EVOLUTION AND GROWTH: How Public Pension Plans Have Diversified Their Investments Amid Changing Markets

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EXECUTIVE SUMMARY

Public pension investing has undergone remarkable changes during the twenty-first century. After decades of primarily investing in bonds and other fixed income assets, public pension plans have shifted to much more diverse investment portfolios, with significant allocations to both public and private equity as well as real estate, hedge funds, and other alternative asset classes. The reasons for this shift in allocation are many and varied, but the impact of the Global Financial Crisis (GFC) of 2008 and the decade of ultra-low interest rates that followed is significant.

Public pension plans have successfully navigated a challenging economic period by reallocating their investment portfolios and seizing opportunities in new asset classes. This change has enabled them to outperform their investment return expectations in many cases and continue to provide earned benefits to their members, while recovering their asset base from a once-in-a-century market downturn.

This research examines the changing economic and market forces that have contributed to the shift in public pension plan asset allocation and assesses how well public plans have navigated this shifting terrain by comparing their investment returns to various benchmarks. This research does not offer advice for how public pension plans should invest nor does it weigh the relative merits of different asset classes. Rather, this paper explains the structural forces that have led to much more diverse investment portfolios today and offers metrics to evaluate the effectiveness of the added diversification.

Key findings:

- **Public pension plans have significantly diversified their portfolios.** From 2001 to 2023, the average plan reallocated about 20 percent of its assets from public equity and fixed income into private equity, real estate, hedge funds, and other alternative investments.

- **Public pension plans adopted the prudent investor rule throughout the twentieth century.** During their early years in the 1920s and 1930s, U.S. public pension plans largely followed an investing philosophy known as "fiscal mutualism" in which they invested primarily in municipal bonds. By the mid-twentieth century, most plans had adopted the "prudent investor rule" instead. This shift in investment philosophy opened the door for the more diverse portfolios seen today.

- **Pension funds responded to significant changes in financial market conditions.** Changes in the broader economy and financial markets, such as the long-term reduction in interest rates and the decline in the number of publicly traded companies, have led plans to adjust their investment portfolios in response to changing market conditions.

- **The decade of ultra-low interest rates was a notable period of transition and change for public plan investments.** This fiscal policy decision following the financial crisis had major consequences for how public plans invest.

- **More diverse pension plan portfolios have performed strongly in recent years.** When compared to a "traditional" 60/40 or 70/30 public stock/bond portfolio, the diversified portfolios of public pension plans in the U.S. mostly outperformed following the GFC, measured net-of-fees over rolling five-year periods. Moreover, the diversified portfolio exhibited less volatility and greater upside and downside benefits.

- **Public pension plans have met their investment return expectations more frequently since the GFC.** When compared to their own return expectations (defined as the actuarial assumed rate of return), U.S. public plans have largely met or exceeded these expectations over rolling five- and 10-year periods that correspond with greater diversification and lower actuarial assumed rates of return. Furthermore, the diversified portfolio met these objectives more frequently than the traditional portfolios.

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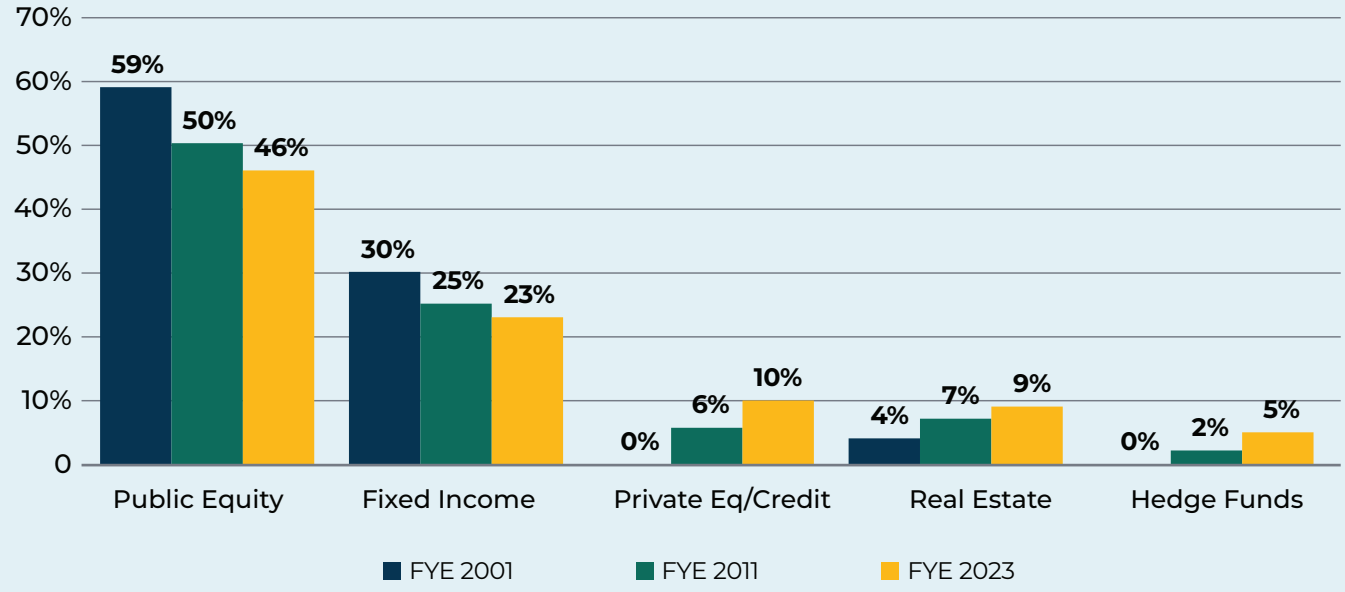
INTRODUCTION

Institutional investors represent a broad range of stakeholders—from corporate and public pension plans to endowments, foundations, and insurance funds. These investors are responsible for managing assets worth more than $34 trillion,[1] of which state and local government pension plans manage more than $6 trillion.[2] Institutional investors play an important role in the financial markets and broader economy of the U.S., and the investment decisions they make have a substantial economic impact. But these investors also are affected by changes in financial markets. For the past 20 years, public pension plans have significantly adjusted how their assets have been invested. **Figure 1** shows the shift in median asset allocation between 2001 and 2023. Public plans went from having nearly 90 percent of their assets allocated to public equities and fixed income in 2001 to less than 70 percent in 2023. The roughly 20 percent of assets that were reallocated were mostly invested in private equity, real estate, and other alternative asset classes, such as hedge funds.

This research examines the changing economic and market forces that have contributed to the shifts in asset allocations of public plans.[3] It also assesses how well public plans have navigated this shifting terrain by comparing public plan returns to various benchmarks. This research does not offer advice for how public pension plans should invest nor does it weigh the relative merits of different asset classes. Rather, this paper explains the structural forces that have led to much more diverse investment portfolios today and offers metrics to evaluate the effectiveness of the added diversification.

It also should be said that there are more than 3,000 public pension plans in the U.S. The majority of those plans are small local plans that largely do not invest in alternative asset classes. Many of those small plans invest their plan assets in public indices. This research focuses primarily on larger public pension plans that have both the scale and resources to be broadly invested in alternative asset classes. This report is not meant to suggest that all public pension plans should be invested in alternative asset classes.

Figure 1: Evolution of Median Target Asset Allocations



Source: Public Plans Data (publicplansdata.org) as of December 2024

Why Public Pension Plans Invest

Defined benefit pension plans always have been a collective effort for a collective benefit. The typical state and local government pension plan receives revenue from three sources: employee contributions, employer contributions, and investment earnings, with investment earnings accounting for a majority of long-term revenue.[4] The assets of pension funds always have been invested. These are not savings plans in which workers save a portion of their disposable income for future use. The combined contributions of workers and their employers are pooled and invested in the financial markets for the purpose of defraying the cost of providing benefits to retired workers and other beneficiaries; however, plans can only invest in the markets that are available to them. As financial markets have grown and developed, and new investable asset classes have become available, public pension funds have responded by adapting their investment strategies.

Investing the combined contributions of employees and employers has generated a solid return on investment for taxpayers, who ultimately provide the contributions made via the employer. Each taxpayer dollar contributed to state and local government pension plans supported $7.79 in total economic output nationally in 2022.[5] It is difficult to find another investment that produces so strong a return, but pension funds are only able to do so because they take the risk of being broadly invested in financial markets. The investment return is the reward for the investment risk. Accepting and navigating that risk-return relationship leads to the complex world of pension investing that exists today.

The goal of investing for maximum return at an appropriate level of risk has not always been the guiding philosophy of public pension investing.[6] Early in their history, public pension funds were guided by a concept known as "fiscal mutualism" in which public plans invested almost exclusively in municipal government bonds. This was seen as a benefit both to the plan and the plan sponsor because the plan was guaranteed a reliable rate of return for its investment and the city government was guaranteed a purchaser for its bonds to fund municipal projects. The next section examines this history in more depth.

HISTORY OF U.S. PUBLIC PENSION FUNDS

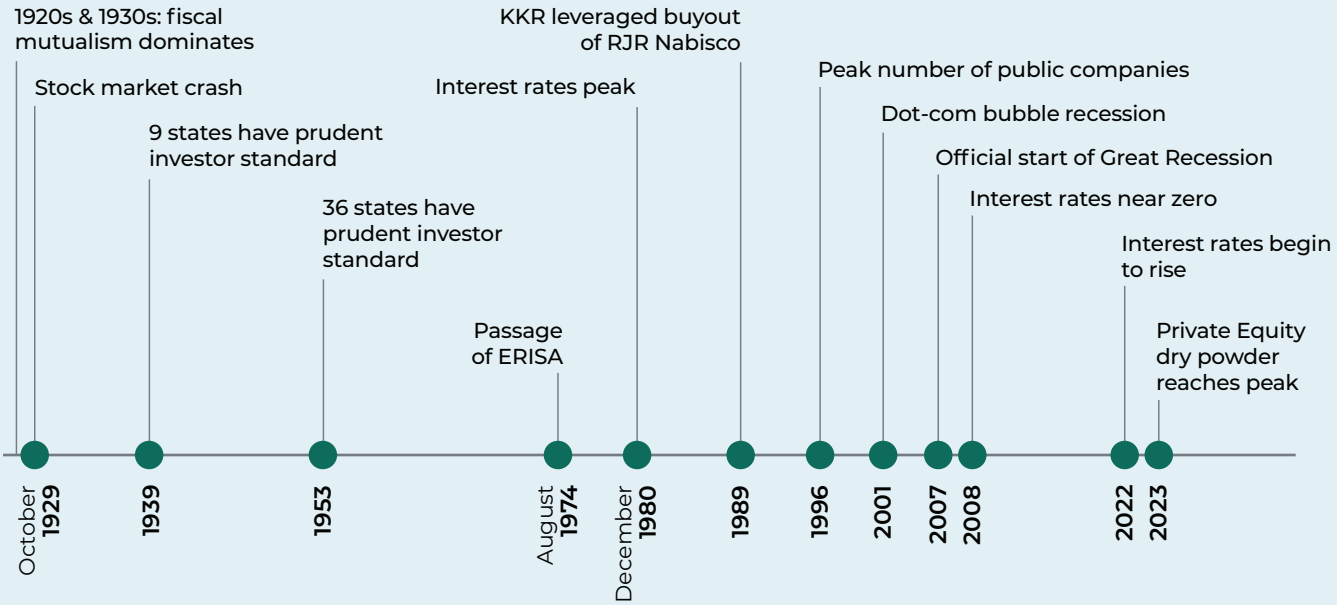
Public pension funds in the U.S. began as modest institutions. The first public pension plan in the U.S. was created in New York City in 1857 to provide a lump sum benefit to retired police officers.[7] Eventually this benefit was extended to NYC firefighters as well, and the lump sum benefit was converted into an annuity payment.[8] Still, the number of retired police officers and firefighters in late nineteenth century New York was small and their life expectancies fairly low by modern standards.

More public pension plans were established during the Progressive Era of the early twentieth century, mostly by states in the northeast. Many of these plans were for teachers, although some were also for general government employees. A primary motivation in creating these plans was facilitating the transition into retirement of elderly public servants, who likely had no other source of income or savings. The federal government simultaneously was debating providing retirement benefits to civil servants, which resulted in the creation of the Civil Service Retirement System in the 1920s.[9] Again, a key motivation was to retire older civil servants who struggled to continue in their jobs but couldn't be fired due to civil service protections and had no financial resources to fall back on in many cases.[10]

The number of state and local government pension plans continued to grow throughout the twentieth century, especially in the postwar era. Many of the public pension plans that exist today were established by the 1950s and 1960s. These plans have provided reliable benefits to retired public servants for decades.

The earliest public pension funds starting in the 1920s largely engaged in an investment practice known as "fiscal mutualism."[11] The pension fund invested primarily, if not exclusively, in municipal bonds. This was seen as mutually

Figure 2: Timeline of Pension Investing History



beneficial: the local government had a reliable investor that would purchase its bonds to facilitate the construction of schools, roads, police departments, and other necessary public infrastructure. Meanwhile, the pension fund would be guaranteed a decent rate of return on the bonds, and most pension plans targeted benefit payments to conform with the expected rate of return from those municipal bonds, typically around four percent.

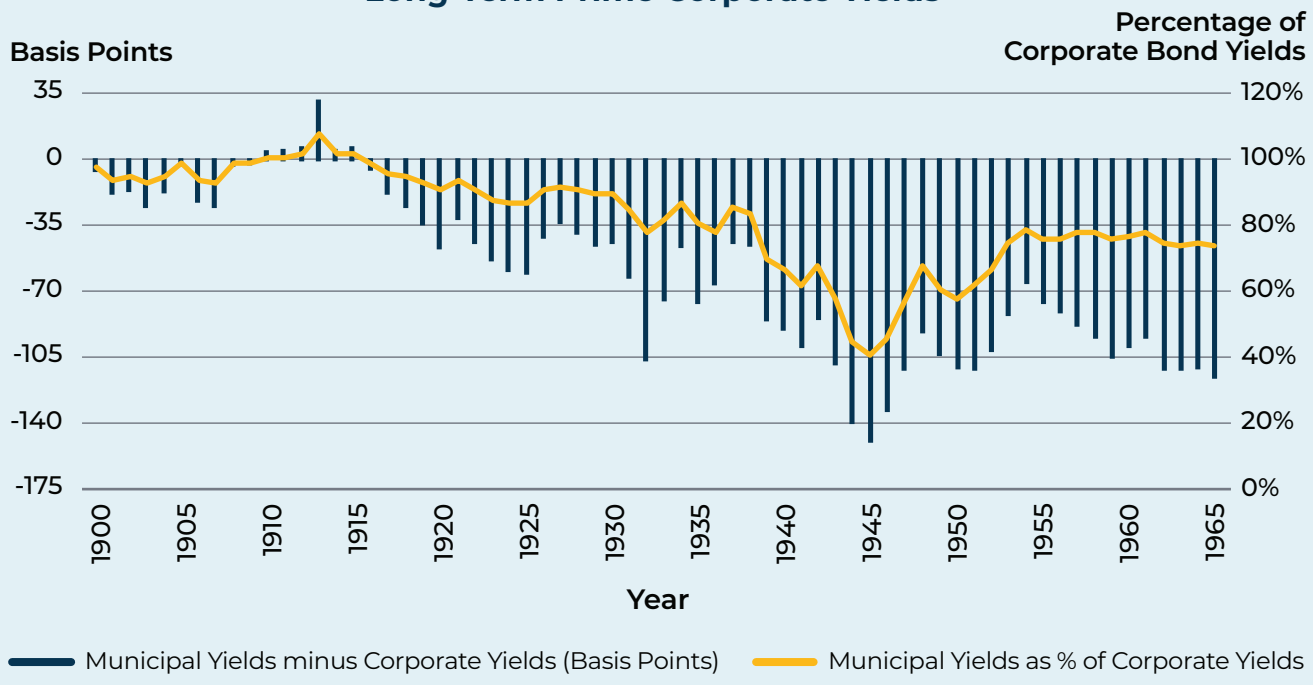
Fiscal mutualism often was pursued through the use of legal lists of permitted investments.[12] The plan sponsor would detail the specific investments in which public plans could engage, and the types of bonds in which plans could invest had to meet certain quality standards. The assets of the plan largely were not invested with the goal of growing the assets. Rather, the plan viewed its role as conserving the assets that were contributed by members and their employers.

Fiscal mutualism prevailed for years, but, over time, changes in the economy and other forces at work in American society and government made the appeal of fiscal mutualism less compelling. The Great Depression harmed many types of investments, including the municipal bonds in which public plans invested, revealing that no investment is truly safe. When some municipalities suspended interest payments on their bonds during the depression, the bonds became ineligible for investment per the rules of the legal lists.[13] This also drove down the yields generated by these municipal bonds as the number of investment-eligible bonds declined and investors piled into the bonds that remained eligible.

Other changes occurring during the New Deal period and World War II continued to drive down municipal bond yields.[14] High-income individual investors increasingly purchased tax-free municipal bonds to avoid higher federal income taxes implemented during the New Deal. As more investors sought to purchase these bonds, the yields on the bonds correspondingly declined. This acted as yet another force driving down yields and, therefore, impacting the investment returns of public pension funds. The yields on municipal bonds declined relative to the yields available from corporate bonds throughout the first half of the twentieth century (**Figure 3**).

The lower yields from municipal bonds created an opening to argue for the liberalization of public pension investment. Professional asset managers began to offer their services to pension plan trustees as a way to earn higher investment returns for their funds.[15] This also allowed pension plans to increase benefits since benefit levels were closely tied to the returns on the bonds in which the plans invested. U.S. corporate bonds were seen as being fairly safe investments, and some corporate bonds already had been included on the legal lists. Thus, there was little reason not to make this subtle shift in investment strategy.

Figure 3: Long-Term Prime Municipal Yields vs. Long-Term Prime Corporate Yields



Source: Sidney Homer, "Factors Determining Municipal Bond Yields," in State and Local Public Facility Needs and Financing: Volume 2, Public Facility Financing (Washington, DC: Government Printing Office, 1966), 269-298 (Glass & Vanatta, 2021, p. 438).

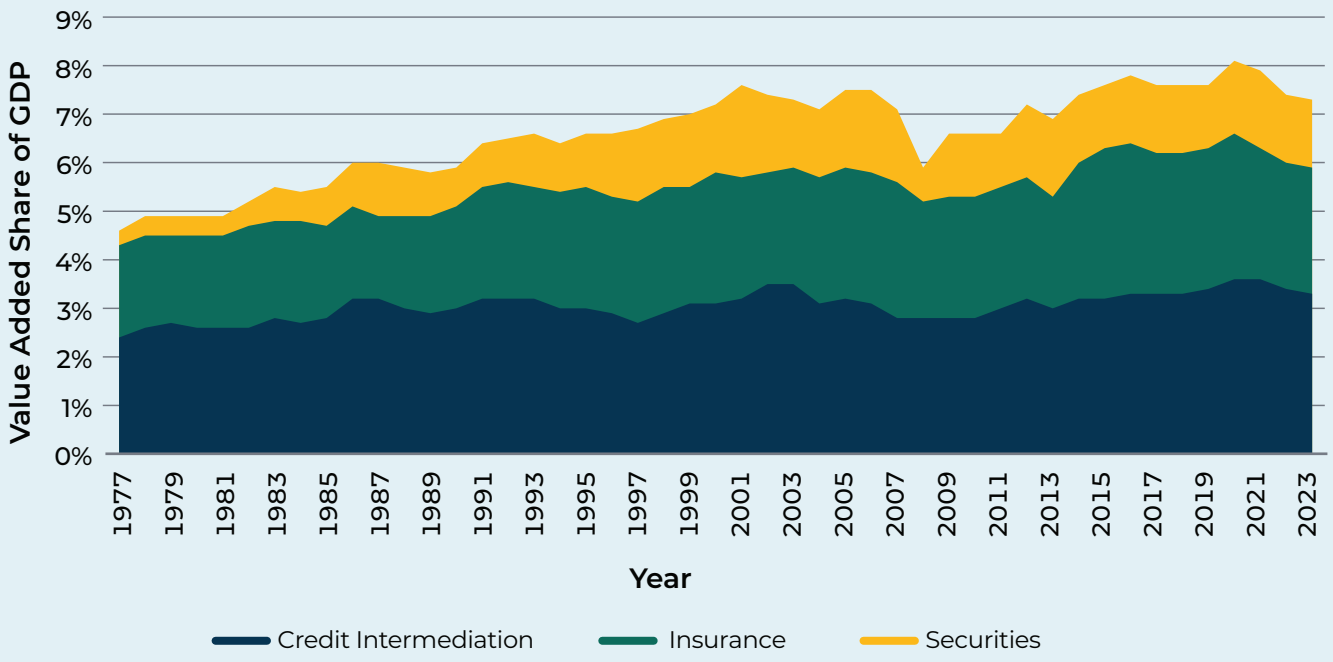
Plan sponsors also faced pressure from labor unions representing public employees to increase benefits during the postwar period. Earning greater investment returns by investing in higher-yielding corporate bonds (and some equities) enabled public pension plans to target higher benefit levels than was possible under the more tightly constrained bounds of fiscal mutualism. The period from the second World War into the postwar economic boom generally saw growth in employee benefits ranging from pension plans to health insurance as workers gained greater power in the economy.[16]

After public pension funds began investing in corporate bonds, it was not difficult to persuade them of the logic of investing in U.S. public equities as well. The strong postwar economy provided a compelling case for investing in a mix of American corporate equities and bonds. During the twenty year period from 1945 to 1965, the S&P 500 Index returned an annualized 14.9 percent.[17] During the next twenty year period, 1965 to 1985, the S&P 500 Index delivered an annualized return of 7.8 percent. Because stocks and bonds do not move in lockstep, the pension funds asserted that investing in these two asset classes provided balance and protection against risk, allowing the plans to maximize their return potential and meet their benefit obligations to their members.

Changes in bond markets were not the only force pushing against fiscal mutualism. While the use of legal lists of permitted investments dominated in most states, some states already had begun to follow the "prudent investor" rule, originally referred to as the "prudent man standard."[18] This represented a fundamentally different approach to pension investing than the legal list approach. The prudent investor rule states that an investment decision is permissible so long as an investor acting prudently would have made that same investment, i.e., the investment isn't motivated by some personal bias or, worse yet, outright bribery. The logic of the prudent investor rule meant that public pension funds became able to invest in a more diverse mix of asset classes, so long as those investments were deemed prudent.

There was a decadeslong movement to have more public pension plans adopt the prudent investor rule. While only nine states had a prudent investor standard in 1939, only 12 states *did not* have a prudent investor standard by 1953.[19] Today, every state operates under this standard, required either by state law or retirement board policy.[20] Ultimately, this shift in approach was cemented by a law that does not even apply to public pension funds.

Figure 4: The Growth of Financial Services



Source: this chart follows and expands upon Figure 1 from Robin Greenwood and David Scharfstein, "The Growth of Finance", Journal of Economic Perspectives—Volume 27, Number 2—Spring 2013—Pages 3–28.

The Employee Retirement Income Security Act (ERISA) of 1974 enshrined the prudent investor rule into law as the guiding principle for the investments of pension plans in the private sector. ERISA does not apply to state and local government pension plans, but the enshrinement of the prudent investor rule seems to have functioned as a signal. As noted above, most states had already adopted a prudent investor standard by 1974, but ERISA seems to have been the final push needed for plans to widely embrace it.

This shift in investing philosophy also occurred during a time of significant growth in the financial services sector of the American economy (**Figure 4**). Financial services as a value added share of gross domestic product (GDP) had reached a low point of nearly two percent in the early 1940s, but was already above four percent by the mid-1970s and would eventually surpass eight percent of GDP by the early 2000s.[21] The strong growth in this sector of the economy presented a prime investing opportunity for public pension funds.

Throughout much of the 1980s and into the early 1990s, most fixed income investments provided double digit returns. U.S. public equities were also strong. As a result, most public pension funds could stay primarily in the "traditional" mix of stocks and bonds and achieve their investment return targets each year without taking on too much risk. Many public plans at this time were still invested mostly in fixed income with only a smaller portion of their assets in public equities, mostly U.S. equities.

Some of the "alternative" asset classes so common today, such as hedge funds or private equity, were only starting to develop in the 1980s and were much smaller than they are now. Many public pension plans didn't even consider these alternative assets for investment because they simply weren't needed (or weren't widely accessible). Even in the mid-1990s, as the investment consulting firm Callan has shown in their *Risky Business* report, a public pension fund could achieve a seven percent investment return with little risk by being primarily invested in fixed income.[22]

The era of the "traditional" stock and bond portfolio seemed to reach its zenith with the Dot-com bubble of the late 1990s. Investment returns swelled as equities delivered outsized returns. Fixed income, while already beginning its long-term decline, was still delivering attractive yields roughly between 5 percent and 8 percent in the late 1990s.[23] Investment returns for many plans were so strong that some public employers took "pension holidays" in which they did not make required contributions to the plan for a year or two because the markets were delivering consistently

positive returns and the plans were well-funded. Alan Greenspan, then the chairman of the Federal Reserve, was speculating about paying off the entire U.S. national debt because markets were strong and the federal government had a budget surplus.[24] Unfortunately, as often happens in financial markets, nothing lasts forever. The bursting of the Dot-com bubble beginning in early 2000 not only caused a minor recession, but delivered some unwelcome news for public pension funds.

The funding ratios of nearly all public pension funds declined in the early 2000s as the sky-high returns of the Dot-com bubble came down to earth. Funding ratios had begun to recover by the mid-aughts, however, and were on an upward trajectory in 2006 and 2007… and then the Global Financial Crisis (GFC) occurred. Investors didn't expect such a bad decade, including two recessions, one of which was the worst in nearly a century.[25] The back-to-back impacts of the two recessions in the 2000s hampered many public pension funds. Those plans that had taken a pension holiday or had a lax history of making full and timely contributions were especially affected because their asset base was already smaller.

The post-GFC era marked another turning point for public pension funds. For starters, short- and medium-term risks associated with investing in public equity were front and center and many plans recognized that their fixed income exposure hadn't provided enough, or the expected, balance and protection that may previously have been anticipated. In addition, the investment environment was radically altered from what they had known before, primarily due to the Federal Reserve holding interest rates artificially low at almost zero. This meant there was little return investors could expect to earn from their fixed income allocation and other yield-oriented investments. This new focus on diversifying public equity risk combined with a notably different and evolving financial environment altered public plans' investment approach. Callan's research finds that a public pension fund now must take on greater complexity and more risk to achieve the same seven percent return that it could have earned with a simpler, lower risk portfolio three decades ago.[26] This is not a reflection of the abilities of public plan investment staff to invest. Rather, it's a result of evolving risk management and changes in the market.

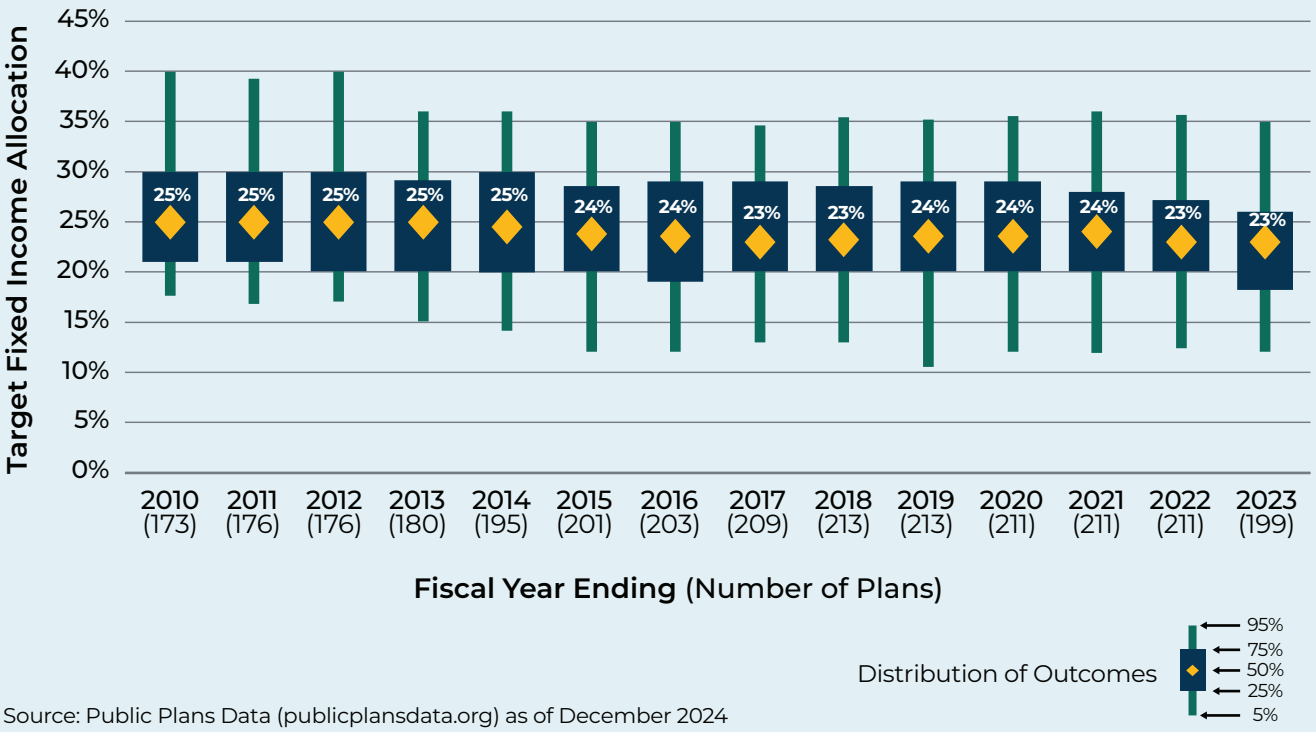
The next two sections explore the two major, and interrelated, drivers for why public pension portfolios evolved to the more diversified asset allocations seen today: the decade of ultra-low interest rates and the rise of private markets.

THE DECADE OF ULTRA-LOW INTEREST RATES

Figure 5 depicts the shift in the allocation to fixed income among public plans from 2001 to 2023. The median plan shifted from having nearly a third of their portfolio to having less than a quarter allocated to fixed income. This largely reflects the impact of the decade of ultra-low interest rates on depressing bond yields.

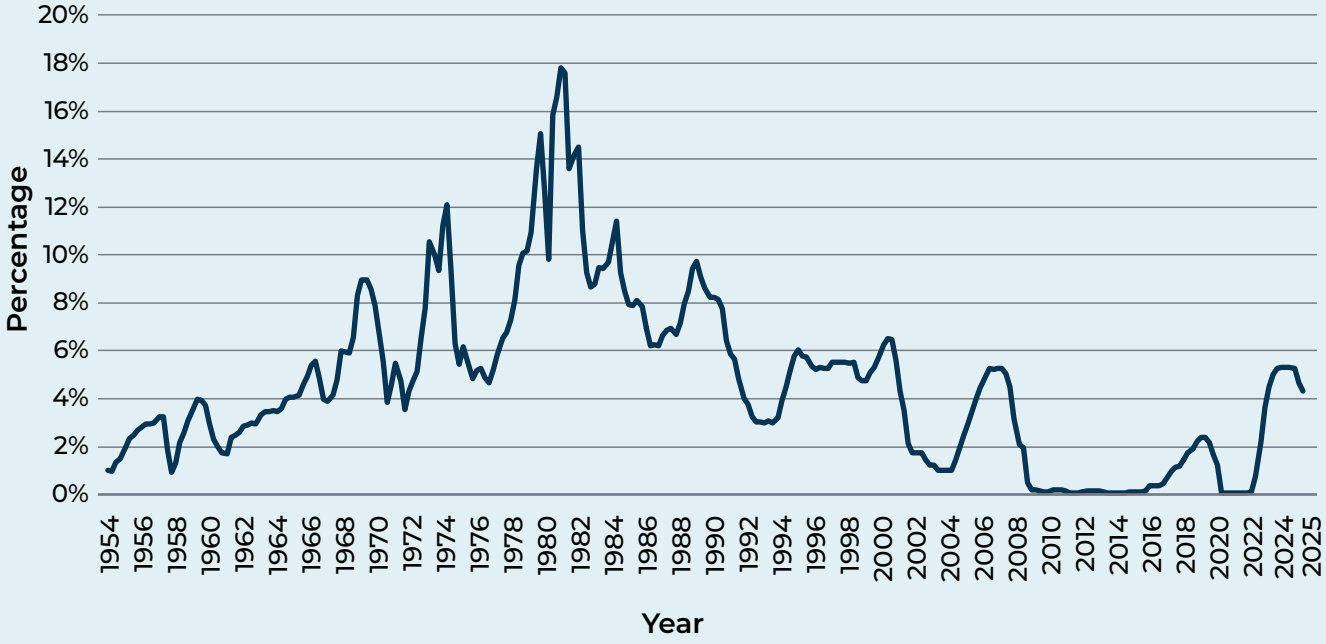
Among the major differences in financial markets following the GFC was the change related to interest rates. Interest rates began their long-term decline in the 1980s. From a peak of 22 percent in December 1980, the federal funds rate had declined to just under eight percent in December 1989. After returning to 9.5 percent in October 1990, the federal funds effective rate has never been that high since (**Figure 6**). The federal funds rate fluctuated between three and seven percent for much of the 1990s, but it moved even lower following the recession caused by the bursting of the Dot-com bubble. The rate had risen to just over five percent before the GFC, but was then held near zero for most of the decade following the crisis. Only in the past few years since the disruption caused by the Covid-19 pandemic has the federal funds rate returned to above five percent.

Figure 5: Distribution of U.S. Public Pension Target Fixed Income Allocations



Source: Public Plans Data (publicplansdata.org) as of December 2024

Figure 6: Federal Funds Effective Rate



Source: Board of Governors of the Federal Reserve System (US) via FRED®

The impact of ultra-low interest rates for all types of savers and investors, but especially for public pension funds, has been undeniable. The lowering of interest rates pushed down the yields from fixed income. The market yield on ten-year U.S. Treasury securities has been below five percent for most of this century and was near or below 2.5 percent for much of the 2010s (**Figure 7**). Yields on Moody's seasoned AAA corporate bonds have been similarly low.

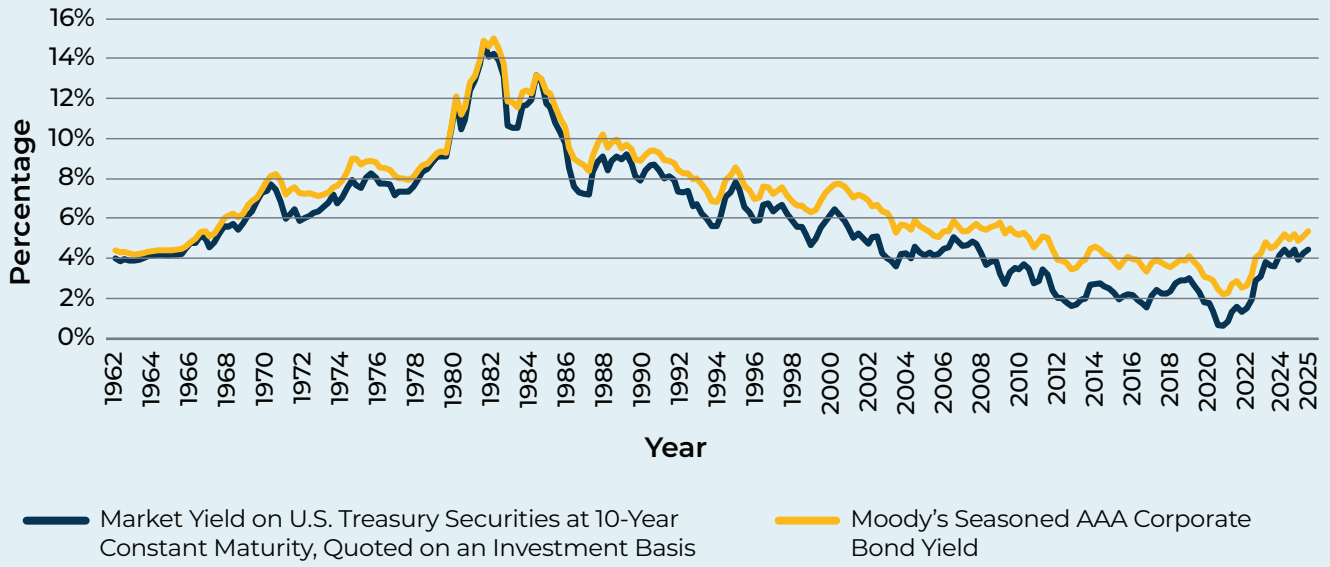
This decline in yields from fixed income changed how public pension funds invested. Investors with money to lend always will look for the highest source of return with the least amount of risk or will charge a higher rate of interest for a riskier investment. Pension funds achieved consistent returns with a small amount of risk for many years by investing primarily in fixed income. This allowed plans to balance their objectives of earning strong returns for their members and keeping costs low for plan sponsors and active members. Ultra-low interest rates scrambled this calculation. In this environment, public pensions with roughly 20 to 30 percent in public fixed income exposure, which was returning little to no investment earnings, had to "reach for yield." This became a common phrase as public pensions needed to look outside of the traditional equity and bond markets to achieve their actuarial assumed rates of return.

Ultra-low interest rates were not the only consequence of the GFC that affected fixed income investing for public pension funds. Banking regulations were tightened in response to some of the actions that sparked the financial crisis. This tightening of regulations was almost certainly well-intentioned and arguably justifiable in response to a major financial crisis that had devastating effects on many in the U.S. and around the globe. However, unintended outcomes often result from major public policy decisions and restricting how banks can lend changed who banks lend to and how they make those loans.

One significant regulatory change for banks following the GFC was higher minimum requirements for the quantity and quality of bank capital.[27] These tighter capital requirements have made it costlier for banks to hold loans with no rating or low ratings. This created a supply and demand imbalance and an opportunity for non-banks to lend directly to these borrowers, commonly referred to as direct lending, which is a type of private credit. The growth in direct lending has been a significant development since the GFC and has created new investment opportunities for public plans.

These more stringent banking regulations occurred against a backdrop of consolidation within the banking sector. The number of banks declined from more than 14,000 to less than 6,000 between 1980 and 2022.[28] This happened largely because of changes in laws that had previously prohibited a bank from having branches in multiple states. As these restrictions were lifted, a smaller number of banks began to operate in multiple states. As the number of banks declined, so did the number of lenders available to potential borrowers, contributing to the gap that institutional investors have helped fill.

Figure 7: 10-year Treasuries and Corporate Bond Yield

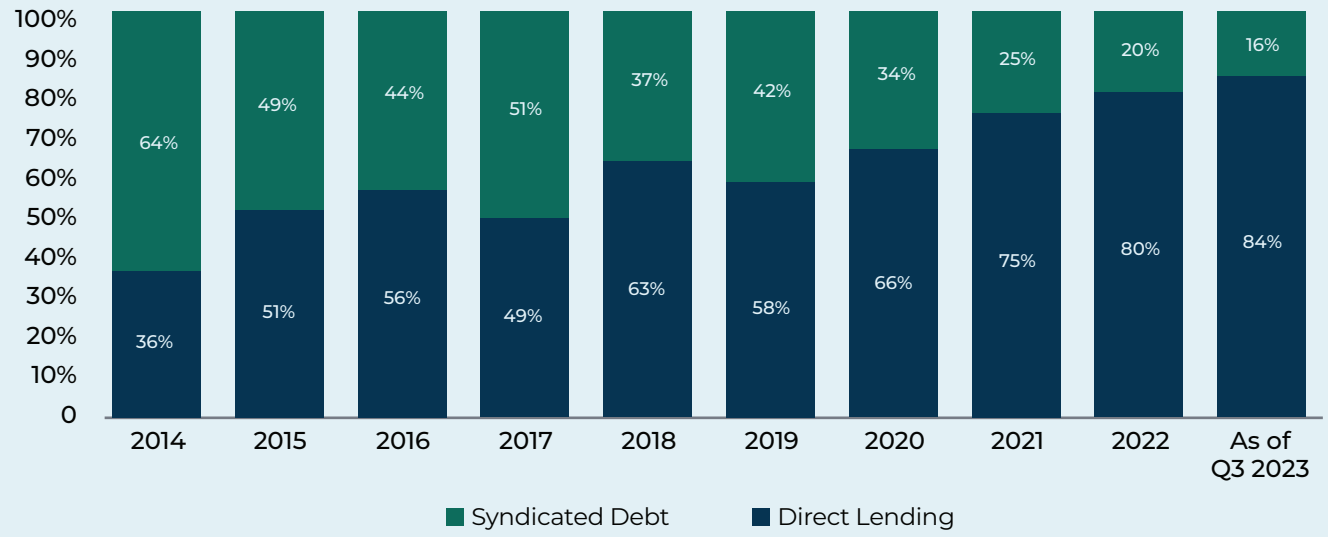


Sources: Board of Governors of the Federal Reserve System (US); Moody's via FRED®

One consequence of bank consolidation is that commercial and industrial (C&I) loans have declined as a percentage of bank balance sheets from 29 percent in 1982 to 16 percent in 2023.[29] Meanwhile, bank lending to non-banks is growing at five times the rate of C&I loans. When there were more banks, they lent to middle-market companies. Now more of that direct lending is done by non-banks (**Figure 8**).[30]

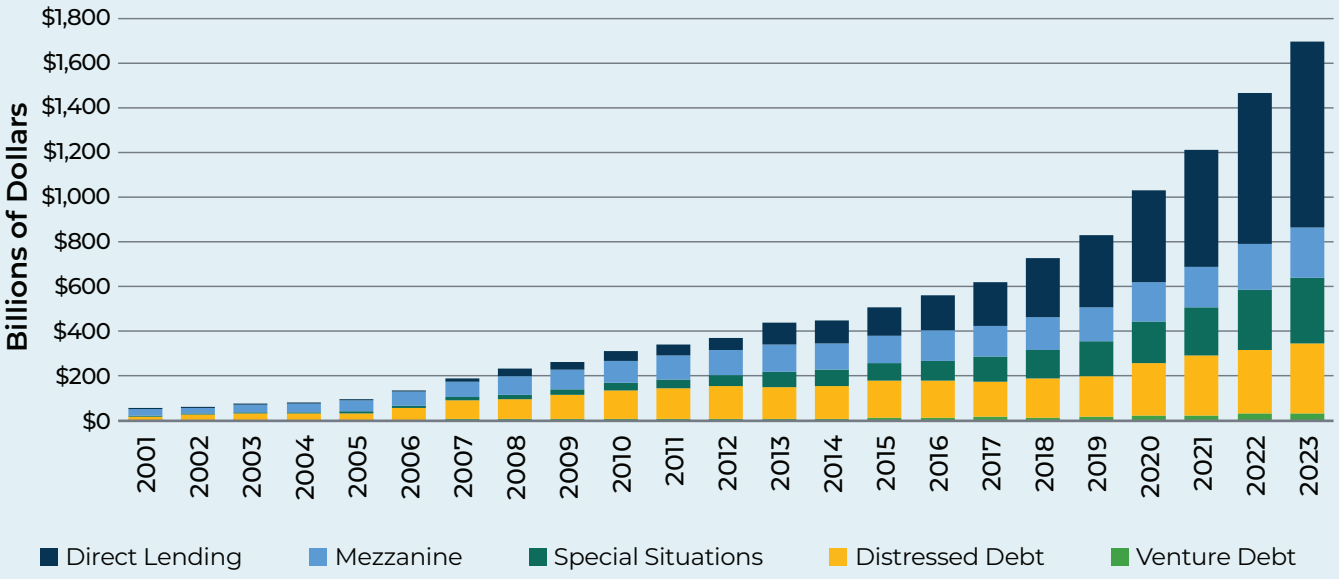
The combination of ultra-low interest rates, tighter banking regulations, and fewer banks led to the significant growth in the private credit and private debt markets (this paper will generally use "private credit" to refer to this asset class). Private credit as a distinct asset class across institutional investors was almost nonexistent at the turn of the century. This asset class has only existed for about twenty years, and most of its growth occurred after the GFC (**Figure 9**).

Figure 8: Nonbank Financing of Middle-Market Deals



Source: Young Soo Jang and Steven Kaplan, "Some Thoughts on Private Markets", Presentation to BIS Pension Fund Workshop on Private Markets, March 2024; Figure 10, slide 13.

Figure 9: Global Private Debt AUM by Strategy



Source: Preqin Pro

Private credit as an asset class consists of several different types of loans or investments:

- Direct lending (to a single company)
- Asset-based lending (e.g., real estate or infrastructure debt)
- Alternative credit
- Opportunistic credit

Each of these occurs outside of the traditional banking sector. As a result, non-bank lenders have been taking market share from traditional banks.[31]

Private credit offers several perceived benefits to both lenders and borrowers. For investors, private credit has a high return-for-risk profile (Sharpe ratio) meaning lenders are better compensated for the level of risk they are taking.[32] This is due to several factors, though primarily due to ties to floating rate loans and the privately negotiated contractual terms. As shown in **Figure 10**, private credit has offered public pensions a strong source of return that is income-oriented and diversified from public equity risk. For borrowers, private credit offers flexibility in lending arrangements relative to what banks can do. For both lenders and borrowers, non-banks tend to hold loans to maturity. This means non-banks hold the risk of default, which promotes an alignment of interests between lender and borrower.[33]

Figure 10: Private Credit Has Outperformed Other Types of Fixed Income

Annual Returns

	Short-term Treasuries	Long-term Treasuries	Private Credit	IG Corp	HY Corp	Leveraged Loans
2017	0.9%	2.4%	12.2%	6.5%	7.5%	4.1%
2018	1.8%	0.8%	2.9%	-2.2%	-2.3%	0.4%
2019	2.3%	7.0%	7.2%	14.2%	14.4%	8.6%
2020	0.6%	8.2%	6.3%	9.8%	6.2%	3.1%
2021	0.1%	-2.4%	20.9%	-1.0%	5.4%	5.2%
2022	1.6%	-12.9%	4.8%	-15.4%	-11.2%	-0.8%
2023	5.1%	3.9%	8.8%	8.4%	13.5%	13.3%
Average	1.8%	1.0%	9.0%	2.9%	4.8%	4.9%

Negative | 0.1 to 4.99 | 5 to 9.99 | 10 to 14.99 | 15 and above

Sources: Bloomberg, Prequin, ICE BofA, Apollo Chief Economist

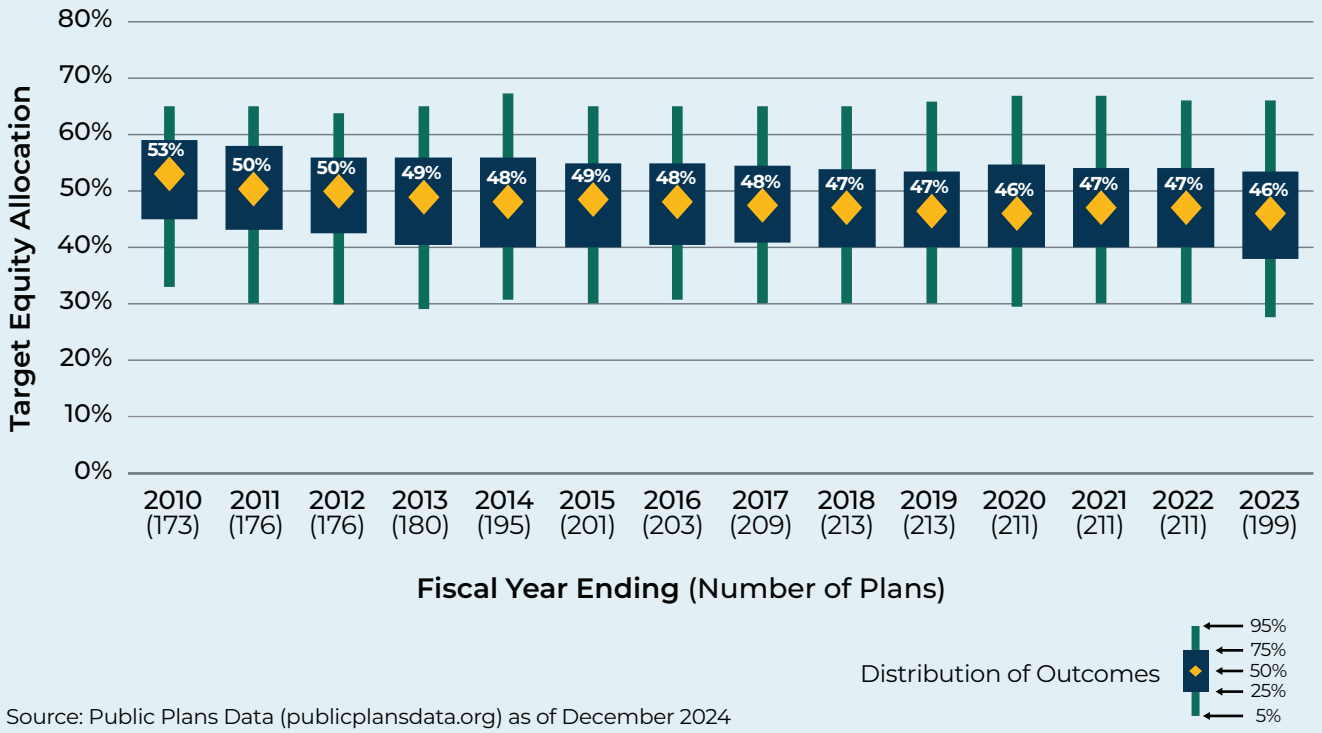
The growth of private credit isn't surprising. The history of finance clearly teaches that there always will be people looking to borrow and people willing to lend. The only question is how they arrange the relationship between debtor and creditor. Private credit may be new as a standalone asset class, but loaning capital at interest is as old as human civilization. Once yields from public fixed income declined so sharply, investors with money to lend went looking for investments with higher rates of return. After banking regulations restricted borrowing opportunities, especially for middle-market companies, those seeking to borrow looked beyond the banks for someone willing to lend. Private credit is the marriage of those looking to borrow and those willing to lend outside of the traditional banking sector.

As will be discussed in the following section, the rise of private credit is tightly connected with the even greater growth in private equity. Many private equity deals are financed now via private credit. This back-and-forth between private credit and private equity has fueled the robust growth of private markets.

FEWER PUBLIC COMPANIES AND THE RISE OF PRIVATE EQUITY

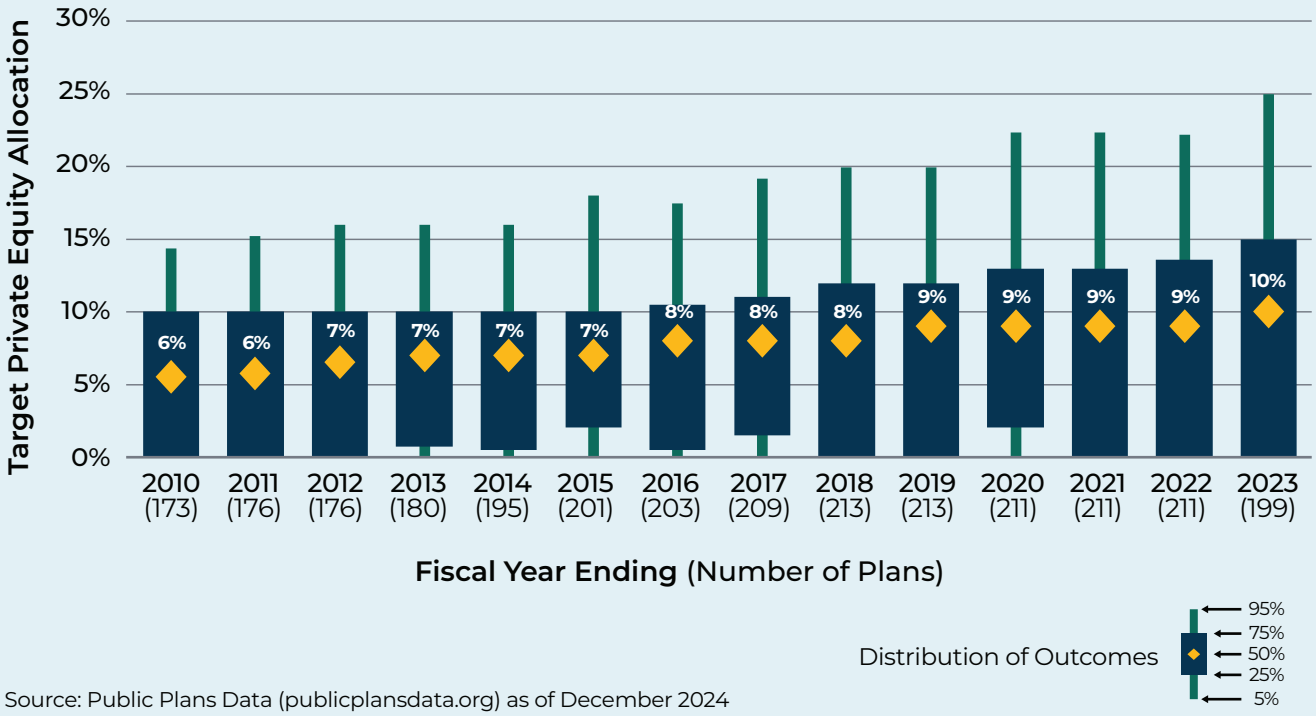
Figures 11 and 12 demonstrate one of the most noteworthy shifts in public plan investing this century. Allocations to public equity remain the largest portion of the typical plan's portfolio, but that allocation has declined from 59 percent at the turn of the century to 46 percent in 2023. Figure 12 reveals that nearly all of that reallocation has gone to private equity/credit, which grew from no allocation in the median plan's portfolio to 10 percent in 2023, with some plans allocating nearly a quarter of their portfolio to private equity. This section discusses the forces behind that shift in allocation.

Figure 11: Distribution of U.S. Public Pension Target Public Equity Allocations



Source: Public Plans Data (publicplansdata.org) as of December 2024

Figure 12: Distribution of U.S. Public Pension Target Private Equity/Credit Allocations



Source: Public Plans Data (publicplansdata.org) as of December 2024

While private credit is a newer standalone allocation for public pension plans, the growth in private equity represents an even more substantial shift to private markets. While the history of private equity extends back to 1946 and, arguably, even earlier than that, it caught the attention of the business and finance worlds in the 1980s with the leveraged buyout boom.[34] The most high-profile leveraged buyout of the 1980s was that of RJR Nabisco by KKR (Kohlberg Kravis Roberts) in 1989.

A number of high-profile leveraged buyouts occurred again in the early 2000s, including, among others, Toys "R" Us, the Hertz Corporation, and Metro-Goldwyn-Mayer. Private equity firms and deals continued to grow right up until the financial crisis. Despite the impact of the GFC, which temporarily reduced the size of private equity deals, private equity has remained a large and growing asset class for institutional investors.[35] A cause-and-effect relationship in a few areas has created the conditions for this sustained growth.

First, the number of publicly traded companies in the U.S. today is half its peak in 1996, declining from 8,090 listed companies in 1996 to 4,642 in 2022 (**Figure 13**).[36] However, it's important to keep in mind that the peak in 1996 represented significant growth from the 5,164 listed companies in 1980, so the endpoints of this comparison matter greatly. Nevertheless, this decline in the number of publicly listed companies has been both a cause and a consequence of private equity investing. Additionally, a portion of the decline in the number of public companies can be attributed to consolidation in a few industries, such as banking.

As discussed earlier, laws were used to tightly regulate interstate banking, meaning there was a greater number of banks serving mostly regional and local clientele. As the laws changed and more banks were able to cross state lines, banks were consolidated and the number of banks in the U.S. decreased from more than 14,000 to fewer than 6,000. This has arguably been to the benefit of consumers, and some maintain that the American banking industry remains too fragmented, but it did contribute to the decline in the number of publicly traded companies.

Banking is not the only industry that has experienced consolidation over the past thirty years. Industrial companies and technology firms, especially those that produce hardware and semiconductors, have also declined since the mid-1990s.[37] A significant force driving consolidation in these two industries has been a broader shift from an economy centered on firms that produce tangible assets, which were the majority in the 1990s, to an economy with more companies that make intangible assets,

Figure 13: Number of Listed Domestic Companies

Sources: World Bank, Macrobond

like software.[38] Additionally, much of the research on new pharmaceutical drugs is conducted by start-up companies that receive venture capital funding, another type of private equity financing. These start-ups then go public at a later date, rather than being public while conducting research.[39]

Waiting to go public, or never being taken public, is another economic phenomenon related to the rise of private equity. Companies today spend more time private before becoming publicly traded (**Figure 14**). Relatedly, the size of initial public offerings (IPOs) has increased.[40] While there are fewer small IPOs today, the number of larger IPOs has remained relatively stable. Some argue that the increase in small IPOs during the late 1990s contributed to the Dot-com bubble.[41]

Again, as with private credit, regulatory changes also have contributed to the growth in private equity. Public companies face more reporting and disclosure requirements today than in the past. Some of these disclosures resulted from the Sarbanes-Oxley Act, which was passed to protect investors and in response to the scandals at Enron, WorldCom, and other companies in the early aughts. These required disclosures from publicly traded companies may be perceived as costly and burdensome by businesses and, especially in certain sectors, companies may wish to avoid disclosures in order to avoid sharing too much information with their rivals.[42]

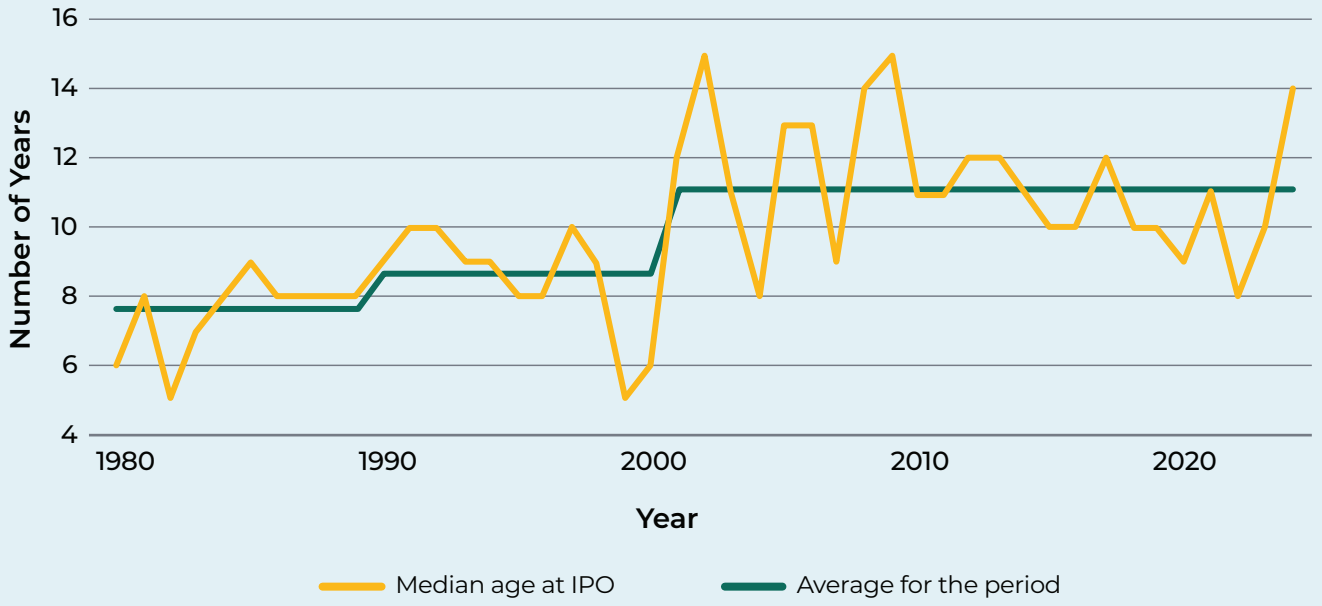
Another reason private companies may decide to stay private for longer is for easier alignment of management decisions with long-term strategic goals. Publicly traded companies are bound by quarterly earnings reports and market reaction. Managing short-term results may be counter to the decisions that otherwise would be made to reach long-term strategic goals, which makes staying private for longer more attractive in certain instances.

For all the attention that private equity receives, there remain advantages to investing in public equity markets. They provide access to capital for businesses, offer increased liquidity, and facilitate wealth creation. Public exchanges remain an important part of capital formation. For all of these reasons, investors likely will continue to look to public equity markets for reliable investments. However, given changing circumstances, private equity markets have become increasingly appealing for both borrowers and lenders. One consequence is that there are now five times as many private equity-backed firms as there are public companies.[43]

The significant growth in private equity has been aided by the growth in private credit. There is more private financing available to companies today, which makes it easier for companies to remain private since they don't need to access public markets to raise capital. While private credit may be facilitating the financing of private equity deals, the money

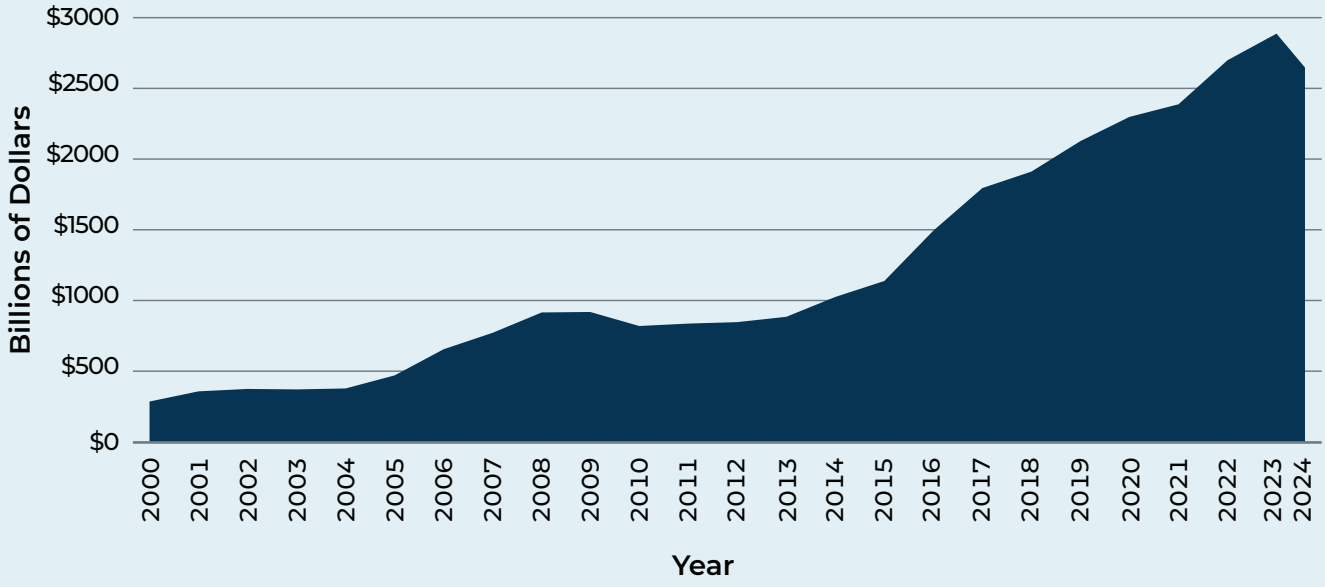
is coming from the significant amount of so-called "dry powder" held by private equity firms. Dry powder represents the as-yet uninvested assets held by private equity firms. Private equity dry powder reached a record amount of $2.62 trillion in the middle of 2024 (**Figure 15**).[44]

Figure 14: Companies Are Waiting Longer To Go Public



Source: Apollo Global Management: Apollo Chief Economist analysis of data from Jay Ritter

Figure 15: Private Equity Dry Powder



Source: Preqin Pro

Whatever the reason for the growth, private equity as a major asset class seems here to stay. The significant amount of outstanding dry powder strongly suggests that more private equity deals will come when conditions are favorable. And as more private companies stay private longer, allocations to both private and public equity are necessary for public pension plans to capture the full equity opportunity set and associated economic growth.

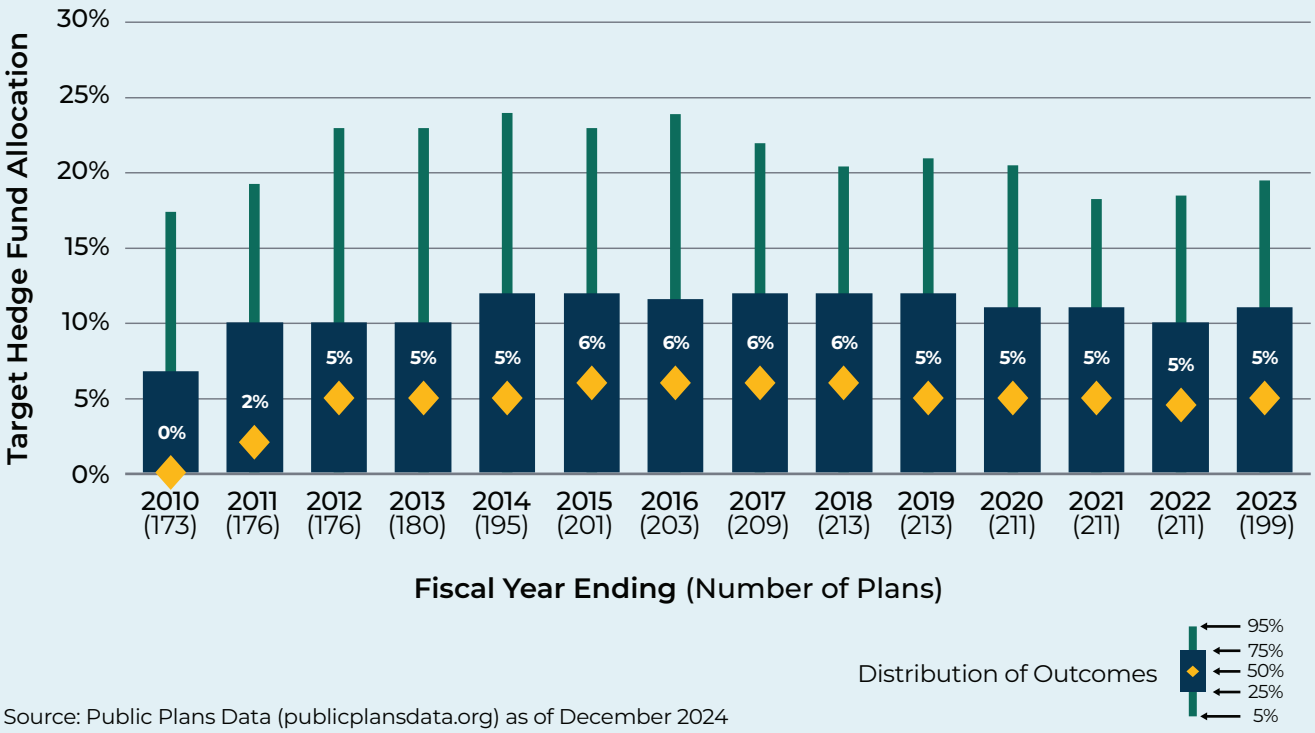
Hedging Their Bets

Hedge funds are another investment that has seen greater allocation from public pension funds since the GFC, as shown in **Figure 16**. As with private equity, hedge funds are not a new investment, but one that has experienced notable growth over the past two decades. A hedge fund, at its core, is an investing strategy. Arguably, private equity and private credit represent new ways that portions of the economy function, e.g., how certain companies are financed. Hedge funds are different. Hedge funds don't indicate the economy is working in a different way, rather they are a means for investors to pool their resources and invest following a specific strategy, e.g., a long/short strategy.

The premise of a hedge fund is that the fund is making a long-term bet that one thing will happen rather than another. This is why hedge funds typically require a lockup period for invested assets: short-term investments don't work with hedge funds because the investor and fund manager need to see if the hedge works out in the long term. This is also why manager selection is so important. An investor needs to trust that the fund manager knows what they're doing and can make a good decision.

Hedge funds often are used by institutional investors such as pensions or insurance funds or by high net worth individuals. Since hedge funds typically require a minimum amount of money to invest and a lockup period for that investment, they are not accessible for the average individual investor. But for precisely these reasons, they can make sense for long-term investors like pension funds. Pension funds already function according to the logic of pooling contributions for the long-term, so investing a portion of those assets in a hedge fund that may be more illiquid but offers the potential of above-average returns and/or downside risk protection is consistent with the goals of pension funds.

Figure 16: Distribution of U.S. Public Pension Target Hedge Fund Allocations



Source: Public Plans Data (publicplansdata.org) as of December 2024

Hedge funds did not appear in the average aggregate asset allocation at the turn of the century, but in the post-recession period grew to be five percent of the typical public pension plan portfolio, a level that has remained fairly consistent over the past decade. As returns declined within "traditional" asset classes, more long-term investors like pension funds looked to hedge funds as a source of return within their portfolios. A pension fund, in many ways, is the ideal investor for a hedge fund due to its long-term outlook. The staff of the pension fund can manage the relationship with the hedge fund over years and seek the most favorable terms for their investment.

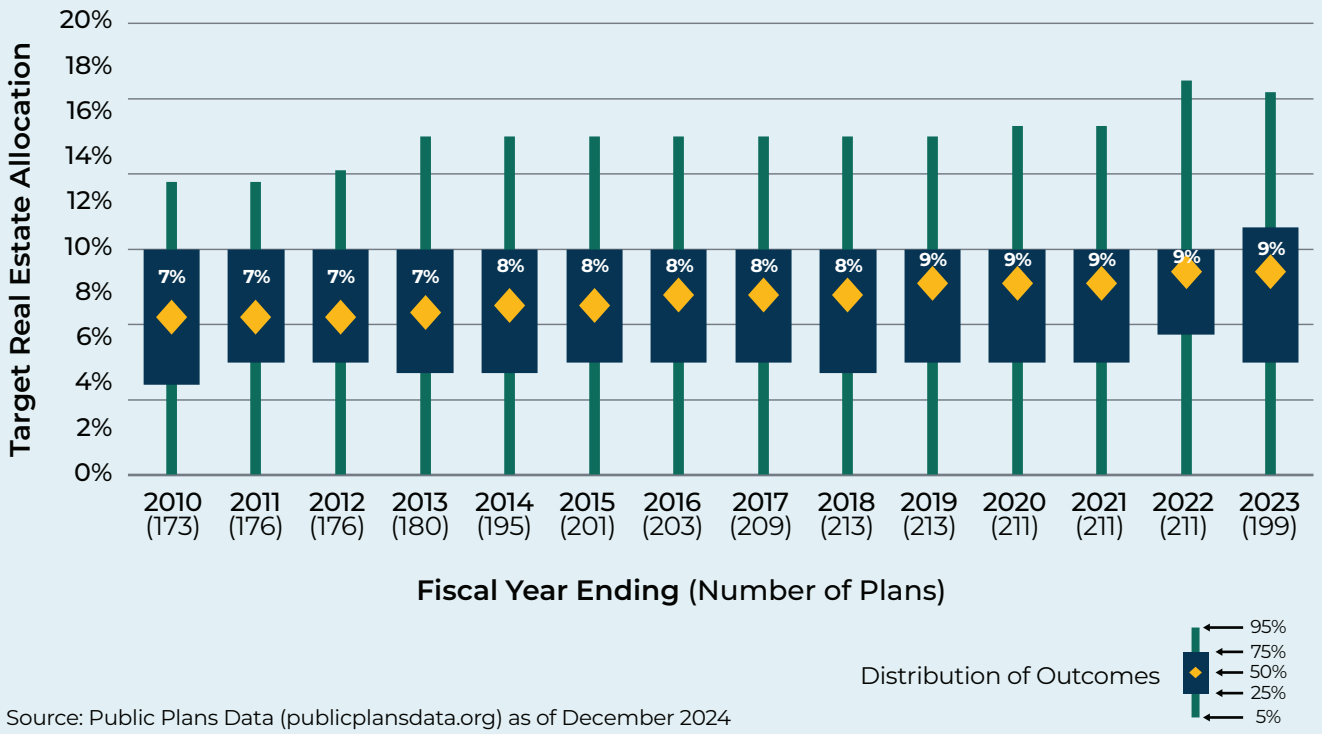
The growth of pension investment in hedge funds seems to be another consequence of the low return environment prevailing after the GFC. Global hedge fund assets under management (AUM) topped $2 trillion in 2007 before declining in the post-recession period. However, hedge fund AUM began to rise again in 2013 and has soared since then, topping $5 trillion in 2023.[45] The period during which assets managed by hedge funds rose corresponds with the increase in public pension fund investment in this asset class.

While the assets managed globally by hedge funds has continued to grow, the portion of their portfolio allocated to hedge funds by public plans seems to have plateaued. Goldman Sachs noted in early 2023 that pension plans were shrinking as a portion of the investment base for hedge funds.[46] While pensions were nearly 40 percent of the investors in hedge funds in 2018, that number had declined to less than 30 percent by 2022.

Real Estate, Real Assets, and Infrastructure

Real estate is yet another asset class that has seen increased investment from public pension funds in the post-GFC period (**Figure 17**). Pension funds had invested in real estate for decades before the 2007–2009 recession with the median fund allocating about four percent of its portfolio to real estate in 2001. This median plan allocation held steady around five percent for most of the aughts before rising above seven percent in 2012 and nearly ten percent by 2022. While still a small portion of the overall portfolio, this is a noticeable increase in allocation, doubling over two decades, and it is reflected in the changing aggregate asset allocation from FY01 to FY23.

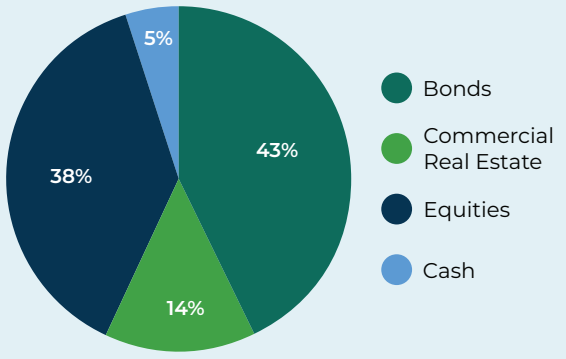
Figure 17: Distribution of U.S. Public Pension Target Real Estate Allocations



Source: Public Plans Data (publicplansdata.org) as of December 2024

Pension funds invest in real estate with the goal of diversifying their portfolios. **Figure 18** shows real estate as a portion of the total investable market in the U.S.[47] While bonds—comprising both government and corporate bonds and the various forms of private credit/debt—and equity—both public and private—remain by far the largest portions of the investment market, real estate is a fundamentally different asset class than either of those with different dynamics driving its outcomes. Therefore, the argument has long been that a successful investment in real estate can offer returns that are uncorrelated to other asset classes.

Figure 18: Commercial Real Estate of Investable Market Basket, 2020Q4



Sources: Stock and bond data from Board of Governors of the Federal Reserve, Financial Accounts of the United States, 2020:Q4; commercial real estate market size data based on Nareit analysis of CoStar property data and CoStar estimates of commercial real estate market size.

Investing in real estate can take different forms, just as with investing in equities or fixed income. A real estate investment can mean directly owning a property, such as an office building. It also can mean investing in a publicly traded real estate investment trust (REIT) or commercial mortgage-backed security (CMBS). REITs function more like equities while CMBSs are fixed-income products. As with the equity markets, real estate investing increasingly has been done through private equity real estate investments.

Along with greater investment in real estate, public pension funds also have begun to invest more in real assets, such as infrastructure. While infrastructure investing has existed for decades, the nature of that investment is changing.[48] Infrastructure investing used to involve owning a single, large asset such as a toll road or port. While that type of investment still occurs, infrastructure investing seems to be moving toward building out the infrastructure needed to support both the energy transition and the growth of the artificial intelligence (AI) industry. AI, for example, requires the use of data centers, which are heavy users of energy. Energy production will need to increase to support this rapidly expanding industry, and some companies are building the means of producing this energy. These companies could represent a new investment opportunity for institutional investors like pension funds.

More recently the growth in infrastructure exposure also has been driven by the evolution of investment vehicles that institutional investors can access. Infrastructure previously had been dominated by closed-end, long-term investment partnerships that had investment lives of 10+ years. With the development of open-end infrastructure fund vehicles that function similarly to the core open-end real estate market, more institutional investors can access this asset class with lower fees, less illiquidity, and less complexity.

Public Pension Plans Have Adapted to Changing Market Conditions

Following the GFC, remarkable changes to financial markets converged with public plans' need for return and diversification and resulted in the more diversified portfolios seen today. The growth of private markets has transformed how companies are financed and has altered the opportunity set available to institutional investors. Exposure to private markets is necessary for plans to gain exposure to the full investable opportunity set. That is the reality of markets today: public markets have shrunk and private markets have grown in response.[49]

HAS DIVERSIFICATION INTO ALTERNATIVES BEEN SUCCESSFUL?

The shift into alternative investments that largely took place over the past fifteen years often has been met with critiques that cite higher fees, greater illiquidity, less transparency, and more complexity. This ultimately results in questions such as "was it worth it?" or "has diversifying away from traditional assets worked?" These questions are valid and have recently bubbled up as public equity markets reached new highs in early 2025 and as fixed income is again offering respectable yields. The second part of this research seeks to evaluate if the move to a more diversified asset allocation was successful.

Before answering these questions, it is important to first define success. Success across public pension investing has a myriad of definitions that can include reducing unfunded liabilities, controlling the costs associated with the plan, meeting expected asset growth rates, outperforming a primary benchmark, and outperforming a peer group, to name a few. In keeping with the scope of this research, the focus is on asset performance success metrics. That said, it is important to acknowledge that asset performance is only one piece of the puzzle, and to truly be successful in managing a public pension plan, the full asset and liability picture must be considered.

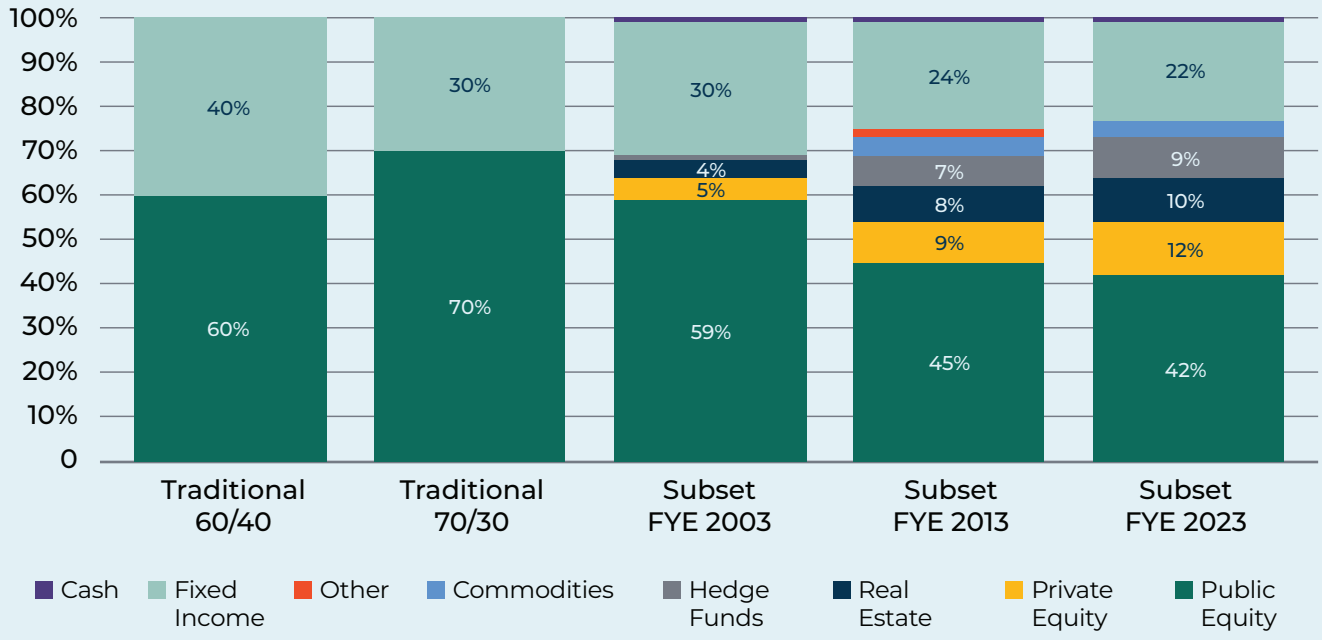
Specifically, this research answers the following questions:

- Has diversification been additive compared to a traditional public equity / public bond portfolio?
- Have public pension plans met their own investment objectives and could traditional portfolios have achieved the same results?

Research Data Definitions

The dataset used in this research represents the net-of-fee returns of 44 public pension plans with fiscal years ending June 30th.[50] The data is sourced from the Public Plans Database (PPD), which contains plan-level data from 2001 through 2023 for about 230 major state and local

Figure 19: The Evolution of Asset Allocation



Source: Public Plans Data (publicplansdata.org) as of December 2024

government pension plans. The subset of plans studied is broadly representative of the public pension universe, but results for this group of plans may not be representative of every public pension plan due to individual facts and circumstances.

Definitions used in this analysis include the following:

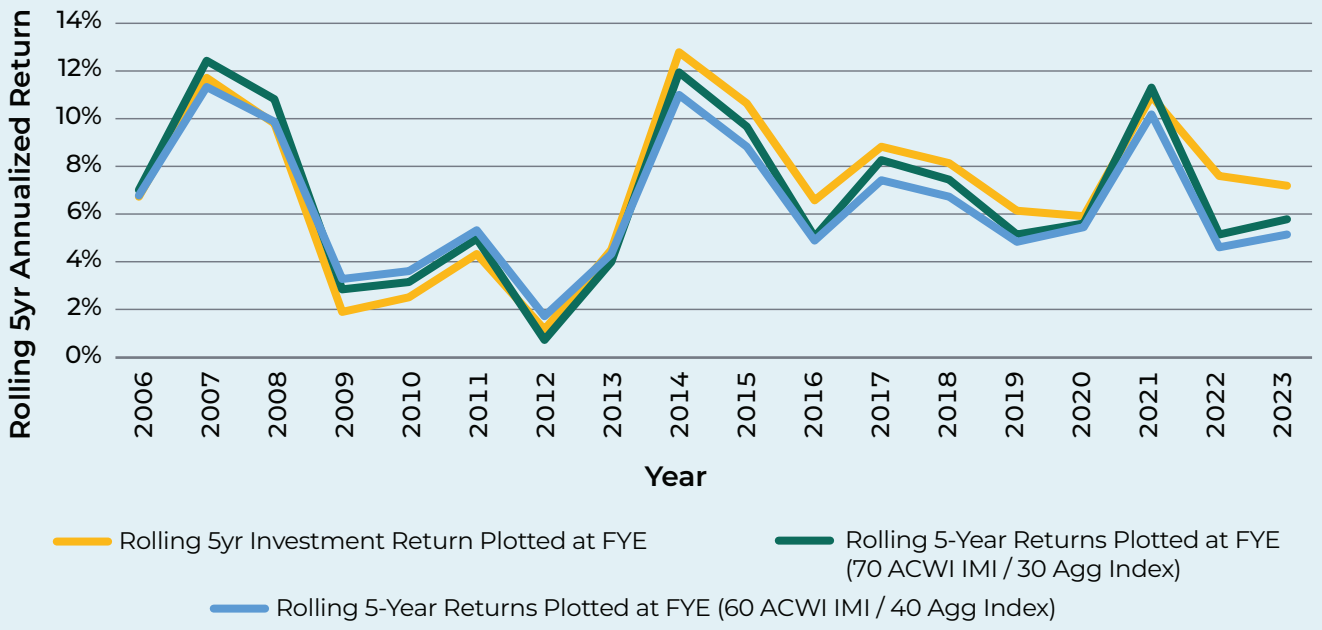
- Actual performance: The average annualized net-of-fee return of the universe of 44 public pension plans. This represents a portfolio that is diversified into alternative investments.
- Actuarial Assumed Rate of Return (AAROR): The average actuarial assumed rate of return of the universe of 44 public pension plans
- FYE: Fiscal Year Ending June 30th
- Traditional portfolios: 70/30 and 60/40 percentage splits to Global Equity (MSCI ACWI IMI) / Bonds (Bloomberg Aggregate Bond Index)

The table on the prior page (**Figure 19**) compares the average asset allocation of the public plan universe across time periods to the traditional 70/30 and 60/40 portfolios. As shown, the average public plan had a similar asset exposure to the traditional portfolios in the early 2000's. Public plans have gradually diversified away from traditional asset classes and into alternatives, with the bulk of this transition occurring after the GFC.[51]

HAS DIVERSIFICATION BEEN ADDITIVE COMPARED TO A TRADITIONAL PUBLIC EQUITY / PUBLIC BOND PORTFOLIO?

This paper has discussed the significant changes in public pension investing over the past 50 years, and particularly the shift into alternative assets over the most recent 15 years. Certainly, alternative investments add complexity to a portfolio and thus it is often asked whether a simple equity/bond portfolio could have performed just as well. The following analysis is a direct comparison of actual public plan performance, representing diversification into alternatives, versus traditional portfolio performance. This research studies both a 70/30 and 60/40 equity/bond split to broadly capture the risk profile of most public pension plans. This comparison directly assesses whether diversifying away from public equity and fixed income and into alternatives such as private equity/credit, real assets, hedge funds, and other alternative investments has been additive to asset performance. The analysis focuses on rolling five-year, net-of-fee returns to allow for a true evaluation of performance through full and different market cycles.

Figure 20: Investment Performance: Simple vs. Diversified Portfolios



Source: Public Plans Data (publicplansdata.org) as of December 2024

The data in **Figure 20** suggests that, for most periods studied and particularly following the GFC, actual performance outperformed traditional portfolios both on the upside and downside. Compared to a traditional portfolio, this research suggests that the evolution into alternative assets has allowed actual portfolio assets over long-term periods to:

- Grow more, net-of-fees, than they otherwise would have
- Grow at a lower level of risk (standard deviation, or volatility of returns)
- Mitigate drawdowns during periods of equity market weakness

Key Observations:

1. The rolling five-year returns are not dramatically different between the actual performance and traditional portfolios, and largely track one another.

The highly correlated relationship between actual and traditional performance is expected given that public equity, the largest driver of investment risk (return volatility), continues to be the dominant asset exposure in actual portfolios as well as traditional portfolios. Additionally, many other asset classes maintain some tie to public equity risk and thus, the pattern of returns between the actual performance and the traditional performance is expected to be largely correlated. That said, there is more difference post-GFC as alternative exposures grew across public pension portfolios. These differences, even if marginal, can offer meaningful benefits to public pension stakeholders through greater stability, potentially lower costs, and/or higher funded statuses.

2. Actual performance has outperformed traditional performance for most periods studied

Observable outperformance of actual returns begins following the GFC. This outperformance is driven by a combination of 1) the diversification benefits of alternatives, 2) the level of alternatives in portfolios, which has grown substantially over the most recent 15 years, and 3) generally and in aggregate, higher returns from alternatives than public markets. It is worth acknowledging that for most of the past decade fixed income returns were severely muted given the low-interest rate environment.

Diversification is often cited for its benefits of balancing market risk and providing a smoother pattern of returns. This benefit is highlighted when diversification improves downside scenario outcomes by mitigating certain risk exposures. The five-year periods ending in 2016 and recently in 2022 underscore this benefit. When public equities, or both

equities and bonds as was the case in 2022, produce weak or negative returns, exposures to alternative assets that provide differentiated market risk and return opportunities may help provide a buffer to the dynamics in public markets. This downside protection can be particularly helpful to plans with negative cash flow profiles and/or that are more sensitive to funded ratio volatility. A more diversified portfolio will reduce potential drawdowns during negative markets, which have the potential to be amplified if weak asset returns coincide with large cash needs.

What is also notable about the results in Figure 20 is that during periods of rising capital markets, actual performance not only kept up, but outperformed traditional portfolios. Often it is the case that when public equity markets rally, a more diversified portfolio will lag a traditional portfolio. This becomes particularly evident over shorter periods of time. That said, as shown in Figure 20, actual performance of the diversified portfolio peaked higher for the five year period ending in 2014 compared to the traditional portfolios. During this period, both public and private equity performed extremely well, and though public fixed income generated positive returns, diversification to alternatives such as private equity/credit, real estate, and infrastructure were additive to results due to return premiums over public markets and the positive impact of diversification. Subsequent to 2014, actual performance remained above traditional portfolio results through 2023 with one exception. For the five-year period ending in 2021, the traditional 70/30 portfolio did keep up with actual results, as public equity exceeded expectations and ended the five-year period with a positive 14.6 percent return.

From a pure risk and return perspective, these results suggest that over long-term periods (rolling five years), diversification into alternatives has generated better results compared to traditional portfolios. Importantly, these results are dependent on a plan's access to the right investment and administrative resources, tolerance for illiquidity, and ability to source skilled managers. These latter factors are not to be taken lightly; however, the results in Figure 20 are evidence that if done right, the inclusion of alternative assets can improve outcomes.

3. Actual performance was earned at a lower level of risk (return volatility).

Headlines for public pension plans, and most institutional investors for that matter, tend to focus on the returns generated. Return is important, but so is return volatility. Notwithstanding Harry Markowitz's Modern Portfolio Theory, which presumes investors always prefer less risk to more risk, reducing volatility has real dollar implications for public pension systems.[52] Traditional portfolios, with greater exposure to public equity, typically have higher volatility.[53] From a return perspective, this translates into higher highs and lower lows, but over the long-term the higher risk is expected to generate higher returns. Most public pension systems in the U.S. have a negative cash flow profile, which means that more dollars are paid out in benefit payments and expenses than are received from contributions. If large cash needs overlap with significant market drawdowns, it can force plans to make adversely timed asset sales, leaving plan assets impaired while increasing their unfunded actuarial liability. Plan circumstances can mitigate or amplify this and thus the importance of return volatility can differ from plan to plan.

For example, a plan with an actuarial funding policy (meaning contributions react to the plan's actuarial funding requirement) may be more sensitive to return volatility as market drawdowns may increase contributions, or the cost of the plan. That said, in this scenario, the assets may not be as impaired because of the higher contributions expected from funding. On the other hand, for plans with a static funding policy, all else equal, a market downturn will not impact the contributions coming into the plan. However, in this scenario, the assets may be more impaired and have a worse impact on funded ratio as the contributions are not making up for the investment losses. Lower volatility portfolios would help mitigate the downside risk of impaired assets and funded ratio erosion.

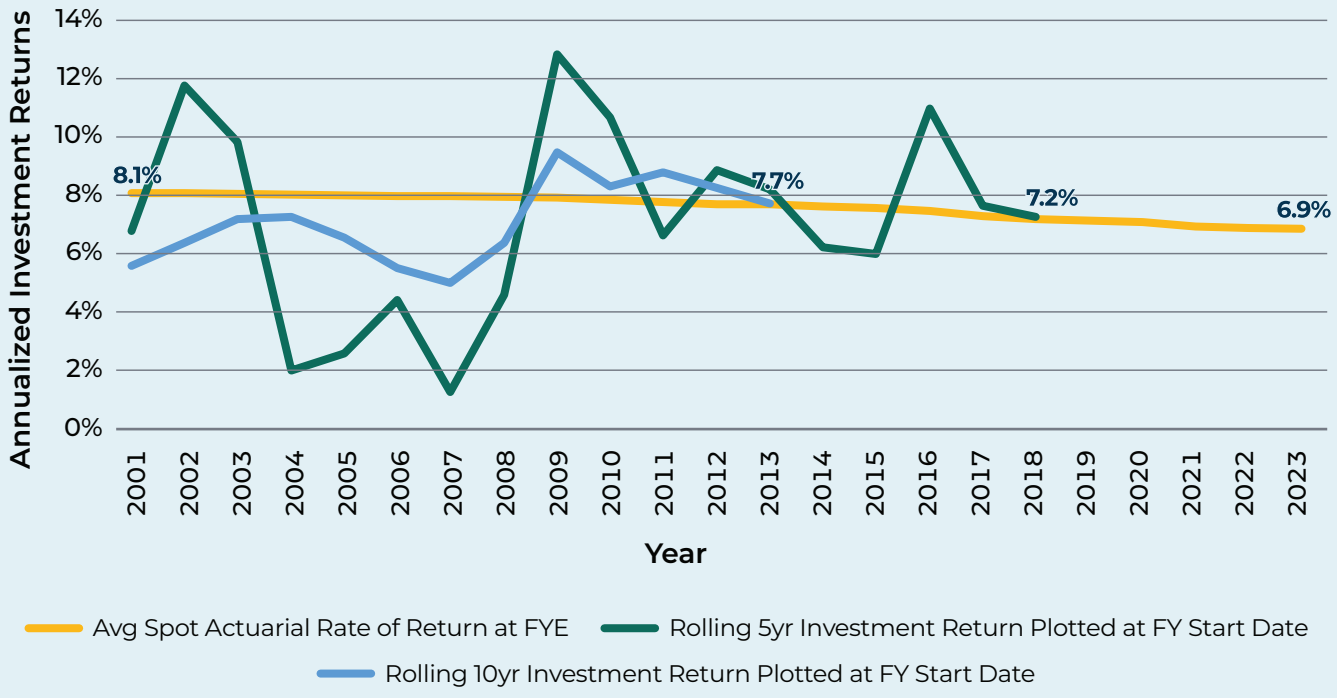
Reviewing past long-term performance has shown that diversifying into alternative investments has, over most time periods, outperformed traditional portfolios at a lower level of risk. While the results in most cases appear to offer the best of both worlds, higher returns and lower risk, it's important to be pragmatic with expectations. A more diversified portfolio may not always work better than a traditional portfolio. There have been, and will be in the future, periods of time when alternative investments do not keep up. This also will likely be true more frequently for shorter time periods (ex. trailing 1- and 3-years). For these reasons, it is important to balance short- and long-term performance evaluation with a preference towards the longer-term. Most public pensions have the benefit of a long-term time horizon due to their open and ongoing nature. This provides them the opportunity to take market risk while constructing portfolios that can weather a variety of market environments and harness the benefits of diversification.

HAVE PUBLIC PENSION PLANS MET THEIR OWN INVESTMENT OBJECTIVES AND COULD TRADITIONAL PORTFOLIOS HAVE ACHIEVED THE SAME RESULTS?

The second question this research sought to answer ties investment performance more directly to a public pension plan's investment return objectives. **Figure 21** compares the actuarial assumed rate of return (AAROR) to the actual performance public pensions earned. The AAROR is used to represent the long-term return expected from the portfolio's asset allocation at the time the asset allocation is set. The actual performance reflects the returns for the subsequent five and 10-year periods. Long-time periods were used to align with how the AAROR is interpreted and with how asset allocation strategy is set. A 10-year time period is preferred to better align with the long-term nature of the AAROR; however, we included the rolling five-year period as well to obtain more data points.

As an example, Figure 21 shows that at fiscal year-end 2013 (FYE = 6/30/2013) the average actuarial assumed rate of return was 7.7 percent. One can interpret this to mean that in 2013, this universe of plan sponsors expected their investment portfolios to earn an annualized 7.7 percent return (on average) looking forward over the long-term. The *actual subsequent* five-year return (FYs 2014 - 2018) was 8.2

Figure 21: Average Actuarial Rate of Return vs. Rolling 5/10 - Year Investment Experience



Source: Public Plans Data (publicplansdata.org) as of December 2024

percent and the *actual subsequent* 10-year return (FYs 2014 – 2023) was 7.7 percent. These specific data points would suggest that public pension portfolios met or exceeded the investment objectives for these time periods.

We then contrast these results with what a traditional portfolio would have earned. For the same five year and 10-year periods, neither a 70/30 nor a 60/40 portfolio would have met the average AAROR.

Figure 21 also reveals two different experiences for public plan portfolios. Prior to 2008, when most plans were expecting their assets to earn eight percent, actual performance fell short of those expectations. This is not surprising as the 10-year periods plotted from 2001 through 2008 (representing 10-year returns ending 2010 – 2017) include two of the worst stock market crashes in modern history: the Dot-com bubble and the GFC. The reality is that public pension portfolios did not meet expectations for these periods. However, we would re-direct this takeaway to address the intent of this research, which is to assess whether *diversifying into alternative investments* has worked. While we cannot claim for certain given most plans had little to no alternative exposure prior to 2008, one could argue that having a more diversified portfolio, and specifically one with less exposure to public equity during the equity market downturns, may have helped mitigate losses that public pensions experienced during these times.

As these market crashes roll out of the return periods, we see a different story. Actual performance has mostly met or exceeded expectations since the GFC. For each of the five 10-year periods studied ending FY 2018 through FY 2023, actual performance has met or exceeded return expectations. For the ten five-year periods studied that followed the GFC, 60 percent of those periods outperformed expectations. It was also during this period when exposure to alternative investments grew the most. After 2009, public pensions began to invest in more alternative assets, and those alternative portfolios that were started earlier began to mature and offer the portfolio diversification benefits.

While it is evident that there will be periods when portfolios may fall short of their long-term return expectations, after the GFC, public pension portfolios have mostly met or exceeded their investment objectives. Further, the diversification into alternatives has, net-of-investment fees, assisted public pension assets to meet return expectations at a greater frequency than what traditional portfolios would have achieved, as shown below.

Periods of Outperforming the Actuarial Assumed Rate of Return

	Rolling 5Y Periods (18 total)	Rolling 10Y Periods (13 total)
Peer Average	9	5
Traditional 60/40	5	0
Traditional 70/30	6	2

"Actual performance has mostly met or exceeded expectations since the GFC (Global Financial Crisis)."

EXTENDING RESULTS BEYOND ASSET PERFORMANCE

The primary focus of this research is to evaluate the asset performance of public pension portfolios and study if diversification into alternatives has been beneficial. The periods examined for this report largely support the notion that alternative investments have benefited public pension portfolio performance from both a risk and a return perspective over long-term periods. So why is there still so much criticism of public pension investing?

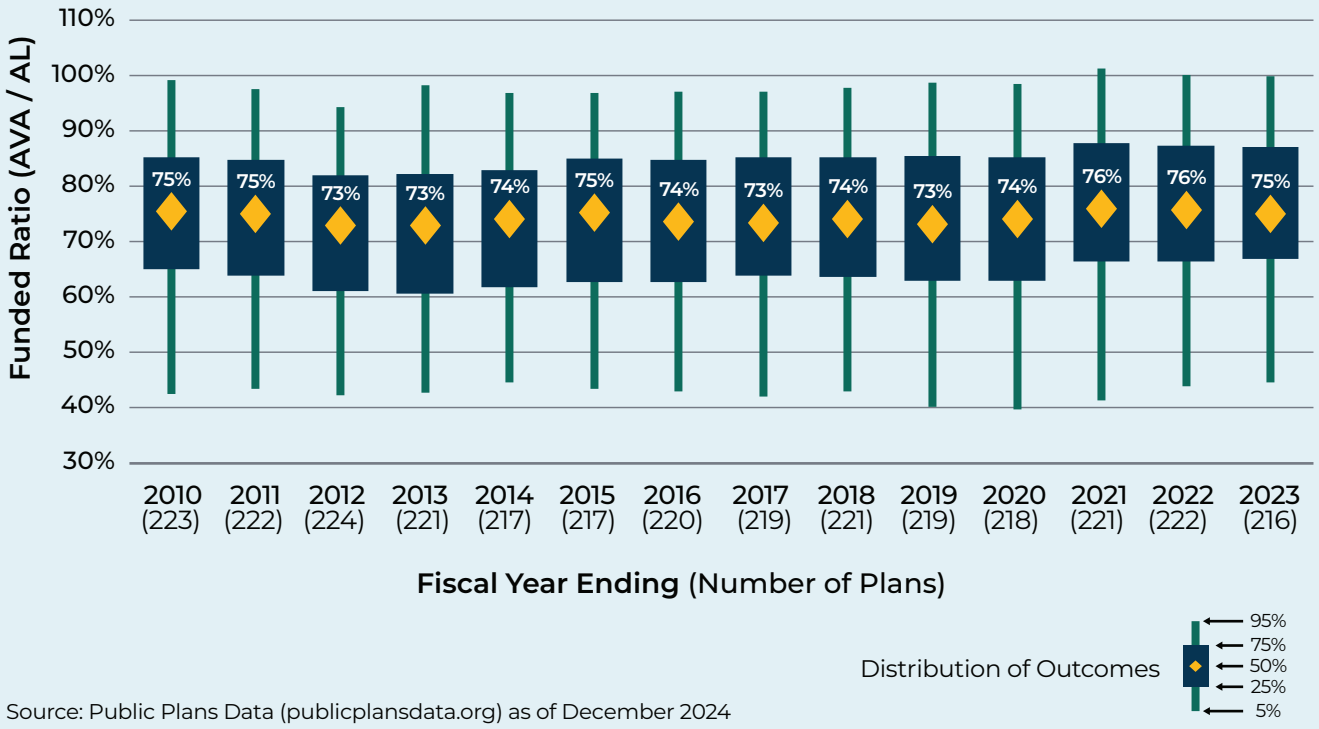
One reason is the trend of public pension plans' funded ratios. As shown in **Figure 22**, the median public pension plan is approximately 75 percent funded as of FYE 2023 and has been at this level for the past 10-15 years.

Figure 23 shows that public pension assets have more than doubled since the GFC to more than $6 trillion today. That is triple what it was in the early aughts right after the Dot-com bubble burst. It's worth acknowledging that public pension plans paid well over $1 trillion in benefits from 2007 through 2013 while recovering their asset base following losses during the GFC.[54]

Some of the asset growth in recent years is certainly attributable to greater contributions by both public employees and their employers, but that level of asset growth does not occur without strong investment returns. As shown above, asset performance over recent years has met or exceeded performance expectations. All else equal, one would expect strong performance to boost funding levels; however, all else has not been equal. The primary reason strong asset returns have not translated into improved funded ratios is because actuarial assumptions have changed.

An earlier National Institute on Retirement Security (NIRS) report examined the experiences of public pension plans since the GFC.[55] Part of that research focused on the changes in actuarial assumptions since the GFC and the role those changing assumptions have played in keeping public plan funding ratios where they are today. The previous research emphasized that, focusing solely on investment performance, many plans would have experienced improved funding ratios since the recession.

Figure 22: Distribution of U.S. Public Pension Funded Ratios

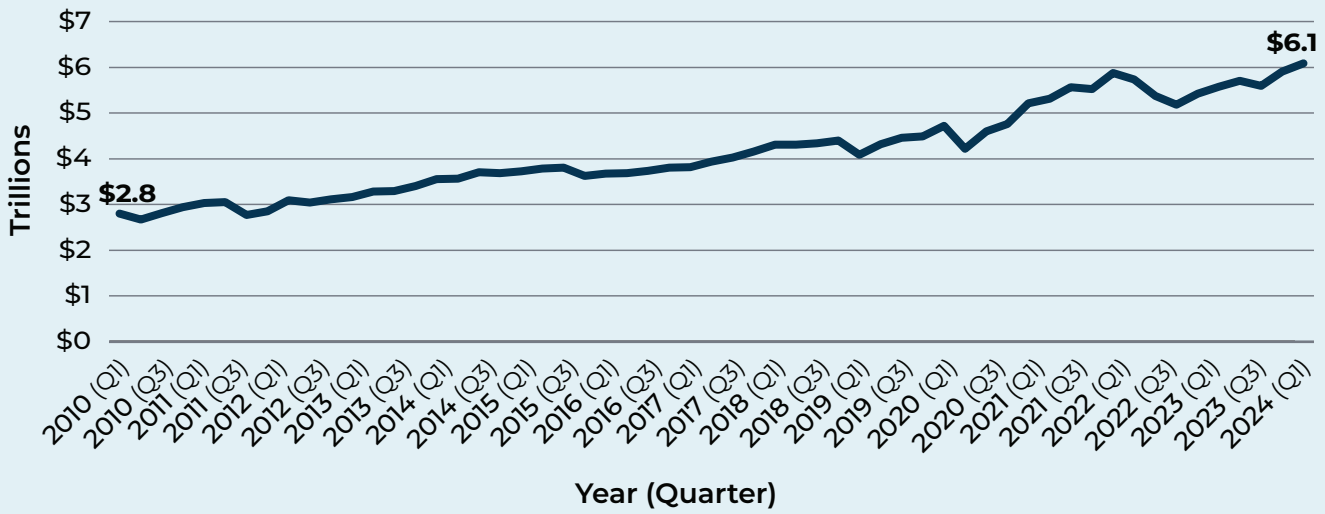


Source: Public Plans Data (publicplansdata.org) as of December 2024

That is, the investment performance of the plans has been strong enough that not only would they have recovered their investment losses, but they would have made sufficient gains to improve their funded status. The relatively flat funded ratios of public plans in aggregate since the GFC have been largely attributable to changes in actuarial assumptions, which were necessary to more accurately reflect the realities of the contemporary public sector workforce and today's capital markets.

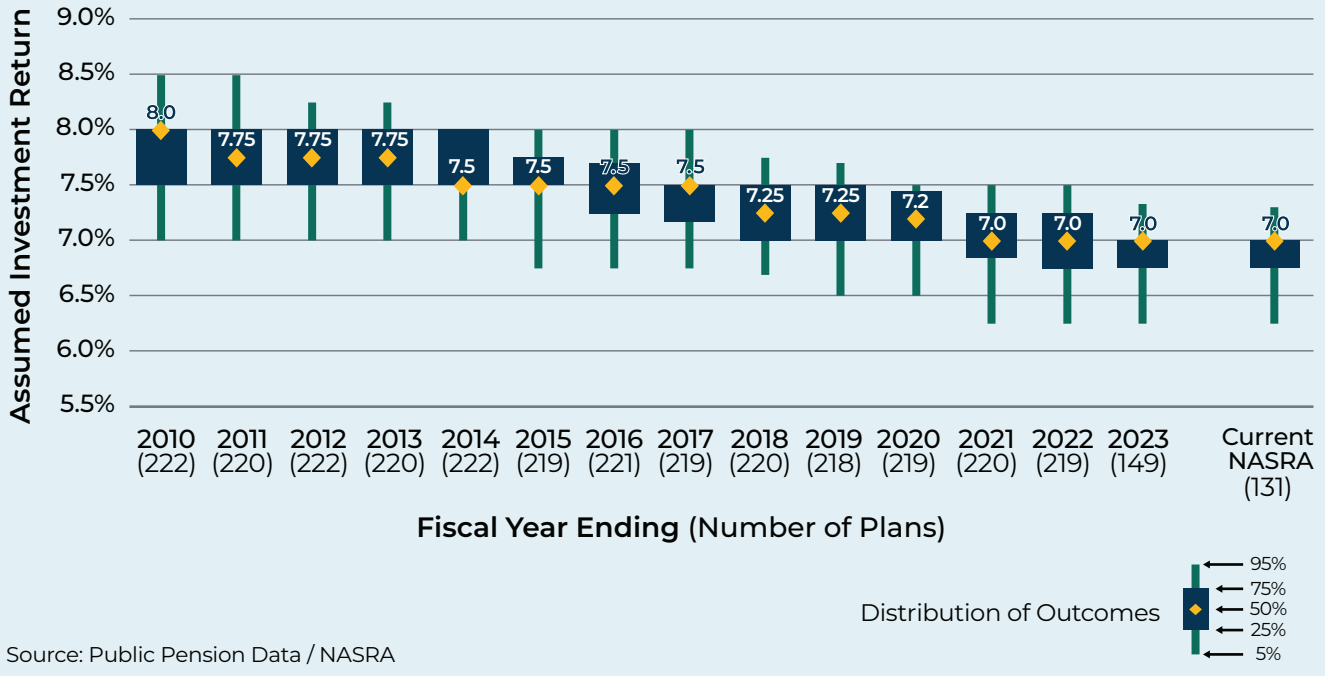
The largest influence has been the change in the assumed rate of return (**Figure 24**). The AAROR has come down from a median of eight percent in early 2000s to a median of seven percent today. Reducing the AAROR increases the

Figure 23: Public Pension Assets (as reported by the Federal Reserve)



Source: Federal Reserve Board as of July 2024

Figure 24: Distribution of U.S. Public Pension Investment Return Assumptions

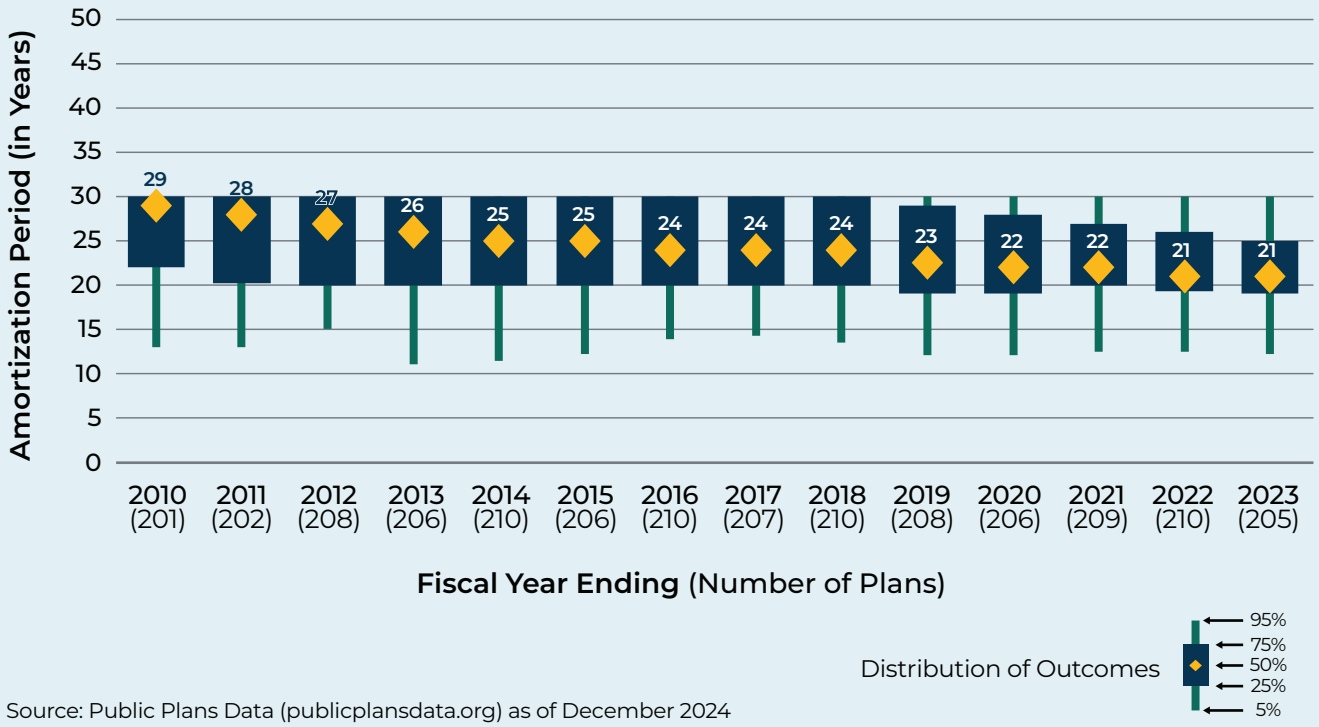


Source: Public Pension Data / NASRA

plan's liability (by assuming the plan will earn less) and has essentially offset strong asset performance; however, lowering the AAROR should mean that plan assumptions are more aligned with forward-looking return expectations. Thus, while funded ratios plateauing may not appear to be a successful outcome, when the underlying dynamics are understood, the reduction in the AAROR should result in public plans that are in a more favorable position to trend towards full funding.

Another reason public pension plans are better positioned today is that many contribution and funding policies have been adjusted to amortize unfunded liabilities more quickly. As shown in **Figure 25**, the median amortization period used by public pension plans has decreased from 29 years in FYE 2010 to 21 years in FYE 2023. Shortening these periods is expected to fill in any funding shortfalls faster – i.e., roughly during the working lifetime of the covered active population – and mitigate any intergenerational transfer of unfunded liabilities.

Figure 25: Distribution of U.S. Public Pension Amortization Periods



Source: Public Plans Data (publicplansdata.org) as of December 2024

STRATEGY SETTING PROCESS AND LOOKING AHEAD

Public pension investing has evolved with capital markets. But this evolution has not occurred blindly in lockstep as financial and capital markets have changed. Public pension plans use a rigorous process when setting asset allocation and employing investment strategy. The strategic investment policy-setting process most plans follow includes a rigorous asset-liability study. An asset-liability study is a process that factors in market risk and return expectations, liability profile, investment horizon, contribution policy, and stress testing across various economic scenarios.

These studies inform plan sponsors of the appropriate investment strategy and provide fiduciaries with the information to conclude that the studied asset allocation will

serve to achieve the plan's investment objectives considering its unique circumstances. This process, intended to provide confidence for both long-term periods and through periods of market volatility, should be conducted on a regular basis, typically every three to five years. This allows fiduciaries to evaluate new and existing allocations in light of updated circumstances. Given the changing dynamics discussed throughout this report, there is an expectation that more plans will trend toward full funding due to improved financial positions which may warrant changes in their future asset allocation strategy.

There is no doubt that capital markets will continue to evolve and so too will the nature of public pension investment portfolios. New investment options may come to market, and the attractiveness of available investments may change. Today's interest rate environment impacts the relative attractiveness of many types of assets where the returns are tied to interest rates (e.g., direct lending), where leverage is used (e.g., core real estate), or where performance is influenced by cash returns (e.g., some hedge funds using derivatives). Public pension systems will continue to assess the attractiveness of such strategies—both now and in the future—and continue to evolve with the global capital markets.

Speculation about the future is always uncertain, but there are some reasonable questions that could be asked about the future of public plan investment portfolios given current trends. For example:

- Has public plan investment in private markets plateaued?
- Relatedly, what would be the impact on public funds if private equity investments become available to individual, retail investors?
- Will pension funds pull back on alternative asset classes now that bond yields have risen again?
- Will cryptocurrencies begin to be included in some public pension fund portfolios?
- What could be the long-term impact of Artificial Intelligence (AI) on public plan investing, both in terms of the investment decision-making process and the companies in which public plans invest?

CONCLUSION

Public pension plans do not invest in a vacuum, and they do not get to choose the market environment. Public funds invest in the real world, which is constantly changing. This requires not only flexibility and adaptation on the part of public funds, but also regular review, scrutiny, and analysis of their investment portfolios to ensure investments are aligned with market expectations and plan circumstances.

Much changed in a short period of time for the investments of public funds, and they received a great deal of scrutiny for this change, especially given the relative quickness of the shift. At the same time, many public plans were criticized for the slowness and caution with which they were lowering their AARORs as they processed new information from capital markets about future investment returns. As more time has passed since the start of this reallocation, new data is starting to provide answers regarding the success of this change. Public pension plans have successfully navigated a challenging economic period by reallocating their investment portfolios and seizing opportunities in new asset classes. This has enabled them to meet or outperform their investment return expectations in many cases and continue to provide earned benefits to their members, while recovering their asset base from a once-in-a-century market downturn.

Most recently, the rise in interest rates over the past few years from the decade of ultra-low interest rates during the 2010s has shifted the discussion around various asset classes. Specifically, many public pension funds are re-evaluating fixed income, which has historically been a source of reliable returns. The investment portfolios of public pension plans seem likely to adjust once again to the new environment, which is different than the post-GFC period of the 2010s. While this may again raise pertinent questions about the specific investment decisions made, the track record for public fund investment portfolios is largely one of successfully navigating changing markets and economic terrain.

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