Global Pension Asset Allocations and Debt Markets*

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Abstract

The pension sector is an important investor group in global financial markets and a key holder of government and corporate debt. This article examines the evolution of pension fund asset allocations around the globe and documents two important structural changes. First, pension investors have shifted portfolio share allocations away from fixed income securities. This trend is robust across Defined Contribution (DC) and Defined Benefit (DB) programs as well as country groups. Second, pensions have instead shifted allocations into riskier investments within mutual funds as well as alternative investments. We hypothesize that a global decline in interest rates is one potential driver of this change. Using a global sample, we show that declining local currency government bond yields are associated with lower bond pension portfolio shares and higher holdings shares of mutual funds and foreign assets. We discuss the potential implications of these trends for borrowing costs. The declining holding share of pensions as a long-term investor group in debt markets implies debtors' financing costs are less sensitive to new issues, but more sensitive to global uncertainty.

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1 Introduction

Government debt has been rapidly expanding over the past several decades. This trend was given an extra boost from the policy response to the Covid-19 pandemic, notably in advanced economies. Alongside the increase in government debt, the total size of fixed income securities (including private debt) has expanded significantly worldwide. In the meantime, there has been a shift in the financial system towards non-bank financial intermediaries (NBFIs), who are also key investors in fixed income markets (Bank for International Settlements 2025). As debt expands, the behavior of investors becomes increasingly important to the borrowers (Fang, Hardy, and Lewis 2025), and similarly the stability and returns to debt are increasingly important to these investors. This article focuses on one particular type of NBFI investors: pension investors.

Fixed income is a crucial asset class held by the pension sector. It provides pensions with a stable return and enables them to achieve their risk-return tradeoff and liquidity needs to meet performance benchmarks and manage risks. Conversely, the pension sector is also an important investor in the fixed income markets. Moreover, pension investors are typically viewed as long-duration, buy-and-hold investors whose relatively stable demand compared to other investors exerts a stabilizing influence on bond prices. While the link between pensions and fixed income markets remains important in both directions, the increasing scale of the fixed income market, the growth of other NBFIs, and other cyclical developments may have impacted this relationship.

This article documents the evolution of the asset allocation of the pension sector worldwide, with particular attention to fixed income markets and where possible, relate these changes to government debt. We use a number of different data sources around the globe to document the pension fund portfolio reallocation noted above, covering three main groups of countries: the United States, Advanced European Economies, and Emerging Market Economies. With this wide geographic coverage, we take an international perspective and examine common trends in pension investors' portfolio allocation around the world.

We begin by studying the trends in global fund allocations and find a striking pattern. That is,

fixed income securities (e.g. bills and bonds) and relatedly, government debt have declined as a share of pensions' asset allocation over time. In its place, pensions have shifted their assets towards riskier assets, particularly holdings of mutual funds.

All country groups demonstrate a similar trend. For example, US pension investors reduced their fixed income securities holdings from close to 40% in early 1980s to around 10% in 2023, while their holdings of mutual fund share increased from being negligible to a significant share of close to 30%. Similarly, the fixed income securities share for pensions from Advanced European Economies also dropped from 35% in the early 2000s to less than 20% in recent years. Emerging Market Economies' pension investors have also significantly reduced bond holdings in favor of mutual funds. At this global level, it is not clear whether the documented declining share of fixed income securities allocation by pension investors is driven by a shift away from public debt, private debt, or both. However, available data for U.S. pension investors' portfolio allocation shows that both public and private debt contribute to the decline.

The shift from fixed income to mutual fund holdings raises the question of whether these allocations have moved from direct bond holdings to indirect holdings through mutual funds. To address this issue, we next conduct "look-through" analysis of the underlying mutual fund holdings to determine whether the shift simply represents a switch from direct to indirect fixed income investments. Specifically, for the Advanced European Economies for which we have these breakdowns, we find that the increased holdings of mutual funds have not represented an expansion of bond exposures indirectly through the investments made by these funds. Rather, when direct holdings and indirect mutual fund holdings of pensions are combined, allocations to fixed income decline overall.

A decline in pension allocations to fixed income securities suggests an increase in allocations into other assets. In addition to the shift towards mutual fund shares mentioned earlier, we find that the pension sector has also experienced a shift from traditional investments to alternative investments, such as private equity, real estate, hedge funds and other alternatives. This trend is shared by the pension investors in the U.S. and multiple advanced economies, such as Canada, Euro Area,

UK, Switzerland and Australia. The shift toward this asset class coincides with the general growth and development of alternative investments in recent decades. These alternative asset investments, though often riskier than government bonds, expose pension investors to more diverse investment opportunities, help them diversify risks further, and provide them with a chance to achieve higher returns.

The decline in fixed income allocations by global pensions coincides with a significant structural change in the pension sector: a shift from Defined Benefit (DB) to Defined Contribution (DC) pension plans. As DB plans promise a fixed payout for life and longevity has increased, the required funding to honor those promises increases. Thus, population longevity creates balance-sheet stress for plan sponsors (often employers or the public sector), making DB schemes more difficult to manage. By contrast, the transition to a DC-dominant pension market implies that asset allocation decisions and flow sensitivities become more market-driven and less liability-anchored. Examining the pension sector as a whole, therefore, it is unclear if the decline in fixed income allocations is due to a general movement into DC plans.

To analyze this possibility, we extend our cross-country data analysis to consider the differences in asset allocation patterns between DB and DC pension plans. Importantly, we find that both DB and DC plans have seen the same trend of moving away from debt to mutual fund shares. As a result, the portfolio allocation movement away from fixed income does not seem to be primarily explained by a global shift into DC plans, though the larger fund allocation of DC plans boosts the overall trend.

Thus, across country groups and plan types the main take-away from our global pension trend analysis is that allocations to fixed income securities have been declining over time both through direct and indirect holdings. In their stead, pensions have been moving toward other asset classes, including mutual fund shares and alternative investments.

This trend raises the question of "why?" and motivates the second major investigation of our paper. One clear contender is the behavior of interest rates over the past several decades, including the low-rate period following the Great Financial Crisis (GFC) and the more recent return to high

rates. These environments affect the rate of return on government debt and thus the demand from pensions and other investors to hold it. Therefore, we hypothesize that the decline of pension investors' fixed income securities allocation may be driven by the secular decline in interest rates globally. As returns to fixed income securities fell, especially post-GFC and post-Covid, pensions needed to turn to other assets in order to maintain their performance.

We therefore explore this possibility with a cross-country data panel of pension holdings and country-level interest rates. Consistent with our hypothesis, we find that as the local currency government bond yields fall in a country, pension investors in the country allocate wealth away from fixed income securities and towards other assets, such as equities, mutual fund shares, and foreign assets. In particular, the substitution seems strongest for foreign assets, followed by mutual fund shares, while the substitution into direct equity holdings is less substantial. These substitution patterns are strongest for DB plans, consistent with having greater pressure to deliver returns.

Pension investments in advanced economies (AEs) and emerging market economies (EMEs) could differ in response to changes in local government bond yields, given that the former's sovereign debt is typically viewed as more safe and liquid. We consider this possibility by analyzing the regressions for the two groups separately. Qualitatively, we find that their portfolio allocation responses are similar in that both groups shift away from bonds into mutual fund shares and foreign assets when domestic bond yields are low. In terms of the magnitude, however, the EME investors' domestic bond holdings are more sensitive to domestic bond yields. On the other hand, AE pension investors more aggressively shift to foreign assets when domestic interest rates are low, consistent with a "search for yield" motive.

Finally, we consider the implications for these findings on the debt markets and financial stability. Intuitively, pensions, with long-dated and relatively predictable liabilities, are commonly viewed as the natural "stable hands" for holding long-term government bonds. By contrast, open-end funds and other NBFI investors stepping into the government and corporate bond markets offer daily liquidity and are more exposed to investor runs and procyclical flows.[1] The retreat of pen-

[1] See Zhou (2024), for example.

sions from debt shifts the investor base for sovereign and corporate bonds towards other investors such as investment funds. This reallocation could change the aggregate elasticity of the debt market and may generally affect borrowing costs along the yield curve. These investors could also be more volatile during times of stress.

We consider the potential impact of the declining share of pension holding through two back-of-the-envelope calculations. Although the pension sector specific information in this article is not sufficient for a precise calculation, we draw on estimates from various studies in the literature. Specifically, we examine its impact on the yield response to global shocks such as VIX and the financing cost sensitivity to debt issuance, i.e., how much the yield of debt would increase if there is a 10% new debt issuance. The approach follows Fang, Hardy, and Lewis (2025). We find that a decline of pension holding share from 20% (in early 2000s) to 6% (recent) doubles the yield response to VIX shocks since more debt is held by short-term, flighty investors. On the other hand, the financing cost sensitivity to debt issuance drops from 21 basis points to 18.7 basis points, because short-term investors have more elastic demand, making it less costly to issue new debt.

Literature: This article relates to various strands of the literature. First, one line of research has noted the shift in pensions toward riskier assets. For example, the rising share of equities in US pension portfolios has been observed since the 1980s for both public and private plans, and both defined benefit and defined contribution plans (Munnell and Soto 2007).[2] Part of this trend could be driven by the growth in the market value of equities. Consistent with this view, evidence from Bikker, Broeders, and de Dreu (2010) and Rauh (2009) suggests that such valuation changes are not fully rebalanced on average. We show these trends have continued, providing evidence across countries and highlighting in particular the move to mutual fund shares and alternative assets. We further document an increase in pension holdings of (riskier) alternative assets (Ivashina and Lerner 2018, Begenau, Liang, and Siriwardane 2025). Using more recent data and a broader country sample, we provide new evidence of their growing participation in private credit.

[2] Zhao and Sutcliffe (2021) find that pension asset allocation for defined benefit funds in the UK follows a time trend, which could reflect structural factors or a persistent trend in returns on fixed income.

Another strand of the literature seeks to understand the reasons for the evolving pension asset allocations over the past four decades, including the role of funding status, accounting standards, fiscal constraints, and regulatory rules. Focusing on the U.S., Brown and Wilcox (2009), Novy-Marx and Rauh (2009), Pennacchi and Rastad (2011), Andonov, Bauer, and Cremers (2017), and Giesecke and Rauh (2023) show that when liability discount rates are linked to expected returns, pension funds increase their exposure to risky assets. Mohan and Zhang (2014) and Lu, Pritsker, Zlate, and Anadu (2019) document that underfunded public plans increase risk exposure, potentially shifting risk to future taxpayers or state debt holders. Andonov, Jansen, and Rauh (2025) further show that funds facing persistent negative cash flows adjust primarily through asset sales rather than portfolio de-risking. And Jansen (2025) uses Dutch pension funds to highlight how regulatory changes can affect the portfolio holdings of government debt. We complement this literature by providing cross-country evidence on long-run reallocations across major asset classes and by relating them to long-term interest rates.

The shift towards increased holdings of mutual fund shares that we document links our results to analysis of fund-of-funds structures in retirement systems. Such structures shape asset allocation, fees, performance, mutual fund flows, and asset prices (Madrian and Shea 2001, Pool, Sialm, and Stefanescu 2016, Kronlund, Pool, Sialm, and Stefanescu 2021, Pool, Sialm, and Stefanescu 2025, Yang 2025). Particularly in the U.S., a growing literature (Parker, Schoar, and Sun 2023, Fang and Goldstein 2025, Loseto and Yang 2025, Parker, Schoar, Cole, and Simester 2025) studies the rise of target-date funds (TDFs) as an important option in defined contribution (DC) plan menus and their implications. While most of this work focuses on DC plans, our work analysis shows similar trends playing out across different countries and across different plan types, including defined benefit plans.

Our paper further sheds light on the asset pricing implications of heterogeneous institutional investors in debt markets. Preferred-habitat theory (Greenwood and Vayanos 2010, 2014, Vayanos and Vila 2021), demand-based asset pricing frameworks (Koijen and Yogo 2019, 2023), and models of institutional bond pricing (Bretscher, Schmid, Sen, and Sharma 2025) provide complemen-

tary perspectives on how investor clientele and heterogeneity shape bond prices, term structure, and credit spreads. Da, Larrain, Sialm, and Tessada (2018), Aldunate, Da, Larrain, and Sialm (2025), Jansen (2025) specifically show how demand shifts by pensions move asset prices and affect yield curves. One key market is that of sovereign debt, where pensions are key investors. Arslanalp and Tsuda (2014a,b), Fang, Hardy, and Lewis (2025) decompose aggregate government debt into different investor categories and document the evolution of the investor base. Fang, Hardy, and Lewis (2025) shows that the composition of investors (particularly their price sensitivity) has important impacts on sovereign borrowing costs. This article digs further into the behavior of a particular investor (pensions) within their generic "non-bank" category. Further, by documenting systematic reallocations of pension portfolios in response to changes in long-term government bond yields, our findings contribute to understanding how liability-driven investors transmit interest rate fluctuations into sovereign and credit markets.

The remainder of this article is structured as follows: Section 2 describes the data, Section 3 documents key patterns and trends in pension asset composition, Section 4 examines the links between government bond yields and pension asset allocation, Section 5 discusses the implications for debt markets, and Section 6 concludes.

2 Data Sources

We draw on multiple data sources to document pension fund asset allocations. First, we use the OECD Global Pension Statistics, which provide annual cross-country information on pension portfolios for 87 countries, including detailed breakdowns by asset class. The main asset categories include bills and bonds, equities, and mutual fund shares (including all collective investment vehicles). These data are used to describe global patterns in pension portfolios across countries.

For U.S. pension funds, we leverage two additional data sources. First, we use data from the Financial Accounts of the United States (Z.1), published by the Federal Reserve Board. The Financial Accounts provide time-series information on U.S. pension fund asset holdings by financial

instrument and by plan type, which we use to analyze portfolio allocation patterns within the United States.

Second, we use data from the Public Plans Database (PPD) to study pension participation in alternative investments. This dataset includes detailed information on asset allocations of U.S. state and local pension systems. These data allow us to document the evolution of pension exposures to private market vehicles, including private equity, real estate, and other alternative investments.

We additionally use Preqin Investor data to obtain fund-level information on pension investments in alternative assets across countries.[3] The data cover both public and private pension funds and provide breakdowns of alternative asset classes, including private equity, private credit, real estate, infrastructure, natural resources, and hedge funds.[4] In our sample, the data set includes 2,431 U.S. pension funds with total AUM of USD 9.9 trillion, as well as 274 funds in Canada, 446 in the Euro Area, 361 in the United Kingdom, 160 in Switzerland, and 60 in Australia, among others. This coverage allows us to construct cross-country evidence and to directly observe pension participation in specific private market segments that are not separately identified in other sources.

Government bond yield data for each country used in the regressions are obtained from the Finaeon database.

3 General Trends in Pension Asset Allocations

This section presents facts on the evolution of pension fund asset allocations globally. These allocations are important because pension funds have been pivotal investors in many countries. For example, data from the U.S. financial accounts (Z.1) as of late 2025 show that U.S. pension funds manage approximately $29.6 trillion in assets, equivalent to around 96% of U.S. GDP. Relatedly, in the data for the euro area from the ECB, pension funds manage roughly € 3.6 trillion of assets,

[3] Rose and Seligman (2016) also combine Preqin and PPD data to study pension allocations to alternative investments in the U.S.

[4] This data set relies on a number of sources including self-reports and imputed amounts from asset providers, and therefore may not accurately capture the full pension portfolio holdings. Despite this caveat, we use these data to get a sense of investment trends given limited information on holdings of alternative investments.

representing about 24% of the region's GDP. In conjunction with their continued importance, the past several decades show important trends in pension funds' portfolio allocation that significantly impact these asset markets.

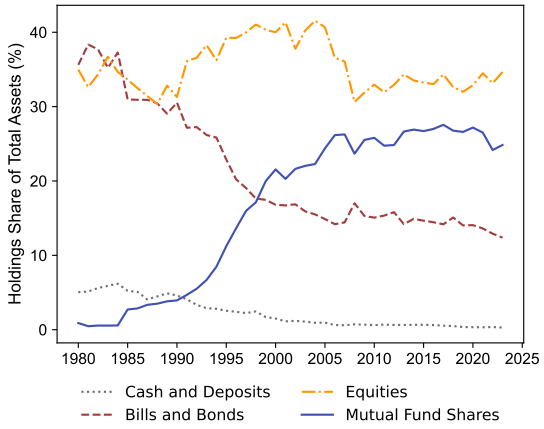
To highlight these relationships, we compare trends across three groups of countries: the US, advanced European economies and emerging market economies (EMEs). We show four basic patterns in this section. First, pension funds around the globe have generally been shifting away from fixed income securities to mutual fund shares. For US pensions, this decline includes holdings of government debt. Second, since mutual fund allocations can also imply indirect holdings of fixed income, we consider a "look-through" analysis of holdings for advanced Europe countries for which we have the data. For pensions in this group of countries, we find that overall fixed income allocations including mutual funds have also declined. The decline in pension fund allocations in fixed income raises the question of which assets' allocations have increased. Third, therefore, we show that there has been an increase into not only public equity but also alternative investments such as private equity and real estate. Fourth, we show that the trends away from debt securities and towards mutual fund shares were common to both Defined Benefit (DB) and Defined Contribution (DC) plans, despite potentially different risk approaches.

3.1 From Fixed Income Securities to Mutual Fund Shares

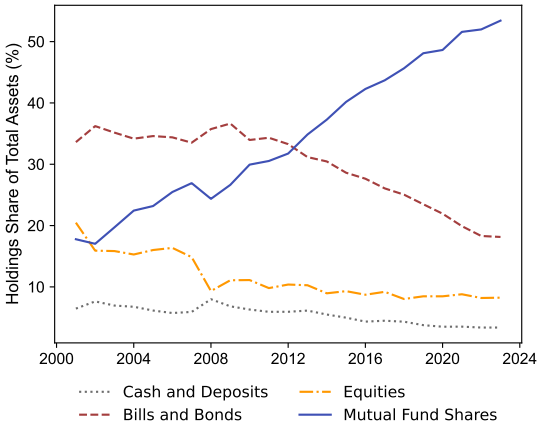
A key development in the global pension sector has been a shift away from holding fixed income securities to corporate equities and mutual fund shares. This shift is illustrated for our three country groups in Figure 1, which plots the time-series of pension fund portfolio shares in four asset classes: cash and deposits, bills and bonds, equities, and mutual fund shares and other collective investment schemes (e.g. ETFs, money market funds, REITs).

As Figure 1(a) shows, there is a pronounced long-run decline in the share of bills and bonds over the past half century for U.S. pensions funds. This share falls from over 35% of the total portfolio in the 1980s to below 15% in recent years. Over the same period, mutual fund shares rise sharply from negligible levels to more than 25% of the total portfolio, becoming one of the largest

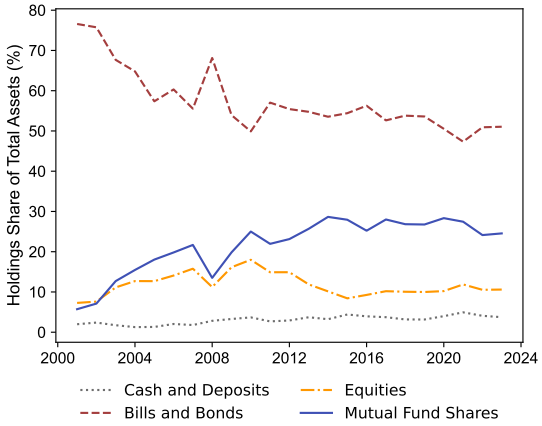
Figure 1: Pension Funds Asset Allocation Around the Globe



(a) United States



(b) Advanced European Economies



(c) Emerging Market Economies

Notes: The figure shows aggregate pension fund asset holdings for the United States (in panel a), Advanced European Economies (panel b) and Emerging Market Economies (panel c). Data are from the OECD Global Pension Statistics that span 1980 to 2023 for US, and 2001-2023 for Advanced European Economies and Emerging Market Economies. The sample includes only countries with continuous time coverage and no missing observations in any asset category (cash bonds, equity, and mutual fund shares). Advanced European Economies include Denmark, Germany, Italy, Portugal, Spain, and Switzerland. Emerging Market Economies include Bulgaria, Chile, Colombia, Estonia, Israel, and Peru. Asset values are aggregated across countries within each group in nominal USD.

asset categories. The portfolio shares in equities experienced some fluctuations, rising from about 30% to more than 40% in the mid 2000s and dropping to the 1980 level after the financial crisis in 2007-8.

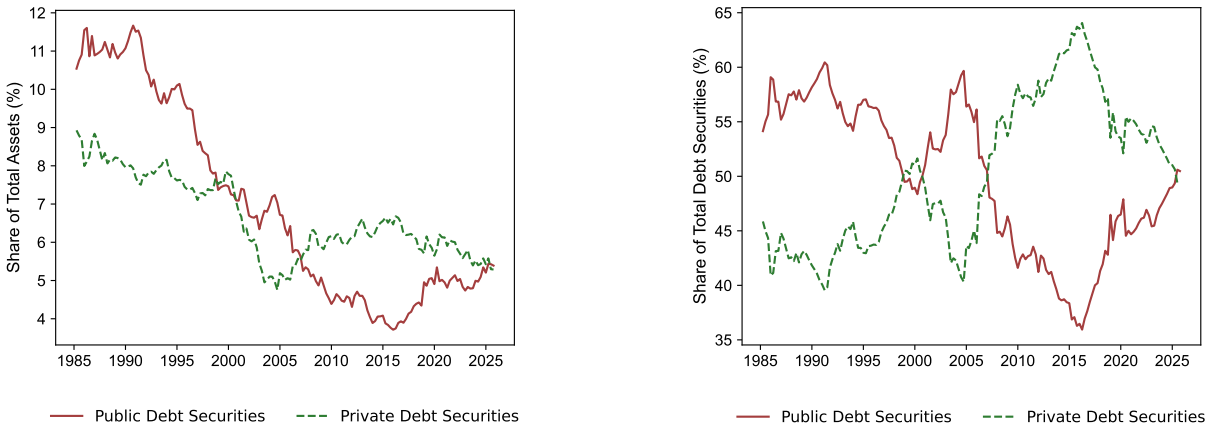
The pension shares for Advanced European Economies plotted in Figure 1(b) show a similar pattern to the US. That is, pension funds shift away from direct holdings of fixed income securities and toward greater exposure to mutual fund shares. Specifically, the shares of mutual fund holdings in pension portfolios rose steadily from below 20% in the early 2000s to more than 50% by 2023. In the meantime, the share of fixed income and corporate equities both decline by 10-15% over the two decades, dropping from 35% (fixed income) and 20% (equity) to 20% (fixed income) and 10% (equity) of the total portfolio.

EME pension funds display a similar pattern in Figure 1(c). They hold mostly fixed income securities in the early 2000s, accounting for close to 80% of their total portfolios. In the two decades since, this ratio drops to around 50%, replaced by a significantly increased share of mutual fund shares.

Figure 1 uses the OECD data to document that pension funds across the globe have been reallocating their portfolios from fixed income portfolios to mutual fund shares. However, this data set combines the bonds issued by the private sector and governments. Nevertheless, the literature has shown that pension funds play an important role in both the government debt market (Fang, Hardy, and Lewis 2025) and corporate bond market as well (Bretscher, Schmid, Sen, and Sharma 2025, Koijen and Yogo 2023). Therefore, documenting the relative importance of private and public debt in pension funds' portfolios have important implications for the operation of pension funds as well as for understanding these two markets. While we do not have data to evaluate public and private debt security holdings by pensions for all OECD countries, we are able to consider the role of U.S. pension funds.

Specifically, we rely on the Flow of Funds data in the U.S. to examine the relative holding of private and public debt by U.S. pension funds. Panel (a) of Figure 2 shows that the share of both public and private debt experiences a significant decline. Notably, the decline is more pronounced

Figure 2: Public versus Private Debt Securities in U.S. Pension Portfolios



(a) Share of Total Assets

(b) Share of Total Debt Securities

Notes: This figure shows the evolution of U.S. pension fund holdings of public and private debt securities. Public debt securities include Treasury securities, agency and GSE securities, and municipal securities. Private debt securities include commercial paper, corporate and foreign bonds. Panel (a) reports each category as a share of total pension fund assets. Panel (b) reports each category as a share of total debt securities. Data are from the Financial Accounts of the United States (Z.1), Federal Reserve Board.

for public debt, which falls from about 11% to around 5% of total assets. Private debt decreases more moderately, reaching the trough in 2005 at 5% and then slightly increases afterwards. The relative share of public debt within the fixed income portfolio declines significantly, as shown in Panel (b), although this trend reverses slightly after 2015. If the US case is representative, therefore, the decline in overall fixed income securities allocations by pensions also reflects a decline in government debt allocations.

3.2 Direct VS Indirect Holdings

The trends we document above reinforce a broader shift away from direct fixed income securities (including sovereign debt) toward mutual funds as intermediated investment vehicles, implying a rising prevalence of fund-of-funds (FoF) structures. This evolution suggests a lengthening of the intermediation chain between the borrower and the investor. It also raises important questions about pension funds' ultimate exposures. That is, while there could be a shift away from government bonds and other fixed income assets, the shift to investment funds could also reflect an indirect holding of fixed income securities.

Indeed, note that the analysis in Figures 1 and 2 treats mutual fund shares as a separate investment asset class than fixed income. In recent years, however, pension funds' equity or fixed income holdings have increasingly been through mutual funds. Such an allocation implies that the true exposure of pension funds to fixed income and equity securities may be masked under the mutual fund shares.

Fully uncovering the ultimate exposure of pension funds to different types of securities requires information about the portfolio allocation of the mutual funds that are held by pensions. Although detailed cross-country level information for these funds does not exist, the OECD dataset provides a breakdown of pension fund holdings of bond mutual funds for a limited number of countries since 2008. We therefore consider this "look-through" analysis for this set of countries. For advanced European countries, Figure 3 shows the direct holdings of fixed income alongside such securities held via their shares in bond mutual funds. Panel (a) depicts the share for the aggregate

market weighted average across the five countries with data beginning in 2008. These countries are Switzerland, Germany, Norway, Italy, and Portugal. There is some substitution away from "Direct Bond Holdings" and into indirect bond holdings through mutual fund shares ("Bond Exposure via Mutual Funds"). Nevertheless, the rise in indirect bond exposure is too small to compensate for the overall decline in direct bond holdings.

The other panels of Figure 3 show these exposures by country. For example, Panel (b) of Figure 3 shows for Swiss pensions a significant decline in direct bond holdings from a little over 25% in 2008 to a little over 5% in 2023. During the same time, indirect bond holdings in mutual funds increased somewhat from around 15% in 2008 (40% less 25%) to 23% in 2023. However, the overall exposure by Swiss pensions to fixed income assets decline over the period from around 40% to under 30%.

Similar declining patterns can be seen albeit with more variation with the exception of Portugal. Nevertheless, Portuguese pensions have a smaller AUM relative to the other countries. In the OECD data, Portuguese pensions are about 1.1% of total pension assets in the Advanced European Economies sample.

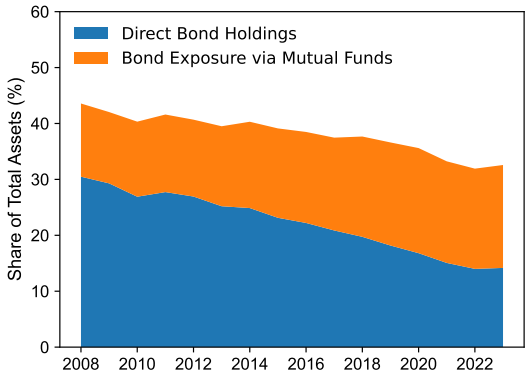
Overall, therefore, the decline in exposure to fixed income securities appears to persist even when accounting for exposures via mutual fund holdings.

3.3 Defined Benefit and Defined Contribution Plans

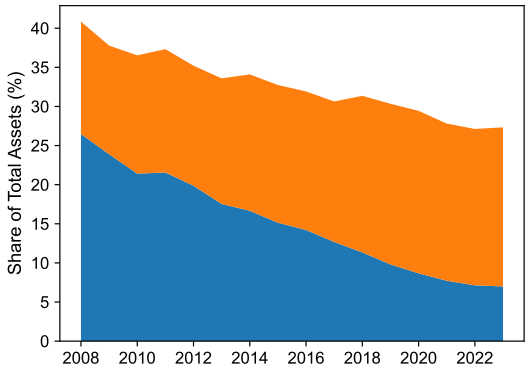
A significant change for the pension industry in recent decades is that more countries are shifting from defined benefit (DB) plans to defined contribution (DC) plans. In a DB plan, the pension fund promises a fixed retirement income, often based on the worker's salary and years of service. The employer (or the public pension sponsor) is responsible for making sure there is enough money to meet those payments, no matter how markets perform. This means that the investment risk ultimately lies with the sponsor, typically the employer or public sector entity, even though the pension fund manages the assets. Compared to DC plans, DB funds often invest more in long-term government and corporate bonds to match the long-term nature of their future payments. By contrast,

Figure 3: Direct and Indirect Bond Exposure of Pension Funds in Advanced European Economies

(a): Advanced European Economies

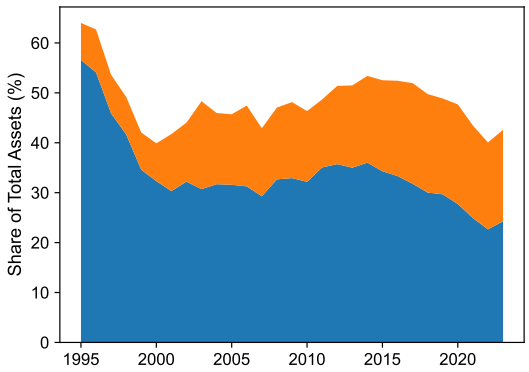


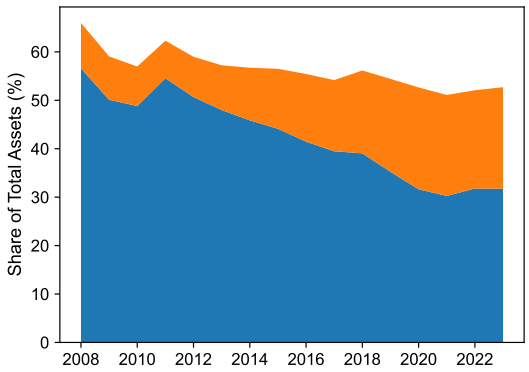
(b): Switzerland



(c): Germany

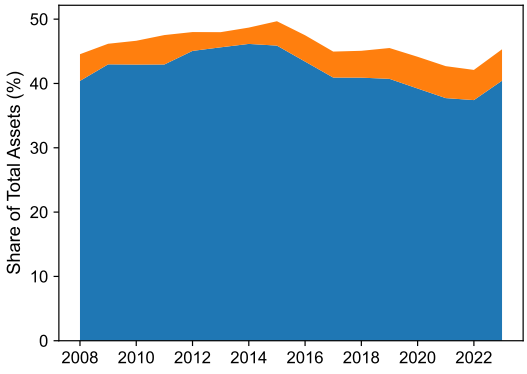
(d): Norway

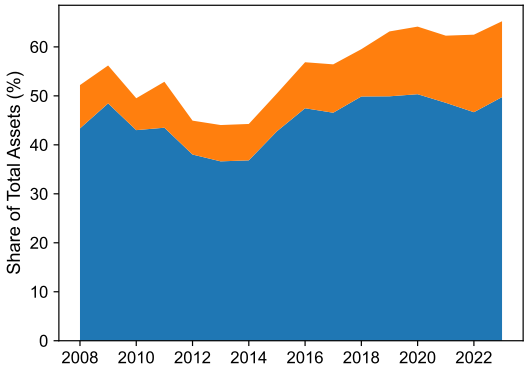




(e): Italy

(f): Portugal



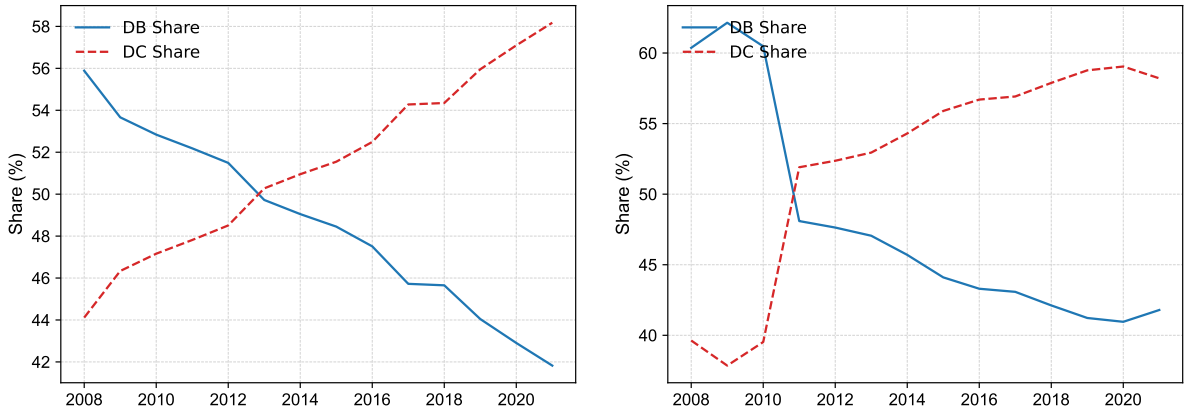


Notes: The figure reports pension fund exposure to bonds through direct holdings and through mutual funds. The sample includes advanced European economies with available breakdown data (Germany, Italy, Portugal, Norway, and Switzerland) over the period 2008–2023. Direct bond holdings correspond to debt securities held outright by pension funds. Indirect bond exposure is calculated as pension fund holdings of mutual funds multiplied by the reported bond share within those funds. Asset shares are expressed as a percentage of total pension fund assets. Data are from the OECD Global Pension Statistics.

a typical DC plan does not provide a guaranteed pension amount. Instead, workers contribute to individual accounts, and the final retirement income depends on how well the investments perform over time. In this case, the individual bears the investment risk, not the employer.

Figure 4 shows how the composition of the pension sector has evolved across these types, shifting towards DC plans. Panel (a) provides the market value of shares for DB versus DC for a balanced global sample of countries with no missing data since 2008. Pensions are classified according to the OECD primary definition of DB versus DC even if they are of a mixed type as described below.[5] Panel (b) of Figure 4 shows the same plot for the balanced sample of Euro Area countries. In this case, there is a slight decline in the value of DC funds following the Global Financial Crisis of 2008, but then a substantial increase in DC relative to DB funds after 2010.

Figure 4: The Composition of DB and DC Plans



(a) All Countries

(b) Advanced European Economies

Note: The figure reports the share of DB and DC plans. Panel (a) reports the aggregate shares using the balanced sample with no missing data, including Albania, Bulgaria, Switzerland, Czech Republic, Denmark, Spain, Finland, Hong Kong (China), Hungary, Israel, Italy, Luxembourg, Nigeria, Norway, Portugal, Turkey, and the United States. Panel (b) reports the shares of Advanced European Economies using the balanced sample with no missing data, including Bulgaria, Spain, Finland, Italy, Luxembourg, and Portugal.

In addition to the broad plan categories of Defined Benefit (DB) and Defined Contribution (DC), the OECD data set further breaks the plans up into "types" that indicate differences in the protec-

[5]Since some types are classified as mixed between DB and DC, the total shares for a country can sum to greater than one. In these cases, the shares are reweighted by the total to ensure comparability across countries.

tions given participants. In particular, these types have four categories: (1) "traditional DB"; (2) "hybrid/mixed DB" which includes both a minimum defined benefit and some benefits that depend on fund performance; (3) "protected DC" which protects the individual participant's pensions from some of the return risk; and (4) "unprotected DC" in which risks are borne fully by the individual.

Countries vary in the importance of these four types in their overall pension landscape. To get a sense of this coverage, Table 1 provides information about this importance across countries at two points in time: in 2008 at the beginning, and in 2022 at the end of the sample. Panels A and B give a simple count of how many countries have each pension type and their share of the total, respectively. As Panel A shows, the number of countries with DC plans increased from 2008 to 2022 from 28 to 44. Moreover, most of the increases in DB plans have been in the form of DB Hybrid while the increases in DC have been in DC Unprotected. To see these trends, Panel C compares the size of pension plan types by their AUM. As the table shows, in 2008 only about 8% of pension assets in DB plans were hybrid, whereas by 2022, they comprised almost 23% of the DB plans. Similarly, DC Protected plans were 4% of the AUM of DC plans in 2008 but shrunk to about 2.4% by 2022.

Table 1: Pension Plan Types in the Early and Late Samples

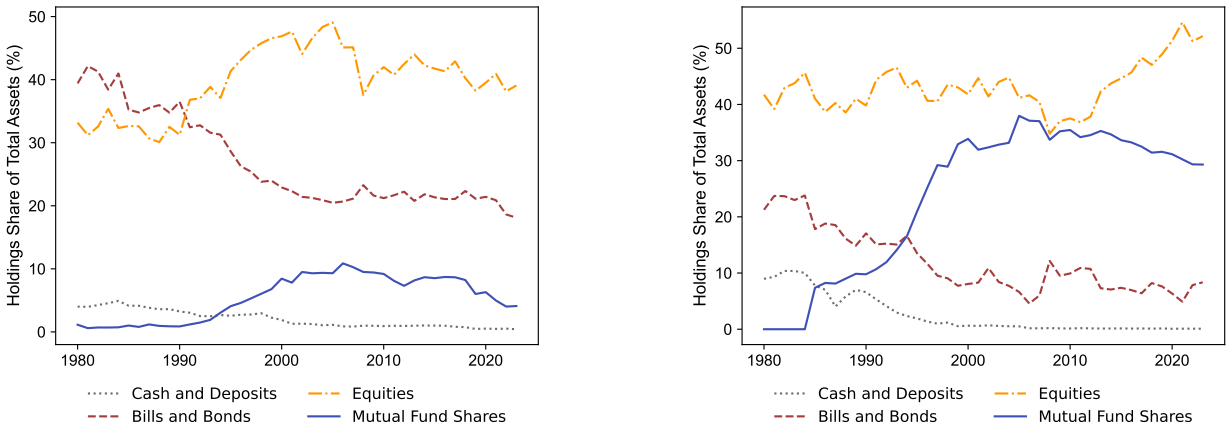
	DB	DC	DB Hybrid	DB Traditional	DC Protected	DC Unprotected
Panel A: Number of countries with each type						
2008	23	28	7	22	8	23
2022	27	44	12	23	14	39
Panel B: Share of countries with each type (%)						
2008	69.70	84.85	21.21	66.67	24.24	69.70
2022	57.45	93.62	25.53	48.94	29.79	82.98
Panel C: Share of each subtype out of DB or DC (%)						
2008			8.21	91.79	4.18	95.82
2022			22.60	77.40	2.45	97.55

To examine their separate roles, Figure 5 reports the changes of portfolio allocation into the same four asset classes for DB and DC plans in the US as in Figure 1. Similar to the aggregate

trend, both DB and DC plans exhibit a gradual decline in direct fixed income security holdings and a corresponding increase in mutual fund shares, though their magnitudes differ. The decline of fixed income security share is larger for DB plans while the increase of mutual fund shares is higher for DC plans. Generally, DC plans have a higher share of investments in both equities and mutual fund shares. As the portfolio shift within DC plans was stronger, the relative shift from DB to DC plans shown in Figure 4 would amplify the shift from debt securities to mutual funds shares seen for the pension sector as a whole.

Automatic enrollment and the proliferation of target date funds (TDFs) may have helped to push DC plans towards a higher mutual fund allocation in the US. TDFs were made eligible to be default investment options for automatic enrollment in 2006. Consequently, many new hires (which skew younger) were automatically enrolled in TDF investment, ultimately boosting the equity share in retirement portfolios through these collective investments (Mitchell and Utkus 2022).

Figure 5: Pension Funds Asset Allocation by Plan in US



(a) Defined Benefit Plan

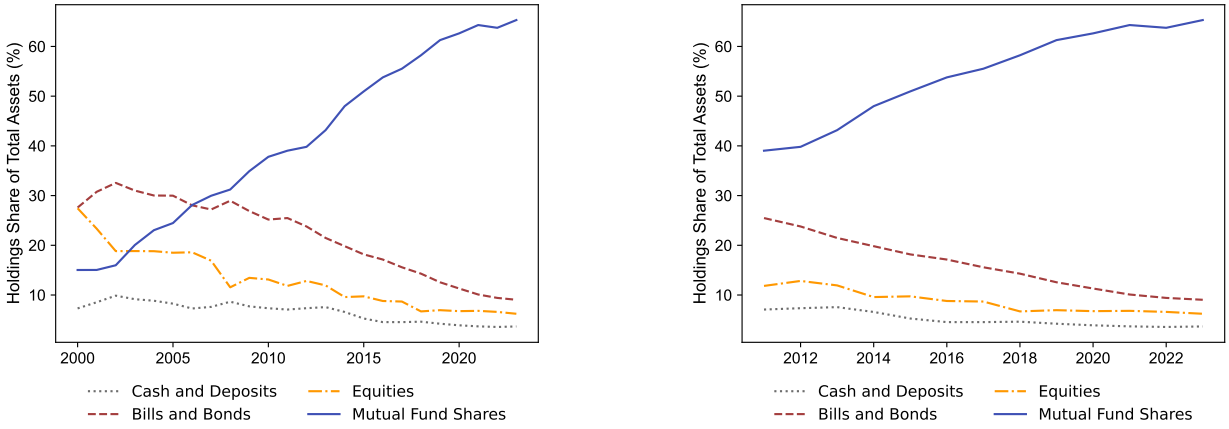
(b) Defined Contribution Plan

Notes: The figure shows asset allocation for U.S. pension funds separately for defined benefit (DB) and defined contribution (DC) plans, using OECD Global Pension Statistics.

Advanced European Economies also saw common shifts for DB and DC plans as shown in Figure 6.[6] Similar to the aggregate trend and the trend in the US, both DB and DC plans show a

[6]The time coverage of DC plan is shorter than that of DB plans for advanced European countries in the OECD

Figure 6: Pension Funds Asset Allocation by Plan Type: Advanced European Economies



(a) Defined Benefit Plan

(b) Defined Contribution Plan

Notes: The figure reports asset allocation by plan type for advanced European economies (Denmark, Germany, Italy, Portugal, Spain, and Switzerland), using OECD Global Pension Statistics. Asset shares are aggregated across countries within the group.

strong and sustained increase in mutual fund shares over time, accompanied by a steady decline in fixed income security holdings. Different from the U.S. trend, the decline of fixed income share is similar between DB and DC plans, but the shift for DB plans towards mutual fund shares is starker because it starts from a lower level.

3.4 From Traditional to Alternative Investment

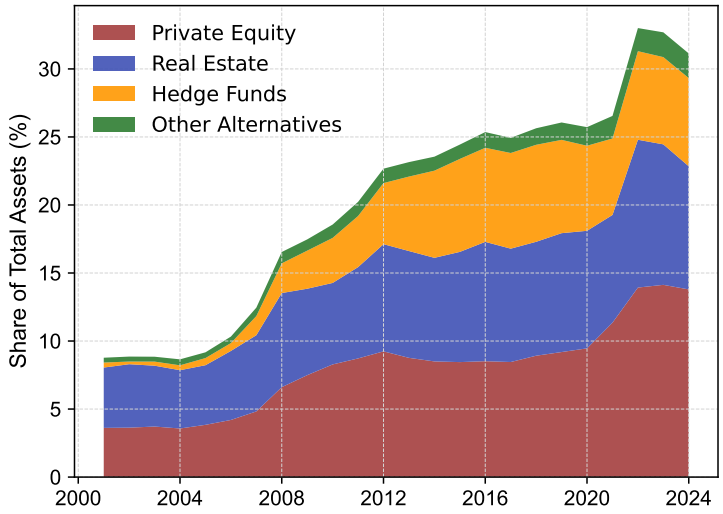
We have documented that pension funds around the globe are shifting their portfolio shares away from fixed income securities either through direct holdings or indirect holdings through mutual funds. This pattern implies that their allocations are increasing in riskier assets. We now show that as pensions have moved out of fixed income, they have also shifted from traditional asset holdings of equities and bonds into alternative investments of private equity, real estate, hedge funds, and others.

To show these trends, we begin in Figure 7 by plotting the time-series of U.S. state and local

database.

pension funds' holdings of the four types of alternative investments as a share of their total assets from early 2000s to now. The figure shows a pronounced and persistent increase in allocations to alternative assets by these U.S. state and local pension funds. The portfolio share of alternative investments rises from below 10% in the early sample to above 30% in 2024. This portfolio reallocation may have important implications for the operation of pension funds, since alternative assets tend to be less liquid and transparent. These features of alternative assets may thereby affect both the liquidity profile and aggregate risk exposure of pension portfolios.

Figure 7: Alternative Investments in U.S. State and Local Pension Portfolios



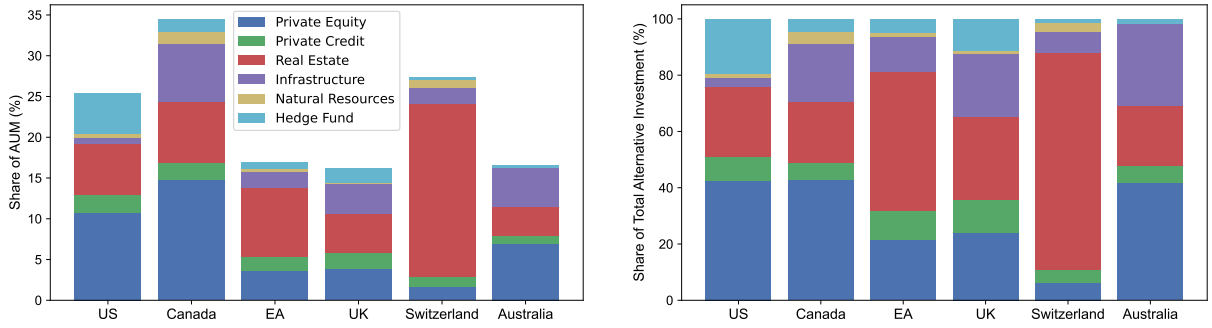
Notes: This figure shows the evolution of alternative investment holdings of U.S. state and local pension funds. Alternative assets include private equity, real estate, hedge funds, and other alternative investments. Asset shares are expressed as a percentage of total assets managed by these pension funds. Data are from the U.S. Public Plans Database.

Moreover, Figure 8 shows that the shift toward alternative assets is not a U.S. specific pattern. Using data from Preqin, the figures illustrate the pension portfolio shares in alternative investments for an early-2026 cross section covering the subset of pensions funds in the U.S., Canada, the Euro Area, the U.K., Switzerland, and Australia.[7] Figure 8(a) plots the portfolio shares for alternative assets held by these funds, while Figure 8(b) shows the shares of specific investments within alter-

[7]The Preqin data set covers only pension funds that invest in alternatives, though may not include all such funds. Thus, total pension AUM in this sample does not represent the full universe of pension assets in each country, and the reported alternative shares are calculated relative to the AUM of pension funds covered by Preqin.

native asset allocations. Across these six jurisdictions, the total amount of alternative investments for these funds ranges from 0.5-2.5 trillion USD, depending on the size of the pension fund sector in different countries. This allocation amounts to 15-30% of their total assets. Moreover, private equity has a significant portfolio allocation for the pensions in all countries with the exception of Switzerland which has a larger allocation to real estate. While these data statistics are not comprehensive for all pension funds in each jurisdiction (e.g., Preqin covers about 35% of the total pension assets in the U.S.), it is nevertheless suggestive of significant investment in alternative assets by pension funds in multiple jurisdictions.

Figure 8: Alternative Asset Allocation of Pension Funds by Country



(a) Share of AUM (%)

(b) Share of Total Alternative Investment (%)

Notes: This figure shows alternative investment holdings of pension funds by country using Preqin Investor data. The sample includes only public and private pension funds; for Australia, the sample corresponds to superannuation funds. Alternative assets include private equity, private credit, real estate, infrastructure, natural resources, and hedge funds. Panel (a) reports asset shares as a percentage of total pension fund AUM. Panel (b) reports asset shares as a percentage of total alternative investment.

These patterns of significant and increasing pension investment in alternative assets are consistent with evidence documented elsewhere. Ivashina and Lerner (2018) documents a broad-based expansion of pension allocations to alternative asset classes across countries between 2008 and 2017, spanning both public and private pension systems. These patterns are also aligned with recent evidence on pension participation in private markets. For instance, Ivashina (2025) surveys the growing role of pension funds as central investors in private credit markets and shows that pension funds have become increasingly important providers of capital to private firms.

4 Pension Portfolios and Government Bond Yields

The trends documented in Section 3 raise important questions about the underlying forces and economic mechanisms behind this trend. This section examines one potential driver: the secular decline in interest rates in recent decades. Intuitively, when interest rates decline, pension investors seek higher-yielding investment opportunities to ensure better retirement income. In general, the literature has shown plenty of evidence that investors' portfolio allocations respond to changes in the price of debt (Bretscher, Schmid, Sen, and Sharma 2025, Jansen, Li, and Schmid 2025, Fang, Hardy, and Lewis 2025). This section provides more systematic evidence on pension investors' portfolio allocation decision in response to changing returns on fixed income investments.

4.1 Pension Investors' Portfolio Allocation and Interest Rates

We examine the relation between pension funds' portfolio allocations and interest rates by using data from the OECD Pension Statistics, covering 87 countries from 1980 to 2023 annually. We focus on the four asset categories highlighted in Section 3: domestic debt securities (including both public and private bonds), domestic equities, domestic mutual fund shares, and foreign assets.[8]

Our objective is to assess how pension portfolio shares vary with the domestic interest rate environment. We measure the latter using each country's 10-year local-currency government bond yield, as pension funds typically hold long-maturity fixed-income securities and discount long-duration liabilities at long-term rates. We estimate the following specification:

$$\text{Share}_{i,t} = \beta_0 + \beta_1 \text{GovBondYield}_{i,t} + \alpha_i + \varepsilon_{i,t}, \tag{4.1}$$

where $\text{Share}_{i,t}$ denotes the portfolio share of a given asset class held by country i pension funds relative to their total assets under management (AUM) in year t. α_i denotes country fixed effects that absorb time-invariant institutional and structural differences across countries. Given that the shares in the portfolio sum to one, the coefficients β_1 must sum to zero. Standard errors are

[8]The OECD Pension Statistics data do not break down debt securities into public and private.

clustered at the country level.[9]

Table 2: Pension Investors' Portfolio Allocation and Government Bond Yields

	Bonds	Equity	MF Shares	Other	Foreign Assets
GovBond Yield (%)	1.145***	-0.325	-1.450***	0.631**	-2.854***
	(0.405)	(0.268)	(0.395)	(0.264)	(0.810)
Observations	851	851	851	851	528
R^2	0.778	0.698	0.819	0.709	0.704

Note: This table reports β_1 estimates of equation (4.1) for each asset class share. Standard errors are clustered at the country level and are reported in the parentheses. ***, **, * indicates significance at 1%, 5%, 10% level.

Table 2 reports the results. As expected, shares of domestic bond holdings are positively correlated with domestic government bond yields, suggesting that investors increase holdings when yields rise and conversely when they fall. The first column indicates that a one-percentage-point (pp) decrease in the domestic 10-year yield is associated with roughly a 1 pp decline in the share of bonds in pension portfolios. This finding suggests that when domestic yields are low, pension investors rebalance away from fixed-income securities.

A decrease in one share naturally leads to an increase in another. When government bond yields fall, the next two columns show that pension funds investments shift into domestic mutual fund shares and equities. For equity holdings, a 1 pp decrease in the 10-year yield corresponds to around 0.3 pp increase in the equity share, although the response is not significant. For mutual fund shares, one sees a larger and more significant response than for equities at around 1.5 pp. Only the residual "Other" asset allocation category declines when bond yields decline.

Although the first four columns comprise the total portfolio, they do not break apart allocations into foreign assets. Therefore, we regress this asset share in a separate regression reported in the last column of Table 2. As reported there, pension investors increase their holdings of foreign assets the most, with the coefficient being strongly negative and significant. A 1 pp decline in local currency government bond yields is associated with roughly a 3 pp rise in foreign asset holdings.

Together, these results suggest that low rates drive a search for yield among pension funds. The

[9]Including year fixed effects yields similar results.

long period of low rates after the GFC and again after Covid could thus be linked to the shift away from government bonds and towards investment fund shares and other assets, among other drivers.

4.2 Defined Benefit vs Defined Contribution Plans

Section 3 above documented differences in portfolio composition between DB and DC plans in levels and over time, reflecting their underlying risk strategies. We therefore now exploit the DB/DC classification provided in the OECD Pension Statistics to analyze portfolio shares separately by plan. Moreover, while some countries' pension systems are dominated by either DB or DC plans, others operate both types simultaneously. This variation allows us to compare the sensitivity of portfolio allocations to 10-year government bond yields across plan types within a unified framework.

We reexamine our regression above separating the effects for these broad plan types. Specifically, we expand our panel so that the unit of observation is at the country-type-year level. We then estimate the following specification:

$$\begin{aligned}\text{Share}_{i,type,t} =& \beta^{DB}\left(DB_{type} \times \text{GovBondYield}_{i,t}\right) + \beta^{DC}\left(DC_{type} \times \text{GovBondYield}_{i,t}\right) \\ &+ \alpha_{i,type} + \varepsilon_{i,type,t}\end{aligned} \tag{4.2}$$

where $\text{Share}_{i,type,t}$ denotes the portfolio share of a given asset class held by pensions funds of the four different types relative to the total AUM of each type in country i in year t. DB_{type} is a dummy variable equal to 1 for the two types of DB plans, and DC_{type} is likewise a dummy variable for the two types of DC plans. $\alpha_{i,type}$ are country-type fixed effects, which controls for time invariant differences in asset allocations for the four different plan types in different countries.

The results are reported in Table 3.[10] The first column reports the response of bond allocations to bond yields and again shows that declining bond yields reduce these allocations. Comparing the DB fund versus the DC fund interaction suggests that DB plans' bond portfolio shares are more sensitive to changes in government bond yields, declining by 1.4 pp for a 1 pp decline in the 10-year yield. DC plans also decrease their bond holdings when local currency bond yield is lower,

[10] Out of the 87 countries in our sample, 67 countries have data on asset class shares separately by plan type.

but the magnitude is smaller and the statistical significance is much weaker.

Table 3: DB vs. DC: Pension Portfolio Responses to Government Bond Yields

	Bonds	Equity	MF Shares	Other	Foreign Assets
DB × GovBond Yield (%)	1.433**	0.292	-1.764***	0.040	-2.973***
	(0.549)	(0.405)	(0.649)	(0.410)	(0.852)
DC × GovBond Yield (%)	0.381	-0.363	-0.751	0.734**	-1.443**
	(0.277)	(0.305)	(0.494)	(0.334)	(0.551)
Observations	966	966	966	966	557
R^2	0.703	0.736	0.683	0.679	0.827

Note: This table reports β^{DB} and β^{DC} estimates of equation (4.2) for each asset class share. Standard errors are clustered at the country level and are reported in the parentheses. ***, **, * indicates significance at 1%, 5%, 10% level.

Both DB and DC plans substitute away from domestic bonds into mutual funds when the domestic bond yield is low, although the magnitude is much larger for DB plans and statistically insignificant for DC plans. The final column shows that a 1 pp decrease in the government bond yield is associated with about a 3 pp increase in DB plans' share of foreign assets and a corresponding 1.4 pp increase for DC plans. The portfolio share changes in equity have different signs for both DB and DC plans, though they are statistically insignificant.

The results show that DB and DC plans similarly tend to rebalance portfolios from bonds to other asset classes when domestic interest rate declines. However, the magnitudes are different across all asset classes. The larger shifts in DB plans may seem natural since the plan needs to generate enough return to support workers' predetermined benefit after retirement, while DC plans face no such constraint. We return to consider the implication of these responses on the market in the Section 5 below.

4.3 Advanced Economies vs. Emerging Market Economies

In our regression analysis in Tables 2 and 3 above, we combined the pension investors in advanced economies (AE) and EMEs together. However, debt in AEs has different characteristics and dynamics than debt in EMEs. For example, many AE government bonds are considered safe or even

reserve assets, while EME debt may be viewed as much riskier due to the potential for default. Thus, pension investors located in AEs compared to EMEs may respond differently to changes in the interest rate environment.

We consider this possibility by comparing the portfolio allocation responses of pension investors in subsamples of AE and EMEs by studying the country-year portfolio shares as in the following regression equation:

$$\begin{aligned}\text{Share}_{i,t} =& \beta^{AE}\left(AE_i \times \text{GovBondYield}_{i,t}\right) + \beta^{EME}\left(EME_i \times \text{GovBondYield}_{i,t}\right) \\ &+ \alpha_i + \varepsilon_{i,t}\end{aligned} \tag{4.3}$$

where, as in Equation (4.1), $\text{Share}_{i,t}$ denotes the portfolio share of a given asset class held by pensions funds in country i in year t. Here, however, AE_i is a dummy variable equal to 1 if country i is an Advanced Economy while EME_i is likewise a dummy variable if the country is an Emerging Market Economy. With some abuse of notation, α_i are country-type fixed effects, but differ in general from those in Equation (4.1).

Table 4: AE vs. EME: Pension Investors' Portfolio Allocation and Government Bond Yields

	Bonds	Equity	MF Shares	Other	Foreign Assets
AE × GovBond Yield (%)	0.835*	0.214	-2.015**	0.965***	-5.070***
	(0.491)	(0.385)	(0.794)	(0.276)	(1.755)
EME × GovBond Yield (%)	1.472**	-0.896**	-0.853***	0.277	-1.987**
	(0.603)	(0.445)	(0.308)	(0.434)	(0.773)
Observations	851	851	851	851	528
R^2	0.779	0.705	0.823	0.711	0.717

Note: This table reports β^{AE} and β^{EME} estimates of equation (4.3) for each asset class share. Standard errors are clustered at the country level and are reported in the parentheses. ***, **, * indicates significance at 1%, 5%, 10% level.

Table 4 presents the results. The AE and EME pension investors exhibit general similarity in their portfolio allocation behaviors in response to changes in government bond yields. When the yield is lower, they reduce their holdings in bonds and generally substitute into mutual fund shares and foreign assets. Furthermore, EME pensions substitute into equity although this response is not

significant for AE pensions. In terms of magnitude, EME pension investors are more responsive in their bond holdings to changes in government bond yields. A 1 pp decline in local currency 10-year bond yield is associated with a 1.47 pp reduction in bond holding for EME pension investors, while this number is 0.84 pp for AE pension investors. AE investors show a strong substitution into foreign assets (5.07 pp) and mutual fund shares (2.02 pp) when domestic bond yield decreases. On the contrary, in response to a 1 pp domestic interest rate drop, EME pension investors substitute into foreign asset holding by 1.98 pp, together with a 0.89 pp higher share in equities and a 0.85 pp higher share in mutual fund shares. Overall, while pension funds in AE and EME countries generally adjust their portfolios away bonds in response to lowering yields, this response is stronger for EME funds.

5 Implications on the Debt Markets

Above we have shown that pension funds are shifting their portfolio allocations away from fixed income securities. This shift may have important implications for both sovereign and corporate borrowers. As pension funds step back, other non-bank financial institutions step in as investors. Take government debt as an example: the trend toward non-bank financial investor (NBFI) holdings moves the composition of investors away from more stable buy and hold investors with potentially lower demand elasticities to more volatile investors with higher price elasticities. Indeed, Fang, Hardy, and Lewis (2025) found that non-bank investors have the highest price elasticities for sovereign debt, and that these are most likely driven by investment funds rather than insurance and pensions. Having an investor base with high price elasticities benefits the sovereign in terms of their borrowing costs, as it requires a smaller increase in yield to recruit these investors to purchase more debt. However, if these investors are also more flighty in the face of local or global risk, then their presence creates financial stability concerns for the sovereign. In effect, these funding sources could dry up when the borrower needs them the most.

5.1 Effects on financing costs

While the analysis in this article is based upon reduced form relationships, we can use the changes in fixed income holdings to get some sense of how important the declining share of pension holdings of debt instruments may be to the market. For this purpose, we assess the impact on the financing costs to debt issuers following the approach of Fang, Hardy, and Lewis (2025). According to that approach, the sensitivity of financing costs to new debt issues depends inversely on the average of the investors' demand elasticities weighted by their holding shares. Intuitively, the more elastic an investor group is, the lower the increase in yield they require to take on more debt. Moreover, their overall importance of this financing cost depends upon their share of outstanding debt held.

Therefore, to understand how changes in the share of pension fund holdings impact this financing cost, we consider a simplified version of the debt market in which there are two types of investors: (a) long-term investors such as pensions and (b) short-term investors.[11] To calculate the financing cost sensitivity, we then need information about the demand elasticities for the long-term and short-term investors. As a full demand estimation is outside the scope of the current paper, we turn to the literature for such estimates. Bretscher, Schmid, Sen, and Sharma (2025) show that long-term investors have a yield elasticity of around 0.3 for corporate bonds, while that of investment funds is higher at 0.6.[12] Similarly, Zhou (2024) estimates the demand elasticity of long-term investors for sovereign debt to be about 0.3. Fang, Hardy, and Lewis (2025) estimate the demand elasticity of foreign nonbank investors for EME sovereign debt to be 0.49.[13] Given these estimates, we assume the long-term investors' yield elasticity with respect to yield is 0.3, and that of short-term investors' yield elasticity to be 0.65.

In addition to the elasticities, we require information about the holding shares of long-term

[11] Fang, Hardy, and Lewis (2025) analyze six investor groups of sovereign debt holdings.

[12] Bretscher, Schmid, Sen, and Sharma (2025) report the estimates for investment-grade and high-yield bonds separately. We take the simple average here.

[13] The investors for these debt instruments are mostly from advanced economies, including both long-term investors such as insurance companies and pension funds as well as short-term investors such as investment funds.

investors including banks and insurance companies in addition to pensions. In the recent U.S. data, for example, banks, pension funds and insurance companies hold around 1/3 of the corporate bonds and around 10% of the Treasuries. Given these numbers, we consider two scenarios. Under the first scenario, long-term investors hold 50% of the total debt and the short-term investors hold the other half. Under the second scenario, long-term investors hold 1/3 of the total debt and short-term investors hold the other 2/3. These trends are roughly consistent with the shifts in pension portfolio shares away from fixed income noted above. We use these shares for a back-of-the-envelope calculation of the financing cost sensitivity to debt issuance.

The effects of these trends using the demand elasticities estimates above are striking. When long-term investors and short-term investors each hold half of the debt market, the financing cost sensitivity to a 10% increase of debt is 21.0 basis points. When the holding share of long-term investors decline to 1/3, this financing cost sensitivity to a 10% debt increase drops to 18.7 basis points. Thus, when more debt is held by more demand elastic short-term investors, debt can be issued at a lower cost due to their higher propensity to absorb the new issuance.

5.2 Changes in flightiness

In addition to changes in financing costs, the shift of pensions away from fixed income may impact how bond yields react to uncertainty in markets. Specifically, Zhou (2024) shows that sovereign bond yields' responses to global shocks such as VIX depends on the debt holding shares of short-term or long-term investors. That is, yields are more sensitive to the VIX if short-term investment funds hold a larger share or long-term investors such as insurance companies and pension funds hold a smaller share. According to his estimates, if pensions reduce holding shares by 1 percent, the bond yield response to a change in VIX change will increase by 0.74 basis points. A decline of pension holding share of 14% will lead to a 10-basis-point yield increase in response to a one-percent VIX shock. While the average yield response to VIX shock is about 20 basis points, the decline of pension holding shares doubles the yield response.

These back-of-envelope calculations reveal the possible consequences of the changing pension

asset allocation on the debt market. On one hand, the yield of debt is more sensitive to global financial shocks as debt holders are more flighty. On the other hand, the financing cost sensitivity to debt issuance is smaller because more demand elastic investors can absorb debt at a smaller yield increase.

5.3 Other implications

In addition to the yield sensitivity to global financial shocks and debt increase, the trends we document in this article have other important implications. For example, the structural shift away from defined-benefit (DB) pension plans and toward defined-contribution (DC) systems may similarly have unintended consequences for financial stability. DC plans hold a lower share of debt and higher share of equities and mutual fund shares. If the pension sector is dominated by DC plans, the debt market would lose a long-term stable source of funding. These patterns suggest a shift to flightier investors at a time when sovereign debt has expanded to recent highs relative to GDP.

Further, the shift to holding mutual fund shares means pension investor behavior is important for the stability and liquidity of mutual funds. A substantial literature documents that bond mutual funds are vulnerable to flow-induced price pressure and fragility (Vissing-Jorgensen 2021, Ma, Xiao, and Zeng 2022, Coppola 2025, Fang and Goldstein 2025). Thus, sudden adjustments in pension portfolios or redemption demands (e.g. the LDI crisis in the UK) can put outflow pressure on mutual funds, which may in turn amplify or transmit those shocks to the bond markets they invest in.

As a result, the evidence in this article relates to the literature on retirement systems under changing macroeconomic and institutional developments, including population aging (Cocco and Gomes 2012, Poterba 2004, 2014), sponsorship (Friedman 1982), and differences between public and private pension plans (Lucas and Zeldes 2009, Munnell and Soto 2007). For example, Poterba, Rauh, Venti, and Wise (2007) studies how DB and DC plans affect household wealth accumulation, while Rauh (2009) examines cost shifting associated with the transition from DB to DC plans. Our work above documents structural shifts in pension asset allocation and shows that both plan types

have shifted more towards mutual funds and away from bonds. Therefore, this evidence suggests areas of future research to study how these shifts may impact bond markets.

6 Conclusion

Over the past decades, pension investors around the globe have been shifting away from fixed income securities into mutual fund shares and other potentially riskier assets. This shift occurs across countries and plan types. The declining share of fixed income holding applies to both the private and public debt and is not offset by indirect bond holdings through mutual funds.

These changes likely reflect both structural and cyclical drivers. Pensions use mutual funds to increase their exposure to riskier assets. We document evidence that supports a search for yield motive contributing to this change.

These shifts have important financial stability implications for both the pension fund sector and the markets where it is a large player (e.g. sovereign debt). Understanding these portfolio shifts is key for understanding the demand for debt and consequent implications for borrowing costs. It is also crucial because stock market volatility may have important implications for pension fund viability as a greater share of the population ages towards retirement.

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