerned with the impact of the strength of a given country's legal system on PD returns. Over the past decade, the U.S. has consistently accounted for around 66% of PD fundraising on average, with Europe at 27% and Asia at 4%.[52] Nevertheless, funds in emerging markets exist, and research suggests there is no relationship between PD returns and a country's legal system.[53] This implies that GPs negotiate terms and conditions for loans to mitigate any legal risk. Munday et al. (2018) corroborates this work by finding that PD performance within and outside of North America is comparable.[54] These academic papers suggest that the location of a fund is not a major risk factor.

[45] Böni and Manigart (2022), "Private Debt Fund Returns."
[46] Ibid.
[47] Douglas Cumming and Grant Fleming, "Debt Investments in Private Firms: Legal Institutions and Investment Performance in 25 Countries," *The Journal of Fixed Income* 21, 1 (Summer 2013): 102-123, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2202539.
[48] Böni and Manigart (2022), "Private Debt Fund Returns."
[49] Kee Chung, Junbo Wang, and Chunchi Wu, "Volatility and the cross-section of corporate bond returns," *Journal of Financial Economics* 133, 2 (Nov 2018): 397-417, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3192559.
[50] Böni and Manigart (2022), "Private Debt Fund Returns."
[51] Cumming et al. (2019), "The Returns to Private Debt: Primary Issuances vs. Secondary Acquisitions."
[52] "Global Private Debt Report 2023 Annual," Pitchbook.
[53] Cumming and Fleming (2013), "Debt Investments in Private Firms: Legal Institutions and Investment Performance in 25 Countries."
[54] Munday et al. (2018), "Performance of Private Credit Funds: A First Look."

More broadly, it is important to note that many financial products in the past "performed well until they did not," and investors are often too late to recognize key risk factors. Well-publicized examples include the implosion of mortgage-backed securities amid the GFC and the 1987 collapse of portfolio insurance products, which were designed to hedge against a fall in stock prices but instead contributed to a selling frenzy that accelerated a market decline.[55] More relevant for PD is the turbulence historically seen in mezzanine debt, a sub-strategy of PD that includes equity-like characteristics and is often subordinated in a company's capital structure (i.e., not repaid until senior debt is fully paid off). After coming to prominence in the 1980s, the market for mezzanine debt "nearly disappeared" in the late 1980s and again in the mid-1990s, likely in response to wider fluctuations in the high-yield market.[56] Altogether, this financial history suggests that, while PD has performed well over the past decade, this trend is not guaranteed to persist.

Overall, fund selection can play an important role in shaping investors' PD returns. Academic work suggests returns are higher given greater access to funding, higher credit spreads, and greater equity market volatility. Investors cannot control these factors once committed to a PD fund, but they can keep them in mind when considering whether to invest in the first place. Even though PD entails less risk than other private capital strategies, investors might benefit from recognizing that careful consideration of macroeconomic trends and fund specifics can impact returns.

Conclusion

Given the findings of this analysis, growing interest in PD among institutional investors such as CalPERS is not surprising. The performance of PD over the past two decades has been impressive. Although lower than returns achieved by equity strategies, PD's annualized return of 8.1% over the last ten years remains attractive among alternative assets given its lower level of risk. Further, our allocation and correlation analyses suggest PD can enhance the benefits of diversification in portfolios that already include public and private capital assets.

Given disappointing returns from fixed income investments in periods of low interest rates, institutional investors, especially pension funds, have come to view PD as an alluring alternative to bonds that can provide higher returns while distributing these returns relatively quickly and consistently. Still, the timing of investment and choice of funds can significantly affect performance.

Prospective investors could benefit from carefully assessing the benefits of PD and gauging whether the illiquidity and long-term nature of these funds make sense in their investment strategy. As a less risky option within the generally high-risk realm of private capital, PD could boost returns and fit into a well-balanced portfolio.

[55] Robert Shiller, "Portfolio Insurance and Other Investor Fashions as Factors in the 1987 Stock Market Crash" in *NBER Macroeconomics Annual 1988, Volume 3* (Massachusetts: MIT Press, 1988), 287 – 297, https://www.nber.org/system/files/chapters/c10958.
[56] Justin Schack, "Stuck in the middle," Institutional Investor, September 30, 2000, https://www.institutionalinvestor.com/article/2btfwte0lc2ld6ykiczcw/portfolio/stuck-in-the-middle.

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