Private Investments in Defined Contribution Retirement Portfolios

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I. Executive Summary

Over the past few decades, private sector businesses have dramatically shifted away from offering their employees defined benefit (DB) plans. During the DB plan era, defined contribution (DC plans, e.g., the 401(k)) were introduced as a supplemental benefit aimed at distributing company profits in a tax-advantaged manner. Over time, factors such as DB plan cost, shorter employment horizons, and the complexities of funding and valuing DB liabilities resulted in fewer employers offering DB plans. The DC plan structure then moved into the role of primary retirement plan in the private sector.

Beginning in 2006 with the Pension Protection Act (PPA), twenty years of bipartisan policy initiatives have resulted in DC plans functioning more like DB plans. For example, the PPA established target date funds (TDFs) as a qualified default investment alternative (QDIA). Today, TDFs comprise a supermajority of 401(k) plan assets. Like DB plans, TDFs relieve participants from making investment decisions. Initiatives that began with the Obama Administration and continued through the Secure Act of 2019 have addressed longevity risks by encouraging the offering of annuities in DC plans. Having annuities in DC plans offers participants a lifetime income option (that can extend to a spouse) similar to the payouts in DB plans.

In furtherance of this twenty-year policy trend, in March 2026, the Department of Labor (DoL) proposed a rule that outlines the processes and considerations involving the selection of designated investment alternatives for 401(k) plans, including private assets and other non-traditional assets. The proposed DoL rule focuses on six factors for fiduciary process consideration (performance, fees, liquidity, valuation, performance benchmarking and complexity) and assesses the benefits, costs, and transfers associated with the rule.

Adding private assets to DC plans would bring them more in line with DB plans' investments. The empirical evidence from DB plans shows that private assets improve DB plans' risk adjusted

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returns. Consistent with this evidence, this report's analysis shows that TDFs in 401(k) plans with private asset components can lead to increases of 16.8% to 27.4% in asset value at retirement, with a commensurate increase in annual income during the distribution phase. The projected increase in retirement income from adding private assets to DC plans would reduce the current gap in replacement income between households that have DB plans and those that do not.

The report concludes with an examination of the benefits of DoL's proposed rule. The report assesses the potential for improved risk-adjusted performance of TDFs with private assets as significantly positive. Over 10 and 20-year horizons, 401(k) participants could accumulate $205 billion and $955 billion more assets (measured in 2025 dollars) from the inclusion of private assets in TDFs. The adoption of the rule will increase the probability that sponsors will add private assets to TDFs, thereby making the benefits estimated more likely.

II. DB and DC retirement plans

Retirement plans are employer-sponsored arrangements designed to help workers accumulate wealth that can be used in their retirement years. In the U.S., the two major types of employer-sponsored retirement plans are defined benefit (DB) plans and defined contribution (DC) plans.

DB Plans are employer-sponsored retirement plans that promise participants a specified formula-based retirement benefit, tied to years of service and salary (e.g., final average pay), payable for life. To fulfill the promised benefits, the employer bears:

1) Accumulation risk/Contribution risk: ensuring that enough assets are contributed and invested over time to fund the promised benefits
2) Investment risk: fluctuations in the investment returns of the plan's assets
3) Longevity risk: paying benefits for as long as retirees live, even if life expectancy exceeds actuarial assumptions.

DB plans are now largely confined to the public sector, unionized workplaces, and legacy corporate plans. According to the Annual Survey of Public Pensions by the Census Bureau, in 2024, state and local government pension plans held $5.99 trillion in assets and covered more than 36 million participants.[2] Corporate and union DB plans held approximately $3.0 trillion in assets at 2023 year-end and covered more than 29 million participants.[3]

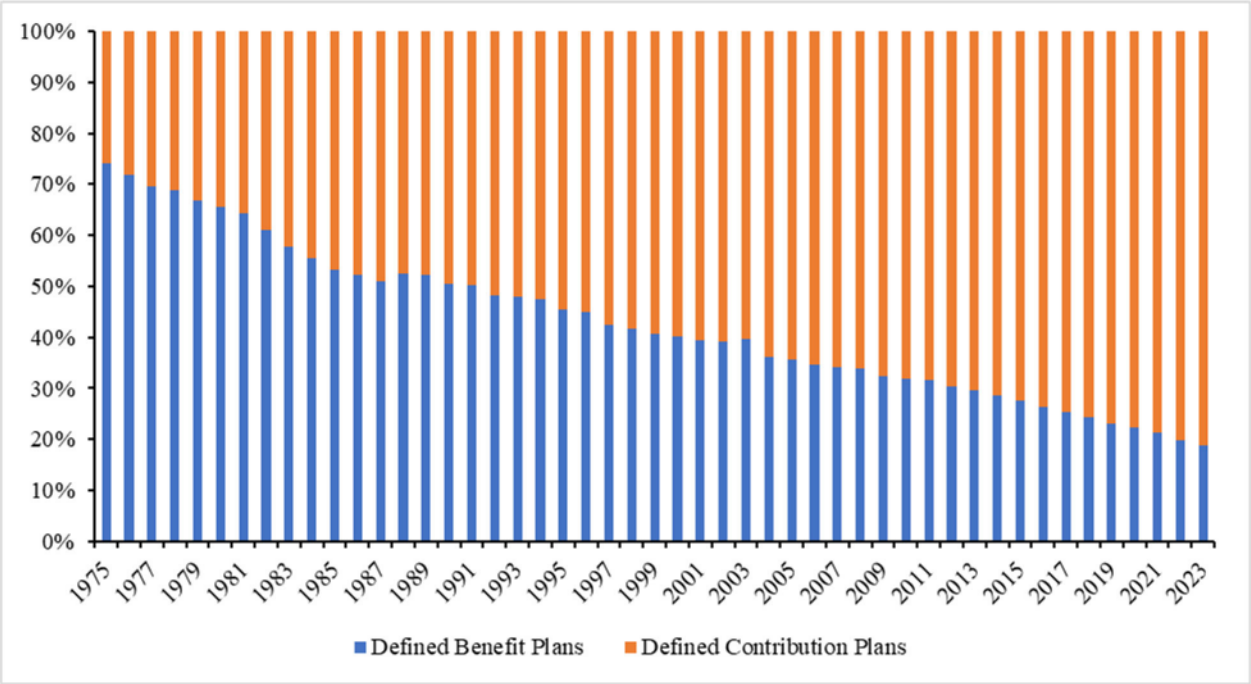
In comparison, the total assets held by DC plans as of year-end 2023 were approximately $9.4 trillion, of which $7.9 trillion were in 401(k) plans and the remaining in 403(b) and other defined contribution plans.[4] Thus, as of year-end 2023, the total assets in DC plans exceeds the amount held in government, corporate, and union plans ($9.4 trillion to $9.0 trillion).

The amount of assets invested in DB plans has been in a long-term decline relative to the amount of assets invested in DC plans.[5] The percentage of private sector participants in DB versus DC

[2] https://www.census.gov/newsroom/press-releases/2025/2024-annual-survey-public-pensions.html
[3] Corporate DB plans are defined as single employer and multiple-employer Private Pension Plan Bulletin, Abstract of 2023 Form 5500 Annual Reports, Department of Labor, January 2026. Table A6, https://www.dol.gov/sites/dolgov/files/ebsa/researchers/statistics/retirement-bulletins/private-pension-plan-bulletins-abstract-2023.pdf.
[4] US Department of Labor, Employee Benefits Security Administration, Private Pension Plan Bulletin, Abstract of 2023 Form 5500 Annual Report, Data Extracted on 6/30/2025, September 2025, available at https://www.dol.gov/sites/dolgov/files/ebsa/researchers/statistics/retirement-bulletins/private-pension-plan-bulletins-abstract-2023.pdf
[5] Federal Reserve Bank of St. Louis, FRED, compare series Defined Benefit Pension Funds; Total Financial Assets (BOGZ1FL594090045Q) to Defined Contribution Pension Funds; Total Financial Assets (BOGZ1FL594090055Q). https://fred.stlouisfed.org/

plans has also been declining sharply over time. Figure 1 shows that, as of 2023, DC plan participants were 81.1% of private company plan participants compared to 26% in 1975.[6]

Figure 1: Percentage of private sector participants in DB plans and DC plans[7]



There are a variety of reasons which led to a decline of DB plans in the private sector,[8,9]

- longer life expectancies resulted in retirees collecting benefits for more years than originally projected.
- more stringent funding, reporting, and disclosure requirements for DB plans.[10]
- employers preferred predictable costs over the open-ended liabilities of DB plans.
- labor market mobility reduced average tenures with employers, preventing DB plan participants from fully benefiting from traditional DB accrual formulas.

[6] Employee Benefits Security Administration, U.S. Department of Labor, Private Pension Plan Bulletin Historical Tables and Graphs 1975-2023 (September 2025), Available at: https://www.dol.gov/sites/dolgov/files/EBSA/researchers/statistics/retirement-bulletins/private-pension-plan-bulletin-historical-tables-and-graphs.pdf

[7] https://www.dol.gov/sites/dolgov/files/EBSA/researchers/statistics/retirement-bulletins/private-pension-plan-bulletin-historical-tables-and-graphs.pdf

[8] Bank of International Settlements, "The Shift from Defined Benefit to Defined Contribution Pension Plans - Implications for Asset Allocation and Risk Management," December 2006.

[9] https://legalclarity.org/why-are-defined-benefit-pension-plans-disappearing/

[10] For example, the Pension Protection Act of 2006 increased cost and risks as tightened funding rules which increased required contributions and year-to-year contribution volatility. https://www.milliman.com/en/insight/pension-protection-act-of-2006united-states

The rise of the 401(k) plan into the dominant private-sector retirement system was not a result of a deliberate retirement policy design, instead it evolved gradually through regulatory interpretation and employer adoption.

Section 401(k) was added to the Internal Revenue Code by the Revenue Act of 1978, originally to clarify the tax treatment of cash or deferred arrangements (CODAs) within profit-sharing and stock bonus plans.[11] The rapid growth of the 401(k) plans didn't happen until the early 1980s, when IRS regulations (issued in 1981–1982) confirmed that employees could make pre-tax salary deferrals into employer-sponsored plans. This clarification opened the door for widespread adoption of 401(k) plans as a tax-advantaged retirement savings vehicle.

Initially, many employers offered 401(k)s as supplemental plans, layered on top of traditional DB pensions and often funded through bonuses or discretionary contributions.[12] Over time, however, rising pension costs, regulatory and accounting pressures on DB plans, increased workforce mobility, and employers' desire for cost predictability led firms to freeze or terminate DB plans and rely increasingly on 401(k)s as the primary retirement benefit.[13]

Subsequent policy changes reinforced this shift. Higher contribution limits, employer matching features, and most notably, the PPA of 2006, which encouraged automatic enrollment and default investments (such as target-date funds), strengthened participation and normalized 401(k)s as the default retirement platform.[14] As a result, what began as a profit-sharing and tax-deferral mechanism evolved into the primary retirement system.

Retirement income from employer plans is an important component of maintaining a household's standard of living after working life. For example, pension and retirement savings contribute a

[11] ICI Research Perspective, 401(k) Plans: A 25-Year Retrospective, November 2006, available at https://www.ici.org/system/files/attachments/per12-02.pdf

[12] "The 401(k) plan had originally been designed to offer additional retirement benefits to the pension plans already in place." https://getbuilding.com/perspectives/the-entire-history-of-the-401k/.

[13] See A Visual Depiction of the Shift from Defined Benefit (DB) to Defined Contribution (DC) Pension Plans in the Private Sector, Congressional Research Services, December the 27th, 2021. "Employer costs are generally higher for DB plans than for DC plans, because the benefit in a DB plan is typically funded entirely by the employer, while a smaller portion of the typical DC plan benefit is from employer contributions"; "For some employees, DC plans may be preferable to DB plans because DC plan account balances are portable." From an employer's perspective, contributions to DC plans tend to be a more predictable cost than contributions to DB plans are". also See, The Shift From Defined Benefit Plans To Defined Contribution Plans, Lewis & Clark Law Review, 2007. "As to the first part of that question, the most cogent explanations that have been offered are: (i) the weight of federal regulation on DB plans, most particularly affecting smaller plans."

[14] United States, Government Accountability Office, 401(k) retirement plans, Department of Labor should update guidance on target date funds, March 2024, available at https://www.gao.gov/assets/gao-24-105364.pdf; Pension Rights Center, Permanent Increase in Contribution Limits, January 2011, available at https://pensionrights.org/resource/permanent-increase-in-contribution-limits/; Holland & Knight, The Pension Protection Act of 2006, December 5, 2006, available at https://www.hklaw.com/en/insights/publications/2006/12/the-pension-protection-act-of-2006.

large portion (27.3%) of retirement income for middle-income households.[15] One study finds that households with DB pensions are able to meet the threshold of 70-75% of pre-retirement income to preserve their standard of living in retirement, while those without pensions are able to attain a replacement rate of only 62-63%.[16,17] Improving the risk-adjusted performance of DC plans would help to close this retirement income gap and allow DC plan retirees to enjoy an improved standard of living.

[15] Congressional Research Service, "Income for the Population Ages 65 and Older: Evidence from the Health Retirement Study (HRS)," August 5, 2025, available at https://www.congress.gov/crs_external_products/R/PDF/R47341/R47341.5.pdf

[16] Munnell, Alicia H. and Mauricio Soto. 2005. "What Replacement Rates Do Households Actually Experience in Retirement?" Working Paper 2005-10. Chestnut Hill, MA: Center for Retirement Research at Boston College; https://crr.bc.edu/wp-content/uploads/2005/08/wp_2005-10.pdf

[17] Studies have found that an income of 75%-85% of pre-retirement income is often assumed to preserve the standard of living in retirement (although individual-specific circumstances may warrant higher or lower replacement rates). Brady, Peter J., "Measuring Retirement Resource Adequacy," (February 1, 2008). Available at SSRN: https://ssrn.com/abstract=1092590 or http://dx.doi.org/10.2139/ssrn.1092590; MacDonald, Bonnie-Jeanne and Kevin D. Moore, "Moving Beyond the Limitations of Traditional Replacement Rates," Society of Actuaries' Pension Section (September 2011). Available at https://www.soa.org/globalassets/assets/files/research/projects/research-moving-beyond-report.pdf

III. Policy initiatives have moved DC plans toward functioning more like DB plans

Over the past 20 years, (2006-2025), bipartisan policy initiatives have moved DC plans toward functioning more like DB plans. For example, in a DB plan, a participant does not have to make investment decisions during her working life. But in a DC plan, a participant must choose from amongst the investment options the plan offers. The PPA of 2006 included a major change to ERISA by establishing qualified default investment alternatives (QDIAs), which are default investment vehicles that plan sponsors can use for participants who fail to make an active investment election. TDFs were designated as a QDIA, which allows plan sponsors to automatically enroll participants into them.[18]

TDFs relieve participants from making investment decisions by automatically adjusting asset allocation over time. Behavioral economics research shows that properly structured default options can have a large positive influence on retirement savings behavior.[19] Studies find that when employees are automatically enrolled in a retirement plan with a default investment and contribution level, participation rates and savings outcomes rise significantly compared with plans that require active enrollment.[20]

TDFs have become the dominant QDIA in DC plans. As noted by Partners Group: "[w]ith most plans designating a target-date product as their qualified default investment alternative (QDIA), these professionally managed investment options capture a significant portion/majority of participant contributions. Nearly two-thirds (65.2%) of 401(k) contributions flow into target-date products and this figure is expected to increase to 69.1% by 2030. As a result, target-date products are the largest single asset class in 401(k) plans, currently holding $3.4 trillion in assets as of 2024, which are expected to nearly double to $6.5 trillion by 2030, making up nearly half (49.0%) of total 401(k) assets."[21]

Regulatory relief under ERISA has also led to lower costs and greater flexibility for TDFs to hold a wider range of assets that more closely resemble the portfolios in DB plans. For example, TDFs can now be offered to 401k plans through mutual funds or a Collective Investment Trust (CIT). CITs are tax-exempt pooled investment vehicles managed by a bank or trust company, regulated by the Office of the Comptroller of the Currency (OCC) or state banking authorities

[18] https://www.robertsandholland.com/news-and-insights/provisions-of-the-pension-protection-act-of-2006-affecting-401k-and-other-defined-contribution-plans/
[19] Scientific Background on the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2017, Richard H. Thaler: Integrating Economics with Psychology, The Committee for the Prize in Economic Sciences in Memory of Alfred Nobel, October 9, 2017.
[20] John Beshears, James J. Choi, David Laibson, and Brigitte C. Madrian, "The Importance of Default Options for Retirement Savings Outcomes: Evidence from the United States," NBER Working Paper 12009 (2006), https://doi.org/10.3386/w12009;
[21] Partners Group, "Unlocking the Potential of Private Investments in Defined Contribution Plans," September 2025, p. 6.

rather than the Securities and Exchange Commission (SEC). Individuals cannot typically access CITs in their ordinary accounts, but they are available to them through employer-sponsored retirement plans.[22]

CITs offer greater investment flexibility than mutual funds as they have flexibility to invest in illiquid alternatives such as real estate, commodities, high-yield bonds, and hedge funds. In contrast, mutual funds are constrained by 15% cap on illiquid securities.[23] With this added flexibility, a TDF can include a wider range of assets (like those held in DB plans) and improve its risk-adjusted performance.

Because CITs are not subject to SEC registration and have reduced administrative and marketing costs, they typically have lower fees,[24] charging 10 to 30 basis points less than mutual funds.[25] As a result, CITs have become the dominant vehicle through which TDFs are offered inside 401(k) plans. As of 2024, CITs account for over $7 trillion of the $12.4 trillion in defined contribution plan assets, according to reports from SEC and ICI.[26]

Starting in 2008, policy and regulatory changes focused on enhancing retirement income options for DC plan participants. In that year, the Employee Benefit Security Administration (EBSA) promulgated a "safe harbor" to satisfy the fiduciary responsibilities associated with selecting an in-plan annuity provider.[27] In early 2012, Treasury Secretary Timothy Geithner issued rules easing the purchase of annuities in 401(k) plans.[28] In 2014, the U.S. Treasury issued Notice 2014-66, which allowed for deferred-income annuities in target-date funds to be used as a default investment.[29]

In continuance of the trend of policy initiatives that have moved the DC plan structure and outcomes toward a focus on retirement income, the SECURE Act of 2019 created a safe harbor for the inclusion of annuities in DC plans.[30] As a result, DC plans are increasingly incorporating annuities, which allow participants to address longevity risk with lifetime (single or joint life)

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[22] https://clsbluesky.law.columbia.edu/2023/11/09/overtaking-mutual-funds-the-hidden-rise-and-risk-of-collective-investment-trusts/

[23] Even so, the SEC's rule 22e-4 allows a funds exceeding the 15% limit to return to the limit within a "reasonable period of time." Securities and Exchange Commission, "Investment Company Liquidity Risk Management Programs," Release Nos. 33-10233; IC-32315; File No. S7-16-15.

[24] https://www.troweprice.com/content/dam/retirement-plan-services/pdfs/insights/investment-insights/CITs_as_investment_options_in_qualified_plans.PDF

[25] https://www.plansponsor.com/cits-lower-fees-seen-as-an-advantage-over-mutual-funds/

[26] https://www.comerica.com/insights/wealth-management/wealth-preservation/CIT.html; https://www.cohenco.com/knowledge-center/insights/may-2025/understanding-collective-investment-trusts-alternative-strategies

[27] Selection of Annuity Providers--Safe Harbor for Individual Account Plans. 73 Fed. Reg. 58,447 (Oct. 7, 2008) (codified at 29 C.F.R. § 2550.404a-4).

[28] Mary Williams Walsh, *New Treasury Rules Ease 401(k) Annuity Purchase,* N.Y Times, February 2, 2012.

[29] IRS, Notice 2014-66, Lifetime Income Provided Through Target Date Funds in Section 401(k) Plans and Other Qualified Defined Contribution Plans, available at https://www.irs.gov/pub/irs-drop/n-14-66.pdf.

[30] Section 204, Fiduciary Safe Harbor for Selection of Lifetime Income Provider. Public Law 116–94, December 20, 2019, 133 STAT. 3165.

payouts like those in DB plans. According to Life Insurance Agency Management Association (LIMRA) research, 70% of workers are interested in guaranteed income products and more than 40% of DC plan sponsors intend to add one or are actively considering it.[31]

[31] https://www.limra.com/en/newsroom/industry-trends/2024/in-plan-annuities-are-gaining-momentum-in-the-workplace-are-they-poised-to-be-the-next-big-thing-maybe/

IV. Current Context

In late 2025-early 2026, U.S. retirement policy began moving toward expanding access to private and alternative assets within DC plans. This shift was formalized in August 2025 with President Trump's executive order directing the DoL, SEC, and the Department of Treasury to review and revise existing guidance and rules that previously limited the inclusion of private market investments in DC plans.[32] The order sought to expand practical access to private equity, real estate, digital assets, and other strategies as potential investment options for plan participants. The process-based safe harbor contemplated by the order aims to reduce the litigation risk that has discouraged fiduciaries from considering these alternative assets.

Consistent with this perspective, SEC Commissioner Mark T. Uyeda, in remarks delivered in November 2025, highlighted the diversification benefits of including private assets in 401(k) plans noting that "[p]rivate investments—such as private equity, private credit, venture capital, infrastructure, and real estate—offer return profiles that may be less correlated to the traditional public markets. When included as part of a diversified portfolio, these assets can enhance overall performance and reduce volatility."[33]

On March 30, 2026, DoL released a proposal that clarifies fiduciary duties under ERISA when selecting investment options for participant-directed retirement plans and introduced a process-based safe harbor.[34] The proposal applies broadly to all designated investment alternatives, while emphasizing that fiduciary prudence is determined by the decision-making process rather than specific outcomes.

The proposal outlines six non-exhaustive factors and provides guidance to evaluate those factors as summarized below:

- Performance: evaluate whether the investment's risk-adjusted expected returns (net of fees) compare favorably to similar alternatives over an appropriate time horizon.
- Fees: Assess whether fees and expenses are reasonable relative to risk-adjusted expected returns and any additional value or features provided.
- Liquidity: Confirm that the investment has sufficient liquidity to meet plan and participant needs, including withdrawals and re-allocations.
- Valuation: Confirm that investments can be valued accurately and in a timely manner using appropriate and reliable methods.

[32] https://www.whitehouse.gov/presidential-actions/2025/08/democratizing-access-to-alternative-assets-for-401k-investors/.
[33] Remarks at the ICI Retail Alternatives and Closed-End Funds Conference, The Diversification Deficit: Opening 401(k)s to Private Markets, New York, November 20, 2025, available at https://www.sec.gov/newsroom/speeches-statements/uyeda-remarks-diversification-deficit-opening-401ks-private-markets-112025
[34] Department of Labor, Fiduciary Duties in Selecting Designated Investment Alternatives; Proposed Rule, Federal Register, Vol. 91, No. 61, March 31, 2026.

- Performance benchmarks: Compare the investment's performance against a meaningful benchmark with similar strategy, objectives, and risks.
- Complexity: Determine whether the fiduciary has sufficient expertise to understand the investment or needs to seek qualified assistance.

V. Private Assets in DB Plans

A. Private equity, private credit, and real assets

Private investments have limited liquidity as they do not trade in a public marketplace like a stock exchange. Private investments include

- Private equity: the principal types of private equity investments include buyout (control investments, often leveraged, in mature businesses typically focused on value improvements), growth equity (typically minority investments in established companies seeking capital to accelerate expansion), and venture capital (early-stage investments in startup and young companies, typically minority stakes).
- Private credit: loans to companies outside of public debt markets and traditional bank lending.
- Real assets: private real estate or infrastructure

The private investment universe is quite large. For example, most mid-to-large scale businesses are private: currently, approximately 87% of US companies with over $100 million in revenue are privately owned.[35]

Private investments often require a long-term commitment that starkly contrasts with the short-term trading environment associated with some public assets, especially equities. Daily liquidity is certainly a desirable feature, but long-term commitment can also be valuable. Illiquidity offers the potential for enhanced returns and diversification.

Private asset funds are the primary investment vehicles through which these investments are made; they pool capital to make multiple private investments. As of 2026, the private investment industry is segmented by fund size, ranging from lower middle market funds that target smaller businesses with $100 million to $500 million in enterprise value, to institutional mega funds, which can exceed $20 billion for a single vintage.[36]

The estimated size of private markets is summarized in Table 1 below.[37]

[35] Apollo Academy. (2025). The Rise of Private Markets: 87% of Large US Firms are Private.
[36] Growthequity Interview Guide. (2025). Private Equity Middle Market vs. Mega Funds: Comparative Overview.
[37] Source: Preqin

Table 1: Estimated size of private markets as of June 30, 2025[38]

Private Equity	$9,796 billion
Buyout	$4,418 billion
Venture Capital	$3,623 billion
Growth Equity	$1,755 billion
Private Credit	$1,753 billion
Real Assets	$3,639 billion
Real estate	$2,033 billion
Infrastructure	$1,606 billion

B. DB and DC plans' allocations to private assets

There are over 5,000 public DB retirement systems in the US. They collectively hold around $6 trillion in assets, covering about 15.3 million active workers and 12.4 million retirees. Approximately $405.5 billion is paid out in benefits annually.

Public DB pension plans invest heavily in private and alternative asset classes to increase diversification and improve long-term returns. In 2024, 13.8% of state and pension plan assets were allocated to private equity, 9.1% were in real estate, and 6.5% were in hedge funds. As these are the *average* allocations across different state and pension plans, many plans have allocations above these averages.[39] The allocation to private equity has grown significantly since 2001, when private equity represented about 3.6% of the plan assets.[40] In contrast, over the same period, the DB plan allocations to public equities have declined. In 2001, equities made up approximately 60% of pension plan assets, but by 2024 that allocation had fallen to 42.3%.[41]

Table 2 shows that the sum of the average alternative asset allocations for DB plans in 2024 is 29.4%. Compared with DB plans, DC plans only make limited use of private market investments. DoL notes that only 0.1% of all DC plan assets are allocated to alternative assets in 2024.[42]

[38] Preqin. The total size includes unrealized asset value and dry powder. Fund of funds and secondaries are excluded to avoid double counting of available capital and unrealized value.
[39] https://www.investmentcouncil.org/wp-content/uploads/2025/07/AIC-2025-Pensions-Report.pdf; https://publicplansdata.org/public-plans-database/browse-data/
[40] https://publicplansdata.org/quick-facts/national/
[41] https://publicplansdata.org/quick-facts/national/
[42] Department of Labor, Fiduciary Duties in Selecting Designated Investment Alternatives; Proposed Rule, Federal Register, Vol. 91, No. 61, March 31, 2026, p. 16106.

Table 2: Investments of DB plans and DC plans in private equity, real estate, and hedge funds (alternative assets) in 2024

	DB plans	DC plans
Investments in alternative assets	29.4%	0.1%

DB plans typically do not buy private companies or issue loans directly. Instead, they act as Limited Partners (LPs) in private funds.[43] As an example, Connecticut's pension system implements PE exposure by allocating capital to a PE Combined Investment Fund (PE CIF). The PE CIF invests in a range of private equity strategies and vehicles with the objective of earning returns above public equity markets. The private investment is done through externally managed limited partnerships or separate accounts that specialize in PE, and the fund may also make co-investments or transact in secondary interests in PE funds.[44]

The use of private assets in retirement plans is not limited to the United States. Australia's superannuation funds have invested up to 38% of their portfolio in private assets with an intention to increase their exposure to private assets.[45] According to a global pension assets study in 2022, the pension funds' allocation to private assets have increased from 7% to more than 26% between 2002 to 2022.[46]

Private assets in DC plans are currently a very small allocation, but the trend to add them is strongly positive. For example, in May 2025, Empower announced that it will offer private market funds from asset managers, including Apollo, to retirement plans through CITs.[47, 48]

Blackrock similarly has suggested that it will include investment in private assets in 401(k) plans through TDFs. It noted that "our preferred approach would include private strategies that are purpose-built for use solely in target date solutions. This approach would help to mitigate the impact of liquidity-driven shocks by giving us full control of the target date solution's building-block architecture, cash flow and allocation management, where we could have tighter control of allocations and align liquidity more closely with expected flow."[49]

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[43] "Pension plans typically invest in private equity through limited partnerships in which the general partner develops an investment strategy and limited partners provide the large majority of the capital." United States, Government Accountability Office, Defined Benefit Pension Plans, "Guidance Needed to Better Inform Plans of the Challenges and Risks of Investing in Hedge Funds and Private Equity," August 2008.
[44] https://portal.ct.gov/OTT/Pension-Funds/Combined-Investment-Funds
[45] ASIC, Australia's evolving capital markets: A discussion paper on the dynamics between public and private markets, February 2025, p. 23, available at https://download.asic.gov.au/media/44hh5ctv/australia-s-evolving-capital-markets-a-discussion-paper-on-the-dynamics-between-public-and-private-markets.pdf.
[46] Thinking Ahead Institute, Global Pension Assets Study, 2022, p. 10, available at https://www.thinkingaheadinstitute.org/content/uploads/2022/02/GPAS_2022.pdf.
[47] https://www.spglobal.com/market-intelligence/en/news-insights/articles/2025/6/sec-opening-door-for-private-equity-in-12-trillion-us-retirement-plans-90315436
[48] https://www.psca.org/news/psca-news/2025/5/empower-will-offer-private-assets-in-401k-plans/
[49] Blackrock, The power of private markets, Unlocking the benefits of private assets in defined contribution plans, June 2025.

VI. Benefits of Private Assets in Defined Contribution Retirement Plans

A. Overview of Fund Structures Used for Private Asset Investments

In a DC plan context, daily valuation, liquidity, and participant transactions are expected. So traditional private asset investment structures such as "drawdown funds" that have long lockups, capital calls, and irregular cash flows might not be appropriate. To accommodate the features of DC plans, using an "evergreen" fund structure is a better fit. Evergreen funds are open-ended perpetual vehicles with no fixed termination date. Capital is invested on a continuous basis, and investors can subscribe or redeem periodically. Valuations are updated regularly, and returns are often distributed over time rather than only at exit.[50] Evergreen funds are used across private equity, credit, and real asset strategies.

"Semi-liquid" funds are a subset of evergreen funds. An example is an interval fund, which typically allows investors to purchase shares at net asset value (NAV) daily. Interval funds offer limited periodic liquidity, typically with caps on redemptions (e.g., five percent of NAV) to manage cash needs and avoid forced asset sales. Interval funds use NAV-based pricing with regular valuations, providing more flexibility and transparency than traditional drawdown funds.

Evergreen funds (including "semi-liquid" funds) are more appropriate for DC plans because they offer NAV based pricing, continuous capital deployment, and limited periodic liquidity, allowing plan fiduciaries to manage contributions, withdrawals, and rebalancing. As a result of these features, these vehicles are also becoming more accessible to individual investors, with AUM now over $500 billion.[51]

Evergreen funds typically charge management fees based on NAV rather than on committed capital like drawdown funds. The fee on NAV incentivizes the managers to deploy the capital efficiently. The funds use a "crystallized" carry structure with highwater marks and performance hurdles, ensuring managers earn incentive fees only when investors receive gains above prior portfolio highs or specified return thresholds.[52]

A report from Morningstar examines the rapid growth of evergreen private market funds. The study reported that traditional public market benchmarks are not well suited to evergreen funds because they have different risk profiles, leverage, liquidity structure, and underlying assets. To

[50] Drawdown funds can make distributions after exiting investments, though typically they limit distributions before the end of their investment period. Distributions are subject to manager discretion to retain cash for fund needs.
[51] MSCI, Research and Insights, "The Ascendance and Implications of Evergreen Funds in Private Markets," March 2026; https://www.msci.com/research-and-insights/blog-post/the-ascendance-and-implications-of-evergreen-funds-in-private-markets
[52] Bocconi Students Investment Club, Evergreen Funds: An Open-Ended Alternative to Private Markets, April 2025, https://bsic.it/evergreen-funds-an-open-ended-alternative-to-private-markets/

address these differences, Morningstar introduced a new family of evergreen fund indices to track the performance of evergreen funds across private market strategies.[53]

A study by Morgan Stanley Capital International documented that evergreen funds have generated returns consistent with broader private-market asset classes over time.[54] Brown and Volkmann (2025) find that evergreen funds and closed-end drawdown funds have similar risk-adjusted performance, and that evergreen funds may have less variation and unpredictability of cash flows and portfolio risk than drawdown funds.[55] Hamilton Lane found a sample of 13 evergreen funds produced higher annualized returns than traditional PE funds over a period of five years.[56]

Despite the relatively recent emergence of evergreen funds, the evidence to date suggests they are likely to produce similar returns as traditional drawdown funds, particularly after controlling for liquidity and performance measurement differences between the fund structures.[57]

B. Recent literature illustrates how private assets can improve the performance of a portfolio and retirement plan outcomes

Several studies and industry analyses find evidence illustrating how private assets can improve portfolio performance and retirement plan outcomes, although estimates vary depending on data, methodology, and time period analyzed.[58] For example, an American Investment Council study analyzed 200 U.S. public pension funds and found that PE investments provided a median annualized return of 13.5% over a 10-year period, which is higher than all other asset classes

[53] Morningstar Indexes, Benchmarking the Evergreen Evolution, https://files.pitchbook.com/website/files/pdf/Q4_2025_Benchmarking_the_Evergreen_Evolution_20536.pdf

[54] MSCI, Research and Insights, "The Ascendance and Implications of Evergreen Funds in Private Markets," March 2026; https://www.msci.com/research-and-insights/blog-post/the-ascendance-and-implications-of-evergreen-funds-in-private-markets

[55] Gregory W. Brown and William Volckmann, "Evergreen vs. Drawdown Funds: Risk, Returns and Cash Flows," Institute for Private Capital, June 2025.

[56] Hamilton Lane, "Evergreen Funds and Private Wealth," available at https://explore.hamiltonlane.com/2025-market-overview/evergreen-funds.

[57] An analysis by Neuberger Berman shows the need to adjust evergreen funds' performance for their liquidity holdings when comparing their performance to traditional drawdown funds where cash is managed via capital calls. Neuberger Berman, "Comparing Evergreen and Traditional Fund Returns in Private Equity," September 2024.

[58] According to the SEC's Division of Economic and Risk Analysis, the private equity literature is evolving and has not reached consensus on the methodology to measure risk-adjusted returns and improvements in portfolio efficiency. Their assessment first notes disagreement regarding how to best measure risk-adjusted performance but also notes that the literature has been consistent in finding private equity has outperformed public benchmarks. Their assessment further notes disagreement regarding whether investors can replicate private-equity risk exposures through public market alternatives like investing in small capitalization illiquid stocks. Even if it were possible to earn a liquidity premium through public market investing, it is unlikely that can be achieved at scale or at low cost given the limited capitalization of the public market for small companies. SEC Division of Economic and Risk Analysis, Memorandum to Private Investments Subcommittee of the Asset Management Advisory Committee, September 1, 2020, available at https://www.sec.gov/files/amac-memo-academic-literature-09162020.pdf.

including public equity (9.7%), real estate (7.4%), and fixed income (1.9%).[59] The study showed that even the bottom quartile private equity return exceeds the top quartile public equity returns.[60]

Brown et al (2025) show that buyout funds, private debt, and infrastructure funds have performed well on a risk-adjusted basis using data on 7,816 funds with vintage years from 1988 to 2019.[61] Similarly, Kortweg and Nagel (2024) analyze returns of 1,073 US buyout funds (vintages from 1978 to 2016) and find that these funds outperformed their public market equivalents.[62]

Balloch et al. (2025) uses an anonymized dataset covering 65,000 investments made by 17,900 high-net-worth investors across more than 4,500 private funds closed between 2000 and 2020. The study finds that the aggregate portfolio outperforms public markets. Public market equivalents adjusted for asset-class risk (beta) average 1.21 for buyout funds, 1.01 for venture capital funds, and 1.07 for fund of funds.[63]

A study by the Council of Economic Advisers finds that portfolios with private asset allocations generated higher risk-adjusted returns (measured by Sharpe Ratio) consistent with the diversification benefit of adding private assets to traditional portfolios.[64]

A study by the National Institute on Retirement Security shows that since the 2008 financial crisis, public pensions' diversification into private and alternative assets has generated better results over long periods compared to traditional portfolios.[65] Consistent with those findings, a study by Cliffwater found that the pension portfolios with higher allocations to private and alternative assets outperform by approximately 0.6% per year during the 2001-2024 period.[66]

Recent analyses also show how the *failure* to include private assets in DC plans harms participant retirement outcomes. For example, a 2023 study from the Center for Retirement Initiatives finds that failing to include allocations to private equity, real estate, and infrastructure in a TDF results in a 15-basis point annual return disadvantage. This translates into roughly $5

[59] https://www.investmentcouncil.org/new-study-private-equity-delivers-the-strongest-returns-for-retirees-across-america/
[60] https://www.investmentcouncil.org/wp-content/uploads/2025/07/AIC-2025-Pensions-Report.pdf
[61] Gregory Brown, Christian Lundblad & William Volckmann, Risk-Adjusted Performance of Private Funds: What Do We Know?, Institute for Private Capital, March 2025, available at https://uncipc.org/wp-content/uploads/2025/03/Private-Risk-Adjusted-Returns-1.pdf
[62] Arthur Korteweg & Stefan Nagel, Risk-Adjusted Returns of Private Equity Funds: A New Approach, The Review of Financial Studies, (Oct. 11, 2024).
[63] Cynthia Balloch et al., Democratizing Private Markets: Private Equity Performance of Individual Investors, The Ohio State University, Fisher College of Business Working Paper Series, June 2025.
[64] The Council of Economic Advisers, Retail Access to Alternative Investments Via Defined Contribution Plans, August 2025, available at https://www.whitehouse.gov/wp-content/uploads/2025/08/Retail-Access-to-Alternative-Investments-Via-Defined-Contribution-Plans-2.pdf.
[65] National Institute on Retirement Security, Evolution and Growth: How Public Pension Plans have diversified their investments amid changing markets, June 2025.
[66] Cliffwater, Alternatives Benefit Long-Term State Pension Performance, June 9, 2025.

billion less in aggregate annual retirement income for participants, equivalent to about $2,400 per year additional income for a retiree in the study.[67] Including private assets in TDFs provides both long-term performance and diversification benefits that translate into improved retirement outcomes for participants.[68]

DC plan participants could also improve their financial outcomes in retirement by making higher contributions to their plan while working. But higher contributions require foregoing consumption and can put stress on maintaining the current standard of living. In addition, since the average job tenure is about five years, interruptions in DC plan contributions are common as an average retiree will hold nine different jobs in her working life.[69] However, a 2025 study by Center for Retirement Initiatives shows that including private equity, real assets, and private credit in TDFs can bridge savings gaps from career interruptions or financial stress. The results illustrate a 7-8% improvement in retirement outcomes over a range of different DC participant profiles.[70]

Industry commentary aligns with this research by emphasizing potential benefits of expanding access to private assets in DC plans. Cambridge Associates suggests that a modest allocation to private investments can boost retirement income replacement and diversify risk, especially when implemented through multi-asset funds.[71] BlackRock's analysis similarly highlights that a strategic mix of private assets could increase participant's account values by about 15%. [72]

An Alliance Bernstein analysis places private assets in a broader asset-allocation context, noting their growing role as public markets shrink.[73] Given the large decline in the number of publicly traded companies as well as the growing concentration risks in large-cap public equities, the case for including private assets in DC plans is increasingly supported by risk-adjusted return considerations.

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[67] https://cri.georgetown.edu/press-releases/study-concludes-lack-of-asset-diversification-in-defined-contribution-retirement-plans-has-been-5-billion-annual-missed-opportunity/

[68] https://cri.georgetown.edu/press-releases/study-concludes-lack-of-asset-diversification-in-defined-contribution-retirement-plans-has-been-5-billion-annual-missed-opportunity/

[69] Vanguard Research, Job transitions slow retirement savings, September 2024. https://digital-assets.vanguard.com/corp/research/pdf/job_transitions_slow_retirement_savings.pdf

[70] Georgetown University, Center for Retirement Initiatives, "Making the case: The effect of private market assets on retirement income in cases of disrupted savings," August 2025.

[71] https://www.cambridgeassociates.com/en-as/insight/better-alternatives-private-investments-may-improve-outcomes-for-defined-contribution-plan-participants/

[72] https://www.blackrock.com/institutions/en-us/insights/thought-leadership/defined-contribution-dc/private-markets-in-tdfs

[73] https://www.alliancebernstein.com/us/en-us/defined-contribution/insights/investment-insights/the-role-of-private-assets-in-strategic-asset-allocation-a-macro-perspective.html

C. A Comparison of Public and Private Asset Performance

a. Return and risk comparisons

Building on the literature in the previous section, Table 3 uses data from December 31, 2000 to September 30, 2025 from Bloomberg and Preqin to compare the risk and return of public and private assets. The returns on both public and private assets are calculated net of fees.[74] The private asset data are available at a quarterly frequency, and all return and volatility estimates are based on these quarterly observations.[75]

Table 3: Returns and volatility for all asset classes (December 31, 2000 to September 2025)[76]

Asset Class	Average Return	Volatility
Public Equities:		
Large Stocks	9.5%	16.7%
Small Stocks	12.0%	22.7%
Fixed Income:		
Long term corporate bonds	5.6%	10.2%
Long term government bonds	4.5%	14.7%
Intermediate term government credit	3.0%	3.4%
Cash:		
Money market	1.5%	0.9%
Private Assets:		
Buyout and Growth	13.8%	16.3%
Venture Capital	6.9%	27.8%
Private Credit	10.4%	10.3%

The table above shows that the buyout and growth equity strategies offer higher expected returns (13.8%) than the large public stocks (9.5%) while carrying similar risk (volatility of 16.3% and

[74] Note that the private asset returns are net of fees charged within traditional drawdown fund structures, including fees that would not be applicable to TDF-directed investment into a private asset sleeve (e.g., fees related to marketing the fund or sourcing investment capital, maintaining investor accounts, providing shareholder services). This analysis is conservative to the extent that elimination of such fees for 401(k) investors could improve the net of fee returns.

[75] See the appendix for details. Due to the appraisal-based nature of private asset valuations, reported values may be stale, resulting in return smoothing and the presence of autocorrelation. To mitigate any effects of staleness, the analysis adjusts the return series to remove autocorrelation and computes de-smoothed returns that more reasonably reflect the underlying economic risk.

[76] See the Appendix for data sources.

16.7%). Similarly, the returns on private credit (10.4%) are higher than the returns on long-term corporate bonds (5.6%) with a similar risk profile (volatility of 10.3% and 10.2%).[77]

The sample period is relevant for understanding venture capital returns. During the first three years of the sample (2001-2003), venture capital experienced very negative returns following the collapse of the dot-com bubble in 2000. These negative returns depressed longer-horizon return averages despite stronger performance in subsequent years.[78] In the subsequent analyses, these lower historical risk-adjusted returns for venture capital result in a zero allocation to optimal risk-return portfolios.

b. Sources of higher returns

Private assets provide higher returns through risk factor exposures – in particular, liquidity risk. Young to middle-aged DC plan investors have long investment horizons that allow them to take advantage of exposure to liquidity risk in their retirement plans. The source for all asset returns above a risk-free rate is exposure to risk factors that provide opportunities to earn premia. Empirical literature shows that factor returns are not perfectly correlated, providing an opportunity for diversification. Exposure to more risk factors can thus result in higher risk-adjusted returns (e.g., as measured by Sharpe ratio).[79] As private assets have exposure to liquidity risk, long-term investors can benefit since liquidity risk exposure provides higher expected returns.[80] Previous empirical observations show that private assets have as a class outperformed public market benchmarks, consistent with the view that the return premium is likely driven by exposure to a liquidity risk factor.[81] Thus, given the long horizons of DC plan investing, adding the ability to earn a liquidity risk premium should be beneficial to plan participants as it will improve long-term risk-adjusted returns.

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[77] The spread between the private credit and public credit markets is a premium required to compensate for, among other things, illiquidity, and smaller issue size. The spread has been documented to be close to 5% as of 2024. https://www.nepc.com/the-nepc-guide-to-private-debt/. As of November 2025, BlackRock documented a private credit yield of approximately 10%, in line with the long term average return; https://www.blackrock.com/us/financial-professionals/insights/the-growth-in-private-credit.

[78] Alternatively using the data from March 2004 to September 2025, the de-smoothed average returns of venture capital strategy are 10.5% with a volatility of 17.4%.

[79] Ilmanen, Antti and Jared Kizer, "The Death of Diversification Has Been Greatly Exaggerated," Journal of Portfolio Management, vol 38, no 3 (Spring 2012).

[80] Angela M. Antonelli, Center for Retirement Initiatives, Georgetown University, Making the Case: Addressing the Myths About Private Assets in Defined Contribution Retirement Plans (2025), https://cri.georgetown.edu/wp-content/uploads/2025/08/Addressing-the-myths-about-private-assets.pdf. For an earlier paper studying liquidity risk premia in public markets, see Pastor, Lubos and Robert F. Stambaugh, "Liquidity Risk and Expected Stock Returns," NBER Working Paper 8462 (September 2001), Available at: www.nber.org/system/files/working_papers/w8462/w8462.pdf

[81] The higher returns could also be due to manager's intervention, improved governance, and value creation. For example, there could be increases in productivity (Aldatmenz & Brown (2019)), reductions in workplace injuries (Cohn et al 2021), fewer health violations (Bernstein & Lerner 2016), and better performance in a financial crisis (Bernstein and Lerner (2017).

While a risk premium is a benefit for holding illiquid or volatile assets, alpha depends on a manager's ability to consistently beat benchmarks. If projected outperformance is driven by an expectation of alpha, the investment analysis should consider the fund's management, historical track record, process, and stability.

D. Private assets improve risk-adjusted portfolio performance by increasing diversification benefits

To assess the potential role of private assets in a DC plan, it is important to examine their impact on overall portfolio performance. As noted above, private assets generally offer higher expected returns than comparable public assets at similar levels of risk. In this section, the report analyzes whether including private assets provides portfolio diversification benefits.

The goal of portfolio optimization is to allocate capital across assets to maximize return for a given target level of risk or minimize risk for a given level of target return. The optimization is implemented using the Markowitz mean-variance framework which provides a quantitative method to calculate the optimal portfolio weights for asset classes based on their expected return, risk (measured as volatility), and correlation across asset classes.[82]

The total portfolio risk is not just the weighted average of the individual volatilities but rather it depends on the correlation across all asset classes. By combining imperfectly correlated assets, the overall portfolio risk reduces without reducing expected return. Private and public equity markets tend to be positively correlated, but the correlations are well below 1.0. Correlations below 0.7 can have significant diversification benefits as the assets share less than half of their variance.[83]

A study by LSEG reports that during 1986 to 2023, the correlations between US private and public equities range from a high of 0.73 between PE and the Russell 1000 to a low of 0.41 between growth equity and the Russell 2000 value index.[84, 85] Table 9 (Appendix) shows correlation between the PE Buyout and Growth index and the large public stock index of 0.75 and correlation between the PE Buyout and Growth index and the small public stock index is

[82] The Markowitz mean-variance framework was developed by Nobel prize winning economist, Harry Markowitz. https://www.nobelprize.org/prizes/economic-sciences/1990/markowitz/facts/

[83] This follows directly from the coefficient of determination (R^2), which equals the square of the Pearson correlation coefficient (ρ); when $\rho = 0.7$, $R^2 = 0.49$, implying that the two assets share 49% of their variance. In other words, about half of the movement in one asset can be statistically explained by the movement in the other asset, while the other half is driven by other factors, thus providing diversification benefits if the two assets are combined.

[84] https://www.lseg.com/content/dam/ftse-russell/en_us/documents/research/managing-risk-exposures-to-private-equity-through-public-equity.pdf

[85] The correlation between public investments and private investments is time varying. The correlations during the mid-1990s were low but rose sharply around the late 1990s and early 2000s. Since then, the correlations have remained at around 0.80. https://www.lseg.com/content/dam/ftse-russell/en_us/documents/research/managing-risk-exposures-to-private-equity-through-public-equity.pdf

0.68 using Preqin data from 2001 to 2025. Table 9 also shows that correlations among private and public fixed income indices are markedly lower than equity correlations. For example, the correlation between private credit and long-term corporate bond returns is 0.18 during 2001 to 2025.[86]

The set of optimal portfolios that maximize return for a given level of risk or minimize risk for a given level of return are represented by an efficient frontier along the risk-return continuum. Portfolios lying below the frontier are inefficient because another feasible combination of assets that offers either higher return for the same risk or lower risk for the same return exists. Calculating the efficient frontier relies on the use of expected returns, volatility, and the correlation across asset classes to maximize returns for a given level of risk.

In Figure 2, the efficient frontier is calculated by considering portfolios of: (i) only public equities, fixed income, and money market instruments,[87] and (ii) all asset classes including private assets (growth equity, venture capital, and private credit). The orange dots show the return-risk profile of all individual asset classes. The blue line shows the efficient frontier when private assets are excluded, and the green line shows the efficient frontier when private assets are included.

[86] The low correlation could reflect the countercyclical nature of private credit. Traditional bank lending pulls back in volatile times, expanding private credit lending opportunities. https://www.guggenheiminvestments.com/perspectives/portfolio-strategy/investing-in-private-debt

[87] More details of the asset classes and the methodology to calculate the optimal portfolios is in the Appendix.

Figure 2: Efficient frontier with and without private asset classes

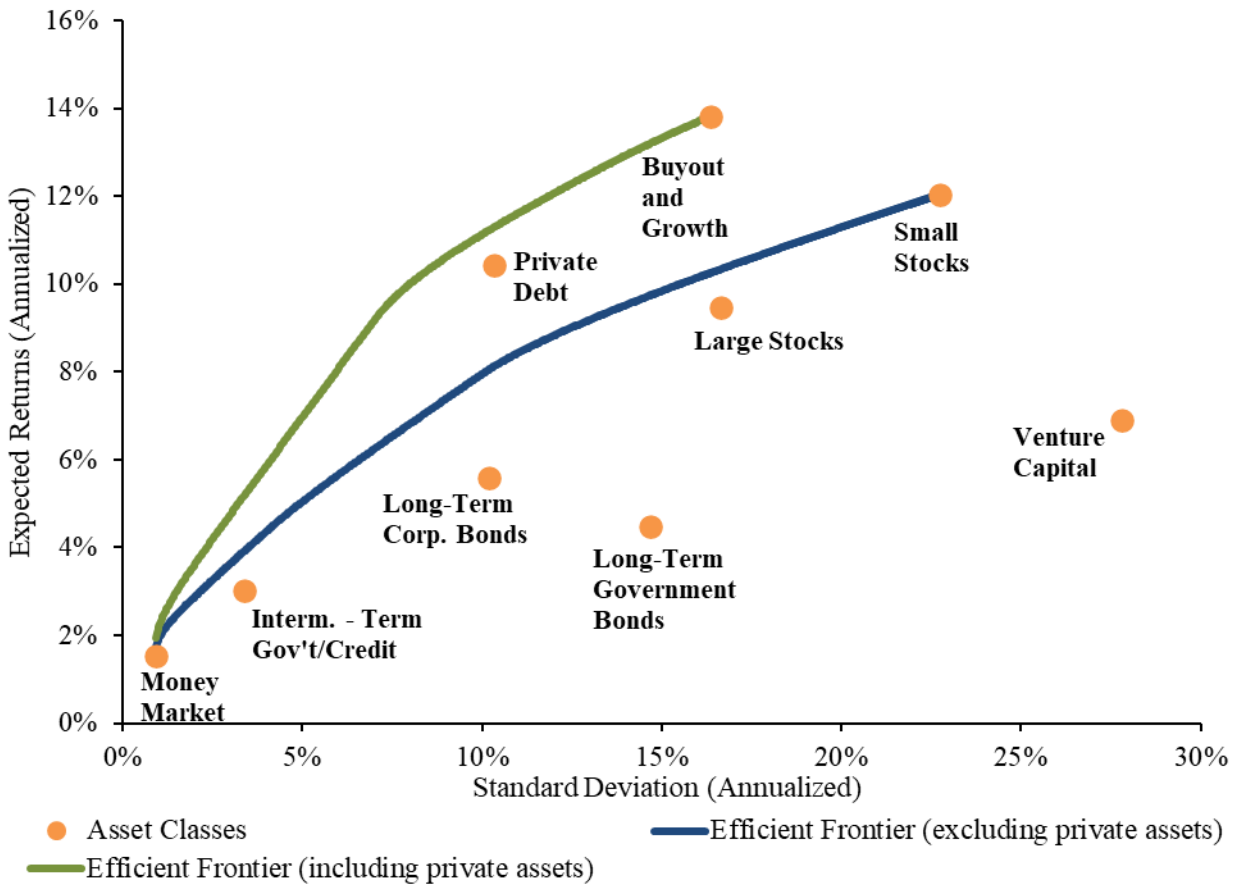


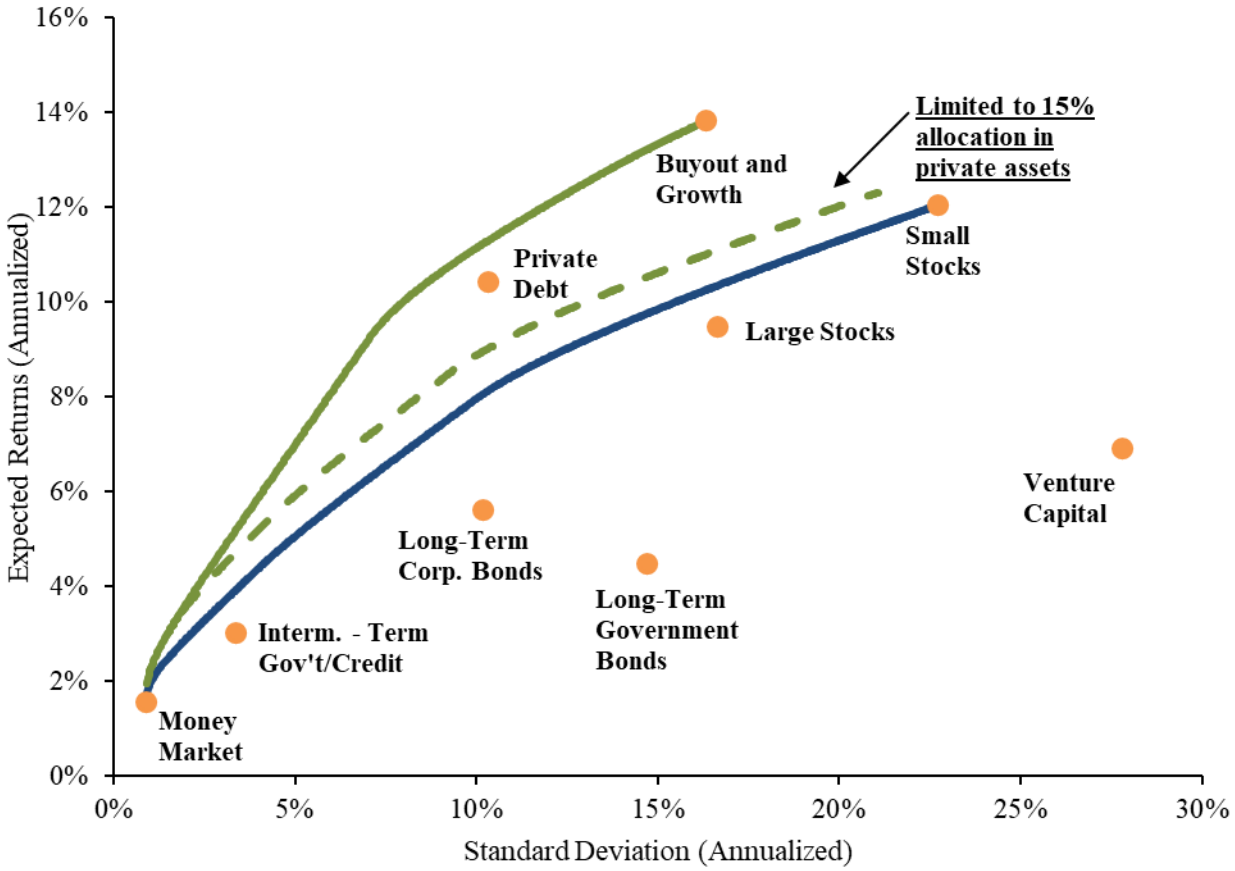
Figure 2 shows the risk–return trade-off across major asset classes and compares efficient frontiers constructed with and without private assets. The efficient frontier constructed using both public and private assets shifts outward relative to the frontier that doesn't include private assets. The shift in the efficient frontier indicates higher expected returns for a given level of risk or equivalently, lower risk for a given return. This improvement reflects the diversification benefits and the higher return potential of private assets, which allow portfolios to achieve more favorable risk–return outcomes than portfolios composed solely of public assets.

a. Constrained optimization

The green dashed line in Figure 3 shows an illustrative constraint of only 15% on private assets. The green dashed line illustrates that imposing such a constraint still allows for improvement in portfolio risk-adjusted expected returns compared to no allocation to private assets. The efficient frontier with the 15% allocation shifts inward relative to the frontier without any constraints on private assets (solid green line) but is still an improvement over the frontier without any private

assets (blue line). The initial focus on a 15% limit should not be taken to imply this is a recommended – or even desirable – limit, nor that a hard limit is required to manage liquidity.[88] Indeed, Figure 3 illustrates the benefit of a liquidity management plan that would employ techniques to manage liquidity beyond relying solely on private asset concentration limits.

Figure 3: Efficient frontier with limited allocation to private assets



b. Improvement in expected return for a TDF portfolio with 30 years to retirement

A typical TDF portfolio with 30 years to retirement has about 89% of its assets invested in public equities and about 11% of its assets in fixed income, reflecting the higher risk tolerance that a

[88] SEC guidelines do limit an open-end fund's aggregate holdings of illiquid assets to no more than 15% of the fund's net assets but no such limit exists for other structures that are likely to be used in defined contribution plans such as CITs: https://www.sec.gov/files/rules/final/2016/33-10233.pdf

long investment horizon facilitates.[89] Table 4 shows that the expected annual return of that TDF portfolio is approximately 11.2% with a risk (standard deviation) of 19.6%. Based on the risk-return results in Figure 3, if the TDF were to reallocate 15% of its assets from public to private, its expected return could improve without increasing risk.

Table 4 shows that the TDF allocation with 30 years to retirement to private assets results in an estimated increase in expected returns of 0.7% (from 11.2% to 11.9%) compared with a solely public assets portfolio. Expected returns also increase similarly across portfolios with varying levels of risk. This is an important consideration given that the TDF "glide path" adjusts the portfolio risk downward as the target date gets closer. Thus, the target risk of the TDF portfolio will decline but the risk-adjusted performance will continue to be improved by maintaining allocation to private assets in the portfolio even up to retirement date. As a result, the incremental benefit of investing in private assets remains relatively consistent over a TDF lifecycle.[90]

Table 4: Portfolio allocation and outcomes with different constraints on private assets

	No allocation to private assets	Max of 15% allocation to private assets	No limit on private assets
Equities	89.0%	80.0%	0%
Fixed Income	11.0%	5.0%	0%
Buyout and Growth	0.0%	15.0%	100%
Expected Portfolio Return	**11.2%**	**11.9%**	**13.8%**
Standard deviation	**19.6%**	**19.6%**	**16.3%**

Table 4 also shows a scenario without any constraints on private assets in the TDF to illustrate the improvement in risk-adjusted expected returns. When the private asset constraint is fully removed, the portfolio with the highest risk and highest return allocates entirely to PE buyout and growth, which dominates all other portfolios. This results in a much higher expected return of 13.8% and lower standard deviation of 16.3%. The result is due to the PE Buyout and Growth returns being higher than public equity returns at similar level of risk.[91] In sum, the Table 4 results highlight both the return enhancement from private assets and their diversification benefits.

[89] Georgetown University, Center for Retirement Initiatives, "The Evolution of Target Date Funds: Using Alternatives to Improve Retirement Plan Outcomes," Policy Report 18-01, June 2018.
[90] The TDF invests 15% in private assets for all portfolios with an annual standard deviation above 4%, which includes the TDF portfolio at the target date.
[91] The risk is based on de-smoothed private equity returns.

c. Analysis of the increase in retirement income from 16.8% to 27.4% by adding private assets to a TDF

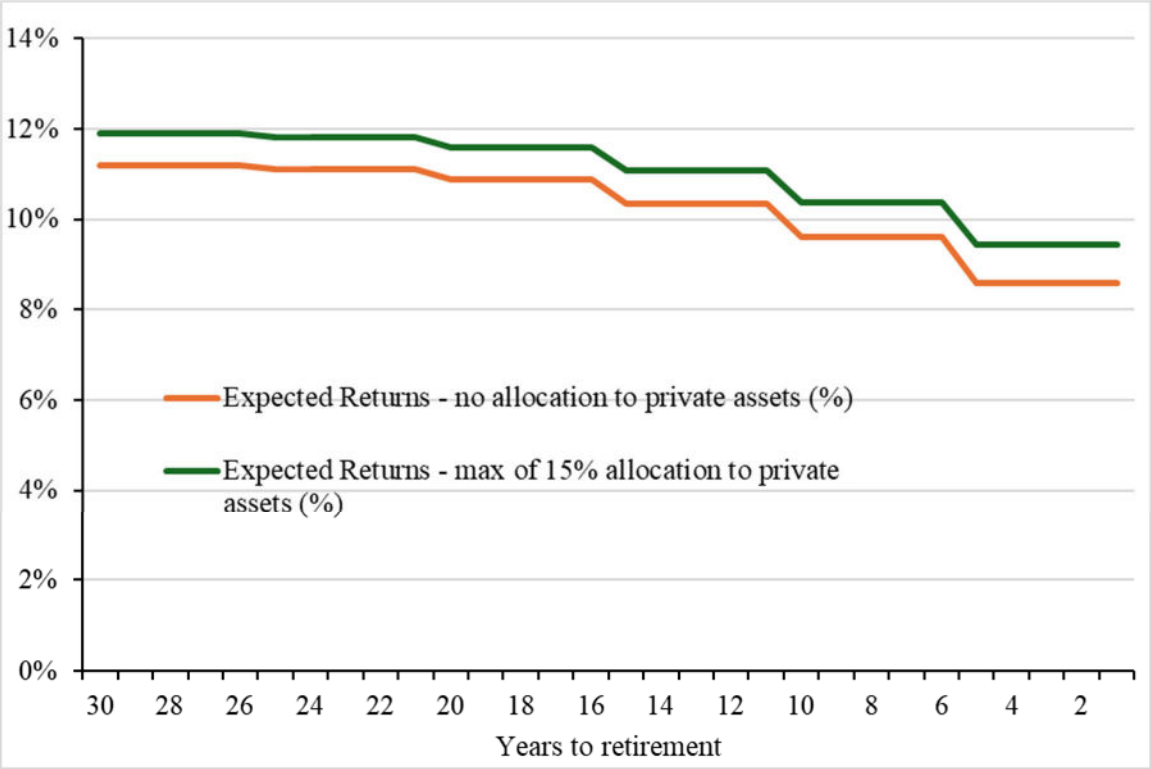
Figure 4 illustrates the benefits for a representative DC plan participant who contributes a fixed amount to her DC retirement plan every year for 30 years. The annual contributions of $10,000 are based on the median participant income of $89,000 and the median contribution rate (considering both employee and employer contributions) of 11.5% in 2024.[92] The analysis is conservative in two respects. It assumes that contributions do not increase with wage inflation and there are no "catch up" contributions after age 50.

The analysis assumes that the contributions are invested in a TDF which generates returns based on its portfolio allocation at various stages of the accumulation phase. TDF allocation becomes more conservative as it approaches the target date. With decreasing allocation to equity assets over time, the optimal portfolio moves left on the efficient frontier as the participant approaches retirement. As the optimal portfolio moves left, the expected return of the portfolio, both with and without private asset allocation, decreases.

Figure 4 presents the expected returns of a TDF portfolio with and without private assets. The green line (15% allocation to private assets) shows the incremental benefit of adding private assets is relatively consistent across varying levels of portfolio risk. This is because risk-adjusted performance continues to be improved by maintaining allocation to private assets, even for portfolios with lower risk.

[92] See https://workplace.vanguard.com/content/dam/inst/iig-transformation/insights/pdf/2025/has/2025_How_America_Saves.pdf.

Figure 4: Expected returns of a TDF portfolio as the participant approaches retirement



Using the expected returns and the assumed contributions, Table 5 illustrates the total assets at retirement in two cases: (a) TDF has no allocation to private assets, and (b) TDF allocated 15% to private assets. The accumulated assets at retirement in those two cases are $1.8 million and $2.1 million, respectively, in terms of 2055 nominal dollars.[93] Using the current annual inflation expectations for a 30-year period of 2.3%,[94] the accumulated retirement assets in 2025 dollars are $925k and $1,080k, respectively.[95]

[93] These estimates do not account for withdrawals from the plan upon job changes. Approximately two-thirds of terminated participants remain in their plans upon job changes and approximately 12%-13% rollover assets into another plan. This results in approximately up to 80% of participants preserving their TDF assets; https://workplace.vanguard.com/content/dam/inst/iig-transformation/insights/pdf/2025/has/2025_How_America_Saves.pdf

[94] https://fred.stlouisfed.org/series/T30YIEM

[95] These figures should not be compared to average or median 401(k) balances at retirement age today, given the progressive policy changes that have increased 401(k) participation and contributions over the last two decades. These include the adoption of automatic enrollment, default contribution rates, automatic escalation features, catch-up contributions starting at age 50, and increases in the prevalence and level of employer match contributions. Comparing retirement asset balances would also need to consider IRAs, given that 401(k) assets may be rolled over into an IRA account after job changes. Fidelity reported in 2025 that the average 401(k) balance is about $250 thousand and the average IRA balance is about $257 thousand for baby boomers (ages 61-79). This figure could understate the amount available at retirement age given the inclusion of age cohorts who have taken distributions for many years in retirement. https://www.fidelity.com/learning-center/personal-finance/average-retirement-savings

To measure the income benefit to a retiree, the analysis assumes that the assets at retirement are converted into an annuity, which provides annual payments for life.[96] The 10-year guaranteed single life annuity rate is ~ 7%.[97]

Table 5 compares the benefits after retirement under the no allocation to private assets and the 15% allocation to private assets scenarios. By allowing investments in private assets, retirement assets increase by 16.8% (approximately $155k increase from $925k with no private assets to $1,080k with a 15% allocation).[98] The higher retirement assets translate into higher annual retirement income using a life annuity. The annual income during retirement increases by $10.9k (from $64.8k to $75.6k) with a 15% private asset allocation. This 16.8% income increase would substantially reduce the retirement income replacement disparity between DB and DC plan households. Aggregating the annual benefit for 20 years as the expected retirement period results in a total benefit of $217.3k with a 15% private asset allocation.[99]

Table 5: Retirement outcomes with 0% versus 15% allocation to private assets[100]

Amounts in $ thousands	No allocation to private assets	Max of 15% allocation to private assets
Assets at retirement	$925	$1,080
10-year single life guarantee rate for a 65-year old	7%	7%
Annual income during retirement	$64.8	$75.6
Incremental income per year by including private investments		$10.9
Incremental income per year by including private investments (%)		16.8%
Aggregated benefit for 20 years		$217.3

Table 6 illustrates scenarios of allocating 20%, 25% and 33% to private assets in the TDF with a limit of only 15% each on private equity, venture capital, and private credit. The 15% limit on

[96] Complete annuitization is a simplifying assumption that allows a lifetime income comparison of the private asset TDF and the public asset TDF. Participant circumstances differ and some may remain invested in the TDF well beyond retirement. To the extent that private assets remain in the TDF after the target date, its superior performance over a public-asset only TDF may continue.

[97] Based on a survey of annuity rates, the annuity rate for single life with 10-year guarantee is approximately 7%. https://www.immediateannuities.com/annuity-rates/by-age.html. Based on the survey results, the average annual payment for a $100,000 premium is ($592 + $573) / 2 * 12 = $6,990 where $592 is the monthly payment for a 64-year-old male and $573 is the monthly payment for a 64-year-old female. The annual payment of $6,990 is equivalent to a rate of 6.99%.

[98] An estimate of the aggregate benefits of the allocation to private assets is presented in Section VII below.

[99] The aggregate benefit is even higher if there is no limit to private asset allocation., though this must be weighed against the risks of private equity investments.

[100] The assets and income are shown in 2025 dollars. As noted above, typical current 401(k) balances may be lower than the one modelled here because in the past automatic enrollment and default contribution rates were uncommon, and employer matching was more limited. Even after adjusting for inflation, then, under modern plans one would expect greater accumulation of the contributions in constant dollars.

each asset class illustrates one approach a TDF might use to deploy private asset strategies. Under this approach, even if there is remaining capacity under the overall allocation limit to private assets, the portfolio's allocation is constrained by the 15% cap applied to each private asset class.

Table 6: Analysis of scenarios with allocation of 20%, 25%, and 33% to private assets with a limit of maximum of 15% each on private equity, venture capital, and private credit asset classes[101]

Amounts in $ thousands	No allocation	Max of 20% allocation	Max of 25% allocation	Max of 33% allocation
Panel A: Improvement in returns of a portfolio with 30 years to retirement				
Equities	89.0%	77.8%	76.1%	76.1%
Fixed Income	11.0%	2.2%	0.0%	0.0%
Buyout and Growth	0.0%	15.0%	15.0%	15.0%
Private Credit	0.0%	5.0%	8.9%	8.9%
Expected Portfolio Return	**11.2%**	**12.0%**	**12.2%**	**12.2%**
Standard deviation	**19.6%**	**19.6%**	**19.6%**	**19.6%**
Panel B: Improvement in assets at retirement and income during retirement[102]				
Assets at retirement	$925	$1,116	$1,150	$1,178
10-year single life guarantee rate for a 65-year old	7%	7%	7%	7%
Annual income during retirement	$64.8	$78.1	$80.5	$82.5
Incremental income per year by including private investments		$13.3	$15.7	$17.7
Incremental income per year by including private investments (%)		20.6%	24.3%	27.4%
Aggregated benefit for 20 years		$266.9	$314.9	$354.5

Table 6 shows that increasing private asset allocations improves expected lifetime income for TDF retirees. Annual income (in 2025) dollars increases from $64.8K with no private assets to

[101] The assets and income are shown in 2025 dollars.

[102] Panel B accounts for the allocations shown in Panel A changing as the plan participant approaches retirement. For example, the TDF portfolio in the scenario with max 33% allocation that allocates 8.9% to private credit with 30 years to retirement will allocate 15% to private credit with 5 years to retirement date, while the TDF portfolio in the scenario with max 25% allocation will allocate 10% to private credit with 5 years to retirement date. The increasing allocation to private credit as the TDF rebalances its portfolio closer to retirement date results in accumulation of higher assets at retirement and higher income during retirement in the scenario with max 33% allocation relative to the scenario with max 25% allocation.

$82.5K with a 33% allocation. The last two columns in the table above show that the allocation to private assets is 23.9% (the sum of Buyout and Growth (15%, the limit under this modeling scenario) and Private Credit (8.9%), below the overall private asset limits of 25% and 33%.

VII. Discussion of the benefits of DoL's proposed rule

In the proposed rule, DoL assessed the benefits, costs, and transfers associated with this regulatory action.[103]

On the benefits side, DoL expects that the proposed rule would

- decrease plan fiduciary uncertainty about fulfilling their duty of prudence and reduce litigation risks;
- provide flexibility to select any alternative asset that improves risk-adjusted returns; and
- increase protections to plan participants and beneficiaries by providing the plan fiduciaries the relevant factors to consider which would improve the evaluation of investment alternatives.

On the cost side, DoL expects that the proposed rule would generate net cost savings of approximately $578 million primarily due to reduction of time spent in preparing, presenting, and discussing litigation analyses.

DoL has also described the potential transfers from fiduciary insurance underwriters to plan fiduciaries from lower costs of insurance, and transfers from financial institutions offering public assets to financial institutions offering alternative investments.

In their analysis, DoL has considered the incremental benefits and costs of following the process to offer investment alternatives to plan participants and beneficiaries. In this section, the analysis of the benefits accrued when the plan selects such alternative assets to offer to plan participants is presented. For example, the Table 5 and Table 6 results show that there are benefits to DC plan participants that accrue from the improved risk-adjusted performance of TDFs with private assets.

DoL's process based safe harbor rule makes it more likely that plan sponsors/committees will adopt private asset strategies in TDFs leading to the significant increases in asset balances/retirement income shown in Tables 5 and 6. According to the most recent 2022 Survey of Consumer Finances, 54.3% of U.S. households, approximately 71.2 million out of a total of 131.1 million households, have retirement accounts in 2022.[104] Among the households with accounts, the average asset balance is equal to $334,097, implying a total balance of $23.8 trillion in retirement assets.

[103] The DoL was unable to quantify all the benefits, costs, and transfers, but provided a description of the non-quantified impacts.

[104] "Because many households roll over assets from DC accounts to IRAs at job change or retirement, examining DC account and IRA savings on a combined basis can provide a more complete picture of the retirement account assets available to a household during retirement." Ownership of Retirement Accounts in 2022: Amounts in Defined Contribution Plans and Individual Retirement Accounts; https://www.congress.gov/crs-product/R48143#_Ref171594142

A study by Partners Group finds that nearly two-thirds of 401k contributions flow into target-date funds and that approximately $3.4 trillion in assets is held by TDFs as of 2024.[105] Assuming that 40% of the plans by assets adopt private-asset TDFs would result in $1.4 trillion allocated to such TDFs.

Table 4 shows that TDFs with private assets can generate incremental net-of-fee returns of 0.7% per year over TDFs without any allocation to private assets. This incremental return would accumulate $262 billion in additional assets over a 10-year period and $1,565 billion in additional assets over a 20-year period.[106] These additional assets are denominated in 2035 and 2045 dollars respectively. Using the current inflation expectations for both 10-year and 20-year period of approximately 2.5%,[107] the incremental accumulated assets in 2025 dollars are $205 billion and $955 billion, respectively.[108] Even if only half the 0.7% per year return improvement were achieved, the incremental benefit to plan participant balances over time would be about $100 billion in 10 years and about $463 billion in 20 years (in 2025 dollars).

[105] Partners Group, "Unlocking the Potential of Private Investments in Defined Contribution Plans," September 2025, p. 6.
[106] $1,400 billion * (1 + 11.9%) ^ 10 - $1,400 billion * (1 + 11.2%) ^ 10 = $262 billion; $1,400 billion * (1 + 11.9%) ^ 20 - $1,400 billion * (1 + 11.2%) ^ 20 = $1,565 billion.
[107] https://fred.stlouisfed.org/series/T10YIE; https://fred.stlouisfed.org/series/T20YIEM.
[108] $266 billion / (1 + 2.5%) ^ 10 = $205 billion; $1,565 billion / (1 + 2.5%) ^ 20 = $955 billion

VIII. Conclusion

The evolution of the U.S. retirement system reflects a sustained shift from employer-sponsored DB plans to DC plans. Over the past two decades, bipartisan policy efforts have progressively introduced DB-like features into DC plans.

DoL's proposed rule in March 2026 provides a process-based safe harbor to enable the inclusion of private market assets in DC plans. This development aligns DC plans more closely with the asset allocation of DB plans, where private assets have historically contributed to improved risk-adjusted returns.

The inclusion of private assets into DC plans will likely happen through evergreen or semi-liquid fund structures rather than traditional drawdown funds, as these vehicles offer continuous capital deployment, NAV-based pricing, and periodic liquidity which are features better suited to DC plan participants.

Academic, industry, and policy research suggests that allocations to private assets can improve long-term risk-adjusted returns and improve retirement outcomes within TDFs. Tables 5 and 6 of the analysis shows that adding private capital to a TDF can improve risk-adjusted accumulation performance and increase retirement income by 16.8% to 27.4%. This increase in projected retirement income from adding private assets to DC plans would reduce the current gap in retirement replacement income between households that have DB plans and those that do not.

DoL expects that the proposed rule would provide fiduciaries with greater flexibility to include alternative assets in DC plans while reducing litigation risk, with estimated cost savings driven largely by lower compliance and litigation-related expenses. The Table 4 results show that TDFs with private assets would (under the assumptions modeled) generate incremental net-of-fee returns of 0.7% per year over TDFs without any allocation to private assets. The incremental return would accumulate additional assets of $205 billion and $955 billion (in 2025 dollars) over a 10-year and 20-year horizon.

IX. Appendix

A. Data description

The analysis uses price and returns data for the public asset classes and the private asset classes from December 31, 2000, to September 30, 2025. The table below shows the index used for each asset class and the source of the index.

Table 7: Index description and source for each asset class

Asset Class	Index	Source
Large Stocks	S&P 500 Total Return Index	Bloomberg
Small Stocks	DFA U.S. Micro Cap Portfolio	Bloomberg
Long-term Corporate Bonds	Bloomberg US Corporate 10+ Years Total Return Index	Bloomberg
Long-Term Government Bonds	Barclays 20+ Year Treasury Bond Fund Index	Bloomberg
Intermediate-Term US Government/Credit	Bloomberg Barclays Intermediate US Govt/Credit TR Index Value Unhedged Index	Bloomberg
Money Market	Bloomberg U.S. Treasury Bills: 1-3 Months	Bloomberg
Buyout and Growth	Preqin Buyout and Growth Index	Preqin
Venture Capital	Preqin Venture Capital Index	Preqin
Private Credit	Preqin Private Credit Index	Preqin

B. Net of fee returns for public assets

The returns of private asset classes are net of fees obtained from Preqin. While for public asset classes, fees are subtracted from the gross returns to calculate net of fee returns. The gross quarterly returns are calculated from the price as of the previous quarter-end to the current quarter-end.

$$Gross\ Quarterly\ Returns = \frac{(price_q - price_{q-1})}{price_{q-1}}$$

The shareholder cost, load fees, and total expense ratios are subtracted from the gross returns to calculate net returns. The fee data is obtained from Investment Company Institute (ICI)

Research.[109] The expenses for equity, hybrid, and bonds were then converted from annual fees to quarterly fees and subtracted from the quarterly gross returns.

C. De-smoothing private asset returns

The analysis de-smooths private asset returns to adjust for the auto-correlation in the private asset returns over time. The analysis estimates the autocorrelation in the returns by running a regression of quarterly private asset returns on lagged quarterly returns using the model below:

$$return_t = \alpha + \rho \cdot return_{t-1} + \mu$$

The parameter ρ measures the autocorrelation in the returns. Then, the analysis adjusts the returns to remove the autocorrelation using the below formula:

$$De - smoothed\ return_t = \frac{(return_t - return_{t-1} \cdot \rho)}{(1-\rho)}$$

The de-smoothed returns reflect an estimate of the underlying economic risk. The table below shows the returns and volatility of private assets before and after de-smoothing.

Table 8: Comparison of Original to De-smoothed Private Asset Returns

	Original	De-smoothed
Buyout and growth		
Returns	13.4%	13.8%
Volatility	8.5%	16.3%
Venture Capital		
Returns	5.2%	6.9%
Volatility	10.4%	27.8%
Private Credit		
Returns	10.4%	10.4%
Volatility	6.9%	10.3%

D. Correlation

The table below presents the correlation across the various asset classes. The correlations are calculated using de-smoothed returns for private asset classes.

[109] Data obtained from communications with ICI and ICI Research Perspective, Vol. 29, No. 3, March 2023, p. 3; ICI Research Perspective, March 2025, Vol. 31, No. 1, p. 3; ICI Research Perspective March 2026, Vol. 32, No. 1, p. 1.

Table 9: Correlation Matrix

	Large Stocks	Small Stocks	Long-Term Corp. Bonds	Long-Term Gov Bonds	Interm-Term Gov't/ Credit	Money Market	Buyout and Growth	Venture Capital	Private Credit
Large Stocks	1.00	0.86	0.32	-0.34	-0.13	-0.06	0.75	0.64	0.56
Small Stocks	0.86	1.00	0.24	-0.42	-0.17	-0.10	0.68	0.61	0.57
Long-Term Corp. Bonds	0.32	0.24	1.00	0.60	0.74	-0.03	0.22	0.10	0.18
Long-Term Gov Bonds	-0.34	-0.42	0.60	1.00	0.72	0.02	-0.41	-0.37	-0.37
Interm-Term Gov't/Credit	-0.13	-0.17	0.74	0.72	1.00	0.23	-0.13	-0.17	-0.06
Money Market	-0.06	-0.10	-0.03	0.02	0.23	1.00	-0.11	-0.11	-0.06
Buyout and Growth	0.75	0.68	0.22	-0.41	-0.13	-0.11	1.00	0.72	0.66
Venture Capital	0.64	0.61	0.10	-0.37	-0.17	-0.11	0.72	1.00	0.53
Private Credit	0.56	0.57	0.18	-0.37	-0.06	-0.06	0.66	0.53	1.00