

WHITE PAPER

Does Private Equity Enhance Retirement Investment Outcomes?

Evidence from the Experience of Pension Funds

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Executive Summary

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In the landscape of retirement account investments, private equity, or PE, has long been included in pension plans; academics and policymakers have frequently debated its usefulness in defined-contribution, or DC, plans. While DC plans offer greater flexibility and portability, they also transfer more responsibility and risk to individual participants. This shift requires individuals to have a higher level of financial literacy and engagement, making the inclusion of PE more challenging in DC plans than in traditional pension plans. Thus, the trade-offs of investing in PE—potentially higher returns and uncorrelated assets versus more risk and less liquidity—present more-complex considerations in the DC space than in the pension plan space.

In contrast to much of the academic literature, our approach to assessing the inclusion of PE in retirement accounts relies on real-world data and avoids unrealistic assumptions. Instead of simulations, like those presented by academics, we examine the actual historical allocations made by pension plans to PE funds and the real returns generated by these PE funds. Surprisingly, our analysis reveals a wider range of pension plan behaviors and outcomes in all aspects, which is unexpected given that professional managers typically make investment decisions for these pension plans. The lack of consensus on the optimal PE allocation percentage and the varied performance of selected funds suggests that a one-size-fits-all approach to PE investments in DC plans may not exist, even among professionals. If plan sponsors are considering adding PE to their DC plans, employers and plan managers should be encouraged to leverage third-party data and tools relating to PE funds to meet their fiduciary duties under the Employee Retirement Income Security Act, or ERISA. Further, plan participants must also be better educated on the trade-offs of investing in PE compared with conventional investments in registered funds.

Key Takeaways

- PE investments in DC plans introduce complexity because of higher fees, lack of price transparency, and illiquidity, posing challenges for participants and plan sponsors.
- Transparency, disclosure, and careful fund and manager selection become crucial to inform participants about risks in this context.
- In our examination of pension plan data filed with the Department of Labor, or DOL, from 2009-20, we find a range of behavior regarding allocation to PE.
- Pension plans displayed diverse allocation strategies for PE investments, characterized by substantial year-to-year fluctuations and an absence of size-related correlations.
- The selection of PE funds, marked by unique preferences, often varied among plans, although we saw more consensus among plans regarding which fund families they had an interest in for investing.
- Returns on selected PE funds mirrored the broader U.S. PE industry's performance, accentuating the complexity and divergence in decision-making among pension plans and indicating that pension plan managers did not demonstrate special skill in selecting PE funds.
- To address these complexities and risks, plan sponsors should consider leveraging available PE data, third-party evaluation, and education of plan participants in order to fulfill their fiduciary duty under ERISA.
- Enhancements to the data filed with the DOL in the Form 5500, including changes previously proposed in 2016 and 2021, are needed to facilitate broader and deeper analysis of the use of PE in pension plans.

Introduction

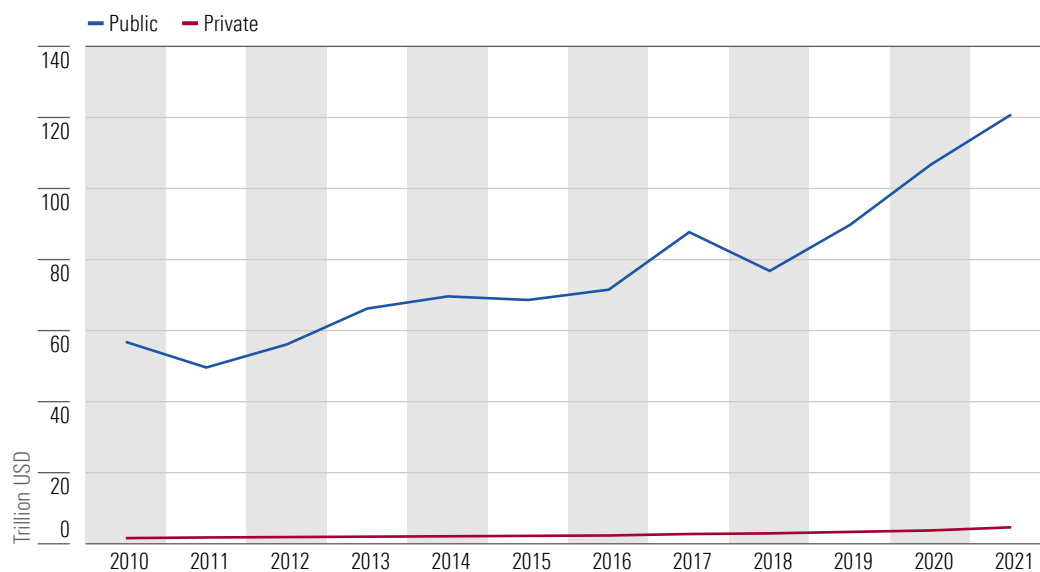
With fewer companies going public—Crunchbase currently estimates almost 1,500 private unicorns valued at \$5 trillion in capital¹—the prospect of investing in private equities is becoming increasingly alluring. Exhibit 1 demonstrates that public and PE markets have grown in tandem over the past decade. While PE is still a small portion of overall markets, as shown in Exhibit 1, PE has grown at a faster clip, going to 3.7% from 2.7% of total equity markets in this span. Many PE firms have long sought to break into the DC market. Stephen Schwarzman, CEO of the world's largest PE firm, Blackstone, stressed his ambition for Blackstone to get access to the \$9.8 trillion in the 401(k) market (401(k)s are the most common type of DC plan), saying “in life you have to have a dream, and one of our dreams is our desire and the market's need to have more access at retail to alternative asset products.”² Traditional pension plans are key investors in PE, comprising about one fourth of total PE capital in 2018.³ However, with pension plans becoming rare compared with DC plans, PE could unlock trillions in capital if available through DC plans.

¹ 2023. “Crunchbase Unicorn Board.” *Crunchbase News*. <https://news.crunchbase.com/unicorn-company-list/>.

² Dayen, D. 2017. “Donald Trump's executive order will let private equity funds drain your 401(k).” *The Intercept*. Feb. 6, 2017. <https://theintercept.com/2017/02/06/donald-trumps-executive-order-will-let-private-equity-funds-drain-your-401k/>.

³ Whyte, A. 2019. “Public Pensions Pour More Money Into Private Equity.” *Institutional Investor LLC*. Jan. 31, 2019. <https://www.institutionalinvestor.com/article/2bsw71bipbjqg3wo17da8/portfolio/public-pensions-pour-more-money-into-private-equity>.

Exhibit 1 Global Public and Private Equity Market Capitalization



Source: Public data from Sifma 2023 Capital Markets Fact Book. Private data from PitchBook.
Analyst Note: What the Future Holds for Private Capital.

The likely entry point for PE firms seeking access to DC plans are target-date funds, or TDFs, a common default option for DC plans.⁴ “Some 5% of DC plans already offer some type of fund option that includes real estate or PE in their investment line-up,”⁵ and such offerings might come through customized TDFs.⁶ However, the majority of DC plan sponsors have traditionally stayed away from adding PE to their TDFs to avoid potential fiduciary liability under ERISA.⁷ Further, TDFs are often offered as a qualified default investment alternative, or QDIA, and, under ERISA, this status raises the bar on their appropriateness for investors.

In this paper, we examine the current policy arguments for and against adding PE to DC plans, assess the current literature, put forth our methodology for evaluating PE performance in pension plans, and present our findings, which we believe are relevant to DC plans considering adding PE options.

⁴ Benz, C. 2022. “Are Target-Date Funds Good Investments?” *Morningstar*. Oct. 6, 2023. <https://www.morningstar.com/articles/1034854/are-target-date-funds-good-investments>.

⁵ Cometto, M.T. 2022. “US: A cautious approach on private assets in DC plans.” *IPE*. July/August 2022. <https://www.ipe.com/comment/us-a-cautious-approach-on-private-assets-in-dc-plans/10060732.article#:~:text=Growing%20up%20take,And%20this%20figure%20is%20growing>.

⁶ Lazard Asset Management. 2021. “DC Rising: The Ultimate Upgrade.” Lazard Asset Management. https://www.lazardassetmanagement.com/docs/-m0-/122203/DCRising_TheUltimateUpgrade.pdf.

⁷ Pepperdine Law. Slomovics, M. 2022. “Reduce Income Inequality: Allow Retail Investors to Invest in Private Equity.” *The Journal of Business, Entrepreneurship, & the Law*, Vol. 14, No. 1. P. 329.

Compelling Arguments Have Been Offered Both for and Against the Inclusion of PE in DC Plans

While PE is a generally accepted asset class to a broad group of investors, its place in DC plans remains highly contentious. On the one hand, the growth and popularity of PE may make its presence in DC plans inevitable. With the number of publicly traded companies reduced by half in the past 20 years, some believe there are more DC dollars than ever chasing fewer and fewer available shares of public companies.⁸ From this perspective, PE investments could potentially address the challenge of allocating DC dollars effectively and provide greater diversification. Furthermore, proponents argue that PE could play a vital role in financing smaller private businesses that lack access to robust equity financing options. This perspective views private equities inclusion in DC plans as a positive step toward channeling the substantial wealth held in these plans to support struggling U.S. businesses.⁹

On the opposing side of the debate, there are valid concerns and drawbacks to consider. PE investments often come with higher fees, which erode potential returns and reduce the attractiveness of including them in DC plans.¹⁰ Excess capital supply through the investment of DC capital may lead to suboptimal investment decisions and lower overall returns from their current trends. Additionally, the illiquidity inherent in PE investments presents challenges in terms of ensuring sufficient access to changes in allocation or withdrawals (if not aligned properly with the retirement timeline) for DC plan participants, potentially introducing risks and complexity into the plans. Furthermore, PE funds do not have the same disclosure and transparency requirements as other investment types commonly offered in DC plans. An additional element of these risks comes from the greater distribution of outcomes than with other investment vehicles, increasing the importance of fund and manager selection.

Ultimately, while there are compelling arguments in favor of including PE in DC plans, such as addressing capital allocation challenges and supporting smaller businesses, there are also significant concerns, including higher fees, potential lower returns, liquidity risks, and transparency issues.

⁸Schick, J. 2020. "Private Equity in Your 401(k): Analyzing Recent DOL Guidance." *University of Cincinnati Law Review*. <https://uclawreview.org/2020/10/29/private-equity-in-your-401k-analyzing-recent-dol-guidance/>.

⁹Slomovics, "Reduce Income Inequality: Allow Retail Investors to Invest in Private Equity."

¹⁰Brown, G.W. 2022. "Should Defined Contribution Plans Include Private Equity Investments?" *Financial Analysts Journal*, Vol. 78, No. 4. <https://rpc.cfainstitute.org/en/research/financial-analysts-journal/2022/should-defined-contribution-plans-include-private-equity-investments>.

PE Could Theoretically Help Retirement Plan Participants, but Practical Limitations Have Hindered Its Inclusion in DC Plans

In addition to spreading wealth among struggling businesses, the inclusion of PE in retirement portfolios could serve to benefit middle-class Americans. By opening PE markets to individual middle-class retail investors, some believe that individuals could reduce the risks of their portfolio while retaining or even increasing their returns, leaving them better off.¹¹ From vintage years 1998 to 2020, with “vintage year” for PE funds akin to the inception year for mutual funds,¹² North America PE has had a pooled internal rate of return, or pooled IRR, averaging IRR across all funds, ranging from a low of 5.12% in vintage year 1998 to a high of 23.66% in vintage year 2017. The average pooled IRR for vintage years 1998 to 2020 is 16.55%. Exhibit 2 presents the pooled IRR values for each vintage year from 1998 to 2020 according to the North America PitchBook Benchmarks published in October 2023.¹³ Compared with the S&P 500 index, the Kaplan Schoar PME, or KS-PME, for vintage year 1998 to vintage year 2020 was above 1.00 for 22 of the 23 years and was exactly 1.00 for one year (2007). Compared with the Morningstar US Market Index, the KS-PME for vintage year 1998 to vintage year 2020 was above 1.00 for 22 of the 23 years and was just below at 0.99 for one year (2007). Thus, according to the KS-PME, North America PE returns outperformed the S&P 500 index and the Morningstar US Market Index for 22 of the 23 years. We note, however, that investors are unable to invest in a way that captures the KS-PME returns – unlike the S&P 500 – the lack of transparency and liquidity in the PE market makes it impossible, currently, for investors to attain the average PE return for any year or set of years.

In addition to analyzing PE returns, one must account for PE risk. PitchBook has found that fair value accounting practices and conservative valuations have resulted in artificially smoothed reported returns in private markets.¹⁴ Artificially smoothed returns systematically underestimate risk and overestimate diversification benefits of private market asset classes. Smoothing returns moves correlation with other assets toward zero, causing private market assets to have smaller observed correlations with public market assets than they really do. Thus, to obtain a more accurate measure of PE risk, PitchBook recommends using a desmoothing method to adjust reported private market returns, such as the one developed by David Geltner.¹⁵ When this method is applied, results suggest that private markets are significantly riskier than they appear as measured by volatility. Whereas the reported volatility (the smoothed volatility) for PE is 9.8%, the estimated true volatility for PE (the desmoothed volatility) is 17.1%.¹⁶ The true volatility for PE can be compared with the volatility for the S&P 500 and Russell 2000. The smoothed volatility and desmoothed volatility for the S&P 500 are the same, at 16.8%. Similarly, the smoothed volatility and desmoothed volatility for the Russell 2000 are the same, at 22.5%. Therefore, PE risk is slightly higher than the risk level for the S&P 500 but lower than the risk level for the Russell 2000.

¹¹ Lewis, A. 2019. “Donald Trump Pledges to Finally Address Carried Interest Loophole.” *PitchBook*. May 21, 2019. <https://pitchbook.com/news/articles/donald-trump-pledges-to-finally-address-carried-interest-loophole>.

¹² The term “vintage year” refers to the milestone year in which the first influx of investment capital is delivered to a project or company. This marks the moment when capital is committed by a private equity fund. The vintage year is based on the year of first investment. If year of first investment is unknown, the year of the final close is used as the vintage year. However, if a firm publicly declares, via press release or a notice on its website, a fund to be of a particular vintage different from either of the first conditions, the firm’s classification takes precedence.

¹³ *PitchBook*. 2023. “PitchBook Benchmarks (as of Q1 2023) – North America” https://files.pitchbook.com/website/files/pdf/PitchBook_Benchmarks_as_of_Q1_2023_North_America.pdf. The pooled IRR is a NAV weighted figure comparable to a market-cap-weighted benchmark, and it is a money-weighted return (not a time-weighted return). The PME values are calculated using the Kaplan-Schoar PME method; a value greater than 1.0 implies outperformance of the fund over the public index.

¹⁴ *PitchBook*. 2021. “Return Smoothing in Private Markets.” June 3, 2021. <https://pitchbook.com/news/reports/q2-2020-pitchbook-analyst-note-return-smoothing-in-private-markets>.

¹⁵ Geltner, D. 1993. “Estimating Market Values from Appraised Value Without Assuming an Efficient Market.” *The Journal of Real Estate Research*, Vol. 8, No. 3. P. 325.

¹⁶ PitchBook, Return Smoothing.

Exhibit 2 North America Private Equity Returns by Vintage Year Relative to Benchmarks

Vintage Year	Pooled IRR	S&P 500 Index		Morningstar US Market	
		Index Return	KS-PME	Index Return	KS-PME
1998	5.12%	7.58%	1.23	7.69%	1.18
1999	10.63%	6.91%	1.41	7.19%	1.37
2000	13.59%	6.61%	1.38	6.84%	1.34
2001	22.28%	7.40%	1.63	7.61%	1.58
2002	19.63%	8.30%	1.50	8.52%	1.46
2003	14.79%	10.14%	1.41	10.37%	1.37
2004	11.54%	9.01%	1.31	9.15%	1.28
2005	11.09%	9.12%	1.26	9.21%	1.23
2006	8.34%	9.08%	1.05	9.05%	1.03
2007	10.60%	8.84%	1.00	8.80%	0.99
2008	14.77%	9.70%	1.05	9.68%	1.04
2009	18.78%	14.36%	1.16	14.30%	1.16
2010	13.64%	12.45%	1.11	12.25%	1.11
2011	17.57%	11.98%	1.17	11.65%	1.18
2012	17.13%	12.56%	1.16	12.22%	1.18
2013	16.21%	12.34%	1.14	11.96%	1.16
2014	21.37%	11.13%	1.37	10.64%	1.39
2015	22.39%	10.69%	1.32	10.23%	1.33
2016	21.01%	12.86%	1.28	12.57%	1.30
2017	23.66%	11.44%	1.35	10.95%	1.37
2018	22.64%	9.83%	1.30	9.32%	1.32
2019	23.26%	12.00%	1.31	11.38%	1.33
2020	20.63%	11.18%	1.26	10.70%	1.28

Source: PitchBook Benchmarks (as of First-Quarter 2023) - North America.

Private assets could potentially be viewed as a hedge against volatility in the public markets. The reduced risk comes through investing in an asset class that is less correlated with the other assets in investor portfolios. Historically, in the United States, PE has outperformed the public markets. As shown in Exhibit 2, pooled IRR for U.S. vintages from 2009 to 2015 all have public market equivalents, or PME, above 1.0, indicating outperformance over public markets (a caveat is that the KS-PME approach assumes a beta of 1.0 for the calculation).

Despite geopolitical conflict, inflation, and central bank hawkishness that brought the global economy to the brink of recession in 2022, fundraising in the private markets in 2022 remained relatively strong, and fund assets experienced only marginal markdowns according to PitchBook's benchmarks.¹⁷ However, PitchBook's 2023 US Private Equity Outlook report forecasts that "aggregate PE fund returns will underperform public equity benchmarks as private market valuations continue to get marked down."¹⁸ Part of the rationale is that PE fund performance has been driven almost entirely by net asset value, or NAV, markups in contrast to realized returns via distributions. PitchBook believes these PE fund markups are unlikely to be fully realized given deterioration of liquidity for exits in addition to a reset in public market valuations.

Another aspect of greater access to PE would be leveling the availability to both institutional and retail investors. Most investors in PE are large institutional investors and wealthy individuals; however, with the inclusion of middle-class retail investors through DC plans, more individuals would have access to the wealth accumulation opportunities that comes with PE. Some commentators believe that laws forbidding retail investors because of their "unsophistication" robs retail investors of the ability to decide for themselves whether to invest in private placements, locking the investor out of these investments.¹⁹ The Securities and Exchange Commission, or SEC, set standards to ensure that only investors who are able "to sustain the risk of loss of investment" are permitted to invest in private placement. To be deemed an accredited investor, individuals need to display financial sophistication and sufficient assets. These requirements are satisfied through wealth and income requirements in addition to professional titles and licenses.²⁰

All investments have risks, with PE investments being no exception. Concerted efforts on education could be made to ensure participants have a clear understanding of the investments they can make. PE can be a diversifier for investors who are willing to take on risk, though selection of the right PE investments is a challenge that we will emphasize throughout this paper.

¹⁷ Carmean, Z. 2023. "Looking Ahead to Private Markets in 2027." *PitchBook*. Jan. 28, 2023. <https://pitchbook.com/newsletter/looking-ahead-to-private-markets-in-2027>.

¹⁸ *PitchBook*. 2023. "2023 US Private Equity Outlook: H1 Follow-Up." July 6, 2023. https://files.pitchbook.com/website/files/pdf/2023_US_Private_Equity_Outlook_H1_Follow-Up.pdf

¹⁹ Lewis, Carried Interest Loophole.

²⁰ SEC. 2022. "Accredited Investor." <https://www.sec.gov/education/capitalraising/building-blocks/accredited-investor>. The income requirements include having a net worth of over \$1 million and annual income over \$200,000, or \$300,000 with a spouse or partner. The professional criteria include holding the general securities representative license, the investment adviser representative license, or the private securities offerings representative license. The current accredited investor income and net worth thresholds are not adjusted for inflation. Congressional Research Service (CRS). 2023. "Accredited Investor Definition and Private Securities Markets." <https://sgp.fas.org/crs/misc/IF11278.pdf>.

Including PE in Retirement Plans Comes With Disadvantages Specific to Private Markets

Some commentators believe that PE's lack of transparency, relatively high fees, illiquidity, and complex valuations are far too risky, making it inappropriate for DC plan participants.²¹ Investors cannot simply infer the value of PE from looking at publicly available market figures; they have to engage in some form of PE valuation if they wish to evaluate PE opportunities.

Looking at the text in ERISA, no specific language prohibits PE. However, incorporating private funds (which generally charge higher fees than public ones and are illiquid, making them harder to value and exit) poses obstacles and potential legal liabilities for retirement plan sponsors.²²

Investors who use PE believe that the benefits outweigh these challenges. The inclusion of PE funds in DC plans could help mitigate one of the possible downsides of PE investments, which is lack of liquidity. Since PE investments are usually illiquid, investors may pay less money relative to a similar asset that is fully liquid. In terms of DC plans, such illiquidity will not present as a downside since most individuals have a long-term time horizon for their investments.²³ Therefore, for individuals with a 40-year time horizon, a relatively small period of illiquidity for a fraction of this time will not be a big issue. Investors would not have the same choices around rebalancing their assets across the PE portion of their portfolio, but such issues could be managed with timely notifications and PE held within another vehicle—for example, a target-date collective investment trust or mutual fund—that would manage the liquidity challenges. Of course, circumstances involving moving or rolling over DC plans when individuals change jobs will present liquidity and operational challenges.

²¹ Buckmann, C. 2022. "Should Private Equity Be in 401(k) Plans?" *InvestmentNews LLC*, March 17, 2022. <https://www.investmentnews.com/should-private-equity-be-in-401k-plans-218394>.

²² Alon-Beck, A. 2020. "Alternative Venture Capital: The New Unicorn Investors," *88 Tennessee Law Review 985, Case Legal Studies Research Paper No. 2020-26*. <https://ssrn.com/abstract=3361780>. As mentioned in this article, Robert Johnson, a professor of finance at Creighton University, believes it's a mistake to give 401(k) investors access to private equity through plans. "Private equity structures are complex and opaque to the average investor," says Johnson, noting that "the asset class embeds large fees in the structures and the returns differ widely by firm and vintage."

²³ Lewis, Carried Interest Loophole.

The Department of Labor Has Flip-Flopped in Its Guidance on the Inclusion of PE in DC Plans

Considering these various benefits and risks, the DOL has shifted its position during different administrations. The question is still open on whether employers who have an obligation to choose beneficial funds will be willing to take on added risk for something that most employees likely will not understand.²⁴ At least one PE sponsor asked the DOL for an advisory opinion regarding ERISA compliance. The DOL under the Trump administration responded by issuing an Information Letter on June 3, 2020, stating that a plan would not violate ERISA solely because of PE presence in a plan.²⁵ This controversial Information Letter addressed the concerns that retail investors were missing out on investment opportunities because of fewer listed firms and initial public offerings.²⁶ The 2020 letter held that, under certain circumstances, PE investments could be permissible as part of a target-date, balanced, or similar investment fund that was an option on a retirement plan menu.²⁷ However, the Biden administration took a more cautious approach, evidenced by the DOL issuing a Supplement Statement in 2021. The 2021 statement was issued in response to concerns from unidentified stakeholders that the Information Letter could be viewed – particularly by sponsoring employers and other plan-level fiduciaries in typical 401(k)-type plans – as endorsing or recommending PE investments and not sufficiently emphasizing the risks that accompany such investments.²⁸

The reasoning behind the apparent “flip-flop” between the two administrations’ positions on the inclusion of PE is clear through a comparison of the two letters. In the 2020 letter, the DOL argued that a plan fiduciary of an individual account plan may offer an asset-allocation fund with a PE component in a manner consistent with requirements under ERISA.²⁹ The DOL’s change of tone in its 2021 Supplement Statement aimed to ensure that the Information Letter was not misread to suggest that PE “as a component of a designated investment alternative – is generally appropriate for a typical 401(k) plan.”³⁰ The DOL now stresses the importance of obtaining assistance from a qualified investment adviser when the responsible fiduciary does not have the skills, knowledge, and experience to evaluate the prudence of the PE component and the continual monitoring of such an investment.³¹ Indeed, the ability to select PE investments that benefit average investors is one of the primary challenges we see in this market, given the current inability to easily capture market performance.

²⁴ A proposed amendment to ERISA’s fiduciary duty section 404(c) may be relevant and may soften the burden of due diligence when investing in PE. Retirement Savings Modernization Act, S.4973, 117th Cong. (2022), <https://www.congress.gov/bill/117th-congress/senate-bill/4973>.

²⁵ DOL, 2020. “Information Letter 06-03-2020.” <https://www.dol.gov/agencies/ebsa/about-ebsa/our-activities/resource-center/information-letters/06-03-2020>.

²⁶ DOL, Information Letter 06-03-2020.

²⁷ DOL, Information Letter 06-03-2020.

²⁸ DOL, 2021. “U.S. Department of Labor Supplement Statement on Private Equity in Defined Contribution Plan Designated Investment Alternatives.” <https://www.dol.gov/agencies/ebsa/about-ebsa/our-activities/resource-center/information-letters/06-03-2020-supplemental-statement>.

²⁹ DOL, Information Letter 06-03-2020.

³⁰ Dygert, D. & Bauer, J. 2021. “Another Swing in DOL Investment Position.” Seyfarth Shaw LLP. Dec. 27, 2021. <https://www.beneficiallyyours.com/2021/12/27/another-swing-in-dol-investment-position/>.

³¹ DOL, Supplement Statement 12-21-2021.

Empirical Studies Tend to Show That PE Could Benefit Investors Saving for Retirement, but These Studies Rely on Assumptions That Are Not Validated by Real-World Experience

In general, the literature on PE in DC plans has found there are benefits to investors of including PE in their portfolios. However, most of this literature relied on key assumptions that are not well stress-tested. For example, some did not use actual, historical PE returns and risk data, while others did not account for the variation introduced through manager or fund selection. The reliability of these assumptions and feasibility of the simulations need to be closely examined to determine how much could be replicated in real DC plans.

In January 2017, a researcher at Pantheon Ventures published a paper titled, “Should DC Plan Sponsors Add Private Equity to Target-Date Funds?” This paper looked at whether adding PE to TDFs has the potential to enhance investors’ retirement returns without assuming additional risk. This paper “quantitatively measured and demonstrated that adding Private Equity to a 45-year custom TDF, the typical glide path for a TDF, had the potential to enhance expected returns while keeping expected risk constant.”³² Specifically, the paper found that “a pension plan member could potentially increase the total amount saved and distributable in year 45 by approximately 8.7%.”³³

To reach these conclusions, the authors relied on J.P. Morgan Asset Management’s 2016 Long-Term Capital Market Assumptions. For the asset class of PE, annualized return was assumed to be 8.50%, annualized excess return was 6.25%, and annualized risk was 21.80%.³⁴ The study used as a benchmark a “standard” TDF, defined as one that has a 45-year life span with a glide path that rebalances every five years and has no allocation to PE. This product is similar to one of Fidelity’s current TDF products, the Fidelity Freedom 2065 Fund.³⁵ The study then introduced a custom TDF that had the same risk profile as the standard TDF but contained PE. This custom TDF’s allocation to PE went from 7.1% in rebalancing period 1-6 to 5.28% in rebalancing period 9. These specific weights for allocation to PE were chosen in a manner that produced the highest risk/return ratio. For an optimized TDF including PE, it was necessary to reduce allocation to U.S. large cap, U.S. small cap, and international large cap. Performance was measured by comparing the difference in the amount saved at retirement between the standard TDF and the custom TDF. The author asserts that investors could seek exposure to PE of up to 10% to increase return potential without incurring higher risk. In short, this paper found that including PE in a 45-year TDF could improve an investor’s retirement income by 8.7%, or \$172,794. However, one should keep in mind that this paper relied on simulations and did not use real, historical returns or risk of PE. This paper’s assumption of 8.50% annualized return and 21.80% annualized risk for PE may not be realistic. The reality is that, in addition to variation in the overall market over time, a given pension plan or individual investor may pick PE funds poorly, achieving much lower returns and taking on more risk than what was assumed in this paper.

³² Reibel, A. 2017. “Should DC Plan Sponsors Add Private Equity to Target-Date Funds?” *Pantheon Ventures LLP*. https://caia.org/sites/default/files/7_dc_11-13-17.pdf. Specifically, a pension plan participant who invests \$6,424 annually for 45 years could increase the total amount saved and distributable at maturity by approximately 8.7%, or \$172,794. This option would be reasonable for a 21-year-old retiring at age 66. The performance of the custom, optimized TDF including private equity increased by 0.27% annually over its 45-year life.

³³ Reibel, Should DC Plan Sponsors Add PE to TDFs?

³⁴ J.P. Morgan sourced its private equity data from the Burgiss Manager Universe, and the return assumptions are net of manager fees. The author sourced TDF glide path data from Fidelity.

³⁵ *Fidelity Investments*. 2022. “Fidelity Freedom 2065 Fund.” <https://fundresearch.fidelity.com/mutual-funds/summary/315796797>.

In October 2019, the Defined Contribution Alternatives Association, or DCALTA, and the Institute for Private Capital, or IPC, published a research paper titled, “Why Defined Contribution Plans Need Private Investments.” This research paper examined the impact of including private investment funds in diversified portfolios that otherwise hold only public stocks and bonds. The authors conducted historical simulations for the years 1987 to 2017 where part of the public equity portfolio was replaced with allocations to PE funds. The authors concluded that investing in private funds always increases average portfolio returns and reliably increases Sharpe ratios.³⁶ The authors found that “including private market funds in the portfolio both improves performance and has diversification benefits that lower overall portfolio risk.”³⁷ In 100% of simulations, the returns with private funds outperformed the public-only benchmark. The largest benefits were obtained from the portfolios with just buyout funds.

Three key takeaways from this research are that 1) returns were consistently higher for portfolios that incorporate PE funds, 2) risk is consistently lower for portfolios that include buyout funds, but portfolio risk tends to be higher for portfolios with venture capital, or VC, funds and, 3) it is difficult to hit specific allocation targets in all years (1987-2017) with only primary commitments to PE funds.³⁸

For its analysis, the authors of the paper use Burgiss data on 1,121 buyout funds and 1,394 VC funds with vintage years from 1987 to 2017.³⁹ This paper limited its analysis to buyout and VC funds.⁴⁰ Performance data for the Vanguard Total Stock Market Fund and the Vanguard Total Bond Market Fund were used as benchmarks. The authors of this paper performed 1,000 simulations targeting a constant allocation to PE of 20%. They provided returns on six portfolios and an all-public benchmark.

An important limitation of this paper is that it assumes a naïve investor. In other words, the funds included in each simulation are randomly selected from the sample for the relevant vintage year. While this approach could underestimate a good manager, it can also overestimate the performance under poor manager selection. Additionally, the simulation approach creates a quasi-index PE fund by selecting 10 funds to allocate to each year, with investments lasting five years. As a result, for 20 of the 30 years simulated, the portfolio is allocated across 50 buyout and/or VC funds. The paper does not address whether this scale of investment could realistically be achieved by a fund offered in a DC plan.

In August 2021, researchers at the Urban Institute analyzed the impact that PE investment would have on 401(k) accounts in a paper titled “How Might Investing in Private Equity Funds Affect Retirement Savings Accounts?” This report examines the possible impacts of including PE funds in retirement savings portfolios and how the effects are distributed across demographic groups. The authors combine a literature review approach with microsimulation modeling. They construct a model of returns to PE and use it along with DYNASIM, the Urban Institute’s dynamic microsimulation model, to simulate investment returns, accumulation of retirement savings, and retirement income.⁴¹

³⁶Baldrige, R. & Curry, B. 2023. “Understanding the Sharpe Ratio.” *Forbes*. Nov. 9, 2023. <https://www.forbes.com/advisor/investing/sharpe-ratio/>. The Sharpe ratio divides a portfolio’s excess returns by a measure of its volatility to assess risk-adjusted performance. A higher Sharpe ratio is desirable for investors and indicates a more attractive risk-adjusted return.

³⁷Brown, G. 2019. “Why Defined Contribution Plans Need Private Investments.” *DCALTA/IPC*. <https://www.northerntrust.com/content/dam/northerntrust/pws/nt/documents/asset-servicing/why-defined-contribution-plans-need-private-investments.pdf>.

³⁸To elaborate on the third takeaway, the investment into private market funds is modeled as a systematic annual commitment process. A challenge investors face in private funds is how to achieve and maintain their desired level of allocation; the reliability of being close to a target allocation likely depends on the number of funds in the portfolio. The portfolios are rebalanced quarterly and rely on valuing the private assets at NAV, which will lead to actual exposures that may be different from the targeted 60/40 allocation.

³⁹Burgiss. 2023. “Private Capital & Multi-Asset Class Solutions.” <https://www.burgiss.com/>.

⁴⁰Buyout funds are a type of PE fund; they allow investors to purchase equity in a private company that is not listed on a stock exchange. Buyout funds typically target more mature companies. VC funds are also a type of PE fund. VC funds typically invest in small, early stage, and emerging businesses with high growth potential but limited access to other forms of capital.

⁴¹The DYNASIM microsimulation model starts with a representative sample of U.S. individuals and families from 2006 and ages them year by year through 2093 while simulating key economic and health events. DYNASIM focused on workers aged 25 to 69, and the average annual DC contribution was \$8,425.

The authors simulated 16 different scenarios that PE investment would have on the returns of a 401(k) plan and analyzed projected outcomes through 2075. When the authors compared these 16 scenarios against a benchmark scenario without any PE investment, they found that 14 of the 16 scenarios would increase average account balances in 401(k) plans over the benchmark.⁴² The most favorable outcome of the scenarios showed average account balances increasing by \$39,500 (a 9.5% increase) by the time the participant turned 65. The worst performing scenario would reduce average account balances by \$3,500 (a 0.9% decrease) by age 65. The scenario that the authors considered to have “neutral” assumptions (scenario 12, with 1.0% alpha, 1.5 beta, and maximum PE share of 15%) still returned \$27,600 (a 6.6% increase) above the benchmark.

This paper made several critical assumptions. For example, the Urban Institute scholars assumed that TDFs would invest no more than 15% of total managed assets in PE and that the shift to include PE would be made gradually to increase exposure to PE funds by 1 percentage point each year until the maximum is reached. The scholars also assumed that TDFs would manage their assets to keep the asset liquidity constant and the same as it was without any PE investments. Finally, they assumed that most DC plan investors seeking PE exposure would invest in both buyout and VC funds.

Similar to the other literature previously discussed in this section, this Urban Institute study reached its conclusions by performing simulations around specified parameters instead of by using historical PE fund returns. Further, the study focused its conclusions almost exclusively on changes in the mean return, but this assumption ignored the wide distribution of outcomes generated through the introduction of a PE allocation. While the allocation strategy deployed in the simulation sought to hold standard deviation constant, all scenarios increased the standard deviation by 1.2% to 2.4%. The distribution of outcomes is incredibly significant when considering bringing PE to DC plans in the real world as it illustrates the effect of manager selection. While PE returns could result in an increase to the average account balance, imagine a scenario where a DC plan just so happened to select the two scenarios that underperformed or the bottom quartile of PE funds. Either of these would place the plan in the negative long tail of the distribution of outcomes, potentially resulting in significant losses for investors.

In October 2021, researchers at CEM Benchmarking Inc. published a paper titled, “Asset Allocation and Fund Performance of Defined Benefit Pension Funds in the United States, 1998-2019.” This paper looked at investment allocations and realized investment performance across aggregate asset classes using a proprietary dataset covering over 200 public and private sector pensions over a 22-year period from 1998 to 2019 with almost \$3.6 trillion in combined assets under management, or AUM, at the end of 2019. Total fund returns consisted of a large corporate-sector plans component and small public-sector plans component. Large corporate-sector plans (more than \$10 billion in AUM) outperformed over the 22-period with an average compound net return of 7.9%, while small public-sector plans (less than \$2 billion in AUM) underperformed with an average compound net return of 7.1%. This study compared annual average returns net of all investment costs across 12 aggregate asset classes and found striking differences in performance. An important finding was that “private equity had the highest average gross return over the period, averaging 13.9 percent” and “private equity had the highest average net return as well, estimated at 11.9 percent.”⁴³

⁴² Cosic, D., et al. 2021. “How Might Investing in Private Equity Funds Affect Retirement Savings Accounts?” *Urban Institute*. Aug. 31, 2021. <https://www.urban.org/research/publication/how-might-investing-private-equity-funds-affect-retirement-savings-accounts>.

⁴³ Beath, A. 2021. “Asset Allocation and Fund Performance of Defined Benefit Pension Funds in the United States, 1998-2019.” *CEM Benchmarking Inc.* <https://www.nareitphotolibrary.com/m/668bbad207d2debe/original/NAREIT-CEM-ES-update-2021-October-6-pdf>.

Regarding methodology, the pension plans report to CEM how each of the 12 asset classes they invest in performed from 1998-2019. PE was the most volatile aggregate asset class by far at 25.8%. However, the market risk of PE at 20.1% is comparable to U.S. small-cap stocks at 18.9% and non-U.S. stocks at 20.9%, with the wide dispersion of returns between funds within years, or idiosyncratic risk, raising the overall volatility of PE above that of these two public asset classes.

Unlike much of the literature we cite, which relied on simulations, this paper relied on actual, historical returns to PE. Nevertheless, even though PE had high average returns, this study does not account for the impact of manager selection. A particular pension plan or individual investor may still choose PE funds with below-average returns.

In June 2023, researchers at Georgetown University's McCourt School of Public Policy's Center for Retirement Initiatives (CRI) and researchers at CEM Benchmarking Inc. jointly published a paper titled, "Has the Lack of Asset Diversification in DC Retirement Plans Been a Costly Missed Opportunity?" This study focuses on the question of whether DC plans should incorporate illiquid, private assets into their TDF options, evaluating the proposition by the impact on returns participants would obtain. To simulate the impact of adding private assets as a sleeve in the TDF investments, the paper explores three scenarios: adding up to 10% of PE, adding up to 10% of real assets, and adding up to 5% of each. The TDFs used for the analysis come from CEM's database of DC plans, and the analysis focuses on the period 2011 to 2020. In each of the three scenarios, the glide path of each TDF is adjusted to replace allocation to public assets with private assets, with PE decreasing allocations to public stocks and real assets decreasing allocations to both public stocks and fixed income. The returns of the private assets are simulated by taking from CEM's database the series of returns for each pension plan's corresponding asset class and pairwise matching them with the allocation of the DC TDF to generate a distribution of outcomes.

The paper finds that when comparing the outcomes of the TDFs with private asset sleeves to the original performance of the TDF, returns improved 80% of the time with the PE allocation, 72% of the time with the real asset allocation, and 82% of the time with the mix of PE and real asset allocations.⁴⁴ The median improvement in annual return was 0.22%, 0.11%, and 0.15%, respectively.

This paper expanded on CEM's previous research by continuing to use actual, historical PE return data, but the findings around volatility run counter to the previous CEM paper. Specifically, the 2023 paper finds that outcomes of the TDF with a PE sleeve had lower observed volatility than the TDF without any PE. On the other hand, the 2021 paper found that PE was the most volatile aggregate asset class of the 12 they examined. This inconsistency is likely due to the different time periods studied, with the 2021 paper spanning 1998-2019 and the 2023 paper analyzing 2010-20. This difference makes clear that, just like other asset classes, PE performance and volatility will vary in different markets and over time.

⁴⁴Antonelli, A. 2023. "Has the Lack of Asset Diversification in DC Retirement Plans Been a Costly Missed Opportunity?" Georgetown University Center for Retirement Initiatives in conjunction with CEM Benchmarking. https://cri.georgetown.edu/wp-content/uploads/2023/06/GeorgetownCRI-CEM-Benchmarking_Lack-of-Asset-Diversification-CRI-paper.pdf.

In addition to exploring the existing literature, we sought to evaluate the experiences in other markets where PE has been allowed into retirement accounts. To date, very few countries have explored such investments—Australia and New Zealand being two notable examples. Extending the experiences in those markets to the U.S. case presents formidable challenges. The first is that there is a lack of high-quality, comparable data on the relative performance of the retirement plans utilizing PE and the contribution to that performance of the PE component. Limited data on the allocation to PE is available. For instance, in Australia, 5% of assets among superannuation funds with more than six members are invested in PE as of May 2023, and New Zealand has at least three KiwiSaver funds with investments in PE ranging from 0.43% to 3.44% as of March 2023. The retirement accounts investing in PE also must report their returns but, given the range in and small portion of the total portfolio allocated to PE, comparing the fund returns to market benchmarks does not provide direct insight into how the PE investments are contributing to overall outcomes.

The second challenge with taking lessons from these markets is that the retirement system is structurally significantly different from in the U.S., and these differences remove many of the previously discussed obstacles to allowing PE in U.S. workplace accounts. Most importantly, in the Australian and New Zealand systems, the retirement accounts follow workers from job to job. This aspect contrasts with the U.S. system where investments available in workplace plans can vary from company to company and where transferring assets with a job change can be cumbersome. As a result, the nature of the Australian and New Zealand systems mitigates operational and liquidity concerns—frequently discussed obstacles to U.S. adoption. Due to both the data challenges and structural differences, we determined it was not possible at this time to draw any clear conclusions from our review of the Australian and New Zealand experiences.

We Constructed a Unique Dataset of Traditional Pension Plans That Invested in PE to Assess the Implications of DC Plans Making PE Available to Retirement Savers

Our methodology to examine the return for PE for retirement accounts differs drastically from the literature. Most of the literature we reviewed simulated retirement portfolios with some allocation to PE and estimated what the portfolio would have earned had it invested in PE under a certain set of assumptions. In contrast, our analysis does not use simulations and instead looks at actual, historical allocations by pension plans to PE and the actual, historical returns of the PE funds in which these pension plans invested. This addresses an important gap in the literature on the potential usefulness of including PE in DC plans.

First, we identified the largest 20 pension plans by AUM with PE exposure as reported under Schedule H on DOL Form 5500 in 2020.⁴⁵ To determine if a plan was investing in PE, we examined the category of partnership/joint venture interests under Schedule H (Part 1, line 1c(5)). This partnership/joint venture category typically reports on the value of interest in limited partnerships, venture capital operating companies, or VCOCs, PE, hedge funds, and other partnership/joint venture interests. Given that some plans utilize master or group trusts as an intermediary to their investments, we included the partnership/joint venture interests reported by any Master Trust Investment Arrangements, or MTIAs, that the pension plan listed on the Schedule D. For example, pension plan “A” may use MTIA “X” to invest part of its assets and reports this on the Schedule D. MTIA “X” also files a Form 5500 and reports any partnership/joint venture interests on the Schedule H of that filing. Considering that Plan “A” has proportional exposure to all the assets of MTIA “X” by the definition of an MTIA, any partnership/joint venture interests of MTIA “X” indicate that Plan “A” has some exposure to this category.

We also considered anything with entity code E on Schedule D on the Form 5500 to identify the 20 largest pension plans with PE exposure. Entity code E means the investment is a 103-12 investment entity, or 103-23 IE. The 103-12 IE is a DOL classification that includes hedge funds, PE funds, and real estate investment trusts, or REITs.

Neither the partnership/joint venture interests category nor the 103-12 IE assets are an exact match for PE investments. Rather, these categories allowed us to flag pensions with nonzero exposure to investments that may include PE. Further data collection was necessary to more accurately estimate that exposure as a percentage of the plans’ invested assets.

⁴⁵We included an additional three plans as we were unsure whether the status of a plan, active or hard-frozen, would have a significant impact on their near-term allocation decisions. These were the next three largest in size, active plans meeting our criteria. The additional three plans are only included in one portion of the results discussion where we look at the impact, if any, of this factor.

Our goal was to see if there were any variations in how much these plans allocated to PE by plan or over time. We collected data from 2009 through 2020, with 2009 being the earliest that the Form 5500 is reliably available in a digital format, and, for each year, we examined each plan's Form 5500 to collect details on the assets of the plans from the financial statements attached to the filing. These attachments are required by the Form 5500 but are not structured to be captured in the electronically formatted Schedules. When examining the financial statements, we collected the total assets invested by the pension as the denominator for our allocation percentage. For the numerator, we collected the total assets invested in PE, to the extent that number was isolated from the overall partnership/joint venture interests figure. The way assets are categorized in these financial statements can vary across pensions and across time, as accounting standards change. In most cases, plans delineated their partnership/joint venture assets into more discrete categories, such as PE, real estate, and infrastructure. By collecting the PE number from these statements, we were able to more accurately estimate the PE exposure of a plan than if we had simply used the numbers available in the Schedule H. Moreover, in the case of plans investing the bulk of their assets in MTIAs or group trusts structured as 103-12 IEs, we once again rolled up any PE exposure reported by these intermediary layers to the pension level to not underestimate the PE exposure of a plan merely because of the organizational structure it uses to invest its assets.

To validate our approach, we obtained annual PE allocation percentage data from PitchBook and compared PitchBook's data with the data we collected. We found our numbers were consistent with those PitchBook had independently collected. Unfortunately, the PitchBook data covered only a subset of the plans in our analysis and did not cover each plan for each year. To ensure consistency, we collected data from the Form 5500 for all plans across all years, regardless of whether PitchBook had previously collected the data or not.

Separate from understanding the allocation of these pensions to PE, we wanted to examine and evaluate the returns the pensions were getting from their PE investments. We obtained data on returns from PitchBook. PitchBook provided IRR, data on the funds that each pension committed to (PitchBook does not gather IRR data at the pension plan level). From the PitchBook platform, we collected the IRR data by vintage year across all funds invested in by any of the pensions in our analysis. PitchBook primarily sources its returns data from online LP websites, the Freedom of Information Act, or FOIA, and GP surveys.

Results

We employed our methodology to examine trends in the usage, quality, and selection of the PE funds in pension plans. At a high level, we found a wider range in all areas than might have been expected given that professional managers are selecting investments on behalf of the pension plans. There is no discernible consensus on the percentage of the portfolio to allocate to PE, with plans varying from less than 1% to nearly 30%. Further, the PE investments the plans selected are not consistently top performers. Rather, the distribution of returns among the funds selected mirrors the distribution of the PE market as a whole. Finally, the majority of fund families are selected by only one of the pension plans, indicating that there is little cohesion on identifying the best PE strategies.

While some pension plans are surely enjoying positive outcomes from their PE investments, the larger picture does not provide a clear path for replicating the experience in DC plans. Starting with a broad scope, allocation to PE, and working toward a narrow scope, that is, manager selection, we discuss our results in detail below.

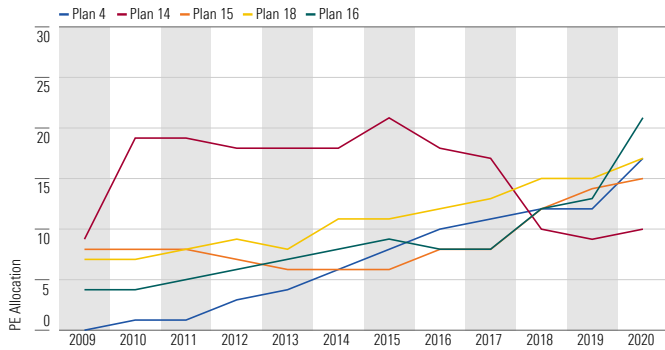
PE Allocation Varied Widely Across Plans, but Most Increased Their Exposure Over Time

To investigate whether plan AUM affected the allocation to PE, we examined PE allocation by year for each plan. Exhibit 3 splits the top 20 largest pension plans, regardless of whether the plans are now hard-frozen, into quartiles by 2009 AUM and graphs the PE allocation from plan year 2009 to plan year 2020. The graphs reveal that PE allocation varies significantly from year to year for some pension plans while remaining fairly consistent for others. For example, Plan 12 remained stable; Plan 12 varied only by 1.4% between the lowest allocation percentage of 0.3% and the highest allocation percentage of 1.7%. By contrast, Plan 11 experienced the largest variation of 24.8%, from a low of 0% to a high of 24.8%.

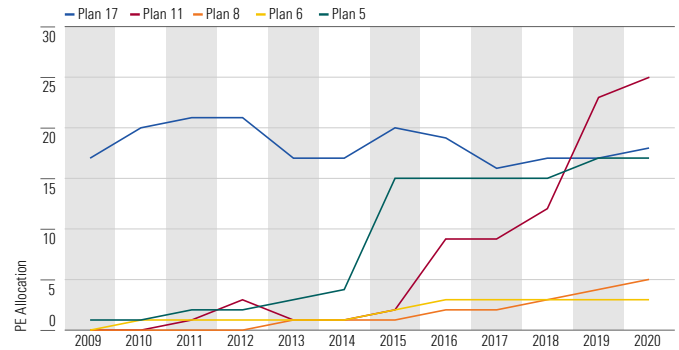
Generalizations that apply to the entire dataset or even within a quartile are hard to make because of the significant variation. One plan within a quartile may have a stable allocation, while another plan within the same quartile may have a volatile allocation. Similarly, plans with relatively high allocations and plans with relatively low allocations exist within each quartile.

Exhibit 3 Allocation to Private Equity by Year – Largest Plans

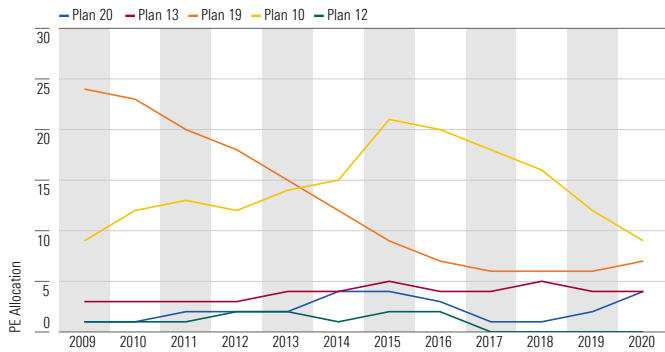
Smallest Quarter of Plans by 2009 AUM



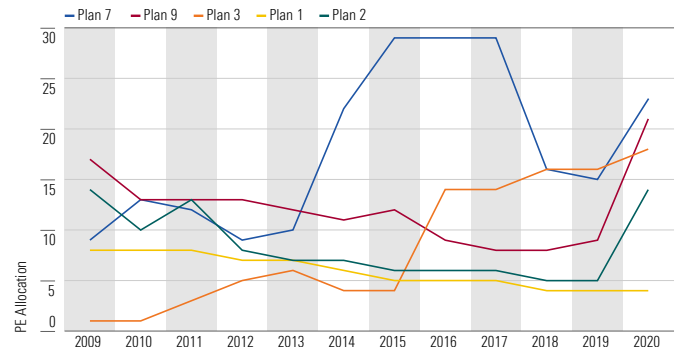
Second Smallest Quarter of Plans by 2009 AUM



Second Largest Quarter of Plans by 2009 AUM



Largest Quarter of Plans by 2009 AUM

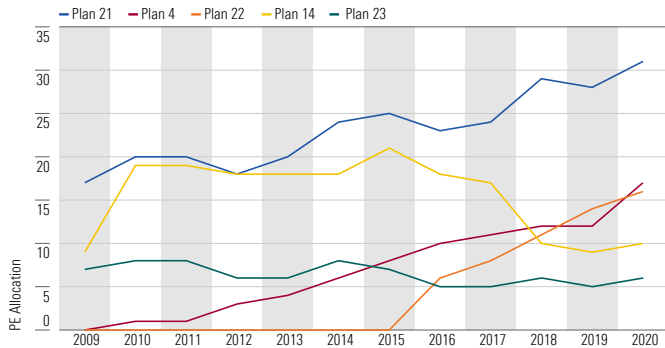


Source: Morningstar analysis of Form 5500 data.

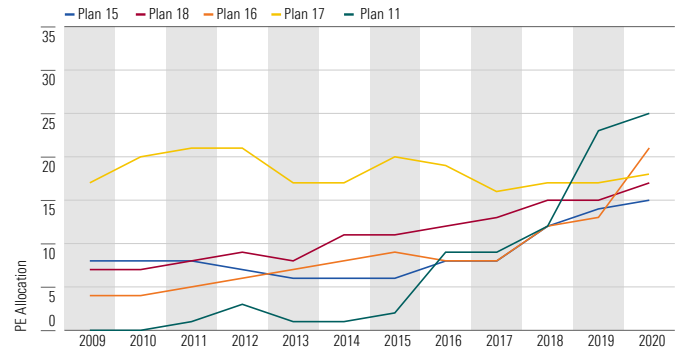
Exhibit 4 repeats the same analysis with the top 20 pension plans by AUM excluding hard-frozen pension plans. Like the previous analysis with Exhibit 3, the graphs in Exhibits 4 demonstrate that PE allocation varies significantly from year to year for some pension plans while remaining stable for others. Given the similarity exhibited by the plans whether or not we included the hard-frozen plans, we determined that it is not necessary to exclude hard-frozen plans. Our remaining exhibits exclude the smallest three of these top 23 plans so that we have the largest 20 plans by AUM regardless of their status as frozen or not.

Exhibit 4 Allocation to Private Equity by Year – Largest Plans, Excluding Hard-Frozen Plans

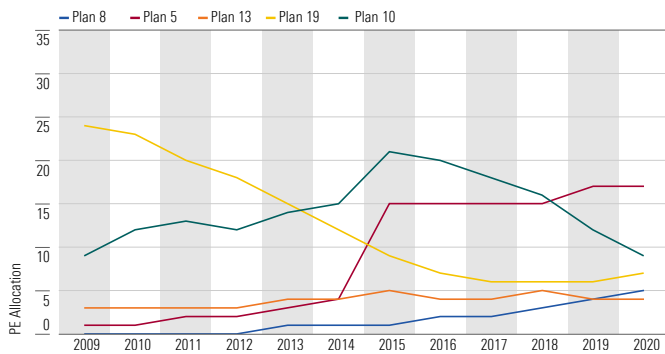
Smallest Quarter of Plans, Excluding Hard-Frozen Plans, by 2009 AUM



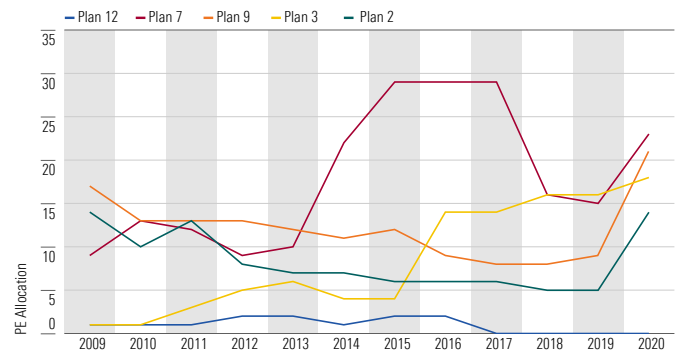
Second Smallest Quarter of Plans, Excluding Hard-Frozen Plans, by 2009 AUM



Second Largest Quarter of Plans, Excluding Hard-Frozen Plans, by 2009 AUM



Largest Quarter of Plans, Excluding Hard-Frozen Plans, by 2009 AUM



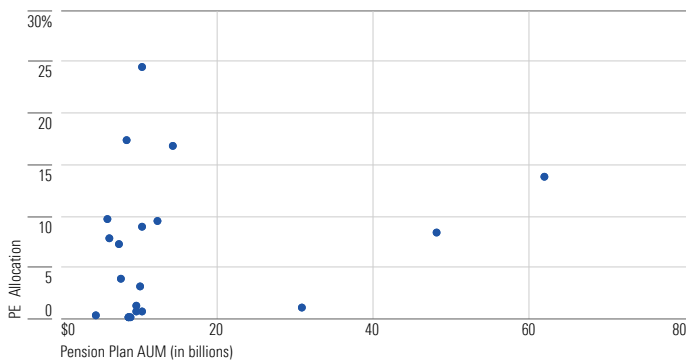
Source: Morningstar analysis of Form 5500 data.

Overall, we found that 19 of the 23 plans experienced increasing allocations to PE during the period of analysis. However, other generalizations are difficult to make because, among the plans examined, different pension plans took very different approaches to setting their allocations to PE. Furthermore, the large changes in allocation percentages show that even within a pension plan, allocation strategies can significantly change from year to year. When extrapolating to the DC market, this variation makes it challenging to identify any meaningful trends, except for the fact that most plans grew their exposure to PE from 2009 to 2020. This trend alone raises the question of whether DC plans should perhaps follow this trend. Perhaps not coincidentally, this timing aligns with when much of the previously discussed research began to examine the possibility of adding PE investment to DC plans.

We Found No Correlation Between the Size of the Plan and the Allocation to PE

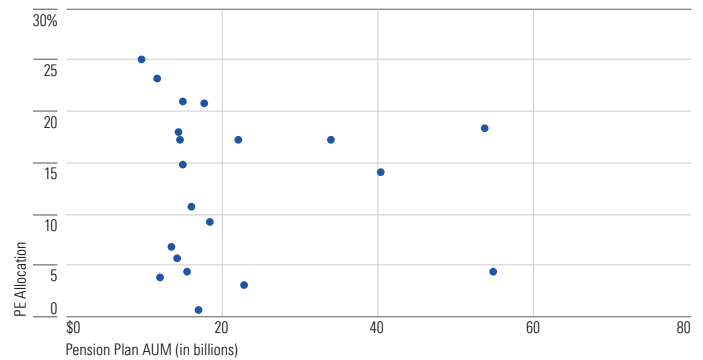
We theorized that there may be a relationship between plan AUM and PE allocation percentage, and we constructed scatterplots to test this theory. Exhibit 5 and Exhibit 6, respectively, display plan AUM versus PE allocation in 2009 and 2020. Although we initially predicted that larger plans would have higher PE allocations, our analysis revealed no such linear relationship. Next, we broadened our analysis to look at all years and all plans as depicted in Exhibit 7 to see if more data points over time would reveal any relationships. However, we still did not find any relationship between plan AUM and PE allocation.⁴⁶ While correlation would not mean causation, the lack of a relationship between plan AUM and PE allocation does suggest that size was not a limiting factor for these plans when it comes to determining how much to invest in PE. In other words, all the plans had sufficient assets to access the PE markets, but, for a variety of reasons, some chose to invest more heavily than others. For DC plans of a comparable size, this experience does not provide any clear direction on how much of an allocation to PE would be reasonable to allow for plan participants.

Exhibit 5 Plan Assets Under Management and Private Equity Allocation, 2009



Source: Morningstar analysis of Form 5500 data.

Exhibit 6 Plan Assets Under Management and Private Equity Allocation, 2020

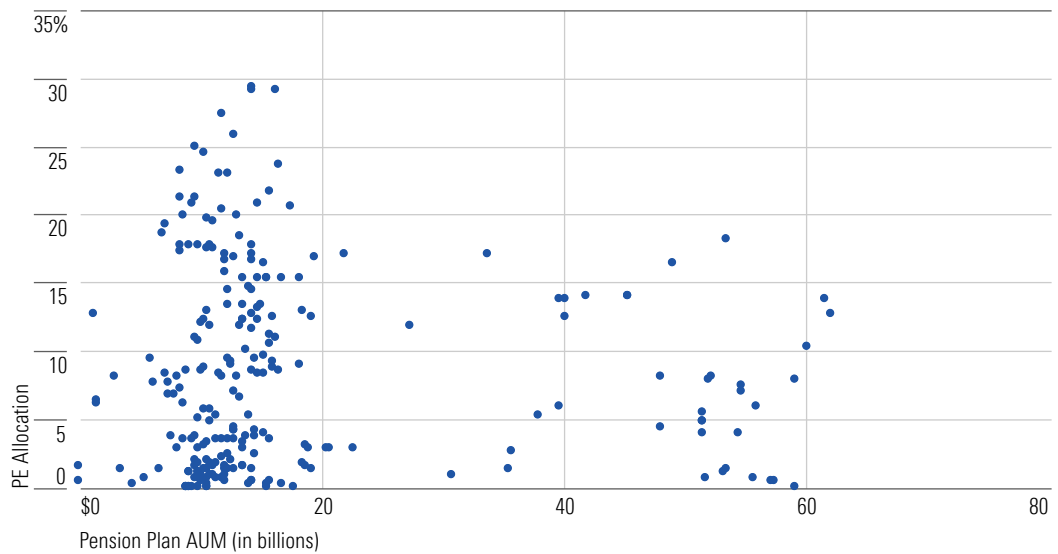


Source: Morningstar analysis of Form 5500 data.

⁴⁶For robustness, we ran a multivariable linear regression on the dataset. We found no statistically significant relationship between either of the independent variables, plan assets and plan status (active/frozen), and the dependent variable, PE allocation. This regression validates the finding shown in the scatterplot in Exhibit 7.

One insight we discovered is that pension plans with relatively smaller AUM show a wider dispersion of PE allocations. For instance, in Exhibit 7, only plans below \$20 billion AUM have any allocations to PE above 20% (10.6% of small plan data points), whereas plans over \$20 billion AUM make up 17.5% of our dataset but have no data points with an allocation above 20% to PE. Note that the imbalanced sample sizes with a cutoff at \$20 billion AUM to indicate a large pension plan could partially account for the lower dispersion of allocation percentages; nevertheless, regardless of the cutoff value for large AUM, it is apparent that the range of PE allocation values decrease as AUM increases. The dispersion of allocations and lack of other clear patterns supports the conclusion that there are multiple views on how to appropriately allocate capital in a balanced portfolio among professional managers.

Exhibit 7 Plan Assets Under Management and Private Equity Allocation, 2009-20

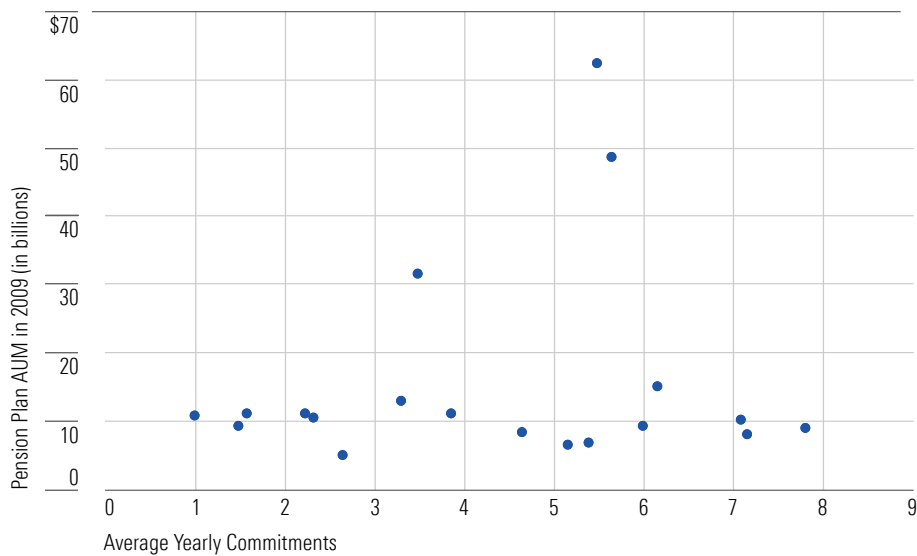


Source: Morningstar analysis of Form 5500 data.

The Number of Commitments Does Not Increase With AUM

We next examined PE exposure through the lens of the number of commitments made to PE across pension plans and over time to see if there was an identifiable trend. Exhibit 8 displays the average number of commitments by plan AUM for 2009 to 2020. Plans of approximately the same AUM differ widely in their average number of commitments per year. For instance, the five plans with AUM between \$9.8 billion and \$10.5 billion have anywhere from an average of 1.0 commitments per year to 7.1 commitments per year. Thus, our analysis indicates that AUM does not have an observable relationship with average number of commitments, a measure of fund diversification.

Exhibit 8 Average Number of Commitments by Plan Assets Under Management, 2009-20

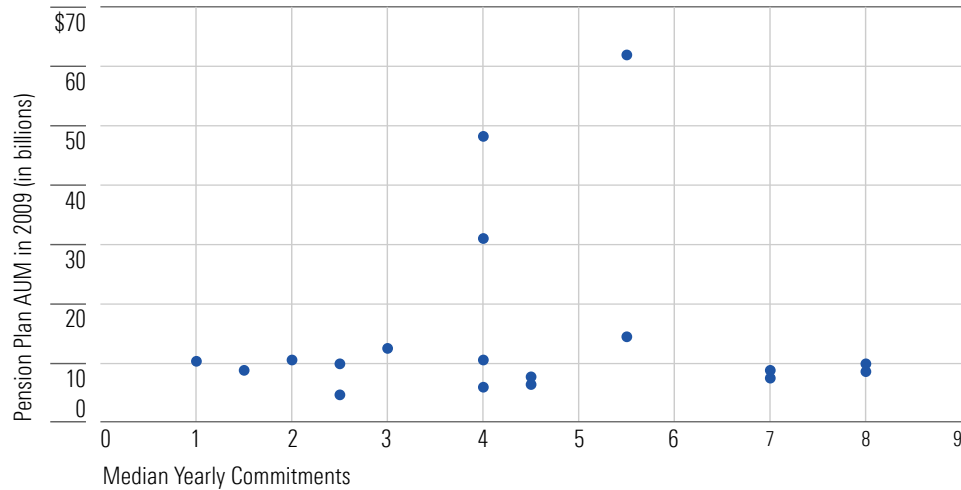


Source: PitchBook as of July 20, 2023.

Notes: PitchBook was missing commitment data for Plan 6.

A similar story can be seen in Exhibit 9, which depicts the median number of commitments by plan AUM for 2009 to 2020. For example, the three plans with an AUM between \$8.6 billion and \$8.9 billion range from a median of 1.5 commitments to 8.0 commitments.

Exhibit 9 Median Number of Commitments by Plan Assets Under Management, 2009-20



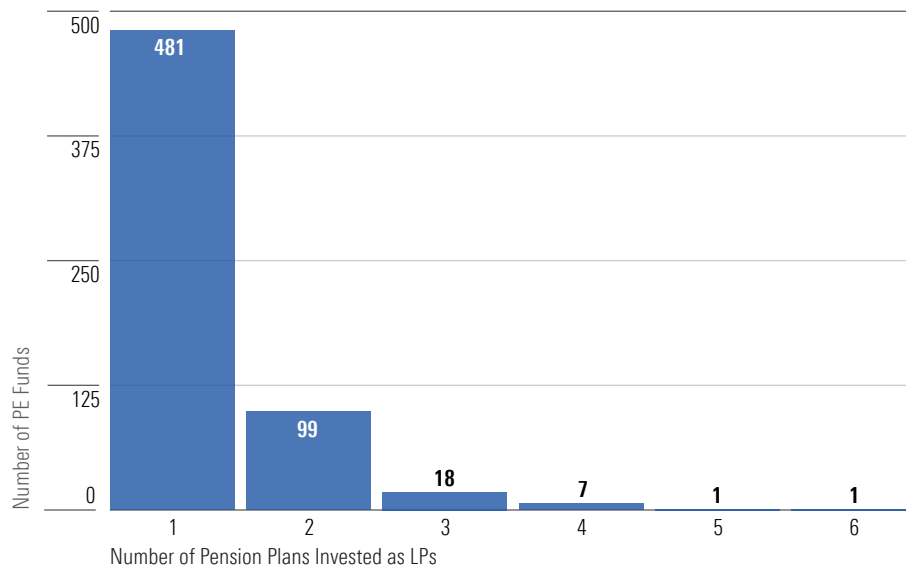
Source: PitchBook as of July 20, 2023.
 Notes: PitchBook was missing commitment data for Plan 6.

The wide dispersion in commitments implies there is no consistent standard for the number of commitments based on plan size. We hypothesize that this result is likely because even the smallest pension plan in the dataset had approximately \$4.6 billion AUM in 2009. At this AUM, the number of commitments is limited primarily by preference and not financial means since the average commitment to a PE fund in our dataset is \$28.72 million, or only 0.6% of AUM of the smallest pension plan in our dataset. While outside of the scope of this study, we hypothesize that, for significantly smaller pension plans, there could be a relationship between size and the number of commitments that is caused by difficulty meeting the requirements for minimum investment size.

Few PE Funds Are Consistently Popular With the Plans in Our Sample

For the pension plans we examined from 2009 to 2020, most of the PE funds in which the pension plans invested were unique and did not overlap. Exhibit 10 shows that there were 481 PE funds that occurred in only one plan, 99 funds that occurred in two plans, 18 funds that occurred in three plans, seven funds that occurred in four plans, one fund that occurred in five plans, and one fund that occurred in six plans. Examining popularity at the fund level has the disadvantage of accounting for timing differences between pension plans. Fortunately, PitchBook identifies fund families—that is, series of funds that share the same strategy, geography, and financial sponsor.

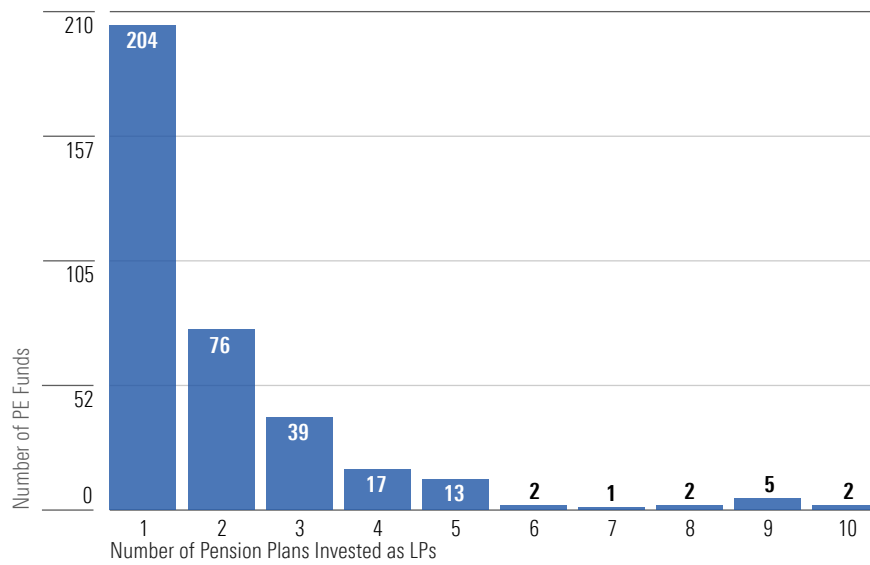
Exhibit 10 Number of Pension Plans Investing in Each Private Equity Fund



Source: PitchBook as of July 20, 2023.

When we consider the PE fund families in which the pension plans invested, we find greater consensus, with over two fifths of the fund families occurring in at least two plans. Exhibit 11 shows that there were 204 PE fund families present in only one plan, while 157 were present in at least two. At the most popular end, we find two fund families present in 10 pension plans, or half of our sample. We conclude that there seems to be some consensus among professional plan managers regarding which PE funds to select; however, there is still substantial divergence, with over half of the fund families showing up in only one plan.

Exhibit 11 Number of Pension Plans Investing in Each Private Equity Fund Family

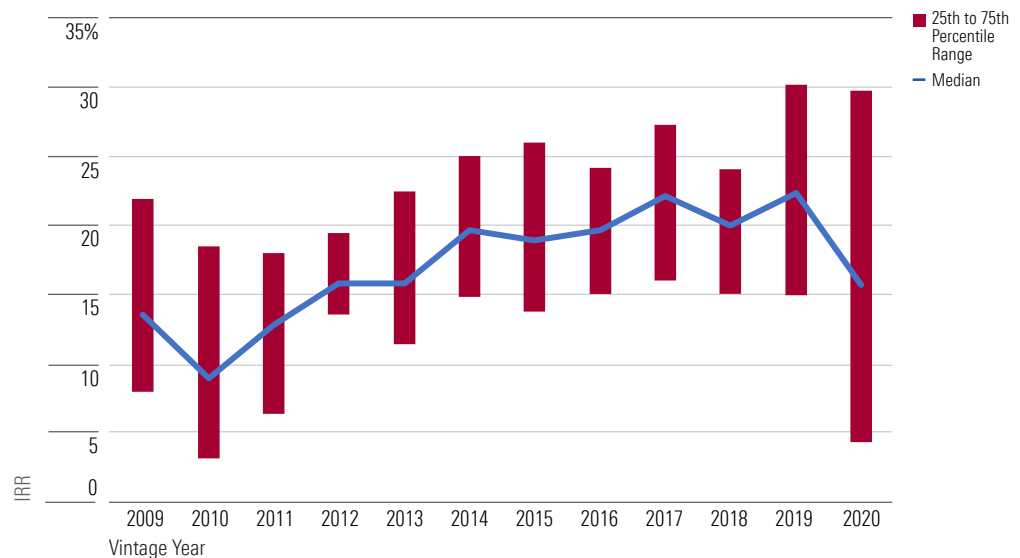


Source: PitchBook as of July 20, 2023.

Returns of PE Funds Selected by Pension Plans Mirror the PE Fund Universe at Large

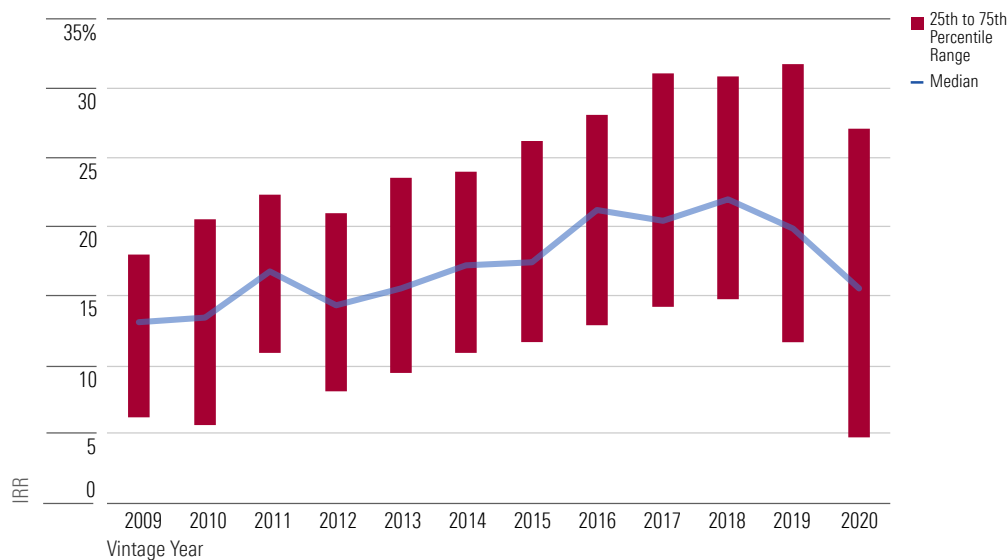
Exhibit 12 shows the median IRR by vintage year for PE funds in which the pension plans invest, and Exhibit 13 shows the median IRR by vintage year for the entire U.S. PE industry. The line in both exhibits represents the median IRR for the set of funds, and the bars represent the 25th and 75th percentile returns. The median IRR tends to slowly increase from vintage year 2010 to vintage year 2019 before a drop in vintage year 2020. Although we observe similar patterns in both Exhibit 12 and Exhibit 13, the median IRR fluctuates less when we look at all PE funds in the industry because the larger sample size smooths returns compared with the smaller subset of funds in which the pension plans invested. In addition, the subset of funds that pension managers selected are on par with the PE industry, averaging just 0.12% better a year. Thus, if there were an index of all PE funds in the U.S., then pension plans would not be meaningfully outperforming the index and would have increased volatility from trying to select individual PE funds.

Exhibit 12 IRR by Vintage Year — Private Equity Funds Invested in by the Largest Pension Plans



Source: PitchBook as of November 10, 2023.

Exhibit 13 IRR by Vintage Year — All U.S. Private Equity Funds

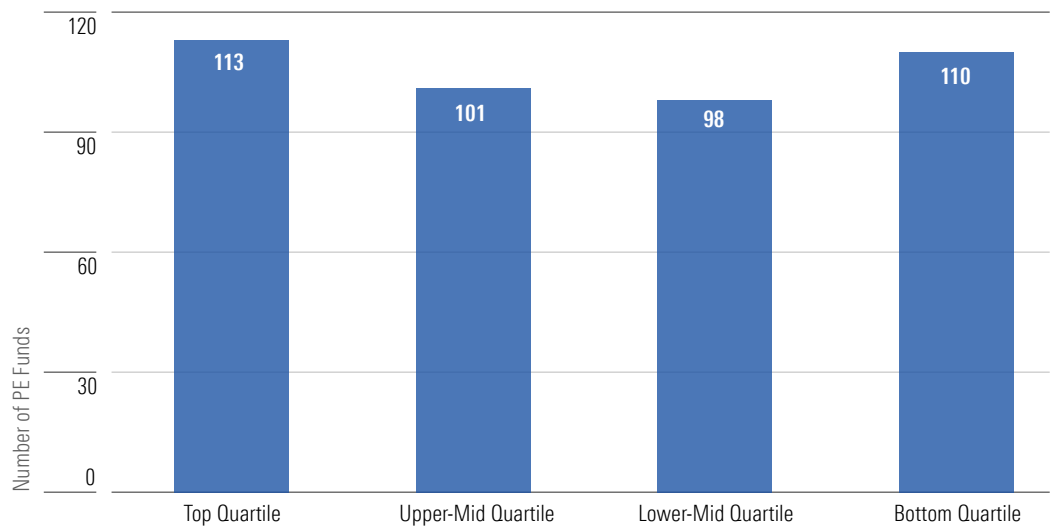


Source: PitchBook as of November 10, 2023.

Bars representing the 25th and 75th percentiles indicate a wide range of returns for PE funds. Fund selection can have significant consequences for an investor. For example, for all U.S. PE funds across vintage years 2009 through 2020, returns at the 25th percentile were 7% lower than the median, and it was another 8% to the 75th percentile. When these differences are compounded across the full time period, it results in more than a 300% difference between the 25th percentile and the median and more than a 600% difference between the median and the 75th percentile. Given the long time horizon for many retirement plan investors, the compounding effects of selecting the poorer-performing fund can be enormously consequential.

We explored whether pension plans employ professional money managers who may have superior skill at fund and manager selection, thereby rendering our findings less generalizable to average investors. Exhibit 14 shows the results of fund selection across all 20 pension plans analyzed with PE fund performance quartiles based on industry standard methodology for IRR. The set of PE funds in which pension plans invested consisted of 607 funds, but 185 funds (30.4%) did not have a quartile ranking, so our conclusion of one fourth in each quartile is based on the 422 funds with reported quartiles.⁴⁷

Exhibit 14 Quartile Performance of Pension Plan Selected Private Equity Funds



Source: PitchBook as of July 20, 2023.

Overall, the PE funds that pension plan managers selected were proportionally distributed across PE performance quartiles, with approximately one fourth of ranked PE funds selected in each quartile. Pension plan selection is comparable to the performance of the theoretically average investor who chooses PE funds, and pension plan sponsors and investment managers did not exhibit unusual skill or incompetence at picking PE funds.

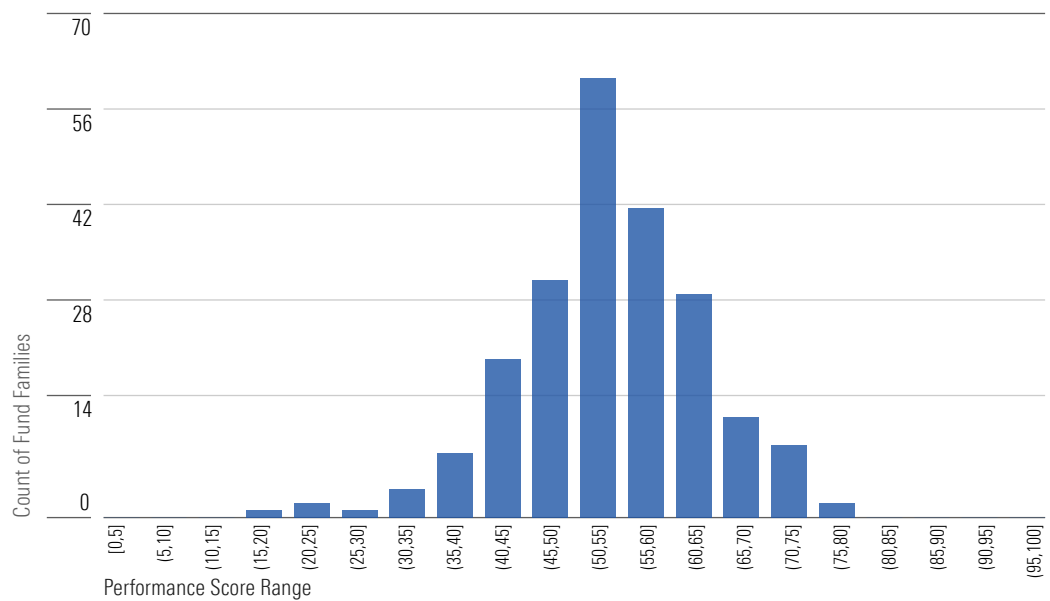
⁴⁷This data may be missing from PitchBook because of limited reporting by the funds or insufficient time invested to calculate IRR.

Pension Plans Were Also Not Better Than Average at Identifying the Best-Performing PE Fund Families

In addition to examining performance at the fund level, we are able to assess the quality of the fund families in which the pensions are investing through PitchBook’s Performance Score, which is calculated at the fund family level.⁴⁸ This methodology was designed to provide a more holistic measure of performance than IRR, performance quartiles, or benchmarking a single fund in a strategy. The score allows for more accurate comparisons between strategies, accounting for variation in vintage years and market environments in which individual funds were launched. Further, this metric provides a score that can be used to benchmark the performance of a fund family within its peer group. With a low value of 0 and a high of 100, fund families are distributed across the spectrum in roughly a bell curve, with a center around 50.

Exhibit 15 shows the distribution of performance scores for the fund families in which the pension plans invest. The bulk of the strategies score neutrally, with more than 72% of the fund families scoring between 45 and 65. Overall, the scores for the fund families found in the pension plans range from a low of 19.3 to a high of 75.9. Similar to the fund level performance analysis, the distribution of strategies selected by the pension plans is not meaningfully different from the overall distribution of the market.

Exhibit 15 Distribution of Performance Scores of Pension Plan Selected Private Equity Fund Families



Source: PitchBook as of July 20, 2023.

⁴⁸ PitchBook. 2023. "PitchBook Manager Performance Scoring." https://files.pitchbook.com/website/files/pdf/PitchBook_Manager_Performance_Scoring.pdf.

This distribution of pension plans not showing special skill is consistent with recent findings by PitchBook that PE fund managers also do not demonstrate particularly persistent performance. PitchBook found that the practical challenge for capital allocators lies in the fact that early IRRs are unreliable indicators of a fund's eventual performance. Predecessor funds are typically only a few years old when the next sequence in the family is fundraising, leading to significant drift in performance over time. As a result, the predictive power of a general partner's, or GP's, track record is nearly negligible when making new commitments. As a result of these findings, PitchBook suggests that pension plans should avoid undue reliance on past performance when selecting PE managers, emphasizing a comprehensive evaluation of the manager's investment approach. Plan managers, according to PitchBook, should embrace a well-rounded approach that considers a broader spectrum of factors to facilitate informed decision-making within the ever-evolving terrain of private markets.⁴⁹

As we previously discussed, there are some distinctly popular fund families among the pension plans, which warrants further analysis of whether they are coalescing around the best strategies. While there are many fund families present in only one or a handful of the pensions, 10 fund families can be found in at least seven of the plans, or at least a third of the sample. Exhibit 16 demonstrates that the 10 most popular fund families are average to above average performers. The most popular two strategies, present in half of the pension plans each, are just below the neutral score of 50, but the next seven are all above-average scorers, with a high of 75. The correlation between popular PE fund families and stronger performance scores is positive for the outcomes of the pension plans but does not provide sufficient evidence that, at the time of entering the investment, a DC plan would be able to replicate this selection process.

Exhibit 16 Top 10 Private Equity Fund Families by Number of Largest Pension Plan Investors

Private Equity Fund Family	Unique Largest Pension Plans as Limited Partners	Fund Family Performance Score
Roark Capital Partners	10	45.9
Warburg Pincus Private Equity	10	48.4
Advent Global Private Equity	9	73.8
Blackstone Capital Partners	9	52.4
Genstar Capital Partners	9	67.0
Platinum Equity Capital Partner	9	75.5
Thoma Bravo Fund	9	75.0
Apollo Investment Fund	8	59.9
Onex Partners	8	55.3
Centerbridge Capital Partners	7	43.5

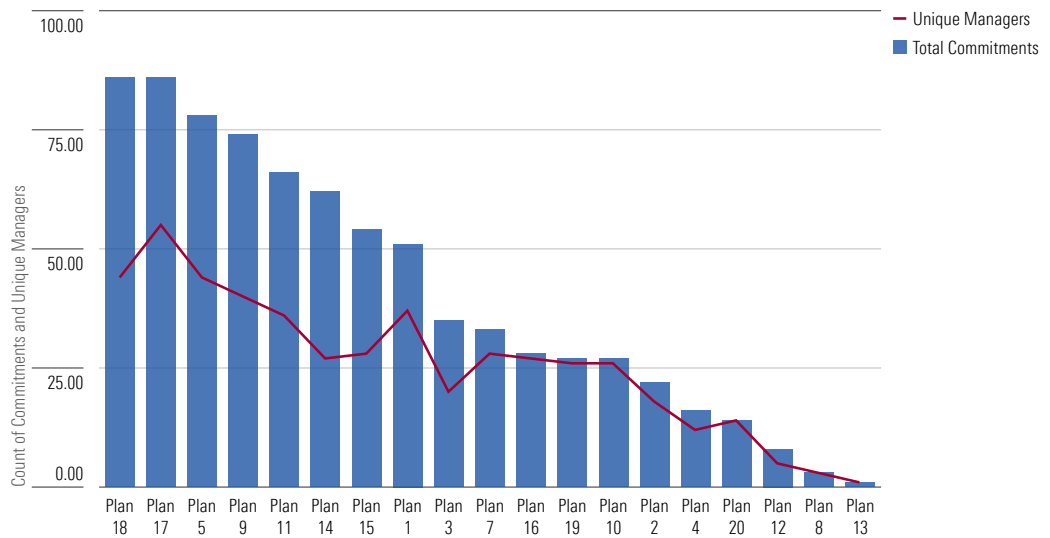
Source: Pitchbook as of July 20, 2023.

⁴⁹ PitchBook. 2023. "Allocator Solutions Evaluating Persistence in Fund Performance." Aug. 24, 2023. <https://pitchbook.com/news/reports/q3-2023-allocator-solutions-evaluating-persistence-in-fund-performance>.

Plans Generally Did Not Concentrate Their Positions With Specific PE Managers

To investigate if pension plan managers prefer certain PE asset managers—also called general partners, or GPs—we compared the number of total commitments across the entire analysis period against the number of unique managers grouped by pension plan in Exhibit 17. In the analysis, a unique asset manager is defined as the parent company of an individual fund so that if Pension Plan A invested in ABC Company Fund 1 and ABC Company Fund 2, then ABC Company would be measured as one unique manager. Additionally, if Pension Plan B also invested in ABC Company Fund 1, then ABC Company would also be a unique manager for Plan B. We found that regardless of how many commitments a pension plan makes, the allocation is diversified across GPs. For example, the plan with the most manager concentration still had 43.5% of all PE funds from different PE asset managers. Among all pension plans, on average, 63.7% of PE asset managers are unique for the pension plans that invest in them. There appears to be agreement among pension plans that diversifying exposure across asset managers is best practice.

Exhibit 17 Commitments and Unique Managers by Pension Plan, 2009-20



Source: PitchBook as of July 20, 2023.

In Exhibit 18, we layered plan size into the analysis of the number of unique managers. We used 2009 AUM as the reference point for plan size. There is no discernible relationship between plan AUM and the number of unique managers; even plans under \$10 billion in AUM range from a low of three unique managers to a high of 55 unique managers. Similarly, large plans with above \$10 billion in AUM range from a low of one unique manager to a high of 40 unique managers. If manager diversification is, indeed, important for managing risk, operationalizing this type of diversification would present significant challenges in DC plans with individual accounts.

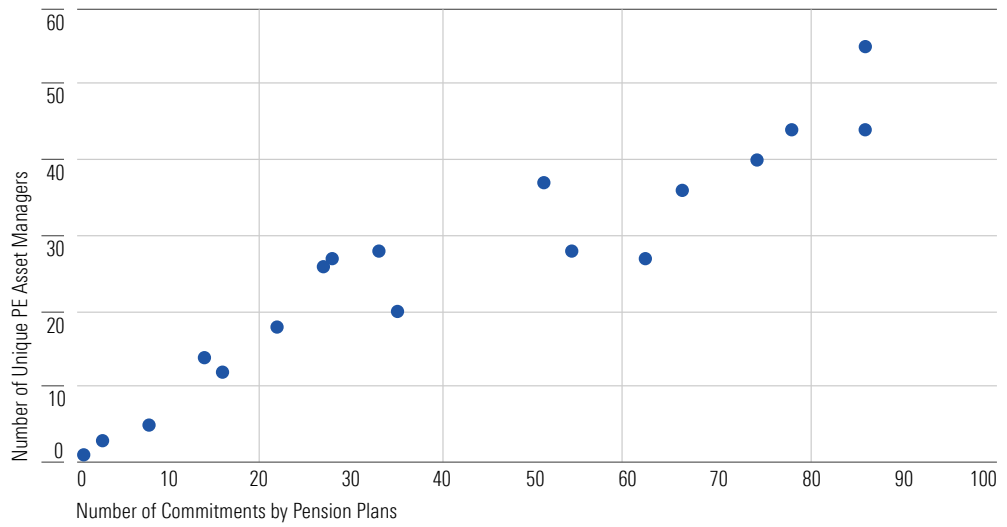
Exhibit 18 Plan Assets Under Management and Total Number of Unique Managers Selected, 2009



Source: PitchBook as of July 20, 2023.

Lastly, we did find a relationship between the number of commitments and the number of unique managers in Exhibit 19. Unsurprisingly, the relationship is positive and approximately linear between the number of commitments and the number of unique managers. The relationship is likely because when a pension plan makes more commitments, it ends up having to repeat managers more often because of the limited universe of GPs.

Exhibit 19 Total Commitments and Unique Managers, 2009-20



Source: PitchBook as of July 20, 2023.

Conclusion

Of the existing literature on PE in DC plans described in this paper, only two studies used actual, historical returns – the rest used simulations. We, on the other hand, did not use simulations and instead looked at actual, historical allocations to PE and their actual, historical returns. Our findings were unexpected. We were surprised to find little evidence supporting skill in fund selection or manager selection by pension plans. We were also surprised that there appears to be no consensus on the percentage allocation to PE. As a group, the pension plans in our dataset underperformed the theoretical index of all U.S. PE. As outlined in our introduction, there are return and diversification benefits to including PE in a portfolio, but the actual results of pension plans that invest in PE indicate that there is no single approach that can be broadly applied to DC plans. When there is no consensus approach, it is essential that retail investors enrolled in DC plans that offer PE are educated on the risks of PE and the wide range of possible allocations to and outcomes from investing in PE.

Although we started to explore whether duration liability was driving allocation decisions, the data was not structured in a manner that would allow us to perform this analysis. We are considering exploring the potential impact of duration liability in a future paper. Improvements to the Form 5500 would facilitate this and other research into the usage of PE. As our methodology section outlines, the process of collecting the PE allocation data is currently labor-intensive, as the data is not reported in the structured section of the Form 5500, nor is it reported consistently within the unstructured attachment. Previously proposed enhancements to the Form 5500 could make future research in this area easier by ensuring the Schedule H 4(i) attachment is in a structured data format and is more detailed than the current version.⁵⁰ The changes would ensure the full name and type of investment vehicle are always provided, as well as any applicable fees for unregistered pooled investments, and would migrate this information from an unstructured, inconsistently formatted attachment to a structured data file. These changes would help with identifying not just PE investments, but all investments held by plans. Having plans report the duration of liability in the structured section of the Form 5500 would also be helpful in allowing for analysis of investment decisions being made by pension plans as impacted by the age profile of their participants. In general, enhancements such as these would make the Form 5500 a more usable source of data on the U.S. retirement system and allow for broader and deeper research.

We would like to conclude with the policy implications of this work. Under ERISA, the prudential duty for pension and DC plans must meet a high bar, and the lack of transparency in the PE market makes this duty difficult to meet. If a PE index fund existed, such an option could potentially be a great addition to a DC or pension plan. The growing availability of data on PE funds provides useful third-party tools to plan managers that can be leveraged in fund selection. We believe that employers and plan managers should be encouraged to utilize such third-party tools in meeting their fiduciary duties under ERISA, particularly if PE becomes more available in DC plans.

⁵⁰ DOL (EBSA), DOT (IRS), PGBC. 2016. "Proposed Revision of Annual Information Return/Reports." <https://www.govinfo.gov/content/pkg/FR-2016-07-21/pdf/2016-14893.pdf>; 2021. "Proposed Revision of Annual Information Return/Reports." <https://www.govinfo.gov/content/pkg/FR-2021-09-15/pdf/2021-19714.pdf>.

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