

Pensions from Capital: How Pension Funds in the United States, Japan and Europe Invest — and What Private Investors Can Learn from Them

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Abstract

This paper examines the pension funds of the large industrial countries — with more than USD 68 trillion between them, the heaviest group of investors in the world. It compares how funded retirement provision is organised in the United States, in Japan and in Europe: how state, occupational and private provision differ, who grants which tax advantages to whom and at what level, and why equity quotas diverge so widely across regions — from 25 per cent in Japan and 27 to 29 per cent in the Netherlands, the United Kingdom and Switzerland to 50 per cent in the United States and 52 per cent in Australia.

A chapter of its own is devoted to Switzerland: there, companies invest their employees' pension capital themselves through their own provident institutions, the employer bears at least half of the contributions, and pension assets of more than CHF 1,220 billion reach 152 per cent of economic output — the highest figure in the world. The paper also describes the awarding practice: many funds tender their asset management externally, controlling firms rank the mandates every six or twelve months, and whoever comes last usually loses the mandate — a greyhound race that palpably raises investment discipline along the agreed strategy. The paper further shows that states and central banks, too, appear as securities investors — from Japan's pension reserve fund through the Swiss National Bank, which holds a quarter of its currency reserves in equities, to the Bank of Japan, which will unwind its equity fund holdings only over generations — while states continually replace their maturing bonds with new ones.

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For private investors, concrete conclusions are derived: employer contributions are the safest return there is and should be exhausted before any other investment; tax-favoured vehicles pay off in almost every situation; the equity share belongs tied to the investment horizon — high in youth, declining by plan towards retirement; and the most important institutional virtue, the regular verifiable review of one's own investments against a written strategy, costs nothing.

Keywords: Pension funds · Retirement provision · Funding · Equity share · Occupational pensions · Tax incentives · Central banks.

JEL codes: G11, G23, H55, J32.

Non-Technical Summary

Hardly any wealth touches as many people as that of the pension funds: more than USD 68 trillion sits in funded retirement provision worldwide — money that employees and employers pay in over decades so that it may one day become pensions. This paper compares the three great pension worlds: the United States, where private funding carries the main load and the equity share sits at the top of the range; Japan, where the state reserve fund GPIF invests by fixed rule as the largest pension fund in the world; and Europe, where the Netherlands, Britain, Germany, Austria and Switzerland have grown thoroughly different arrangements.²

The differences are instructive. The state pension is almost everywhere pay-as-you-go: the contributions of those working are paid straight out to pensioners, and little or nothing is invested — the American Social Security holds its reserve exclusively in IOUs of its own government. Occupational and private provision, by contrast, is capital investment on the grand scale, and there the equity share decides the outcome: American pension assets are half in equities, Japanese a quarter — with correspondingly different returns over long periods. The state supports pension saving everywhere with tax advantages, but with very different generosity; the paper places the rules of five countries side by side.

Switzerland receives particular attention. Its model — every company provides for its staff through its own or a collective pension fund, with the employer paying at least half of the contributions and often voluntarily more — has created the world's highest pension assets relative to economic output. Many funds award their management through tenders to external managers and have the mandates compared every six or twelve months in rankings drawn up by controlling firms; whoever trails the field loses the mandate. This greyhound race, which the author knows from his own professional practice, keeps managers disciplined to the agreed strategy — and is at the same time an object lesson in the uses and limits of performance comparison.

The paper closes with the yield for the private investor: private provision pays first where an employer contributes — a subsidy of fifty or one hundred per cent on one's own contribution is a return no market offers; in Switzerland, individual houses, banks in particular, voluntarily double the contributions for senior staff. Next comes the tax saving of the favoured vehicles, which reaches several thousand euros or francs a year depending on country and tax rate. For the investment itself, the rule of life-cycle theory applies: a high equity share while retirement is far away, a step-by-step reduction thereafter — and, in old age, an honest choice between annuity and lump sum.³

² Assets: Thinking Ahead Institute (2026), the 22 largest markets as at end-2025: USD 68,274 billion.

³ On portfolio choice over the life cycle fundamentally Samuelson (1969) and Merton (1969); the link to age is established only by Bodie, Merton and Samuelson (1992); on annuitisation Yaari (1965).

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1 Introduction

The pension is an investment problem. Whatever a country promises its old, the money must come from one of two sources: from the current contributions of those working — pay-as-you-go — or from a capital stock saved and invested over decades. How large that capital stock is, how it is divided among state, occupational and private carriers, and how it is invested separates the large industrial countries more deeply than almost any other question of economic policy: between Japan, whose pension assets are one quarter in equities, and the American section 401(k) saver, whose target-date fund is ninety per cent equities in youth, lie worlds — and trillions.⁴

The magnitudes justify the close look. The 22 largest pension markets in the world managed around USD 68,274 billion at the end of 2025 — more than the sovereign wealth funds and the university endowments combined that the author has examined elsewhere. Two thirds of this wealth lies in the United States; the seven largest markets — the US, Canada, Japan, the United Kingdom, Australia, the Netherlands and Switzerland — account for 91 per cent. Measured against its own economic output, however, a small country leads: Switzerland holds pension assets of 152 per cent of its gross domestic product — the highest figure in the world — and is therefore treated at particular length in this paper.⁵

This paper pursues four aims. First, it orders the systems: what does the state pension deliver, what the occupational, what the private — and who favours whom in tax terms, and by how much? Secondly, it compares the investment policies of the regions, above all the equity quotas, and explains their causes. Thirdly, it describes two easily overlooked groups of investors: the reserve funds of states and the central banks, some of which hold large securities portfolios of their own — and it distinguishes both from the debt management of states, which continually replace maturing bonds with new ones. Fourthly, it translates the observations into conclusions for private investors: from when private provision pays, which equity share belongs to which age, and what of institutional discipline can be copied.⁶

The course of the study: Chapter 2 orders concepts and magnitudes — pay-as-you-go and funding, defined benefit and defined contribution, the three tiers of provision. Chapter 3 deals with the United States, Chapter 4 with Japan, Chapter 5 with Europe — the Netherlands, the United Kingdom, Germany, Austria and Sweden. Chapter 6 is devoted

⁴ The classic rationale of retirement saving is the life-cycle hypothesis of Modigliani and Brumberg (1954): people smooth their consumption over life by accumulating wealth during their working years and consuming it in old age.

⁵ Thinking Ahead Institute (2026); assets relative to gross domestic product as at end-2024: Switzerland 152 per cent, Canada 148, Australia 146, Netherlands 143, US 130 (Thinking Ahead Institute, 2025). On sovereign funds and endowments, Ruppachter (2026d).

⁶ The paper continues the author's series on institutional investors: Ruppachter (2026d) on churches, sovereign wealth funds and university endowments; Ruppachter (2026c) on the transfer of wealth between the generations.

to Switzerland and its model of company-based provision, including the awarding practice of tender, ranking and greyhound race. Chapter 7 asks whether states and central banks, too, hold securities. Chapter 8 draws the conclusions for private investors; Chapter 9 concludes.

2 Pay-As-You-Go, Funding and Three Tiers of Provision

Almost all old-age security systems of the industrial countries rest on three tiers, known in the German-speaking world as pillars — Switzerland even wrote the three-pillar principle into its federal constitution in 1972. The first, state tier is almost everywhere pay-as-you-go: the contributions of today's workers flow straight to today's old as pensions; at most a fluctuation reserve is invested. The second tier is occupational provision — organised by the employer, compulsory in some countries, voluntary in others. The third tier is the individual's private, tax-favoured saving. Funded, and thus the subject of this paper, are above all the second and third tiers; Table 1 shows where this capital lies.⁷

The roots of the two paths reach far back. Pay-as-you-go goes back to Bismarck's invalidity and old-age insurance of 1889, the first state pension in the world, and became the contribution-based normal case of continental Europe after 1945; the Anglo-Saxon counter-model in the tradition of Beveridge relies on a lean state basic pension and leaves the standard of living to occupational and private funding. That old switch-setting reaches into the tables of this paper: countries of the Bismarck tradition — Germany, Austria, Japan too — hold small capital stocks and large pay-as-you-go promises, while countries of the Beveridge tradition — the US, the United Kingdom, Australia, the Netherlands, Switzerland — have accumulated pension assets the size of their economies. Pension policy is path dependence: what a country decided generations ago determines today whether its old owe their income to contributors or to the capital markets.⁸

⁷ Feldstein (1974) examined early how a pay-as-you-go social security displaces private saving; the debate over his finding continues to this day.

⁸ On the displacement of private saving by pay-as-you-go, fundamentally Feldstein (1974); the asset ratios according to Thinking Ahead Institute (2025).

Table 1: The largest pension markets in the world (end-2025)

Market	Assets, USD bn	Share of largest 22	Assets in per cent of GDP*
US	44,900	65.8%	130%
Canada	3,755	5.5%	148%
Japan	3,414	5.0%	81%
United Kingdom	3,065	4.5%	88%
Australia	2,045	3.0%	146%
Netherlands	1,707	2.5%	143%
Switzerland	1,365	2.0%	152%
Largest 22 markets in total	68,274	100%	—

Source: Thinking Ahead Institute (2026), Global Pension Assets Study; own compilation.

Notes: * Ratios as at end-2024 (Thinking Ahead Institute, 2025). Country values partly rounded, derived from the published shares.

Across the three tiers runs the second great distinction: defined benefit against defined contribution. Under a defined benefit promise, the carrier guarantees a certain pension — the investment risk lies with the employer or the fund. Under defined contribution, only the contribution is fixed; what comes out at the end depends on the investment, and the saver bears the risk. The world's direction is unambiguous: 63 per cent of the assets of the seven largest markets now sit in defined contribution arrangements, which have grown three times as fast as the old defined benefit promises for ten years. For the individual, this shift means nothing less than that the investment decision — the equity share above all — has passed from the employer to him.⁹

Table 2: Three tiers of retirement provision at a glance

Feature	State provision	Occupational provision	Private provision
Financing	pay-as-you-go, partly reserve funds	funded	funded
Carrier	state, social insurance	employers, funds	individual, banks, insurers
Participation	compulsory	compulsory or voluntary by country	voluntary
Investment risk	taxpayers and contributors	fund or employee	employee
Examples	Social Security, AHV, state pension	401(k), BVG funds, company pensions	IRA, pillar 3a, Riester, iDeCo

Source: Own presentation.

Notes: Simplifying overview; hybrid forms — such as state reserve funds investing in markets — are treated in Chapter 7.

How well these tiers carry together is measured by replacement rates — the pension as a share of previous earnings — and by system comparisons such as the Mercer CFA Global Pension Index, which grades 52 systems for adequacy, sustainability and integrity.

⁹ Thinking Ahead Institute (2026): defined contribution 63 per cent of the assets of the seven largest markets; ten-year growth 9.4 per cent per annum against 3.2 per cent for defined benefit.

Together they yield a telling picture: Austria pays the highest replacement rates of the comparison out of its pay-as-you-go system, yet receives one of the weakest system grades for lack of funding; the Netherlands combine a high replacement rate with the best grade in the world; Switzerland sits mid-field on the mandatory replacement rate but, thanks to its capital stock, among Europe's best-graded systems. Table 3 in Chapter 5 brings the two together. Replacement rate and system stability are two different questions — whoever looks only at today's pension level overlooks who is to pay it tomorrow.¹⁰

3 The United States: Funding as a National Pastime

3.1 The State Pension: Pay-As-You-Go with an IOU Reserve

American Social Security is a classic pay-as-you-go scheme with one peculiarity: its reserve — still USD 2,560 billion at the end of 2025 — is invested exclusively in non-marketable special-issue securities of its own Treasury. The state thus borrows the contribution surpluses from itself and pays interest on them; equities or corporate bonds the fund does not hold. This reserve is melting: according to the 2026 trustees' report, the old-age fund will be depleted in the fourth quarter of 2032; from then on, current contributions could pay only 78 per cent of scheduled benefits. America's state tier is thus the opposite of an investor — and precisely that explains why the funded provision of the Americans has grown so large.¹¹

How risky the promise of a pay-as-you-go scheme without a true capital stock can be has also been shown for the pension plans of the US states and municipalities — America's second state-adjacent tier. These plans are funded, but only to a good three quarters: their funded ratio stood most recently at 76.7 per cent, computed with a discount rate of around seven per cent that simply equals the hoped-for investment return. Novy-Marx and Rauh (2011) demonstrated that the gap is a multiple of the reported figure under market-consistent discounting; Andonov, Bauer and Cremers (2017) show the incentive mechanism behind it: because a higher discount rate shrinks the reported gap, it is precisely the underfunded public funds that choose riskier investments — and, unlike funds in other countries, they raise their risk the more pensioners they already have to serve. An object lesson in how accounting rules make investment policy.¹²

¹⁰ OECD (2025), Pensions at a Glance; Mercer and CFA Institute (2025), Global Pension Index: Netherlands grade A (85.4 points), Switzerland B (72.4, rank 11), Germany B (67.8), US C+ (61.1), Japan C (56.3), Austria C (54.5).

¹¹ Board of Trustees (2026), annual report: reserves USD 2,560 billion at end-2025; depletion of the old-age fund in the fourth quarter of 2032, thereafter 78 per cent of benefits; both funds combined third quarter of 2034 (83 per cent).

¹² NASRA (2025), Public Fund Survey for fiscal year 2024: funded ratio 76.7 per cent, median discount rate 7.0 per cent; Novy-Marx and Rauh (2011): market-consistent discounting triples the funding gap; Andonov, Bauer and Cremers (2017), the effect being most pronounced where boards are politically staffed.

3.2 Section 401(k) and IRA: the Private Main Load

The road there took half a century of legislation. The pension security act ERISA of 1974 subjected occupational defined benefit plans to nationwide protection and funding rules for the first time and, with the individual retirement account (IRA), created the first tax-favoured vehicle for everyone; the Revenue Act of 1978 added that section 401(k) from which, after 1981, today's standard plan grew. Since then the investment risk has migrated from employer to employee in two great waves: private defined benefit plans were closed or frozen, and defined contribution became the normal case instead of the supplement. Even the state as employer follows this logic: the Thrift Savings Plan of federal employees — at USD 1.1 trillion one of the largest plans in the world — consists of a handful of index funds costing a few basis points and is widely regarded as a model of what defined contribution provision can be: simple, cheap, broadly diversified.¹³

The actual provision of the Americans takes place in the funded vehicles, which together reach USD 49.1 trillion — more than a third of households' entire financial wealth. The largest parts: USD 19.2 trillion in individual retirement accounts, USD 14.2 trillion in employers' defined contribution plans — of which USD 10.1 trillion in 401(k) plans — plus USD 10.0 trillion in the defined benefit promises of states and municipalities and USD 3.1 trillion in private defined benefit plans. The system is a child of the tax code: the 401(k) plan grew from a single section of the income tax law, permits tax-deferred contributions of USD 24,500 a year in 2026 (individual retirement accounts: 7,500) and displaced the classic company pension within a generation.¹⁴

Two peculiarities make the American model especially interesting for this paper. First, the employer match: the typical plan adds fifty cents to every dollar the employee contributes on the first six per cent of pay — on average the employer contributes 4.6 per cent of pay. Secondly, the behavioural architecture: ever since Madrian and Shea (2001) showed that automatic enrolment raises participation dramatically, automatic rules have become standard — 61 per cent of plans enrol new employees automatically, mostly into a target-date fund that lowers the equity share with age and holds ninety per cent equities for young savers. Behavioural economics has thus depersonalised the investment decision: whoever does nothing still saves — and saves equity-rich.¹⁵

3.3 Why America Holds the Highest Equity Share

¹³ Employee Retirement Income Security Act of 1974; Revenue Act of 1978 (adding Section 401(k) to the Internal Revenue Code); Thrift Savings Plan assets: Investment Company Institute (2026).

¹⁴ Investment Company Institute (2026), quarterly data as at end-2025; contribution limits 2026: Internal Revenue Service (2025). On the displacement of defined benefit, also Thinking Ahead Institute (2026).

¹⁵ Vanguard (2025), How America Saves: most common match formula 50 per cent on 6 per cent of pay, average employer contribution 4.6 per cent, 61 per cent of plans with automatic enrolment, target-date equity share at age 25: 90 per cent; Madrian and Shea (2001): participation of 37 per cent under opt-in against 86 per cent under automatic enrolment; on naive diversification in defined contribution plans Benartzi and Thaler (2001).

In sum, American pension assets hold around 50 per cent equities — together with Australia (52 per cent) the highest figure among the large markets and twice as much as Japan (Figure 1 in Chapter 5). Three causes work together. First, the structure: defined contribution dominates, and its target-date funds are equity-heavy while retirement is distant. Secondly, the incentives of the public funds, which could not reach their return target of around seven per cent without high equity and private equity quotas — 44.4 per cent listed equities plus 13.6 per cent private equity are the normal case there. Thirdly, the culture of a country in which the share has counted for generations as a self-evident part of retirement provision and the state rewards funding through the tax code rather than eyeing it with suspicion. Whoever admires American return stories should know: behind them stands less genius than quota.¹⁶

4 Japan: the Largest Pension Fund in the World

4.1 GPIF: Investing by a Constitution of Quarters

Japan's state pension is pay-as-you-go — but with the largest reserve fund in the world. The Government Pension Investment Fund (GPIF) managed around 318 trillion yen at the end of June 2026, the equivalent of a good two trillion US dollars and thus more than the Norwegian sovereign wealth fund. Its investment policy is of disarming simplicity: 25 per cent each in domestic equities, foreign equities, domestic bonds and foreign bonds, with fixed bands and rule-bound rebalancing. Since 2001 this quartering has delivered 4.95 per cent per annum and a cumulative investment return of 221 trillion yen — earned by an agency that issues no forecasts but holds a quota. Remarkable is where that quota came from: until 2014 the fund held mostly Japanese government bonds; only the reform of that year doubled the equity weights to today's level — one of the largest investment decisions in history, taken by changing a rule.¹⁷

Beneath the state fund, however, Japan remains the country of the bond. The occupational defined benefit plans manage some 69 trillion yen in traditionally bond-heavy fashion; the younger defined contribution plans hold around 24 trillion, and only there is the picture changing: the share of pure safety products — deposits and insurance — has fallen within a few years from a good 45 to around 31 per cent, while the equity fund share rises. In total, Japan's pension wealth holds 25 per cent equities and 55 per cent bonds — almost the mirror image of the United States. The causes range from three decades of

¹⁶ Equity quotas: Thinking Ahead Institute (2025) as at end-2024; public funds: NASRA (2025) and Reason Foundation (2025); private equity 13.6 per cent.

¹⁷ GPIF (2026), quarterly report as at 30 June 2026: 317.8 trillion yen; since fiscal 2001: +4.95 per cent per annum, cumulative 221.0 trillion yen; target weights of 25 per cent each with bands of ± 5 to ± 9 percentage points.

deflation experience through home bias to the caution of an ageing society; the consequences are borne by the saver in the form of lower long-term returns.¹⁸

Behind Japanese caution stands demography: no large country is ageing faster, ever fewer contributors face ever more pensioners, and the reserve fund exists expressly to relieve the pay-as-you-go system in the decades of steepest ageing — its horizon is long, but finite. Remarkable is how calmly the GPIF organises this brief: a lean staff awards management overwhelmingly to external houses, measured against clear benchmark indices, and its own results are published quarterly — rule-binding and accountability replace the forecast. That Japanese provision as a whole is nonetheless graded weakly lies not with the fund but with the ratio of promises to contributions in the pay-as-you-go scheme beneath it.¹⁹

4.2 iDeCo and NISA: Japan's Late Tax Turn

For the individual, Japan took tax support seriously only late — and is now catching up. The individual contribution account iDeCo permits fully deductible contributions — 23,000 yen a month for employees without a company pension, 68,000 for the self-employed — and from 2027 the ceiling for employees rises to 62,000 yen, almost threefold. Larger still is the effect of the NISA account renewed in 2024: 3.6 million yen may be invested each year, 18 million over a lifetime, and all returns remain tax-free indefinitely. The reform has set off an investment surge that reaches into the household statistics — and it shows how powerfully tax rules can shift the investment behaviour of an entire country: the same Japanese who stayed in passbooks for decades are now filling tax-free equity accounts.²⁰

5 Europe: Variety between Pay-As-You-Go and Capital

5.1 The Netherlands and the United Kingdom

Europe's capital-strongest provision stands in the Netherlands: pension assets of 143 per cent of economic output, a net replacement rate of 96 per cent — the highest in the OECD comparison — and the best system grade in the world. It is precisely this showcase system that is passing through the greatest upheaval in its history: the pension act of 2023 converts all funds from defined benefit to personal capital accounts by the beginning of 2028 at the latest; the health-sector fund PFZW converted at the start of 2026, and the civil servants'

¹⁸ Occupational assets: Resona Bank (2025), Nenkin Note, as at March 2025; share of safety products in the occupational defined contribution plans: 45.0 per cent in March 2021, 30.3 per cent in March 2025 (Pension Fund Association, 2025); country allocation: Thinking Ahead Institute (2025) as at end-2024.

¹⁹ GPIF (2026): over ninety per cent of assets externally managed, some 190 staff; Mercer and CFA Institute (2025): Japan grade C (56.3 points), rank 39 of 52.

²⁰ iDeCo limits and the 2027 reform: Japanese Ministry of Health, Labour and Welfare, summarised in HUB International (2026); NISA parameters: Japan Securities Dealers Association (2024).

fund ABP — Europe's largest fund with EUR 533 billion and an equity share of 31 per cent — follows in 2027. With that, investment risk migrates to the insured in Europe too, albeit collectively buffered.²¹

The United Kingdom, in turn, is the textbook case of behavioural policy: since 2012 every employee has been enrolled automatically into a workplace pension — minimum contribution eight per cent of qualifying pay, of which at least three percentage points from the employer — and only those who actively object stay out. The state-created default provider NEST now counts 13.8 million members with almost GBP 50 billion. The automatic rule works exactly as Madrian and Shea (2001) showed for America: participation has become the default, not the exception. At the same time the British example teaches humility before herd risks: in the autumn of 2022 a jump in yields forced the liability-hedging defined benefit funds into forced sales until the Bank of England stepped in.²²

5.2 Germany and Austria: Pay-As-You-Go with Trimmings

Germany and Austria continue to carry their old-age security mainly through pay-as-you-go — with small but growing islands of capital. In Germany, the cover funds of occupational pensions reach EUR 728 billion; tax support in 2026 extends to salary conversion of up to EUR 8,112 a year free of tax (half of that also free of social charges), to the basic pension of up to EUR 30,826 as special expenses, and the Riester pension persists with around 14.7 million contracts but has gained no new savers for years. Austria, alongside its strong pay-as-you-go system — net replacement rate 86.8 per cent, the second-highest of the comparison — has created two funded institutions: the Pensionskassen with, for the first time, more than EUR 30 billion for 1.13 million beneficiaries, and the severance funds of the Abfertigung Neu with EUR 23.6 billion.²³

The Austrian case deserves a second look, because it condenses the chapter's tension: pay-as-you-go delivers high pensions today, but the Mercer index grades the system C, rank 42 of 52, for lack of funding and ageing — below Japan. Tax support for self-provision remains modest: employers may deduct pension fund contributions of up to ten per cent of the payroll, employees keep EUR 300 of future-security payments tax-free, and the premium-aided Zukunftsvorsorge carries a state premium of 4.25 per cent on at most EUR 3,817 of annual contributions — magnitudes that close no provision gap. Sweden shows the counter-model within Europe: part of the state contribution flows into individual

²¹ OECD (2025); Mercer and CFA Institute (2025): Netherlands 85.4 points, first place; ABP (2026), annual report 2025; conversion timetable under the Wet toekomst pensioenen (in force since 1 July 2023).

²² The Pensions Regulator (2025): contribution rates since April 2019; NEST (2025), annual report as at 31 March 2025; on the hedging crisis of 2022, Bank of England (2022), Financial Stability Report.

²³ Germany: aba (2025), cover funds 2023: EUR 727.9 billion; contribution ceiling 2026: EUR 101,400, of which 8 per cent under Section 3 no. 63 of the Income Tax Act = EUR 8,112; BMAS (2026), Riester statistics. Austria: FMA (2026), as at end-2025.

premium accounts whose state default fund AP7 invests the young one hundred per cent in equities and only begins shifting at 55 — life-cycle investing as a state programme.²⁴

5.3 The Equity Share as a Question of Region

Figure 1 condenses the chapter into one picture: Australia and the United States hold around half of their pension wealth in equities, Canada likewise, while Switzerland, the Netherlands, the United Kingdom and Japan lie between 25 and 29 per cent. The explanation is less temperament than institutional economics. Where defined contribution with a long horizon dominates and regulation sets no tight quotas, the equity share rises; where guarantee-like defined benefit promises must be carried on balance sheets — as in the old Dutch and British funds — supervision pushes into bonds; and where, as in Switzerland, property traditionally makes up a fifth of the portfolio, arithmetic leaves less room for equities. Whoever compares equity quotas always compares legal orders too — an insight that guards against quick verdicts about “brave” and “timid” investors.²⁵

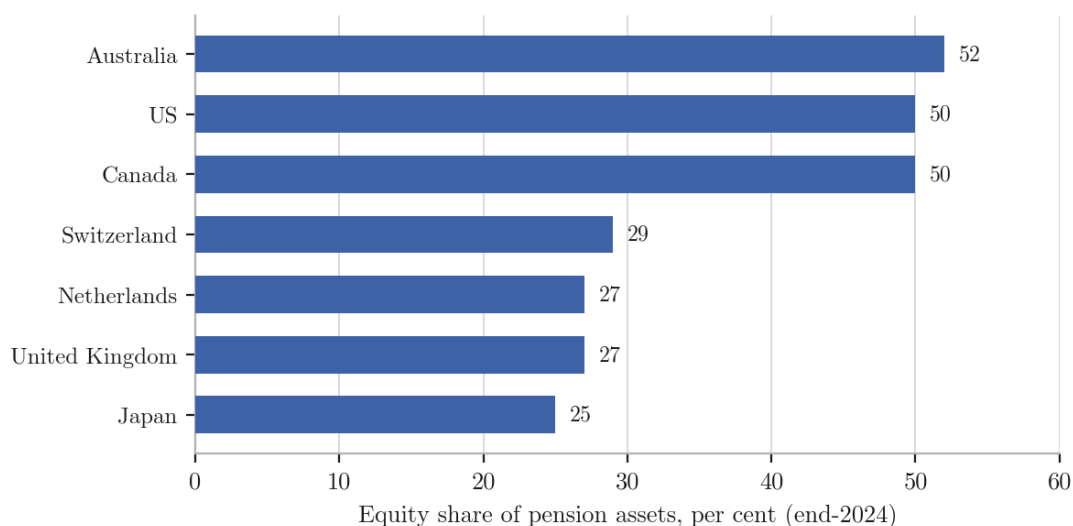


Figure 1: Equity share of pension assets in the seven largest markets, per cent (end-2024).
Source: Thinking Ahead Institute (2025); own presentation.

²⁴ Mercer and CFA Institute (2025): Austria 54.5 points (grade C, rank 42 of 52); Section 4(4) no. 2 of the Austrian Income Tax Act (deduction of up to ten per cent of the payroll); WKO (2026) on the future-security payment and the premium-aided scheme; AP7 (2026), annual report 2025: SEK 1,500 billion, equity share 100 per cent to age 55; the buffer funds AP1-AP4 and AP6 together managed SEK 2,234 billion at end-2025.

²⁵ Thinking Ahead Institute (2025), allocations as at end-2024; on regulation as a cause, Andonov, Bauer and Cremers (2017).

Table 3: Replacement rate and system grade compared

Country	Net replacement rate, mandatory	Mercer CFA grade 2025 (points)	Rank of 52
Netherlands	96.0%	A (85.4)	1
Austria	86.8%	C (54.5)	42
Germany	53.3%	B (67.8)	22
US	51.3%	C+ (61.1)	30
Switzerland	47.5%	B (72.4)	11
Japan	42.4%	C (56.3)	39

Source: OECD (2025), Pensions at a Glance (net replacement rates of mandatory schemes, average earner); Mercer and CFA Institute (2025); own compilation.

Notes: Germany including voluntary provision: 67.9 per cent; the US including typical 401(k) contributions markedly higher. Ranks per the results table of the index press release. The replacement rate measures the pension level, the grade also sustainability and integrity of the system.

A second regional difference is quieter but just as consequential: costs. Institutional provision buys management wholesale — the American Thrift Savings Plan runs on a few basis points, and even average large funds pay fractions of what private investors are charged in retail funds. Where provision is organised through individual contracts, by contrast, acquisition and administration costs eat visibly into the result; the United Kingdom drew the conclusion and capped the running costs of the default funds of its automatic enrolment at 0.75 per cent. For the comparison of systems this means: a country supports funding not only through tax rules but also through how cheaply it gives the saver access to the market.²⁶

6 Switzerland: Provision as the Company's Business

6.1 The Model: Compulsory, Joint, Close to the Firm

Switzerland made occupational provision compulsory in 1985 and gave it a peculiarity that distinguishes it from almost all neighbours to this day: not the state but the company provides. Every employer must attach its staff to a provident institution — a company pension fund of its own or a collective foundation — and must bear at least half of the contributions; many voluntarily pay more. In the extra-mandatory part, freedom of design is wide: banks in particular sometimes double the employer contribution for senior and executive staff as a deliberate instrument of retention — a quiet pay rise that is regularly underestimated when jobs are changed. Thus 1,292 provident institutions have arisen with

²⁶ Charge cap on British default funds: 0.75 per cent per annum under the Occupational Pension Schemes (Charges and Governance) Regulations 2015 of the Department for Work and Pensions (DWP, 2015), unchanged in 2026; on the management costs of large funds also Rupprechter (2026d).

a balance sheet total of CHF 1,220.6 billion — 152 per cent of economic output, the highest figure in the world, around CHF 135,000 per inhabitant.²⁷

Table 4: Switzerland's occupational provision in figures

Indicator	Value
Balance sheet total of all institutions (end-2024)	CHF 1,220.6bn
Provident institutions / active insured	1,292 / 4.79m
Asset allocation equities / property / bonds	31.6 / 21.9 / 26.9%
Net return 2024 / 2025	7.6% / 5.3%
Funded ratio of private-law funds (2025)	120.3%
BVG minimum interest / minimum conversion rate	1.25% / 6.8%
2026	
Entry threshold / coordination deduction 2026	CHF 22,680 / 26,460
Pillar 3a maximum 2026 (with / without pension fund)	CHF 7,258 / 36,288

Source: BFS (2026), pension fund statistics 2024; Swisscanto (2025, 2026); 2026 parameters per the official threshold amounts; own compilation.

Notes: The reduction of the minimum conversion rate to 6.0 per cent was rejected in the referendum of 22 September 2024. Above 1.5 times the upper BVG salary limit (CHF 136,080), insured persons in 1e plans may choose the investment strategy themselves.

The mechanics of the mandatory part are strictly regulated: insured is the salary between the entry threshold and the upper limit, reduced by the coordination deduction; on this, retirement credits are due that rise with age from 7 to 18 per cent of insured pay. The accumulated retirement capital must earn the minimum interest rate and is translated at retirement into a lifelong pension at the conversion rate of 6.8 per cent — a rate whose reduction the electorate rejected in 2024 and which, at today's life expectancy, works a quiet redistribution from the active to the pensioners. For the investments, the ordinance sets guardrails — equities at most half of assets, property at most three tenths — within which the board of trustees decides freely; the funds' actual quotas lie well below these ceilings.²⁸

What does this model deliver? Measured by pension assets, Switzerland leads the world; on the level of the pension itself the picture is more differentiated. The replacement rate of the mandatory part sits, at 47.5 per cent, only mid-field, because Swiss pay is high and the mandatory part insures salaries only up to CHF 90,720; the strength of the model therefore lies not in the highest single pension but in the capital stock that carries it and in the breadth of coverage. Remarkably developed is survivor provision: the AHV pays widows 80 per cent of the underlying old-age pension, and the pension fund pays the surviving spouse at least 60 per cent of the old-age pension — quotas at the upper end of

²⁷ Art. 66 BVG (employer to bear at least half of the contributions); BFS (2026), pension fund statistics 2024. The observation on the doubling practice of individual banks for senior staff stems from the author's long professional practice in Switzerland.

²⁸ Retirement credits: Art. 16 BVG (7, 10, 15 and 18 per cent by age bracket); investment limits: Art. 55 BVV 2 (50 per cent equities, 30 per cent property); referendum of 22 September 2024 on the occupational pension reform: rejected.

the European range, even though no systematic country comparison of survivor benefits exists. The legislator is working on a reordering. And the returns bear inspection: 7.6 per cent net in 2024, 5.3 per cent in 2025, with funded ratios above 120 per cent in the private-law funds.²⁹

Why do Germany and Austria not have this model? The honest answer is: path dependence and distribution politics. Where pay-as-you-go promises high replacement rates, the pressure to erect a second, compulsory capital stock beside it is missing — and any introduction of compulsory funding feels in the short run like a pay cut whose yield becomes visible only decades later. Switzerland crossed that dry stretch in the decades after 1985; today it harvests the fruit, with a capital stock of over CHF 1.2 trillion and pensions fed by returns rather than by contributions alone. For the neighbours this is less reproach than route description: the best moment to erect a funded tier was forty years ago — the second best is now.³⁰

6.2 Tender, Ranking, Greyhound Race

The investment organisation of the Swiss funds is as division-of-labour as any in this series. The board of trustees — composed in equal parts of employer and employee representatives — sets the investment strategy and guidelines; implementation is tendered externally by many institutions, often split into several like mandates for competing managers. The process is accompanied by specialised houses: consulting and controlling firms such as PPCmetrics or Complementa — whose Risiko Check-up has covered the greater part of Swiss pension assets for three decades — organise tenders and monitor the mandates continuously, while audit firms such as PwC and KPMG, as statutory auditors, attest compliance with law and regulations.³¹

Out of this division of labour has grown a practice known in the industry as the greyhound race, which the author knows from years of his own professional practice: the controlling houses evaluate the mandates awarded with the same investment objective every six or twelve months and draw up a ranking — by return, risk measures and fidelity to the prescribed strategy. Whoever repeatedly brings up the rear of the ranking usually loses the mandate, which is then re-tendered. The effect is double-edged and instructive for precisely that reason. On the one hand the race palpably raises discipline: no manager

²⁹ AHV widow's pension: Art. 36 AHVG, 80 per cent of the underlying old-age pension (AHV/IV leaflet 3.03); BVG spouse's pension: Art. 21 BVG, at least 60 per cent; replacement rate: OECD (2025): 47.5 per cent mandatory. On the reordering: message of the Federal Council of 23 October 2024, approval by the National Council in September 2025, before the Council of States committee in the summer of 2026. Returns and funded ratios: Swisscanto (2025, 2026).

³⁰ Cf. the replacement rates and system grades of Table 3; on the political economy of pay-as-you-go, Feldstein (1974).

³¹ Complementa (2025), Risiko Check-up (31st edition; the previous edition covered around CHF 810 billion); on the role of the audit firms, the BVG audit services of KPMG and PwC Switzerland.

can afford to stretch the investment guidelines or to take bets outside the brief, for the measurement is against colleagues with an identical brief — style drift shows at once.³²

On the other hand, research knows the reverse side of dismissal by ranking: Goyal and Wahal (2008) showed for thousands of American mandate decisions that the managers who shone before appointment delivered nothing above average afterwards, and that those dismissed did no worse than their successors — whoever hires and fires on past returns alone buys dear and sells cheap. The Swiss procedure escapes this error where it is done well: the ranking measures not only return but above all fidelity to rules — departure from the brief weighs more heavily than a weak half-year — and dismissal follows indiscipline, not bad luck. Understood in this way, the greyhound race is less a chase for returns than institutionalised supervision: it holds all involved to the written strategy — the true gain of the procedure.³³

Two younger developments round off the picture. First, consolidation: more and more companies give up their own fund and join collective foundations — the number of institutions has been falling for years while the professionalism of the remainder rises. Secondly, executive provision: for salary parts above CHF 136,080, insured persons in so-called 1e plans may choose the investment strategy themselves — around ten billion francs already sit in such plans, which cautiously open the Swiss collective model towards the American self-decision. Switzerland is thus moving, on both levels, towards where this paper began: more contribution logic, more personal responsibility, more equity share for those who want it and can bear it.³⁴

³² The author's own professional experience as a mandate holder in such procedures; on the measurement logic of comparison against like mandates, also Complementa (2025).

³³ Goyal and Wahal (2008); cf. also the results on mandate awarding in Rupprechter (2026d), Chapter 6.

³⁴ Vorsorgeforum (2025): 1e volume around ten billion francs, some 46,000 insured; threshold 2026: CHF 136,080 (Art. 1e BVV 2).

7 Do States and Central Banks Invest Too?

7.1 State Reserve Funds: Yes — and by Rules

The chapter's first answer is: yes, states too invest for the pension — where they have placed a true capital stock beside their pay-as-you-go scheme. Japan's GPIF was described in Chapter 4; Table 5 sets its closest relatives beside it. Canada decided in 1996/97 to move its state supplementary pension to partial funding, founded the Canada Pension Plan Investment Board for the purpose in 1997 and has been investing since 1999 — CAD 793 billion, a net 8.8 per cent per annum over ten years, invested with high equity and private-holding quotas after the model of the great university endowments. Sweden runs, beside its buffer funds, the individual premium pension with the equity-rich state fund AP7. Switzerland holds in compenswiss an equalisation fund of a good CHF 50 billion for its first-pillar schemes, which earned a net 6.3 per cent in 2025. And the United States shows the opposite pole: the Social Security reserve may hold nothing but IOUs of its own government — no investing takes place there.³⁵

Table 5: State pension reserve funds compared

Fund (country)	Assets	Investment policy
GPIF (Japan)	JPY 317.8tn (6/2026)	25% each domestic and foreign equities and bonds
Government Pension Fund Global (Norway)	NOK 21,268bn (2025)	71% equities, index-near, rule-bound
CPP Investments (Canada)	CAD 793.3bn (3/2026)	active, high equity and private-holding share
AP1-AP4, AP6 (Sweden)	SEK 2,234bn (2025)	buffer of the pay-as-you-go scheme, broadly spread
AP7 (Sweden, premium pension)	SEK 1,500bn (2025)	100% equities to age 55, then reduction
compenswiss (Switzerland)	CHF 50.6bn (2025)	broadly spread, high liquidity
Social Security Trust Fund (US)	USD 2,560bn (2025)	exclusively IOUs of the US Treasury

Source: Annual and quarterly reports of the funds named (2025/2026); Board of Trustees (2026); own compilation.

Notes: Norway serves intergenerational equalisation without securitised pension claims; the other funds expressly support pension systems.

7.2 States as Debtors: the Eternal Roll

To be distinguished from investing is the debt management of states — and here lies the answer to an often-asked question: do states raise new money chiefly to service the interest and repayments of old bonds? In essence, yes. The German federal government plans

³⁵ CPP Investments (2026), as at 31 March 2026; AP7 (2026); compenswiss (2026); Board of Trustees (2026). On the Norwegian sovereign fund as the special case of a pension reserve without pension liabilities, Rupprechter (2026d).

issuance of EUR 512 billion for 2026, matched overwhelmingly by maturing paper; Austria's financing agency issues EUR 43 to 47 billion of federal bonds; and for the United States the government auditors have reckoned that of eleven trillion dollars of gross issuance in fiscal 2025, a good nine trillion — 83 per cent — served merely to refinance maturing debt. States, then, do not repay; they roll: old bonds are replaced at maturity by new ones for as long as investors trust the debtor. That is no scandal but the nature of sovereign credit — yet it explains why a state is not an investor: it stands on the other side of the market.³⁶

7.3 Central Banks: Investors by Accident — and by Design

Central banks, in turn, raise no bonds at all to service old ones — they need not, for they pay in central bank money of their own creation. Where they do issue debt paper, as the Swiss National Bank issues its SNB Bills, it serves the steering of liquidity, not financing. As holders of securities, central banks are nonetheless magnitudes of their own order, along two quite different paths. The first is monetary policy: the Federal Reserve still holds USD 6,462 billion of government bonds and mortgage paper from its purchase programmes, the Eurosystem EUR 3,643 billion — holdings that have been melting by plan since the programmes ended and whose interest losses currently shape entire central bank accounts: the Bundesbank booked, at EUR 19.2 billion in 2024, the largest loss of its history and has distributed nothing to the federal budget for six years.³⁷

These losses deserve sober classification. A central bank cannot become illiquid like a company — it pays in money of its own creation — and negative equity does not end its ability to operate; the losses arise because higher interest must now be paid on the bank reserves created in the purchase era than the low-yielding bonds acquired then bring in. The fiscal effect is real nonetheless: where central bank profits once flowed into state budgets — the Bundesbank still transferred EUR 5.9 billion for 2019 — nothing flows for years until the loss carryforwards are worked off. For the investor this is perhaps the clearest illustration of the interest-rate risk of long bonds: it spares not even the institutions that set the interest rate themselves.³⁸

The second path is investment in the proper sense — and here two houses stand for two extremes. The Swiss National Bank invests its currency reserves of CHF 759 billion like a sovereign wealth fund: a good quarter in equities, spread broadly across thousands

³⁶ Deutsche Finanzagentur (2025), issuance plan 2026: EUR 512 billion (318 capital market, 176 money market, plus green issues); OeBFA (2025), funding programme 2026; U.S. Government Accountability Office (2026): USD 9.1 of 11.0 trillion refinancing in fiscal 2025.

³⁷ Federal Reserve (2026), statement as at 26 August 2026: USD 4,546 billion Treasuries, 1,914 billion mortgage securities; balance sheet run-off ended as of 1 December 2025. ECB (2026), weekly financial statement as at 26 June 2026. Deutsche Bundesbank (2025, 2026): loss 2024: 19.2, 2025: 8.6 billion euros; last distribution in 2020 for the year 2019.

³⁸ Deutsche Bundesbank (2026): loss carryforward EUR 27.8 billion; last distribution of EUR 5.9 billion in 2020 for financial year 2019.

of stocks, excluding systemically important banks and grave norm-breakers; its US equity holdings alone reached a record USD 191 billion in mid-2026, and the 2025 result — a profit of CHF 26.1 billion, carried by gold — shows the swings of such balance sheets. The Bank of Japan, by contrast, bought equity funds of its own market from 2010 to 2024 as the only large central bank to do so, and now sits on holdings of around 37 trillion yen at book values, whose market value the equity rally has since driven above 110 trillion yen. Since 2026 it has been selling: at around 330 billion yen of book value a year, a pace at which the unwinding would take more than a century. It is perhaps the most vivid lesson of the chapter: into securities leads a decision — out of them leads a task for generations.³⁹

Table 6: Central banks as holders of securities

Central bank	Holdings	Nature and purpose
Swiss National Bank	CHF 759bn currency reserves (2025)	investment of reserves; a good quarter equities
Bank of Japan	c. JPY 37tn ETF book value	monetary-policy legacy; sales from 2026 over generations
Federal Reserve	USD 6,462bn (8/2026)	bonds from purchase programmes, melting
Eurosystem	EUR 3,643bn (6/2026)	bonds from purchase programmes, melting
Deutsche Bundesbank	part of the Eurosystem	losses 2024/25: EUR 19.2bn and 8.6bn

Source: SNB (2026); Bank of Japan (2025); Federal Reserve (2026); ECB (2026); Deutsche Bundesbank (2026); own compilation.

Notes: Central banks finance themselves by creating central bank money; own debt certificates such as the SNB Bills serve liquidity steering, not the refinancing of interest and redemptions.

8 Conclusions for Private Investors

8.1 From When Private Provision Pays

The first conclusion is an order of steps. Private provision pays immediately and without exception where an employer contributes: whoever leaves a fifty per cent match on the table — as the typical American plan grants — forgoes a safe, immediate return that no capital market offers; the same holds for the Swiss senior staff whose houses voluntarily double the contribution, and for every salary conversion with an employer top-up. In second place come the tax-favoured vehicles of Table 7: whoever in Switzerland puts CHF 7,258 into pillar 3a saves, at a marginal tax rate of thirty per cent, over two thousand francs of tax in the year of the contribution — the later withdrawal tax is markedly milder; salary conversion and the basic pension in Germany, iDeCo in Japan, 401(k) and IRA in

³⁹ SNB (2026), annual result 2025; US holdings per the 13F filing as at 30 June 2026: USD 191.4 billion. Bank of Japan (2025), decision of 19 September 2025: ETF sales of around 330 billion yen book value per year (around 620 billion at market values), start January 2026; market value of the holdings around 83 trillion yen in September 2025 and above 110 trillion by mid-2026; duration of the unwinding: own calculation (37 trillion / 0.33 trillion $\approx$ 112 years).

the United States work comparably. Only in third place follows the free portfolio — not because it invests worse, but because it lacks match and tax advantage.⁴⁰

How much the early start matters is shown by a simple sum. Whoever invests 500 euros a month from age thirty at five per cent a year reaches around 554,000 euros by sixty-five — 210,000 of it paid in. Whoever starts only at forty-five arrives, despite contributions of a full 120,000 euros, at around 203,000: less than half, on a good half of the contributions. The answer to the question of when private provision begins to pay is therefore: from the first year of work — not because early francs and euros are better, but because they work longer. The same sum explains why the employer match weighs so heavily: it raises not only the contribution but every future compound return on it.⁴¹

Table 7: Tax-favoured provision 2026 in a five-country comparison

Country	Vehicle	Maximum 2026	Effect
Switzerland	pillar 3a; buy-in to the pension fund	CHF 7,258 (with PF); buy-in individual	fully deductible; mild withdrawal tax
Germany	salary conversion (Sec. 3 no. 63); basic pension	EUR 8,112; EUR 30,826	tax-free or special expenses; taxed downstream
Austria	future-security payment; premium-aided Zukunftsvorsorge	EUR 300; EUR 3,817	tax-free; premium 4.25%
US	401(k); IRA	USD 24,500; USD 7,500	tax-deferred; often employer match
Japan	iDeCo; NISA	JPY 276,000 p.a.*; JPY 3.6m p.a.	fully deductible; returns tax-free

Source: Official 2026 threshold amounts of the respective countries (IRS, Income Tax Act, WKO, BSV, Japanese Ministry of Health, Labour and Welfare); own compilation.

Notes: * Employees without a company pension (23,000 yen monthly; from 2027: 62,000). Simplified overview without special rules; downstream taxation in retirement differs by country.

8.2 Which Equity Share at Which Age

The second conclusion concerns the investment itself. The theoretical foundation was laid by Samuelson (1969) and Merton (1969) — although in their basic model without earned income the optimal equity share is precisely independent of age, and Samuelson himself rejected the notion that a long horizon alone justifies more equities. The link to age is established only by Bodie, Merton and Samuelson (1992): whoever still has decades of earnings ahead owns, in his human capital, a bond-like asset and can moreover offset a poor run of markets by working longer or more — this flexibility of labour supply acts like an insurance and diminishes with age. That is precisely what the target-date funds of the

⁴⁰ Match formulas: Vanguard (2025); Swiss doubling practice: the author's professional experience; tax effect of pillar 3a: own calculation at a thirty per cent marginal rate.

⁴¹ Own calculation with monthly compounding, before costs and taxes; the five per cent are to be read as the real order of magnitude of long-term equity returns after Dimson, Marsh and Staunton (2026), and the terminal values accordingly in today's purchasing power.

American plans and the Swedish AP7 implement: ninety to one hundred per cent equities in youth, planned reduction from the mid-fifties to protect the years just before retirement against a crash. Figure 2 shows this glide path beside the old rule of thumb “100 minus age”; Table 8 translates it into a framework oriented on retirement at 65, to be adjusted in the individual case for risk tolerance, other wealth and safeguards.⁴²

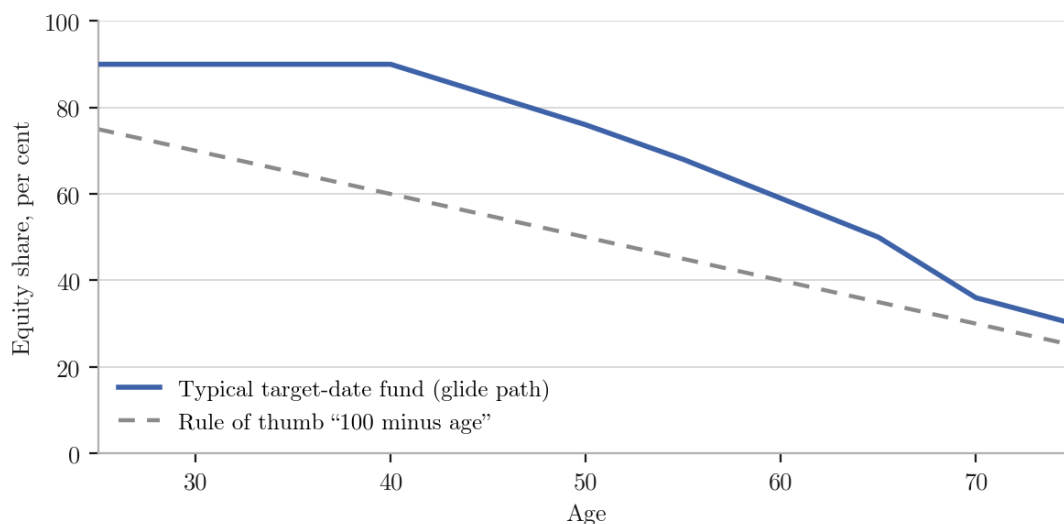


Figure 2: Equity share over the life cycle: typical glide path of a target-date fund and the rule of thumb “100 minus age”. Source: Vanguard (2026), stylised; own presentation.

Table 8: Equity share by phase of life: a frame of orientation

Phase of life	Equity share	Reasoning
to about 40	80 to 100%	long horizon, large human capital; setbacks are saved away
about 40 to 55	60 to 80%	horizon still long; first securing of gains
about 55 to 65	40 to 60%	protecting the final saving years from severe setbacks
in retirement	30 to 50%	withdrawal phase: limit swings, preserve purchasing power

Source: Own presentation based on Bodie, Merton and Samuelson (1992) and the glide paths of large target-date funds (Vanguard, 2026).

Notes: A frame of orientation, not advice in the individual case; decisive are risk tolerance, other wealth, safeguards and the true investment horizon, which with partial annuitisation reaches well beyond the retirement date.

Three additions belong to the frame. First, automation: Madrian and Shea (2001) showed that in pension matters people do one thing above all — nothing; whoever sets savings plan, annual increase and target quota once and firmly uses his own inertia instead of failing by it. Secondly, diversification: Benartzi and Thaler (2001) found that pension

⁴² Samuelson (1969) and Merton (1969) on the horizon-independent basic model; Bodie, Merton and Samuelson (1992) on human capital and labour supply flexibility; glide path of the target-date funds: Vanguard (2026); AP7 (2026).

savers spread naively across the funds on offer rather than across markets — one global equity fund solves the problem more thoroughly than ten product names. Thirdly, the investment's end of life: whether the capital is annuitised or drawn is the last great decision. Yaari (1965) showed that full annuitisation is optimal so long as there is no bequest motive and the annuity is priced on actuarially fair terms; Mitchell, Poterba, Warshawsky and Brown (1999) measured how far practice departs from that: a sixty-five-year-old man received, depending on mortality table and discount rate, between 81 and 93 cents of present value for every dollar paid in. In Switzerland, ever more insured nonetheless draw capital instead of pension — whoever considers that should know the arithmetic of the conversion rate: 6.8 per cent on the mandatory part is, at today's life expectancy, a promise that is hard to replicate privately.⁴³

8.3 What Can Be Copied from the Greyhound Race

The third conclusion leads back to the Swiss awarding practice. What the greyhound race does for funds, the private investor can set up for himself — in a civilised form. Worth copying is the basis: a written investment strategy with target quotas, bands and exclusions against which the own portfolio can be measured. Worth copying is the rhythm: a fixed annual review — does the portfolio keep its quotas, are the costs right, does every fund still do what it was bought for? And worth copying is the criterion: dismissal for breach of rules, not for one weak year. Not worth copying is blind firing by ranking — Goyal and Wahal (2008) showed that precisely this reflex costs return. The private greyhound thus runs differently: it does not chase the best fund of the last half-year but keeps its own strategy under continuous, documented supervision — institutional discipline, brought down to household size.⁴⁴

There remains the question of the model in the large. From the United States the private investor learns the equity share and the match; from Japan the rule-binding of the quarters and the power of tax-free accounts; from the Netherlands the honesty of adjusting promises to the funding; from Sweden the life cycle as default; and from Switzerland the interplay: compulsory participation, joint financing, professional awarding, continuous control. None of these lessons demands forecasts; all demand rules. Precisely therein lies the common ground with the sovereign funds and endowments of the author's preceding paper: the successful large investors differ in almost everything — except discipline.⁴⁵

9 Conclusion

⁴³ Madrian and Shea (2001); Benartzi and Thaler (2001); Yaari (1965); Mitchell, Poterba, Warshawsky and Brown (1999); on the trend to lump-sum withdrawal Swisscanto (2025).

⁴⁴ Goyal and Wahal (2008); on the mandate awarding of institutional investors in detail, Rupprechter (2026d).

⁴⁵ Rupprechter (2026d).

Funded retirement provision is the largest group of investors in the world and at the same time the most unequal: between America's 401(k) savers with half their assets in equities, Japan's rule-bound state fund, Europe's pay-as-you-go systems with islands of capital and the Swiss company-based provision lie orders, not merely percentage points. The comparison shows a recurring pattern: where provision is funded, compulsory and rule-bound, wealth grows and pensions with it; where it trusts pay-as-you-go alone, the promise hangs on the ratio of contributors to pensioners — and that ratio is tipping everywhere. The equity share, in turn, is less a question of courage than of institutions: accounting rules, forms of promise and the tax code decide how much productive capital sits in the portfolios of future pensioners.

For the private investor the paper condenses into three steps: first collect the employer's match in full, then fill the tax-favoured vehicles, then invest freely — with an equity share that follows one's age and a written strategy reviewed once a year like a Swiss mandate. Whoever proceeds in this way has adopted the best of the pension funds of three continents and has deliberately left out their greatest error — the procyclical chase after the latest ranking. The pension from capital is neither a gamble nor a privilege: it is the most patient form of earned income — pay disbursed thirty years later, compounded by the capital markets of the world.

References

Preliminary note: legal sources (BVG, BVV 2, AHVG; German Income Tax Act; Internal Revenue Code), official threshold amounts and press or data releases of individual institutions are referenced in the footnotes and table source lines and are not repeated here individually.

aba — Arbeitsgemeinschaft für betriebliche Altersversorgung (2025). Deckungsmittel der betrieblichen Altersversorgung 2023. Berlin: aba.

ABP (2026). Jaarbericht 2025. Heerlen: Stichting Pensioenfonds ABP.

Andonov, A., Bauer, R.M.M.J., Cremers, K.J.M. (2017). Pension fund asset allocation and liability discount rates. *Review of Financial Studies*, 30(8), 2555-2595.

AP7 (2026). Annual and Sustainability Report 2025. Stockholm: Sjunde AP-fonden.

Bank of England (2022). Financial Stability Report, December 2022. London: Bank of England.

Bank of Japan (2025). Statement on Monetary Policy, 19 September 2025. Tokyo: Bank of Japan.

Benartzi, S., Thaler, R.H. (2001). Naive diversification strategies in defined contribution saving plans. *American Economic Review*, 91(1), 79-98.

BFS — Swiss Federal Statistical Office (2026). Pensionskassenstatistik 2024: definitive Ergebnisse. Neuchâtel: BFS.

BMAS — German Federal Ministry of Labour and Social Affairs (2026). Statistik zur privaten Altersvorsorge (Riester-Verträge), as at end-2025. Berlin: BMAS.

Board of Trustees (2026). The 2026 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds. Washington, D.C.: Social Security Administration.

Bodie, Z., Merton, R.C., Samuelson, W.F. (1992). Labor supply flexibility and portfolio choice in a life cycle model. *Journal of Economic Dynamics and Control*, 16(3-4), 427-449.

compenswiss (2026). Annual Report 2025. Geneva: compenswiss (fonds de compensation AVS/AI/APG).

Complementa (2025). Risiko Check-up 2025: Studie zur finanziellen Lage der Schweizer Pensionskassen (31st edition). St. Gallen: Complementa AG.

CPP Investments (2026). Annual Results, Fiscal Year 2026. Toronto: Canada Pension Plan Investment Board.

Deutsche Bundesbank (2026). Geschäftsbericht 2025. Frankfurt am Main: Deutsche Bundesbank.

Deutsche Finanzagentur (2025). Emissionsplanung des Bundes 2026. Frankfurt am Main: Bundesrepublik Deutschland — Finanzagentur GmbH.

- Dimson, E., Marsh, P., Staunton, M. (2026). UBS Global Investment Returns Yearbook 2026. Zurich: UBS.
- DWP — Department for Work and Pensions (2015). The Occupational Pension Schemes (Charges and Governance) Regulations 2015 (SI 2015/879). London: DWP.
- ECB (2026). Consolidated weekly financial statement of the Eurosystem as at 26 June 2026. Frankfurt am Main: European Central Bank.
- Federal Reserve (2026). Factors Affecting Reserve Balances (H.4.1), 26 August 2026. Washington, D.C.: Board of Governors of the Federal Reserve System.
- Feldstein, M. (1974). Social security, induced retirement, and aggregate capital accumulation. *Journal of Political Economy*, 82(5), 905-926.
- FMA (2026). Statistics on Pensionskassen and occupational severance funds, fourth quarter 2025. Vienna: Austrian Financial Market Authority.
- Goyal, A., Wahal, S. (2008). The selection and termination of investment management firms by plan sponsors. *Journal of Finance*, 63(4), 1805-1847.
- GPIF (2026). Investment Results for the First Quarter of Fiscal 2026. Tokyo: Government Pension Investment Fund.
- HUB International (2026). Japan: DC Pension Reform and Contribution Changes (May 2026). Chicago: HUB International.
- Internal Revenue Service (2025). 401(k) limit increases to \$24,500 for 2026, IRA limit increases to \$7,500 (IR-2025-110). Washington, D.C.: IRS.
- Investment Company Institute (2026). Quarterly Retirement Market Data, Fourth Quarter 2025. Washington, D.C.: ICI.
- Japan Securities Dealers Association (2024). NISA Guidebook 2024. Tokyo: JSDA.
- Madrian, B.C., Shea, D.F. (2001). The power of suggestion: Inertia in 401(k) participation and savings behavior. *Quarterly Journal of Economics*, 116(4), 1149-1187.
- Mercer, CFA Institute (2025). Mercer CFA Institute Global Pension Index 2025. Melbourne: Mercer.
- Merton, R.C. (1969). Lifetime portfolio selection under uncertainty: The continuous-time case. *Review of Economics and Statistics*, 51(3), 247-257.
- Mitchell, O.S., Poterba, J.M., Warshawsky, M.J., Brown, J.R. (1999). New evidence on the money's worth of individual annuities. *American Economic Review*, 89(5), 1299-1318.
- Modigliani, F., Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In: Kurihara, K.K. (ed.), *Post-Keynesian Economics*. New Brunswick: Rutgers University Press, 388-436.
- NASRA (2025). Public Fund Survey: Summary of Findings for FY 2024. Washington, D.C.: National Association of State Retirement Administrators.
- NEST (2025). Annual Report and Accounts 2024/25. London: National Employment Savings Trust.

- Novy-Marx, R., Rauh, J. (2011). Public pension promises: How big are they and what are they worth? *Journal of Finance*, 66(4), 1211-1249.
- OeBFA (2025). Funding programme of the Republic of Austria 2026. Vienna: Austrian Treasury.
- OECD (2025). Pensions at a Glance 2025: OECD and G20 Indicators. Paris: OECD Publishing.
- Pension Fund Association (2025). Statistics on occupational defined contribution plans, as at March 2025. Tokyo: Pension Fund Association.
- Reason Foundation (2025). Annual Pension Report 2025. Los Angeles: Reason Foundation.
- Resona Bank (2025). Nenkin Note: key figures of Japanese occupational pensions, as at March 2025. Tokyo: Resona Bank.
- Rupprechter, R. (2026c). Wealth Management 2035: How testators and heirs achieve the best possible return from the transfer of wealth. Working Paper, R&B Wealth Management.
- Rupprechter, R. (2026d). Money for Generations: How churches, sovereign wealth funds and university endowments invest — and what private investors can learn from them. Working Paper, R&B Wealth Management.
- Samuelson, P.A. (1969). Lifetime portfolio selection by dynamic stochastic programming. *Review of Economics and Statistics*, 51(3), 239-246.
- SNB (2026). Annual Report 2025. Zurich and Berne: Swiss National Bank.
- Swisscanto (2025). Schweizer Pensionskassenstudie 2025. Zurich: Swisscanto by Zürcher Kantonalbank.
- Swisscanto (2026). Pensionskassen-Monitor as at end-2025. Zurich: Swisscanto by Zürcher Kantonalbank.
- The Pensions Regulator (2025). Automatic Enrolment: Contribution Levels. Brighton: TPR.
- Thinking Ahead Institute (2025). Global Pension Assets Study 2025. London: Thinking Ahead Institute and WTW.
- Thinking Ahead Institute (2026). Global Pension Assets Study 2026. London: Thinking Ahead Institute and WTW.
- U.S. Government Accountability Office (2026). Federal Debt Management, Fiscal Year 2025. Washington, D.C.: GAO.
- Vanguard (2025). How America Saves 2025. Valley Forge, PA: The Vanguard Group.
- Vanguard (2026). Target-Date Funds: Glide Path Overview 2026. Valley Forge, PA: The Vanguard Group.
- Vorsorgeforum (2025). 1e-Vorsorgepläne konkurrenzieren Pensionskassen (BVG-Aktuell, July 2025). Berne: Vorsorgeforum.
- WKO (2026). Steuerliche Vorteile der Pensionskassen; Prämienbegünstigte Zukunftsvorsorge. Vienna: Austrian Economic Chamber.

Yaari, M.E. (1965). Uncertain lifetime, life insurance, and the theory of the consumer.
Review of Economic Studies, 32(2), 137-150.

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The author gratefully receives notice of any inaccuracies and will take them into account in future versions.