

The U.S. Pension Challenge: What Global Pillar-Based Systems Reveal About Reform Pathways

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Abstract

The United States pension system faces mounting challenges stemming from demographic shifts, fiscal strain, and structural fragmentation. While Social Security (Pillar I) and voluntary private savings (Pillar III) form the backbone of U.S. retirement income, the absence of a robust mandatory occupational pension (Pillar II) has led to inadequate replacement rates and inequitable coverage—particularly among lower-income and non-traditional workers. This paper employs a comparative framework using data from eight OECD countries to evaluate how pension systems with integrated Pillar II components perform in terms of fiscal sustainability, income adequacy, and asset accumulation. Countries like the Netherlands, Denmark, and Sweden demonstrate superior outcomes through diversified, multi-pillar models that balance public and private responsibilities. Based on international best practices and quantitative performance indicators, the paper offers actionable reform pathways for the U.S., including the introduction of a national mandatory retirement savings system, Social Security stabilization, and enhanced participation among underserved populations. These findings underscore the importance of systemic integration, governance, and long-term planning to secure retirement for future generations.

Keywords: U.S. Pension System, Multi-pillar Retirement Model, Social Security, Pillar II, Occupational Pensions, Retirement Adequacy, Fiscal Sustainability, OECD Pension Comparison, Pension Reform, Retirement Savings Coverage.

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Introduction

The sustainability and adequacy of pension systems have become pressing policy concerns in both developed and developing economies. As populations age and the ratio of workers to retirees shrinks, public pension systems—particularly those based on pay-as-you-go (PAYG) financing—face escalating fiscal pressure. The United States, where the retirement system relies heavily on Social Security (Pillar I) and voluntary private savings (Pillar III), exemplifies these challenges. With public pension expenditures reaching approximately 7.1% of GDP and private savings heavily dependent on employer-provided 401(k)s and IRAs, the American system reveals both structural limitations and potential for reform [1].

A growing body of comparative literature has emphasized the benefits of diversified, multi-pillar pension systems in achieving

both fiscal sustainability and benefit adequacy. The World Bank's five-pillar model and subsequent OECD frameworks have provided international benchmarks for analyzing pension system performance [2]. Countries like the Netherlands, Denmark, and Sweden—featuring strong Pillar II components (mandatory private occupational pensions)—consistently outperform in global pension indexes [3]. In contrast, the United States ranks lower in both replacement rates and income security, particularly among lower-income retirees [4, 5].

This paper seeks to assess how the U.S. pension system performs relative to leading OECD models across key performance dimensions: fiscal sustainability, replacement rate adequacy, and asset accumulation. Using a comparative, pillar-based framework and updated OECD data, this study evaluates whether a stronger emphasis on Pillar II (mandatory private savings) correlates with

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improved pension outcomes. In doing so, we aim to provide a roadmap of evidence-based reform pathways that can help U.S. policymakers strengthen retirement security while maintaining fiscal discipline.

The chapter is organized as follows: Chapter 2 reviews the theoretical framework and relevant literature; Chapter 3 describes the data and methodology; Chapter 4 presents comparative results across eight OECD countries; Chapter 5 discusses the implications for U.S. pension reform; and Chapter 6 concludes with policy recommendations.

Literature Review

Theoretical Framework: The Multi-Pillar Model

The foundational model for analyzing pension systems globally is the World Bank's five-pillar framework, first proposed by Holzmann and Hinz [2]. This model conceptualizes pension provision as a diversified strategy, where different "pillars" interact to achieve income security, fiscal sustainability, and inclusivity:

1. Zero Pillar – Non-contributory social pensions aimed at poverty alleviation.
2. First Pillar – Mandatory, publicly managed, PAYG systems.
3. Second Pillar – Mandatory, privately managed occupational or personal savings.
4. Third Pillar – Voluntary personal savings, often tax-advantaged.
5. Fourth Pillar – Informal support, such as family transfers or housing wealth.

This multi-pillar architecture seeks to mitigate systemic risk by combining the redistributive strength of public pensions with the investment potential of private accounts. Countries that diversify across Pillars I and II have consistently outperformed those that rely heavily on public PAYG structures alone [2,6].

Global Comparisons of Pension System Design

The OECD uses a performance-based approach to evaluate pension systems along five dimensions: sustainability, adequacy, coverage, security, and efficiency [1]. Countries like the Netherlands, Denmark, and Sweden have achieved high scores across all five dimensions largely due to strong Pillar II systems. For example, the Netherlands mandates employer-sponsored occupational pensions, which cover over 90% of the workforce, resulting in a gross replacement rate of 97% and pension assets exceeding 180% of GDP [1, 7].

In contrast, the United States relies predominantly on Social Security (Pillar I) and voluntary 401(k)/IRA accounts (Pillar III). However, many workers—particularly low-income and self-employed—lack access to employer-sponsored retirement plans [8]. This has led to insufficient replacement rates and rising old-age poverty, particularly among women and minority workers [4, 5].

Empirical Evidence on Pension Outcomes

Empirical studies suggest that mandatory occupational pension schemes (Pillar II) are associated with higher levels of asset accumulation and more favorable dependency ratios. For example:

- Barr and Diamond argue that funded pensions (Pillar II)

shift the demographic risk to capital markets, thus alleviating intergenerational stress in PAYG systems [9].

- Sørensen et al. compare Denmark, Sweden, Canada, and the Netherlands and find that Pillar II strengthens both adequacy and sustainability when embedded in a coordinated policy framework [10].
- Mercer CFA Institute rankings show that countries with high Pillar II shares—such as Denmark (72%) and Australia (84%)—also maintain lower public pension expenditures and higher investment returns [3].

In the U.S. context, Mitchell and Fields emphasize the inefficiencies of fragmented private savings systems, citing high administrative costs, inconsistent participation, and a lack of portability [11]. Additionally, Brown, Clark, and Rauh highlight the severe underfunding of state and local government pensions, which poses long-term fiscal risks [12].

Gaps in the U.S. SYSTEM

Despite a relatively high pension asset-to-GDP ratio (~140%), the U.S. system suffers from low mandatory savings coverage, particularly among small-business employees and gig workers [8,13]. The lack of a mandatory Pillar II framework has resulted in uneven access and insufficient balances at retirement. As a result, the U.S. ranks 29th out of 47 countries in the 2023 Mercer CFA Institute Global Pension Index, with a "C+" grade [3].

Data and Methodology

Research Design

This study employs a comparative, cross-sectional design to examine the relationship between pension pillar structures—specifically the strength of Pillar II (mandatory occupational/private savings)—and three critical retirement outcomes:

- Fiscal Sustainability: Assessed by public pension expenditure as a percentage of GDP.
- Income Adequacy: Measured by gross replacement rate (GRR) for average earners.
- Financial Security: Evaluated through pension assets as a share of GDP.

The objective is to assess whether countries with robust Pillar II systems demonstrate superior performance across these indicators, and how such models can inform reform pathways for the U.S. pension system. This design builds upon prior frameworks and integrates recent comparative metrics developed by the OECD, Mercer CFA Institute, and the International Social Security Association [1-3,9,14].

Country Selection Criteria

Eight OECD countries were selected to ensure diversity in pension architecture while maintaining comparability in economic development and data availability. The selection criteria included:

- OECD membership (for data harmonization).
- Availability of disaggregated Pillar II statistics.
- Representation of both public-dominant and private-dominant systems.

Countries analyzed: United States, Netherlands, Denmark, Sweden, Australia, France, Germany, and Japan. These countries capture a spectrum of pension structures, from heavily public (e.g., France, Japan) to hybrid (e.g., Sweden, Germany) and private-heavy (e.g., Australia, Netherlands).

Data Sources

Data were collected from Multiple high-quality, peer reviewed and institutional sources:

Variable	Source
Pillar II share (%)	Mercer CFA institute Global Pension Index (2023); OECD (2023) [1,3]
Public Pension Expenditure (% GDP)	OECD Pensions at a Glance (2023) [1]
Replacement Rate (%)	OECD (2023); World Bank Retirement indicators [1]
Pension Assets (% GPD)	OECD Pension Markets in Focus (2023); IMF (2023) [1]

Recent work by Allianz (2023) and the world Economic Forum also informed the interpretation of aggregate asset ratios and their implications for retirement resilience [15].

Variables and Definitions

- Pillar II Share (%): The percentage of a country’s pension replacement rate that is delivered via mandatory private savings, either occupational or personal.
- Public Pension Expenditure (% GDP): Government spending on old-age and survivor benefits as a share of gross domestic product.
- Gross Replacement Rate (%): The ratio of pension income to pre-retirement income for an average earner with a full career.
- Pension Assets (% GDP): The total financial assets accumulated in pension funds (both public and private) expressed as a share of national GDP

Analytical Framework

This chapter uses a mixed-methods approach, combining descriptive statics with basic correlation analysis:

1. Descriptive Tables and Scatterplots: Comparative visualization of country-level indicators.
2. Correlation Analysis: Pearson correlation coefficient estimates the association between Pillar II strength and fiscal/adequacy outcomes.
3. Ranking and Typology Mapping: Countries are categorized by pension system type to observe structural effects on performance.

As suggested by Brosch Supan et al., we also consider the interaction between mandatory and voluntary schemes, using the composite index approach from the Global Pension Sustainability Tracker [16].

Table 1: Comparative Pension System Performance (2023)

Country	Pillar II Share (%)	Public Pension Expenditure (% GDP)	Replacement Rate (%)	Pension Assets (% GDP)
United States	20	7.1	49.0	140
Netherlands	68	5.4	96.9	180
Sweden	19	7.7	55.8	110
Denmark	72	8.0	86.4	209
Australia	84	4.3	32.2	131
France	15	13.6	74.0	12
Germany	12	10.4	51.0	15
Japan	10	10.0	38.0	28

Sources: OECD (2023), Mercer CFA Institute (2023), IMF (2023) [1, 3]

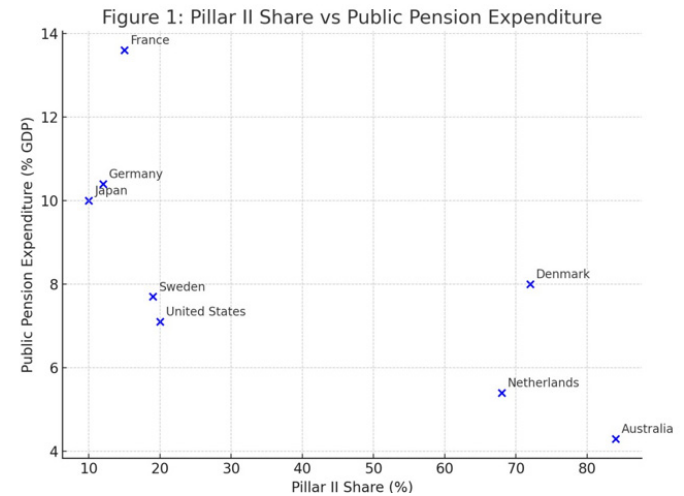


Figure 1: Pillar II Share vs Public Pension Expenditure

A negative correlation is observed: countries with higher Pillar II shares tend to have lower public pension burdens.

Limitations

This analysis is conducted at the national level, which may mask significant intranational disparities—such as differences between state and federal pension coverage in the United States. Additionally, while the paper discusses correlations, it does not imply causality, and multivariate regression analyses are not included. Furthermore, coverage under Pillar III (voluntary savings) is not comprehensively examined due to inconsistent data availability across countries.

Results and Analysis

This chapter presents the key findings from the comparative analysis of eight OECD countries, focusing on the relationship between Pillar II integration and pension system outcomes—namely fiscal sustainability, replacement rate adequacy, and asset-backed security. The data, visualized in Table 1 and Figure 1, reveal meaningful patterns that help evaluate the relative performance of the U.S. pension system and identify viable reform strategies.

Pillar II and Fiscal Sustainability

Figure 1 and Table 1 show a moderate negative correlation be-

tween the Pillar II Share (%) and Public Pension Expenditure (% of GDP). Countries with a higher proportion of retirement income delivered through mandatory private savings (Pillar II) tend to have lower public pension costs:

- Australia, with the highest Pillar II share (84%), spends only 4.3% of GDP on public pensions.
- The Netherlands (68% Pillar II) and Denmark (72% Pillar II) both maintain public pension expenditures below 8%, while achieving strong retirement income outcomes.
- In contrast, France, Germany, and Japan—where public systems dominate and Pillar II is weak—spend over 10% of GDP on public pensions.

United States: Although the U.S. has a modest Pillar II share (20%), public spending is relatively moderate at 7.1%, due largely to Social Security’s low replacement rate and capped benefits. However, this creates a trade-off: reduced fiscal burden comes at the cost of inadequate retirement security.

This trend aligns with findings from Barr & Diamond and OECD that diversifying financing mechanisms reduces the fiscal pressure on governments without necessarily reducing retirement adequacy [1,9].

Pillar II and Replacement Rate Adequacy

The replacement rate—a key measure of pension adequacy—generally shows a positive correlation with the strength of Pillar II, though this relationship is not universally consistent. For example, the Netherlands and Denmark exhibit both high Pillar II shares (68% and 72%, respectively) and correspondingly high replacement rates (96.9% and 86.4%), reflecting the effectiveness of their mandatory occupational pension systems.

In contrast, Sweden achieves a relatively strong replacement rate of 55.8% despite having only a 19% share in Pillar II. This outcome is attributed to a well-managed public pension system under Pillar I and the role of comprehensive collective agreements that supplement retirement income. The United States, however, demonstrates a significantly lower replacement rate of just 49%—among the lowest within the comparison group—underscoring the limitations of a system heavily reliant on voluntary participation. Wage disparities and unequal access to 401(k) plans and IRAs have contributed to inadequate retirement income, particularly for lower-income earners and minority groups (Mitchell & Lusardi, 2015). Similarly, Australia performs poorly in terms of replacement rate (32.2%) despite a robust Pillar II structure, largely due to the relatively recent implementation of its superannuation system and the resulting lag in benefit accumulation [6].

These findings support earlier conclusions by Sørensen et al. (2016), which emphasize that Pillar II alone cannot ensure pension adequacy unless it is accompanied by mechanisms for universal participation and redistribution.

Pension Assets and Financial Security

A third dimension of analysis is pension assets as a percentage of GDP, which proxies the level of financial security and system preparedness:

- Denmark (209%), Netherlands (180%), and Australia (131%) have the highest levels of pension fund assets, reflecting the depth of funded schemes and their integration into capital markets.
- The United States also ranks high at 140%, but this figure is heavily skewed by top-income households and large institutional investors. Coverage gaps remain wide among gig workers, part-time employees, and small business staff [8].

Countries like France, Germany, and Japan, where PAYG dominates and funding is limited, show pension assets below 30% of GDP. These systems face greater long-term sustainability risk, especially as demographic pressures increase.

Summary of Performance

Country	Strengths	Weaknesses
Netherlands	High adequacy, low public cost, large assets	Complex occupational system
Denmark	Highest assets, strong adequacy, diversified	High administrative burden
Sweden	Balanced public/private mix, good governance	Moderate replacement rate
Australia	Efficient, capitalized system	Low adequacy for low-income retirees
United States	High private assets, moderate public spending	Uneven coverage, low adequacy, no Pillar II mandate
France	Strong Pillar I benefits	Unsustainable public spending
Germany	Broad public system coverage	Underfunded, limited private savings
Japan	Coverage via Pillar I	Aging population, low adequacy, low asset base

Implications for the U.S.

The U.S. stands mid-range across all dimensions. Despite a large capital market and extensive voluntary savings structure (401(k)s, IRAs), the absence of a mandatory occupational system (Pillar II) undermines both coverage and retirement adequacy. The fragmented nature of voluntary participation leads to inequality and inefficiency, especially for underrepresented groups [5,13].

As demonstrated by the Netherlands and Denmark, a coordinated public-private model with automatic enrollment, mandatory contributions, and strong governance achieves better outcomes across all metrics.

Discussion and Policy Implications

The comparative results presented in Chapter 4 highlight the diverse outcomes produced by different pension system structures across developed economies. Countries with strong mandatory private pension components (Pillar II) consistently outperform those relying solely on public PAYG systems (Pillar I) or fragmented voluntary schemes (Pillar III). For the United States,

which features a limited Pillar II and heavily depends on Social Security and voluntary savings, the analysis reveals a mixed performance: moderate public expenditure, high asset accumulation among top earners, but low overall replacement rates and uneven coverage. This chapter explores the policy implications of these findings and outlines reform pathways to improve sustainability, adequacy, and coverage in the U.S. pension system.

Pillar II: The Missing Link in U.S. Pension Design

The results demonstrate that countries with mandatory occupational pension systems—such as the Netherlands, Denmark, and Australia—manage to combine low public pension costs with high replacement rates and large pension asset pools [1,3]. In contrast, the U.S. lacks a coordinated, mandatory second pillar, leading to:

- Inequitable coverage: More than 40 million American workers, particularly those in part-time or gig roles, do not have access to an employer-sponsored retirement plan [8].
- Insufficient savings: The median 401(k) balance for near-retirement households is under
- \$90,000—far below what is needed for income adequacy [5,13].
- Inefficiency: Administrative fees in U.S. 401(k) plans can consume up to 30% of returns over a 35-year horizon [11].

To address these deficiencies, the U.S. must introduce a mandatory, auto-enrolled occupational pension layer—modeled on the Dutch “Pension fonds” system or Australia’s Superannuation Guarantee. Such a system would build upon existing 401(k) infrastructure while ensuring universal access, regulated fees, and portability.

Reforming Social Security to Enhance Adequacy and Longevity Resilience

While Social Security (Pillar I) has played a crucial role in reducing poverty among the elderly, it offers only a modest replacement rate of approximately 40–50%, which is particularly inadequate for low-income earners [9]. Furthermore, without legislative reform, the Social Security Trust Fund is projected to be depleted by the mid-2030s [17]. International experiences provide useful lessons for enhancing both the sustainability and adequacy of the system. For example, Sweden has implemented an automatic balancing mechanism that adjusts benefits and contribution rates in response to demographic and economic changes, thereby ensuring long-term solvency without the need for frequent political intervention [18]. In addition, indexing benefits to wages rather than prices allows replacement rates to keep pace with rising living standards.

Drawing on these insights, a reformed U.S. Social Security structure should incorporate a minimum benefit guarantee to effectively establish a formal zero pillar, introduce a sustainability trigger similar to Sweden’s notional defined-contribution model, and adjust the retirement age in line with projected increases in life expectancy. Together, these reforms would strengthen the fiscal foundation of the system while preserving its redistributive function.

Expanding Coverage and Equity Through Targeted Instruments

The absence of universal coverage in voluntary Pillar III retire-

ment schemes contributes to widening disparities in retirement security, particularly along racial, gender, and income lines. For instance, only 48% of Hispanic workers and 54% of Black workers participate in employer-sponsored retirement plans, compared to 66% of white workers [8]. Women face additional disadvantages, as they tend to have lower lifetime earnings and longer life expectancies, leaving them especially vulnerable within a fragmented and predominantly private retirement system [4].

To address these inequities, several reform strategies should be considered. Implementing auto-enrollment IRA mandates for all employers, with opt-out provisions, modeled after successful programs like the UK’s National Employment Savings Trust (NEST) and Oregon Saves, could significantly expand participation. Establishing portable retirement accounts for gig economy workers, linked to a national clearinghouse, would ensure coverage in non-traditional employment arrangements. Furthermore, providing targeted tax credits or matching contributions for low-income savers would enhance equity and inclusion. Lastly, incorporating default annuitization options into defined contribution plans could mitigate longevity risk and promote stable retirement income. Collectively, these reforms would expand access, improve risk-sharing, and enhance retirement adequacy—particularly for underserved populations—without placing undue strain on public finances.

Enhancing Governance and Administrative Efficiency

Lessons from the Netherlands and Denmark highlight the importance of robust governance frameworks in ensuring pension system success. Key features such as centralized fund management, low administrative fees, and high levels of transparency have been instrumental in delivering strong outcomes in these countries [7].

By contrast, the U.S. retirement system remains highly fragmented, with thousands of individual plans that often operate under opaque fee structures and limited fiduciary oversight. To address these shortcomings, several policy measures should be pursued. Standardizing fee disclosures and implementing benchmarking mechanisms across 401(k) plans would enhance comparability and empower participants to make informed choices.

Promoting the adoption of pooled employer plans (PEPs) and establishing centralized clearinghouses could streamline administration and reduce costs, particularly for small and medium-sized employers. Additionally, extending fiduciary obligations and incorporating environmental, social, and governance (ESG) standards across all retirement plan providers would strengthen oversight and align investment strategies with long-term sustainability goals.

Collectively, these reforms would improve investment performance, minimize fund leakage, and help rebuild public trust in the U.S. retirement system.

Balancing Intergenerational Equity

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Conclusion

Ensuring a sustainable, adequate, and inclusive pension system is a central policy challenge for aging societies, and the United States is no exception. This study examined the U.S. retirement system within a global comparative framework, drawing on the World Bank's multi-pillar model and OECD performance indicators. Through detailed comparison of eight OECD countries, we assessed the outcomes of pension systems with varying pillar structures—particularly the role of Pillar II (mandatory private savings)—across key dimensions: fiscal sustainability, replacement rate adequacy, and asset accumulation.

The findings reveal that countries with well-integrated Pillar II systems—such as the Netherlands, Denmark, and Australia—are able to maintain low public pension burdens while ensuring high replacement rates and large pension fund assets. By contrast, the United States, which lacks a universal mandatory occupational pension framework, performs moderately on public cost control but poorly on adequacy and coverage.

The evidence highlights a structural gap in the U.S. system: its overreliance on voluntary private savings (Pillar III) and insufficient support for workers outside traditional employment settings. While Social Security provides a broad base of retirement income, its limited benefit formula and looming insolvency risk weaken its protective function. Without a strong second pillar, many Americans—especially women, minorities, and gig workers—face the prospect of financial insecurity in retirement.

To address these challenges, we offer several key reform pathways drawn from international best practices:

- Implement a mandatory Pillar II structure through automatic enrollment and pooled occupational savings plans.
- Strengthen Social Security by incorporating longevity indexing, automatic fiscal stabilizers, and a minimum benefit guarantee.
- Broaden participation through portable accounts, targeted tax credits, and simplified plans for small employers and self-employed workers.
- Improve governance and cost-efficiency by centralizing plan administration and enforcing fiduciary oversight.

These reforms must be complemented by financial education campaigns, cross-sector collaboration, and a long-term vision for intergenerational fairness. If implemented with care and political will, such a framework can transform the U.S. pension system into a resilient and equitable model that balances public responsibility with private initiative.

Ultimately, the lesson from international comparisons is clear: diversification, inclusion, and governance matter. The United States must evolve from a patchwork system toward a coordinated, multi-pillar approach that secures retirement dignity for all.

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Appendix A: U.S. Pension Policy Timeline

Year	Milestone	Description
1935	Social Security Act	Established the foundation of the U.S. public pension system (Pillar I), introducing old-age benefits funded by payroll taxes.
1950s–60s	Amendments to Social Security	Expanded coverage to self- employed, domestic workers, and disabled persons; increased benefit generosity.
1974	Employee Retirement Income Security Act (ERISA)	Regulated private pension plans to protect participants; established the PBGC (Pension Benefit Guaranty Corporation).
1983	Social Security Reform	Raised retirement age, introduced taxation on benefits, and increased payroll taxes to address funding issues.
2001	EGTRRA	Increased contribution limits to 401(k)s and IRAs to encourage retirement savings.
2006	Pension Protection Act	Strengthened funding rules for defined benefit plans and encouraged automatic enrollment in 401(k)s.
2019	SECURE Act	Expanded access to retirement plans for part-time workers and small employers; delayed RMD age from 70.5 to 72.
2022	SECURE Act 2.0	Further expanded coverage, auto-enrollment, and portability; increased RMD age to 73 (and eventually 75 by 2033).
2024	State-based Auto-IRA Expansion	Continued growth of state- facilitated retirement plans like CalSavers and OregonSaves, addressing gaps in coverage for gig and low-income workers.