EFMA, Annual Conference 2025

Pension fund management under the current global economic environment

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Big picture

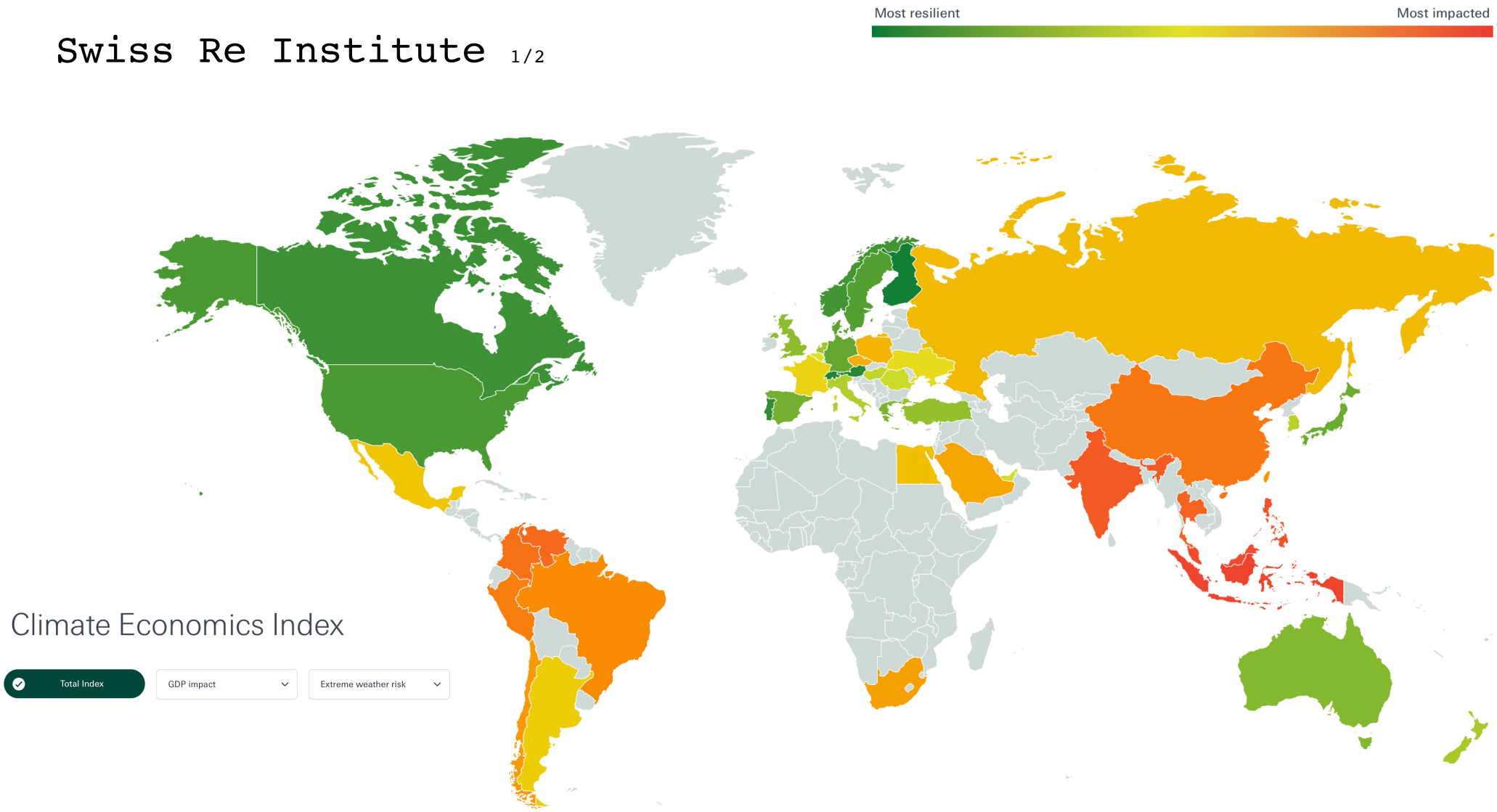
Demographic problem +

Climate crisis +

Pension funds

Clue (cliché): No action is not an option

Swiss Re Institute 1/2



Swiss Re Institute 2/2

Climate Economics Index

Total Index | GDP impact | Extreme weather risk

	Total index rank	GDP impact (Expand)	Extreme weather risk: Dry index	Extreme weather risk: Wet index	Adaptive capacity	Total index score
Finland	1	3	8	32	8	11.3
Switzerland	2	4	12	37	2	11.6
Austria	3	7	15	41	6	15.1
Portugal	4	9	21	30	10	15.9
Canada	5	12	18	20	16	16
Norway	6	6	29	34	10	17.4
US	7	13	34	12	16	17.9
Sweden	8	10	28	36	7	17.9
Denmark	9	1	40	48	3	18.8
Germany	10	17	25	45	1	19.4
Japan	11	22	35	16	9	19.5
Spain	12	14	17	31	19	19.5
Greece	13	28	3	25	21	20.3
Australia	14	33	16	17	13	20.4
UK	15	11	36	47	4	21.1
Turkey	16	15	4	26	36	21.3
Netherlands	17	5	26	46	18	21.3
New Zealand	18	29	2	27	24	21.7
Italy	19	31	7	33	15	21.8
Korea	20	24	30	14	20	22

The twin challenge:

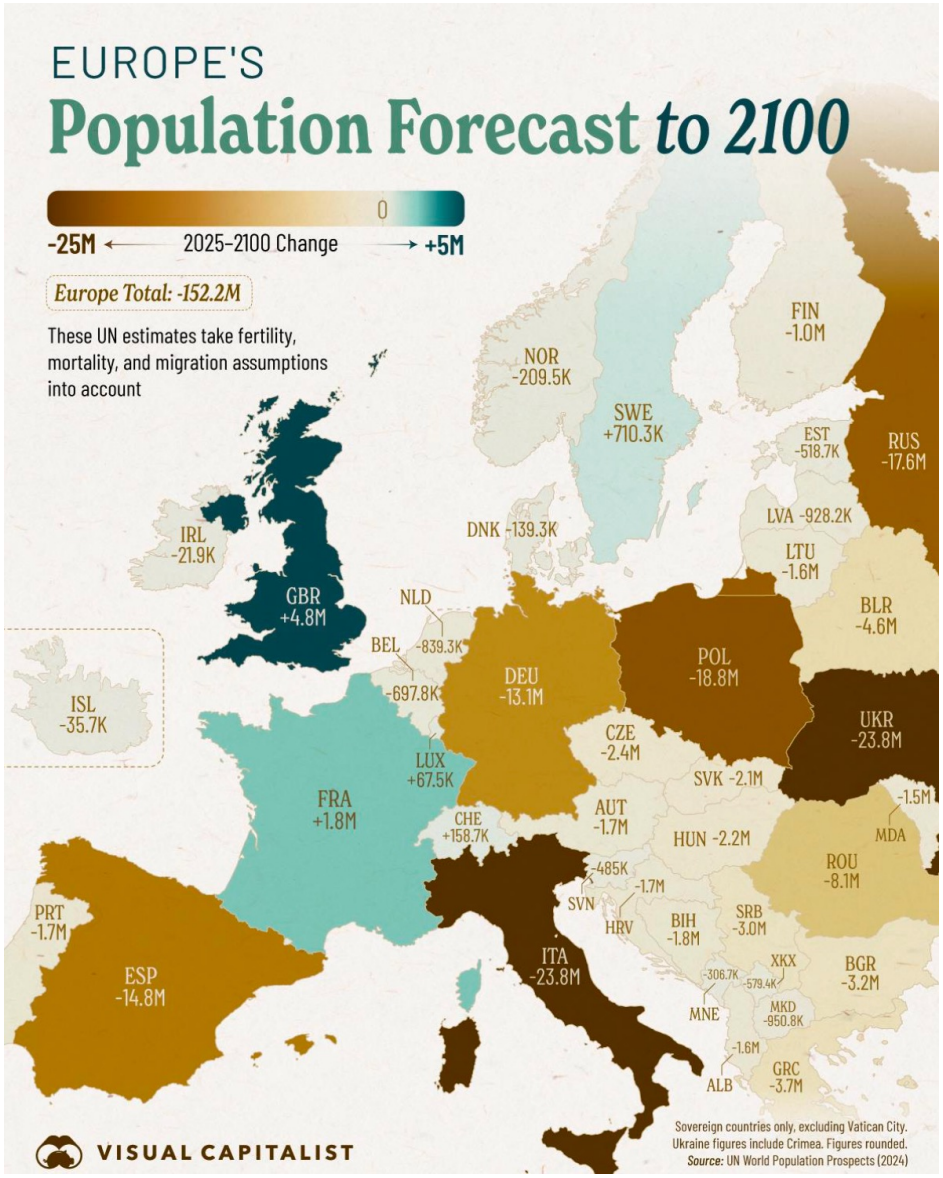
Demographic problem + Climate crisis

- Negative impact on the contributions/benefits ratio
- Macroeconomic effects, shift in investment horizon
- Search for excess returns in emerging markets

- Physical and transition risks
- Reshaping of investment strategies
- Long-term opportunities

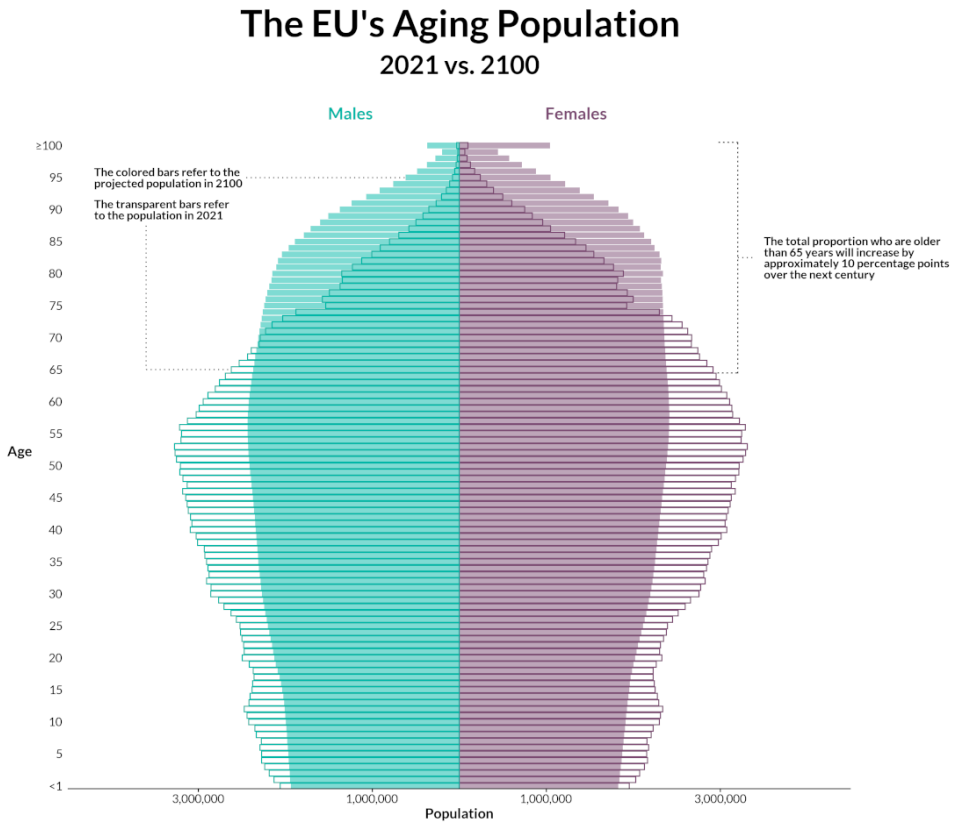
1-6. The demographic problem

The demographic collapse of Europe



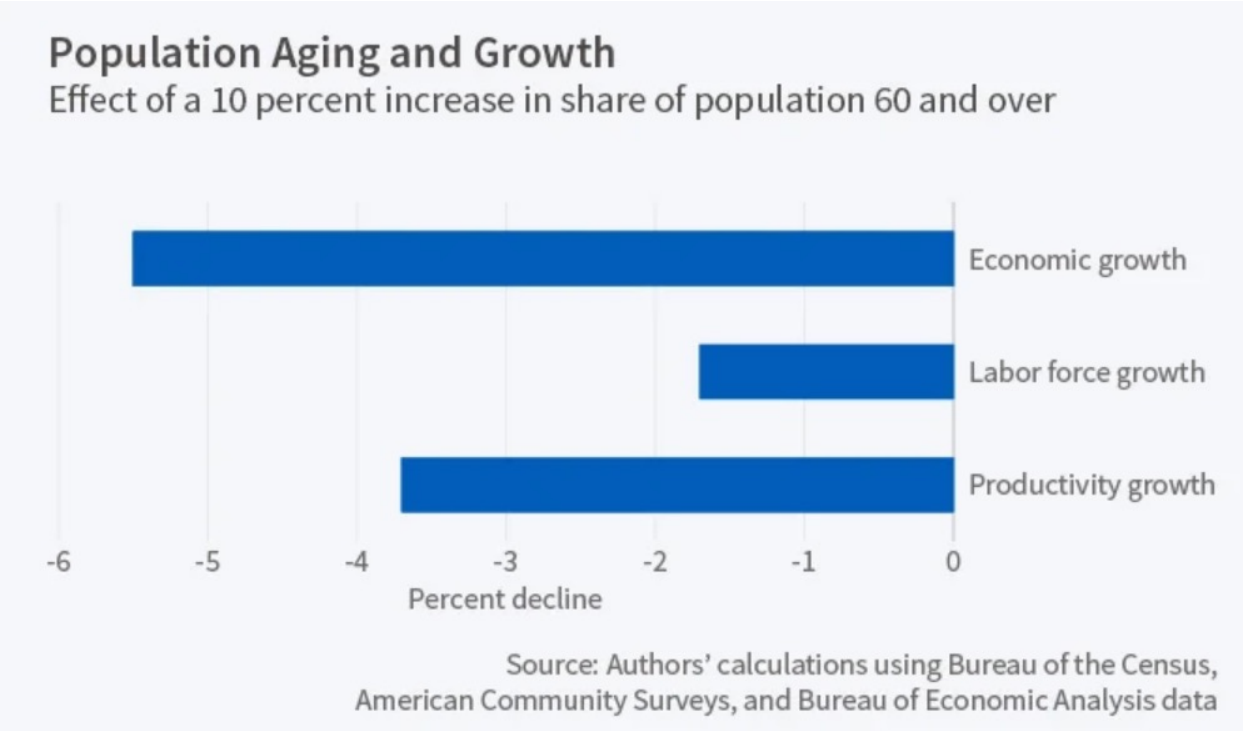
Source:
Visual Capitalist, UN

The EU’s aging population: Demographic shift from 2021 to 2100



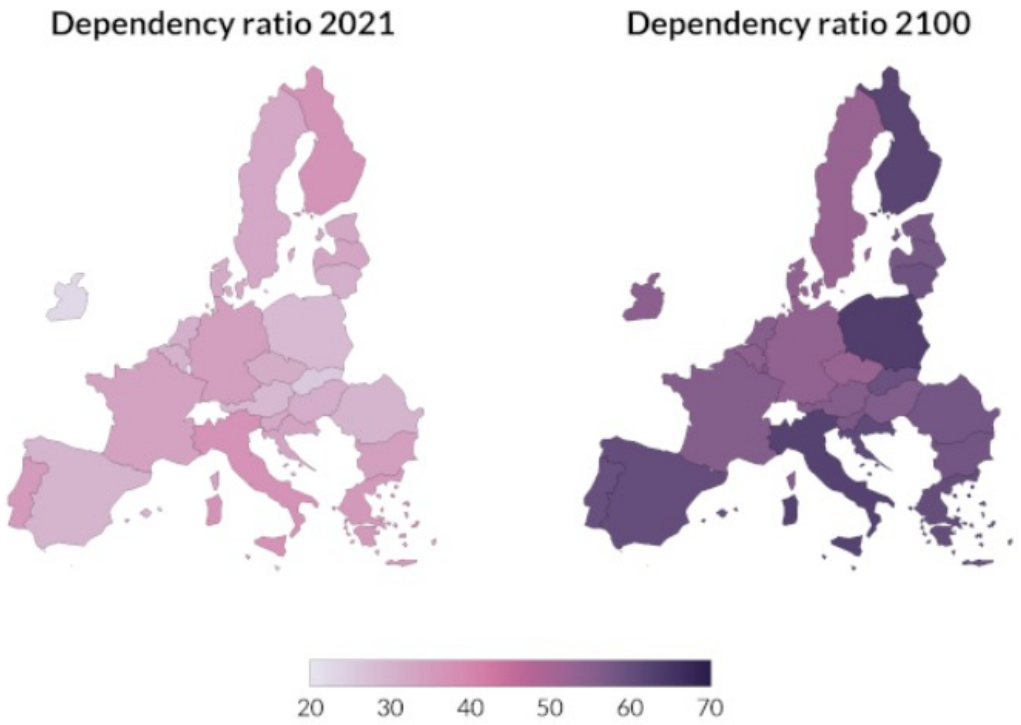
Source: Eurostat (2022)

The effect of population aging on economic growth, the labour force, and productivity



Source: Maestas et al. (2023)

Projected change in dependency ratio: 2021 vs. 2100



Source: UN DESA (2022)

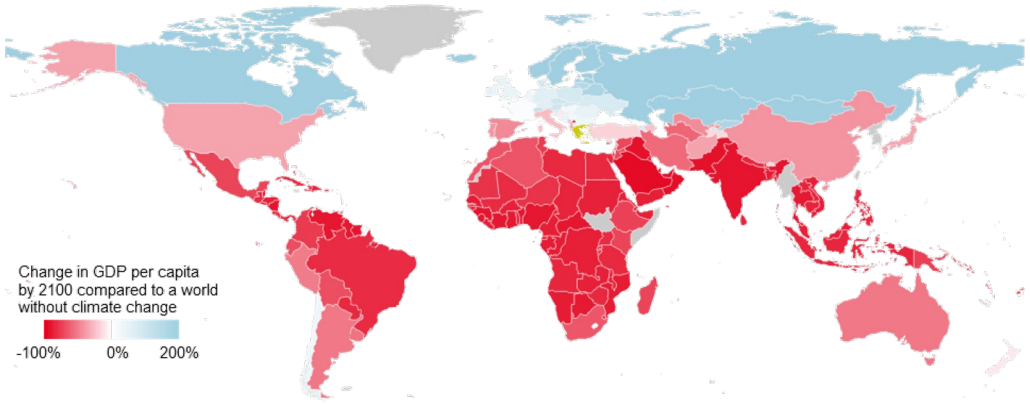
2-6. Climate crisis

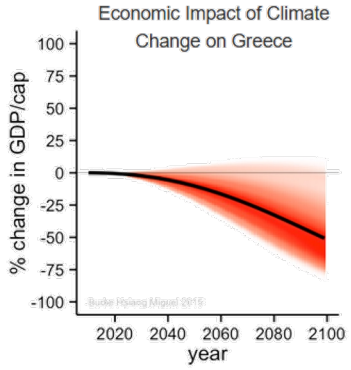
Global temperature rises will negatively impact GDP in all regions by mid-century

	Temperature rise scenario, by mid-century			
	Well-below 2°C increase	2.0°C increase	2.6°C increase	3.2°C increase
	Paris target	*The likely range of global temperature gains*		*Severe case*
Simulating for economic loss impacts from rising temperatures in % GDP, relative to a world without climate change (0°C)				
World	–4.2%	–11.0%	–13.9%	–18.1%
OECD	–3.1%	–7.6%	–8.1%	–10.6%
North America	–3.1%	–6.9%	–7.4%	–9.5%
South America	–4.1%	–10.8%	–13.0%	–17.0%
Europe	–2.8%	–7.7%	–8.0%	–10.5%
Middle East & Africa	–4.7%	–14.0%	–21.5%	–27.6%
Asia	–5.5%	–14.9%	–20.4%	–26.5%
Advanced Asia	–3.3%	–9.5%	–11.7%	–15.4%
ASEAN	–4.2%	–17.0%	–29.0%	–37.4%
Oceania	–4.3%	–11.2%	–12.3%	–16.3%

Source: Swiss Re Institute (2021)

Projected economic impact of climate change on Greece and the World by 2100



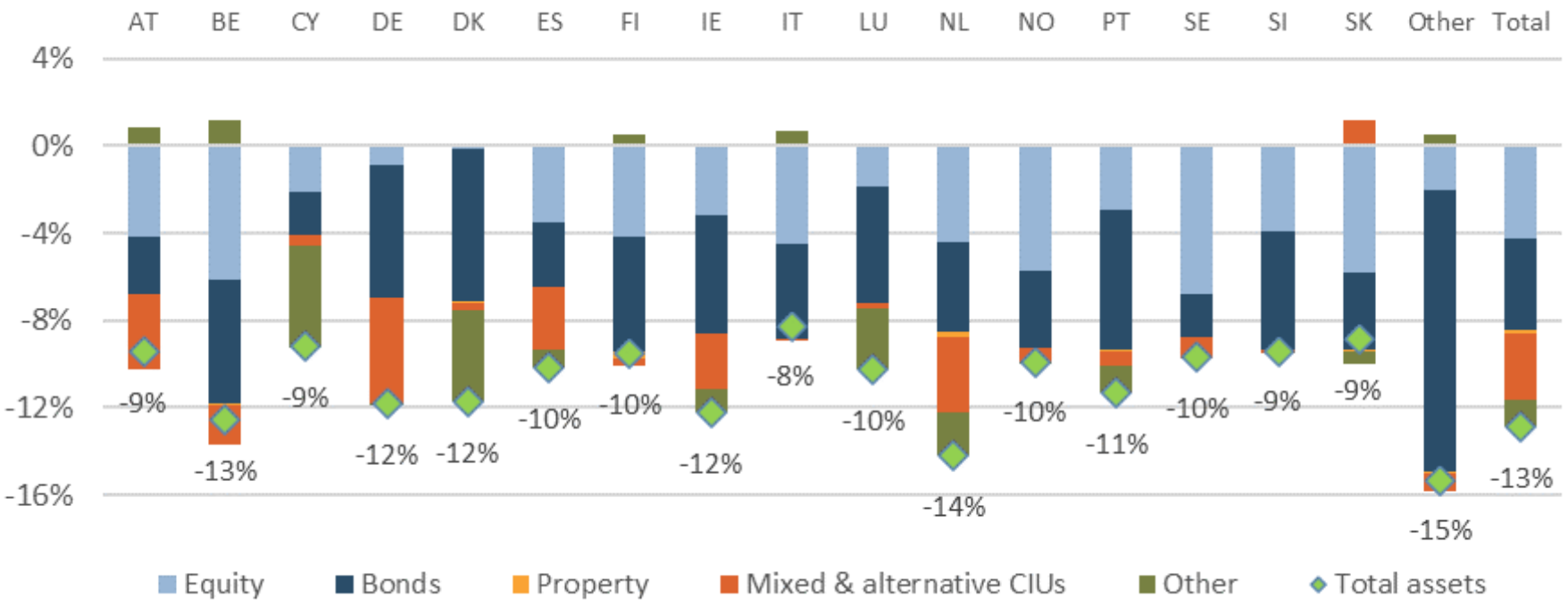


Likelihood climate change will reduce Greece's GDP per capita by

- more than 0%: **94%**
- more than 10%: **90%**
- more than 20%: **86%**
- more than 50%: **50%**

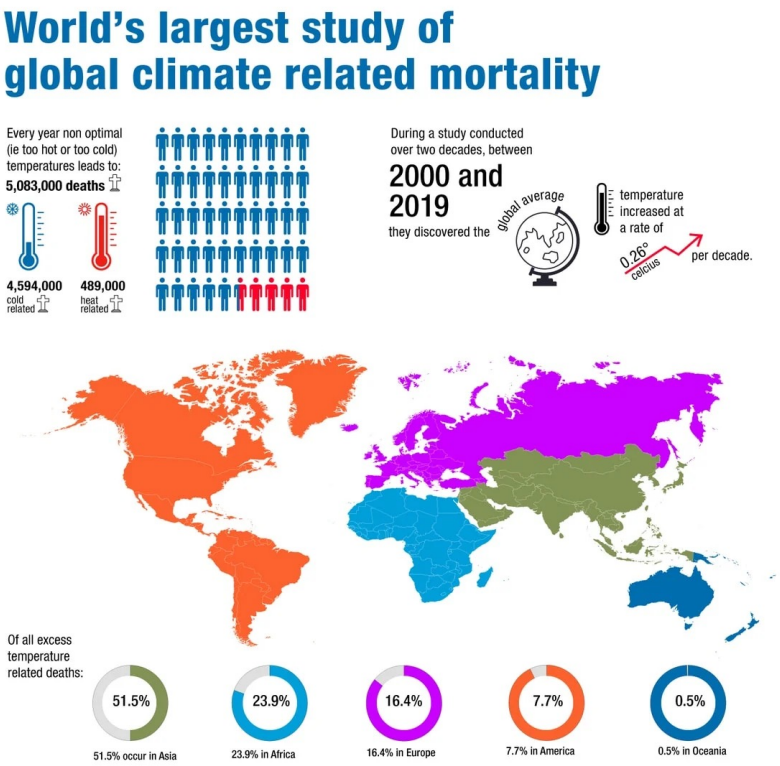
Source: Burke, Hsiang & Miguel (2015)

Estimated impact of climate-related market shocks on investment portfolios in EU countries



Source: EIOPA (2022)

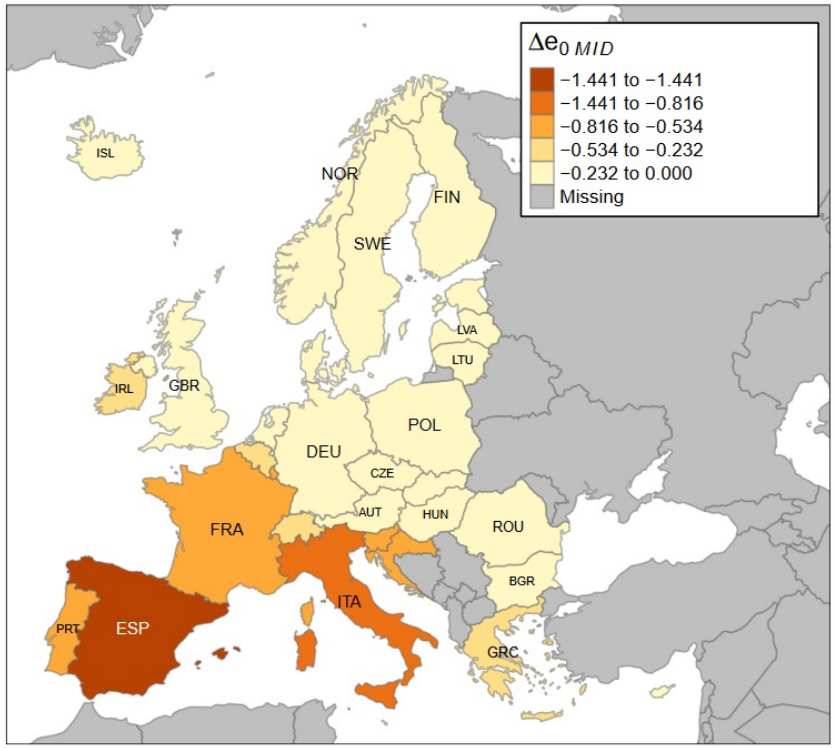
Global climate-related mortality



	Overall		Cold-related		Heat-related	
	Number of excess deaths (95% eCIs)	Regional proportion	Number of excess deaths (95% eCIs)	Regional proportion	Number of excess deaths (95% eCIs)	Regional proportion
Global	5 083 173 (4 087 967–5 965 520)	100·00%	4 594 098 (3 337 222–5 640 617)	100·00%	489 075 (304 216–732 518)	100·00%
Americas	391 469 (349 949–434 634)	7·70%	334 710 (294 660–385 116)	7·29%	56 759 (29 551–93 707)	11·61%
Europe	835 897 (740 194–929 440)	16·44%	657 185 (585 782–723 962)	14·30%	178 712 (142 070–227 795)	36·54%
Northern Europe	85 878 (75 113–96 426)	1·69%	71 445 (63 009–78 495)	1·56%	14 433 (10 658–19 559)	2·95%
Southern Europe	166 485 (151 444–181 291)	3·28%	130 312 (118 584–140 789)	2·84%	36 173 (29 677–45 340)	7·40%
Western Europe	173 037 (153 969–191 754)	3·40%	140 271 (125 698–153 056)	3·05%	32 766 (25 376–42 719)	6·70%
Eastern Europe	410 497 (357 620–459 748)	8·08%	315 157 (274 617–352 139)	6·86%	95 340 (76 914–120 295)	19·49%
Africa	1 214 035 (140 886–2 213 802)	23·88%	1 188 486 (106 557–2 197 519)	25·87%	25 549 (15 385–38 113)	5·22%
Asia	2 617 322 (2 345 204–2 857 273)	51·49%	2 393 300 (2 183 014–2 625 909)	52·10%	224 022 (112 925–366 535)	45·81%
Oceania	24 450 (15 401–35 023)	0·48%	20 417 (12 874–28 406)	0·44%	4033 (1029–8423)	0·82%

Source: Zhao et al. (2021)

Inaction on climate change projected to reduce European life expectancy



Source: Hauer & Santos-Lozada (2021)

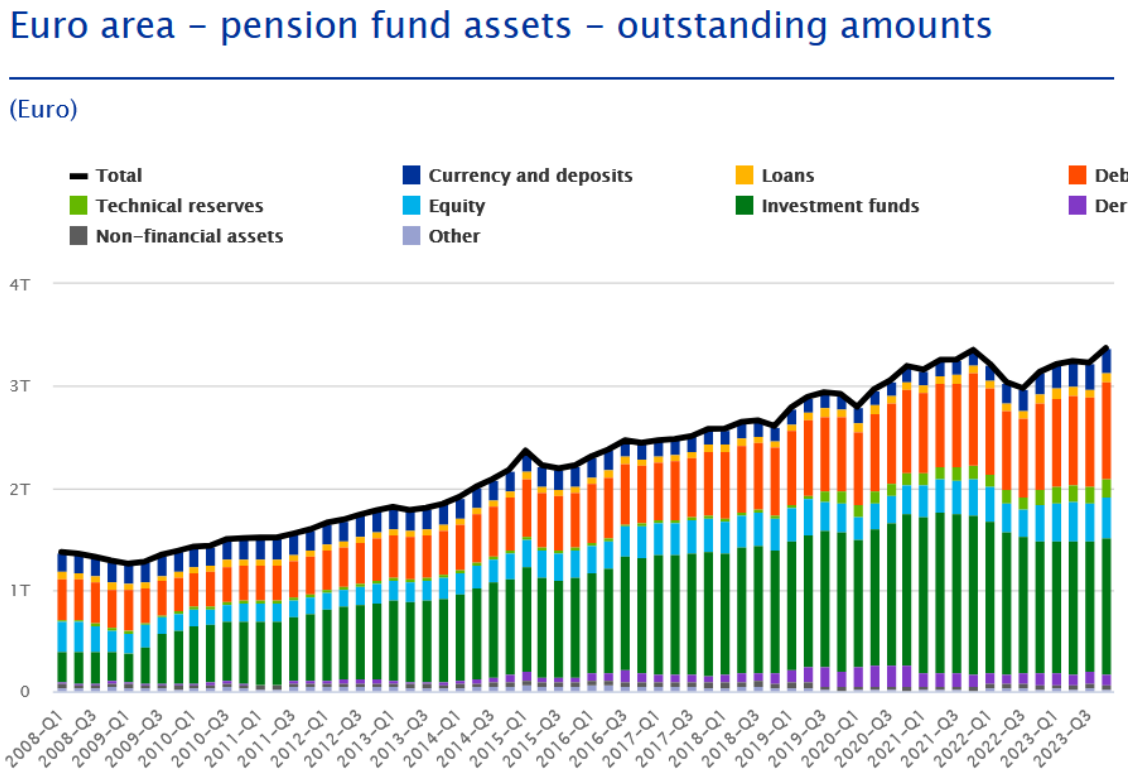
EU climate policy

- **European Green Deal:** Comprehensive strategy to make the EU climate-neutral by 2050.
- **Renewable Energy Targets:** 32% of energy consumption from renewable sources by 2030.
- **Just Transition Mechanism:** €45 billion of sustainable investments in the regions most affected by the transition challenges.

Source: EU

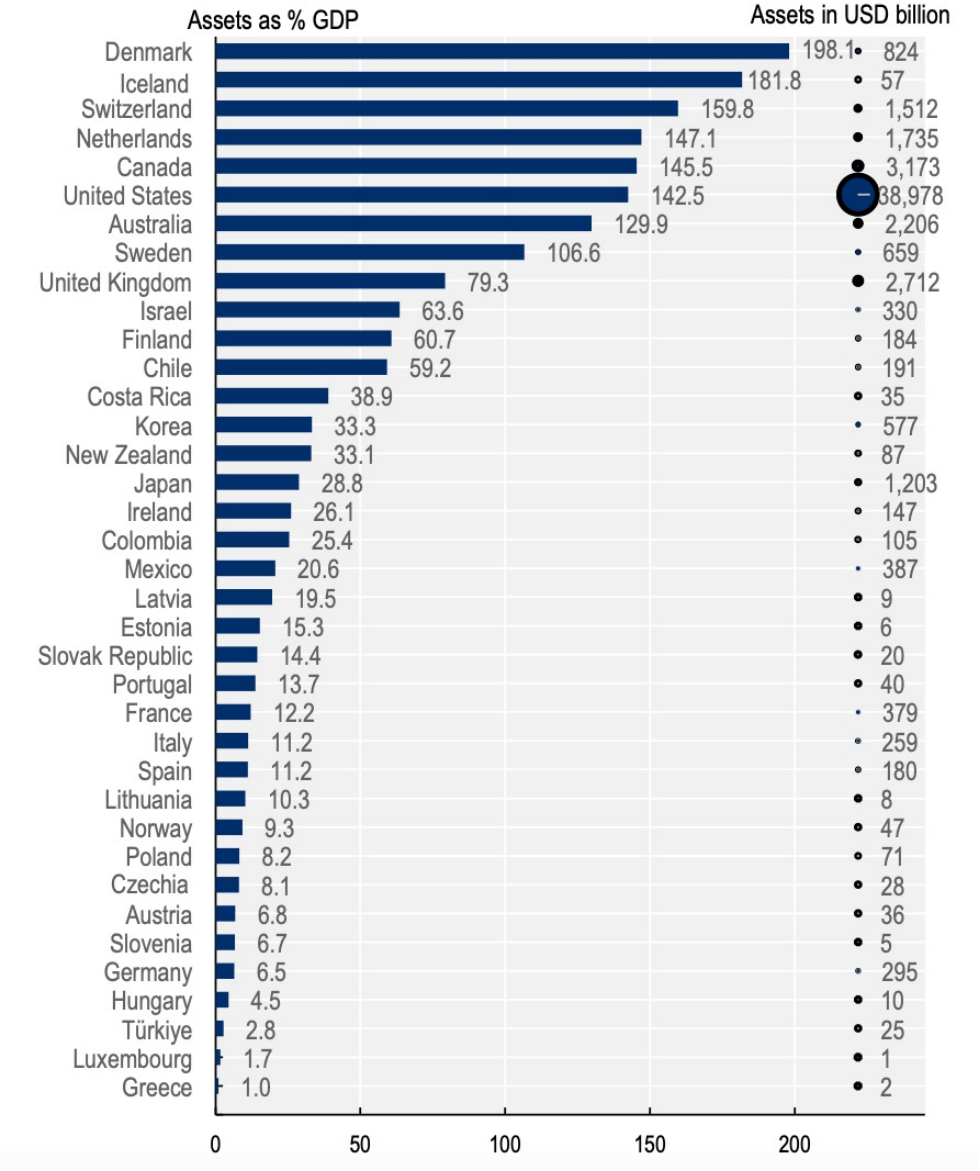
3-6. Pension funds

Pension fund assets in the Euro area 2008-2023



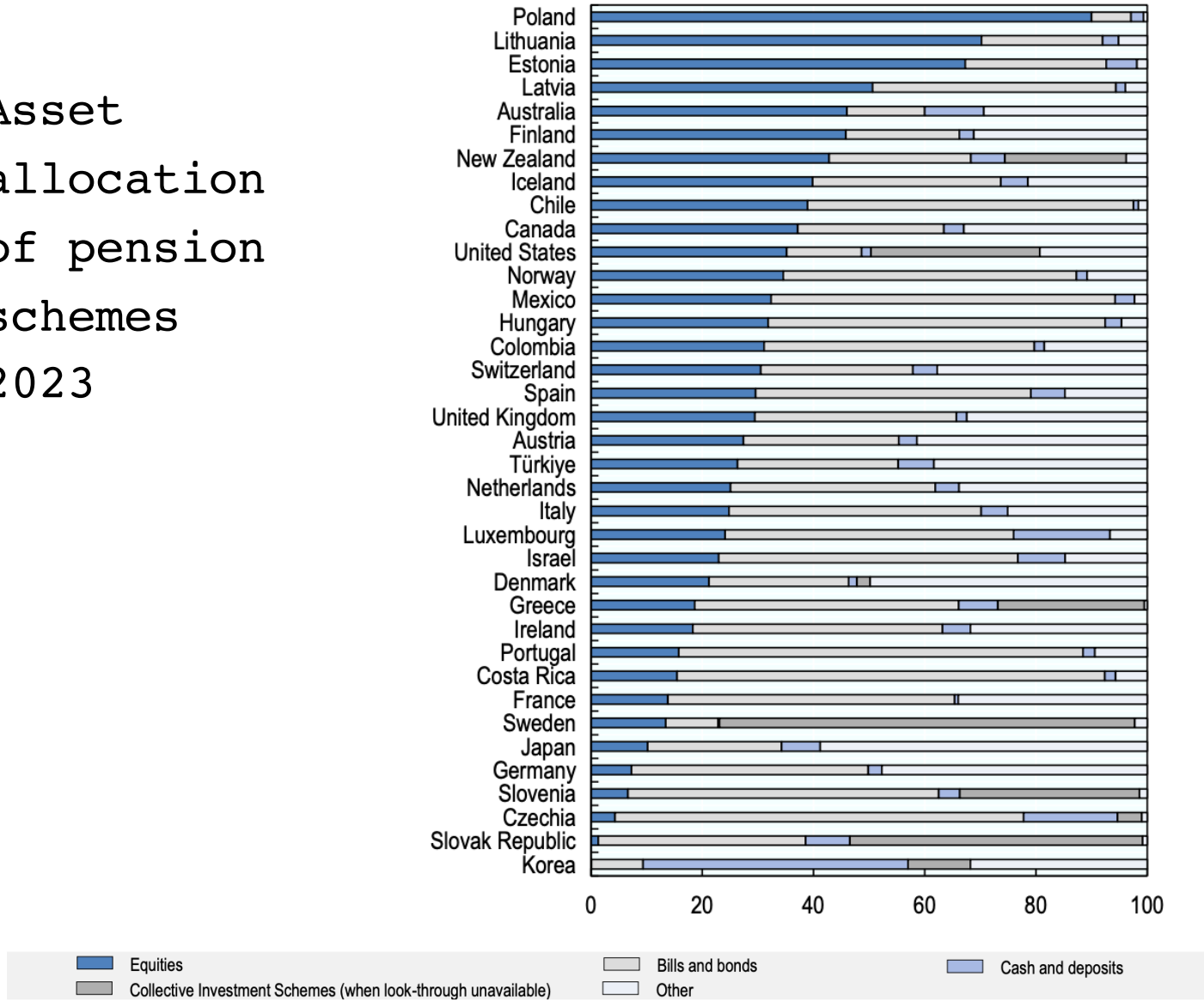
Source: ECB

Total assets % GDP of pension schemes 2023



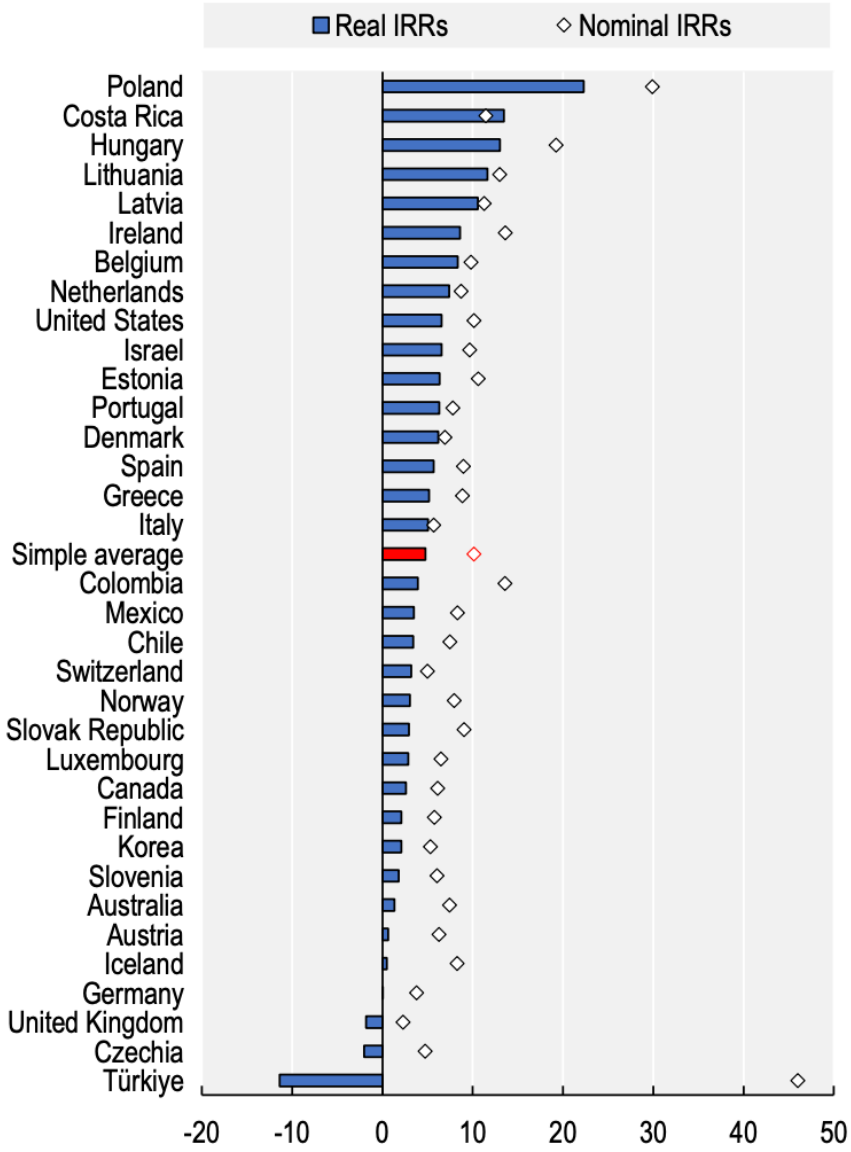
Source: OECD (2024)

Asset allocation of pension schemes 2023



Source: OECD (2024)

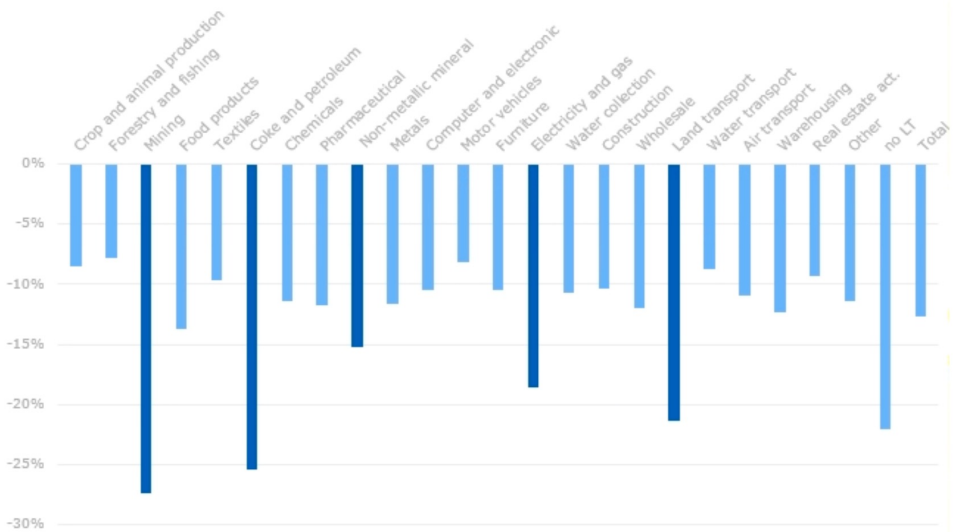
Nominal & real returns of pension schemes 2023



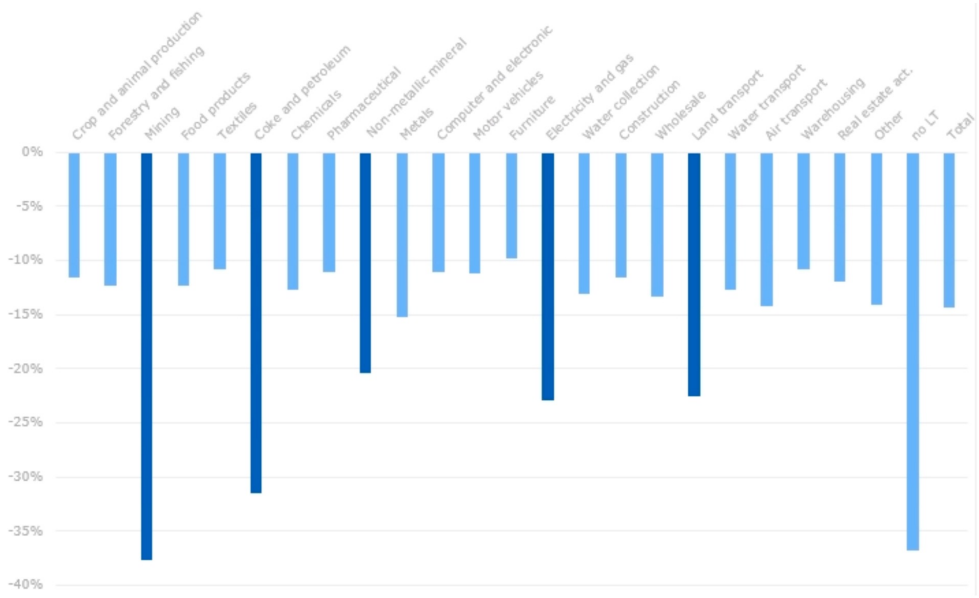
Source: OECD (2024)

Impact of the adverse climate scenario on investments in equity & bonds

Corporate Bonds



Equity



Source: EIOPA (2022)

4-6. Cases

Pension fund management implications

PROFESSIONAL PENSIONS SUSTAINABLE INVESTMENT HUB

Partner Insight: A tool to decarbonise pensions

Does your pension mitigate climate risk?

New York City Pension Funds Adopt Implementation Plan to Achieve Net Zero Investment Portfolio By 2040

. **Divest to reduce risk**, building on the funds' historic divestment of fossil fuel reserve owners in public equities by asking all private markets managers to exclude upstream fossil fuel investments. In addition, if thorough engagement proves to be futile with managers or companies whose core business undermines climate goals, the systems will consider excluding them, consistent with fiduciary duty.

Net Zero Commitment

The Devon Fund is a member of the Institutional Investors Group on Climate Change (IIGCC). The IIGCC enjoys a strong international reputation for providing robust, insightful thought leadership across the climate agenda informed by leading members of the investment community committed to action on climate change.

The Devon Fund is a signatory to the IIGCC's Commitment to achieve net zero portfolio greenhouse gas emissions by 2050 or sooner. The full commitment statement, launched in March 2021 can be found here.

Dutch pension giant ABP to dump €15bn in fossil fuel holdings

Retirement scheme says 'radical change' needed as global temperatures rise

Smart Pension announces 75% emissions reduction by 2030

Approach focuses on decarbonisation, rather than using offsets

Scottish Widows using pension power to fight climate change in £1.4bn green fund launch

Source: Mass media

Japanese Government Pension Investment Fund (GPIF)

- The largest public pension fund in the world
- Demographic challenge: Japan faces one of the most intense aging trends globally. GPIF has shifted from bonds to equities and alternative investments (infrastructure, private equity) to enhance returns.
- Climate strategy: GPIF is a pioneer in ESG integration, with rigorous evaluation of its asset managers. It is committed to the TCFD (Task Force on Climate-related Financial Disclosures) and actively monitors the carbon footprint of its investments.
- Energy: It prefers companies undergoing a "climate transition" and avoids high-carbon assets.

Government Pension Fund Global (Norway)

- Despite managing oil-derived revenues, it applies extremely strict ethical investment criteria.
- Climate policy: Since 2020, it has excluded companies with a high environmental footprint and advocates for transparency on climate risk exposure.
- Demographic volatility: It incorporates global demographic shift scenarios and their implications for growth.

ABP (Netherlands)

- Second-largest pension fund in Europe
- Response to demographics: Portfolio restructuring to manage the increasing number of retirees, with an emphasis on cash flows and duration risk management.
- Climate divestment: In 2022, it announced divestment from all fossil fuel companies (~€15 billion), reallocating capital to renewables and green bonds.
- Actively participates in corporate climate governance through proxy voting.

Key Takeaways

- Major funds are no longer limited to the "traditional" 60/40 portfolio but pursue multidimensional strategies that align with the new reality.
- There is a shift from simple risk management to creating positive impact (e.g., climate resilience, ESG integration).

5-6. Indicative literature

Pension funds 1/2

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- Franzoni, F. and Marin, J.M., 2006. Pension plan funding and stock market efficiency. **Journal of Finance**, 61(2), pp.921–956.
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Pension funds [returns, asset allocation, optimal portfolio choice, market efficiency etc.] 2/2

- Forsyth, P.A. and Vetzal, K.R., 2011. *Optimal portfolio choice with exponential utility: Application to pension funds*. **Management Science**, 57(12), pp.2105-2120.

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- Dahlquist, M., Setty, O. and Vestman, R., 2018. *On the asset allocation of a default pension fund*. **Journal of Finance**, 73 (4), pp. 1893–1936.

Pension funds + demographic problem

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- Bikker, J.A., Broeders, D., Hollanders, D.A. & Ponds, E.H.M., 2009. *Pension funds' asset allocation and participant age: A test of the life-cycle model*. **Journal of Risk and Insurance**, 79(3), pp. 595–618.

Pension funds + climate crisis 1/2

- Boermans, M.A. & Galema, R., 2019. *Are pension funds actively decarbonizing their portfolios?* **Ecological Economics**, 161, pp.50–60.
- Bolton, P. & Kacperczyk, M., 2021. *Do investors care about carbon risk?* **Journal of Financial Economics**, 142(2), pp.517–549.
- Ilhan, E., Sautner, Z. & Vilkov, G., 2021. *Carbon tail risk*. **Review of Financial Studies**, 34(4), pp.1540–1571.

Pension funds + climate crisis 2/2

- Ilhan, E., Krueger, P., Sautner, Z. & Starks, L.T., 2023. *Climate risk disclosure and institutional investors.* **Review of Financial Studies**, 36(5), pp.2617–2650.
- Lopez-de-Silanes, F., McCahery, J.A. & Pudschedl, P.C., 2024. *Institutional investors and ESG preferences.* **Journal of Financial and Quantitative Analysis**, forthcoming.
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My (small) contribution

- Xidonas, P., Mavrotas, G., 2014. *Multiobjective portfolio optimization with non-convex policy constraints: Evidence form the Eurostoxx 50.* **European Journal of Finance**, 20 (11), 957-977.

- Xidonas, P., Mavrotas, G., Hassapis, C., Zopounidis, C., 2017. *Robust multiobjective portfolio optimization: A minimax regret approach.* **European Journal of Operational Research**, 262 (1), 299-305.

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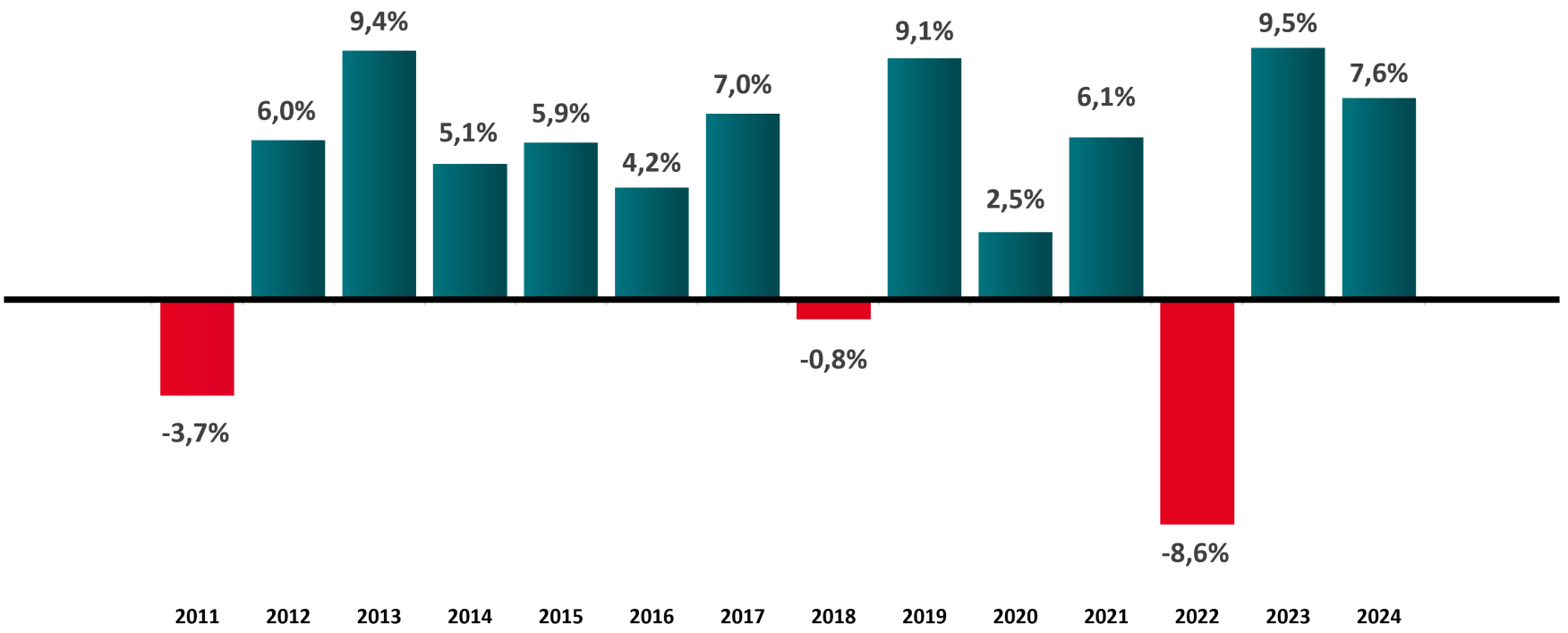
- Daglis, T., Konstantakis, K., Xidonas, P., Michaelides, P., Samitas, A., 2024. *Solar weather dynamics and the US economy: A comprehensive GVAR perspective.* **Review of Quantitative Finance & Accounting**, 63, 955-977.

6-6. Greece

Value of assets (mEUR) Greek Occupational Retirement Funds 2004-2022

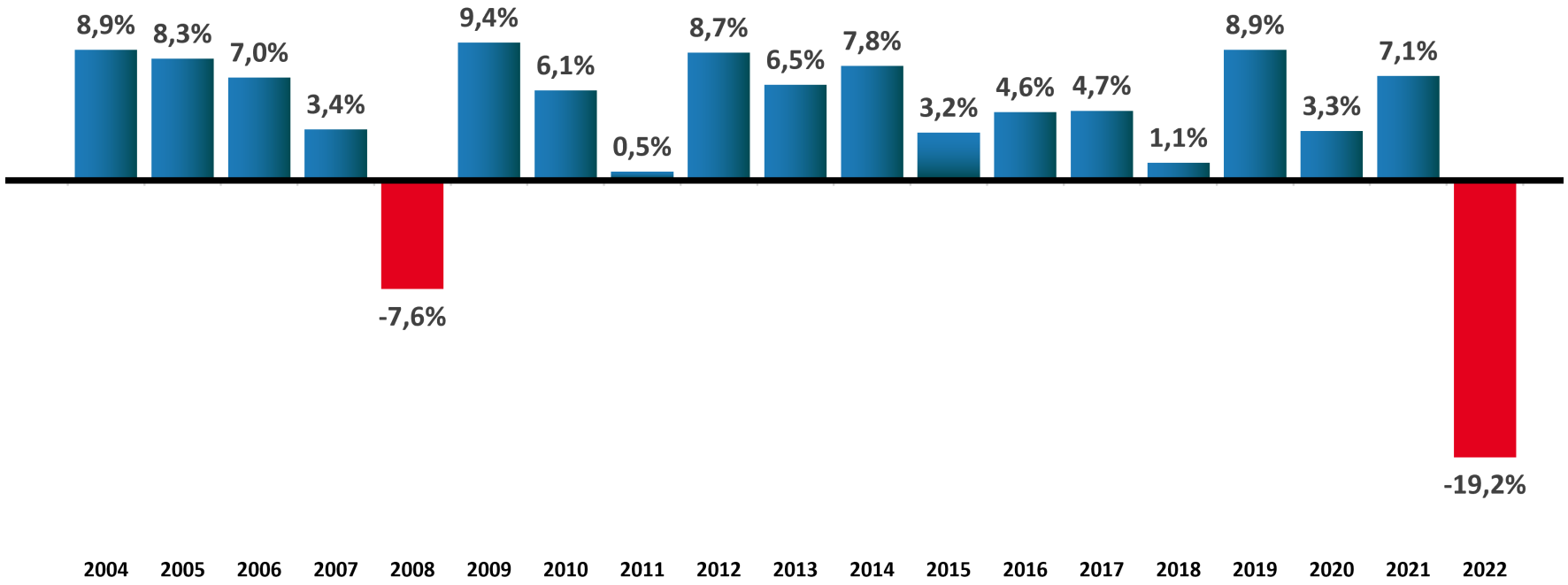
Source: HCMC, EIOPA, HUIORP (2025)

Annual returns of Greek Occupational Retirement Funds, Average 2011-2024: 4.23%



Source: EIOPA, HUIORP (2025)

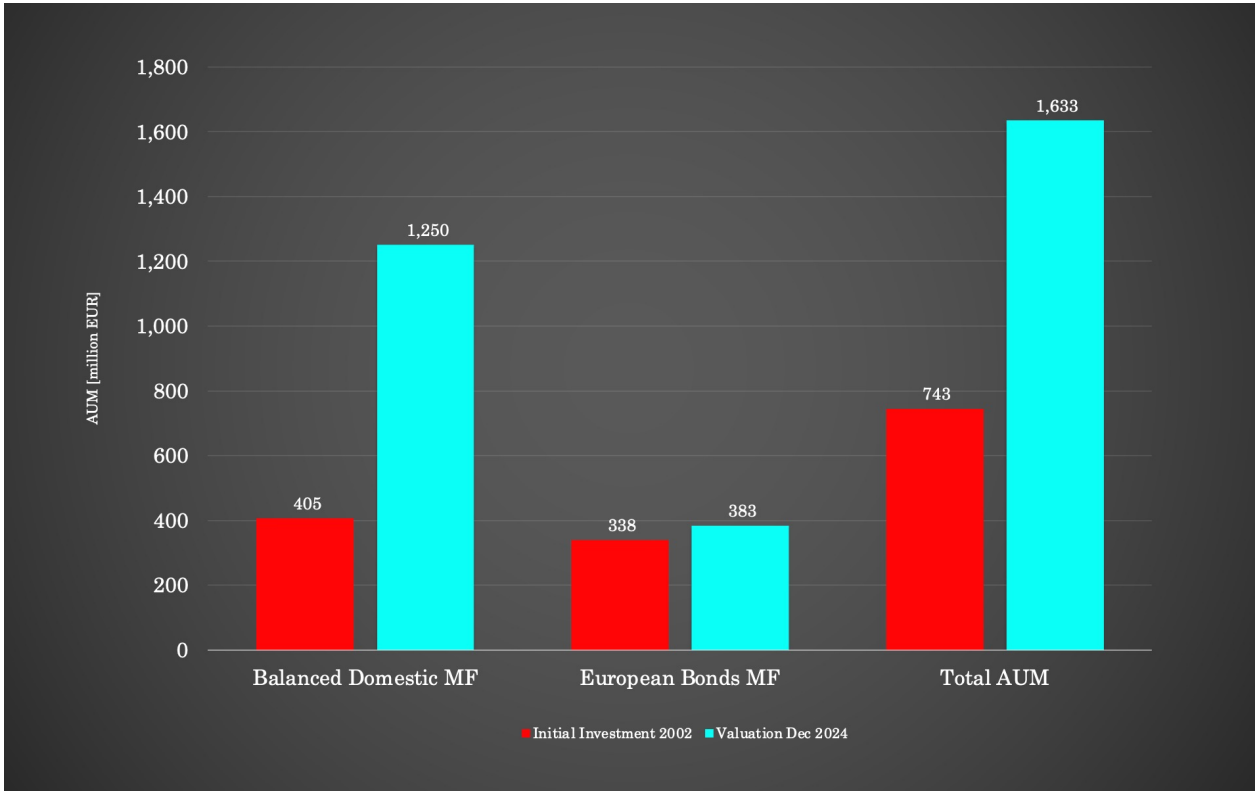
Annual returns of European Occupational Retirement Funds, Average 2004-2022: 3.83%



Source: EIOPA, HUIORP (2025)

MFs management for EFKA (Greek National Security Fund)

- Total return: +120%
- Profits for EFKA: 890 mEUR



Source: HPMF (2025)

Thanks for your attention

EFMA, Annual Conference 2025

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