

THE SCALE EFFECT

How size shapes investment governance and allocation

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AUTHOR

Stuart Jarvis, DPhil Managing Director, Portfolio Research PGIM Multi-Asset Solutions

For Professional Investors Only. All investments involve risk, including the possible loss of capital. There is no guarantee that any particular asset allocation will meet your investment objectives. Please see the "Important Information" section for additional disclosures. Asset owners, from pension plans to sovereign wealth funds, differ widely in structure and scale. Recent years have witnessed a trend towards larger size as large institutions continue to gather assets and as smaller investors group together to emulate their larger peers' perceived successes. A greater asset base permits an asset owner to build in-house expertise, to rely less on external advisers and portfolio managers, and to incorporate more complex strategies into their investment process.

But scale also has costs: market liquidity limits a large investor's capacity for trading the portfolio, and finding sufficient return opportunities for a large asset pool can be challenging. In addition, while the division of responsibilities can lead to efficiencies that enable investors to capture economies of scale, it can easily lead to silo behaviour and create co-ordination problems for a CIO. Governance structures therefore play a critical role and must align with the chosen investment process while allowing appropriate oversight and challenge. The net result is an investment organisation that is different both inwardly (internal roles and structures) and outwardly (asset allocation and return outcomes).

One driver of increased scale has been a desire on the part of policymakers to create local giants: megafunds that are capable of funding projects they see as important for the domestic economy. A significant allocation is of course more readily funded from a larger portfolio. In addition, the idiosyncratic risks – from both an investment and operational perspective – require a degree of organisational sophistication. An investor's overarching governance controls need to be robustly structured to ensure that stakeholder interests remain paramount in the face of political pressure.

As we will argue, large investors can seize opportunities to evolve their organisational structures and invest in capabilities that allow them to move beyond what smaller investors can achieve. But this is far from being a matter of investors *sitting back* and allowing economies of scale to emerge, and much more about them *leaning forward* and thinking strategically both about what can be achieved and how best to structure themselves to deliver this.

CIO Takeaways

- 1. Larger funds can invest at lower cost across a wide range of asset classes and potentially achieve better net-of-fee performance at the portfolio level.
- 2. Large capital pools can afford more capable in-house investment functions, enabling them to invest in a broader range of asset strategies.
- 3. As the centre of gravity for asset allocation governance moves from the Board to the CIO in step with fund scale, different methodologies *e.g.*, factor lenses, thematic investing, total portfolio approaches can be applied that further increase the potential asset universe.
- Scale enables investors to develop their domestic competitive advantage and invest locally, in potential alignment with broader macro-economic goals.

Dimensions of the Scale Effect

We contrast the behaviours of large pension plans with small plans. In the context of pension plans, 'large' plans are those with around \$10b or more in assets and 'small' those with \$100m - \$1bn.¹ If sovereign wealth funds (SWFs) were our focus, a different scaling would be required. A 'large' SWF would exceed \$300b and a small one would be \$3-50b in size.² For our purposes, most SWFs are considered 'large.' This is consistent with policymaker objectives and rhetoric around consolidation: for example when then-Chancellor George Osborne first began to push for consolidation in the UK's local government pension scheme (LGPS) he sought to create 'British wealth funds, containing at least £25b of scheme assets each'.³

Greater scale can bring benefits to the investment process in many areas – larger funds have the resources to build internal capabilities across portfolio design and management, allowing them to move into less familiar but, perhaps, more profitable markets. Yet smaller funds have reasons to prosper, too: finding managers with sufficient capacity in public markets is simpler, and they can employ well-established approaches to asset allocation. Working in tried and tested locales also means that advisers are readily available when internal resources need to be augmented. Figure 1 gives a summary of some areas that we examine in more depth below.

	Smaller funds (\$100m - \$1b)	Larger funds (\$10b+)
Investment: Asset allocation	 Implement standard allocation process Advisers can help set strategic allocation 	 Can develop tailored asset allocation approach Incorporate internal management capabilities Dynamic asset allocation
Investment: Portfolio construction	 Many managers with sufficient capacity Advisers can help source managers Staff cost and retention 	 Internal portfolio management Access to private market managers Operational capacity for including private assets Lower investment management costs
Operational: Governance	 Board retains control of strategy Limited co-ordination problems 	 CIO can drive investment policy more actively Division of responsibilities drives efficiency

Figure 1: Potential Scale Benefits Across the Investment Process

Source: PMA 2024. For illustrative purposes only.

- 2 \$3b, \$52b and \$344b are, respectively, the 10th, 50th and 90th percentiles in the Global SWF database, as of August 2024. This includes central banks and public pension funds alongside sovereign wealth funds; if the former are excluded then \$300b is still the approximate 90th percentile cutoff.
- 3 Spending Review and Autumn Statement Blue Book, HM Treasury November 2015, page 39.

¹ In 'Scale economies, bargaining power and investment performance: evidence from pension plans', de Vries et al (2023) reports the 10th, 50th and 90th percentile of global plans by size in the CEM database to be \$107m, \$1.01b and \$9.3b, respectively.

Figure 1 shows that funds differ not just in *what* they invest in, but also in *how* they structure and govern their investment process. These are of course interlinked: appointing a third party as an active manager of a public asset portfolio necessitates processes for assessing, contracting with, and monitoring the performance of, the third party. In a private asset context, a fund will additionally require processes for managing cashflows and updating valuations. And alongside *responsibility* – clear ownership for each aspect of the investment process – comes *accountability*, *i.e.*, structures allowing for their oversight. Investment governance is the 'how' of investment management: the structures and processes to deliver asset return outcomes. The interrelationship between the different roles is the fund's **governance structure**. An organisation's level of resources available for deployment across its investment processes reflects its **governance capacity**. Clear governance structures should enable decisions to be made at the right place in an organisation: by the people and teams with the areas of expertise that make them most capable of making these decisions. Good governance structures also integrate oversight, ensuring that this is both timely and effective.

Larger organisations have the potential for greater governance capacity. The resource difference can be very substantial: a move from \$1b to \$10b in assets means that 10bp/y of cost corresponds to an additional \$9m/y of resources for the larger fund; 25bp/y of cost corresponds to an additional \$22.5m/y. More resources allow an investment organisation to undertake existing activities more efficiently, and to do more (*e.g.*, maintain more relationships, or deeper partnerships, with external investment partners; manage unforeseen cashflows; engage with a company's management).

The fundamental constraint faced by a smaller fund is a lack of **economies of scale**: its asset base is too small to allow desired additional investment cost – which could help improve performance – without producing a meaningful drag on overall fund performance. A lack of scale can be experienced along multiple dimensions of the investment process. A smaller fund will often have more dependence on external advisory expertise when forming its asset allocation and may gain less benefit from regular professional oversight and review. A lack of internal capability may limit a small fund primarily to use investment building blocks that are relatively easier to manage. These constraints are of course not binary: there is a spectrum of governance budgets, and larger investors may choose to allocate resources to aspects of the investment process according to their particular circumstances and investment beliefs.

The investment process can often be split into an 'asset allocation' component – which asset classes or sources of return should drive the overall portfolio, and in what proportions? – and a 'portfolio construction' component – how best to implement the portfolio to deliver exposure to the desired asset allocation? This terminology is not universal, and the steps may not be rigidly sequential (possible implementation options help determine the investment universe considered for asset allocation), but these two components are sufficiently distinct for us to discuss them separately.

Looking across the asset management process, both governance and investment aspects, large asset owners have multiple opportunities arising from scale:⁴

- **Economies of scale.** By spreading fixed costs across a larger asset base, funds may improve net returns. Scale enables specialisation, *i.e.*, a large organisation can afford systems and expert personnel in specific asset classes, in particular markets or in risk management. These *operational* changes improve *investment* efficiency far beyond what a small group around the CIO might achieve.
- **Comparative advantage.** As investors begin to develop capabilities in particular areas (*e.g.*, venture capital and domestic infrastructure) they can be more strategic about where they have a comparative advantage relative to external managers. There may be a change in the optimal mix of internal versus third-party management. The Norway oil fund, for example, uses external managers for emerging market equity and for small and mid-cap company investment, but manages the bulk of the remaining fund internally.⁵
- Learning by doing. Over time, funds get better at what they do. This both drives costs down and builds specialist expertise that can be deployed more broadly. Economies of scale in one asset class can create the conditions for understanding and grasping opportunities in another asset class: processes developed for originating and managing corporate loans might enable expansion into the asset-backed financing market, for example.
- **Market access.** By developing expertise and a presence in relatively niche markets, a large asset owner can become a desired partner in new projects or companies. Canadian pension plans, for example, have developed strong reputations in direct infrastructure and real estate transactions, allowing them to participate in the structuring of transactions.
- **Innovation.** Large asset owners have been at the forefront of developing new ways to allocate assets across a wide investment universe. The Norway oil fund was an early proponent of using systematic factor risk to design and manage their portfolio; the Future Fund (Australia) and GIC (Singapore) have more recently advocated the use of the 'total portfolio approach' (described below) to building an asset allocation.

5 GPFG Annual Report 2023, page 69.

⁴ These categories are based on those in the paper, 'Increasing returns', Michael Mauboussin, Counterpoint Global Insights, January 2024.

Governance Models and Scale

Developments in the functional capacity of an investment organisation can only occur if the institutional structure allows it. This is not just a case of having a deeper pool of skilled individuals, but also designing structures with roles that can carry out the various responsibilities and having others that can oversee to ensure alignment with the overall goals of the institution. Any growth in the capacity of the investment strategy layer (CIO, Investment Committee and supporting teams) requires clarity in what is expected and ensuring that the Executive Board has the time, expertise, and input required to oversee this expansion.

The Board represents the interests of the various stakeholders and not all its members may have deep investment knowledge. Such Boards may be better placed setting the overall targets (a long-term return, a tolerance for drawdowns, perhaps expressed in a **Reference Portfolio** consisting of a mix of global public equity and bond markets) rather than a detailed **Strategic Portfolio**, defined using perhaps 10-15 asset classes. When a Board "owns" the strategic portfolio, they are necessarily dependent on external input (from consultants or the investment layer) and will therefore find it difficult to update this rapidly if market conditions change to offer a very different investment opportunity set. The strategic portfolio, as its name suggests, is therefore necessarily long-term in nature and not sensitive to market conditions. In contrast a full-time CIO and investment team will be able to manage a much more dynamic asset allocation process.

A recent study of Swiss pension plans looks at the impact of governance on asset allocation decisions.⁶ Governance quality is difficult to quantify; but the authors gather and combine 22 measures of governance quality, from ones that are clearly linked to investment policy (*e.g.*, having a statement of investment objectives) to broader ones (frequent Board meetings; existence of an investment committee). A further challenge is that improvements in both types of governance measure are strongly linked to increases in fund scale. The authors nonetheless find that while fund scale and governance strength may be correlated, they have effects beyond what either can explain on its own. Scale and good governance are each significant drivers of increases in allocations to risky assets, of increases in non-Swiss assets and of decreases in cash holdings. Internal expertise is a further driver of increases in risky assets. Furthermore, different governance measures are found to play slightly different roles. While the investment policy related measures are linked to increases in equity allocations, it is the strength of governance on broader measures that helps drive increases in alternatives.

Governance structures at large funds move the decision-making centre of gravity from the Board to the CIO and their team. The Board shifts to providing oversight and acting as the key conduit between the interests of external stakeholders and the institution. Boards at smaller asset owners lack the depth of this internal investment expertise and are forced to rely more on external advisers and to take decisions on the strategic asset allocation for example. As the study of Swiss funds suggests, large funds are more nimble and innovative, and create structures that allow decisions to be taken by those with the greatest expertise to take them.

A *small fund* nonetheless typically does have a Chief Investment Officer (CIO) who can help co-ordinate the Board's investment decisions on asset allocation and portfolio strategy. The CIO may not have the capacity to drive this strategy on their own but when also supported by external advisors, the Board can readily determine a strategy with a relatively low level of complexity. The Board can help to demarcate the potential investment universe by also articulating investment beliefs, *e.g.*, on the relative merits of active *vs.* index approaches to investment, costs, their comparative advantage, and sustainability goals for example. The CIO, with a small number of staff, is then responsible for implementation: hiring, monitoring, and firing asset managers; for varying the allocation within limits set by the Board; and for managing the overall risk of the portfolio. The construction of portfolios in each asset class sleeve, buying and selling individual securities, is outsourced to external asset managers with appropriate expertise. Figure 2 illustrates the key roles within this structure.

Figure 2: Small Fund Governance Structure: Internal CIO and Outsourced Investment Management



Source: PMA 2024, for illustrative purposes only.

6 'Pension fund board governance and asset allocation: evidence from Switzerland', Nadège Bregnard and Carolina Salva, Journal of Pension Economics and Finance (2023).

A *large fund* will have a bigger team reporting to the CIO and this team can be given more responsibilities. The fundamental role of the Board, to represent external stakeholders and set direction, is unchanged, but it is now less involved in aspects of the investment decision making process. The CIO can incorporate more complex strategies into the portfolio; can move the portfolio materially away from its benchmark asset allocation; and can include new assets into the portfolio more easily. Some of the portfolio can be managed internally rather than requiring external asset management expertise.

Figure 3: Large Fund Governance Structure: Significant Internal Investment Capability

Board	Articulate high level objectives & beliefs
with input from CIO / OCIO	Determine high level investment strategy
CIO / OCIO + Investment staff with input from internal PMs	Determine strategic and tactical investment strategy Determine mix of investment styles e.g. active vs. passive Determine mix of internal managers vs. external mandates Select and monitor PMs and internal capabilities
Internal	Sleeve-level security section and portfolio management
PMs	Identify new market opportunities for portfolio
External PMs	Sleeve-level security section and portfolio management

Source: PMA 2024, for illustrative purposes only.

Asset Allocation Approaches and Scale

Large funds can allocate more resources to **Asset Allocation**, allowing them to diverge from traditional approaches that small funds follow. It is widely appreciated that larger funds have been keen investors in private markets, expecting to achieve higher returns and a degree of additional diversification from what remains a relatively niche asset class. Figure 4 for example, drawn from data on defined benefit pension plans in the Netherlands, shows how larger schemes have a tilt within their portfolios towards private markets that is many times larger than smaller schemes. All investors may follow similar journeys in their early investment education, and share many of the same advisers, yet they come to very different conclusions when building their investment organisations and portfolios. This divergence in allocations could appear counterintuitive: surely an approach that works for one fund should just scale up or down for any other? But this ignores the operational aspects: monitoring third party managers, dealing with sudden cashflow calls, and rebalancing across portfolio components *etc.* that demand expert time and attention that will be in limited supply at a smaller fund.

Figure 4: Larger Dutch Pension Plans Allocate More to More Complex Asset Classes



Source: 'Have scale effects on cost margins of pension fund investment portfolios disappeared?" J.Bikker & J. Meringa, DNB (2021), Table 1, PMA calculations.

Modern Portfolio Theory (MPT), going back to work by Harry Markowitz, James Tobin and others in the 1950s, provides the framework for many investors' asset allocation efforts. Mutual fund separation theorems (whose early versions have since been extended in multiple directions) imply that the diverse objectives across investors can be met via an investment in a small number of shared investment vehicles. Each investor will need to hold different *proportions* of these funds in their total portfolio but the relative holdings of individual securities are common across investors, and determined within the funds by the overall market structure. This theoretical foundation has helped support the strong growth of index funds.

These academic reflections also align with more empirical approaches to investing. In the very different context of an individual's savings, inexperienced investors are generally wise to acknowledge that they do not have a competitive edge relative to others, and therefore try to benefit from the 'wisdom of crowds' by using market weights for their own allocations. The market as a benchmark has relevance in an institutional context, too. Market weights form an appropriate starting point even for larger, more experienced investors; and this applies not just within markets such as US equities but also across markets.

While diversification ("the only free lunch in investing") has its benefits it also has a cost: investors are forced to forego potentially large allocations to high expected return investments. Investors will be rightly wary of the risks involved in holding what would be a more concentrated portfolio of high-return assets. Larger investors may however be able to use their greater resources to build capabilities or to adopt less conventional asset allocation approaches that enable them to be more confident about holding such portfolios.

Firstly, consider an investor's investment capabilities. Larger investors have the resources to build teams and processes that create a competitive advantage relative to other investors. Capabilities could include management of portfolios of private market assets; origination and structuring of specific investment opportunities; processes for engaging with investee companies; detailed risk assessment of investment decisions, etc. Once an organisation develops specific expertise, it makes sense to exploit that within the portfolio rather than continuing to diversify. Spreading one's eggs across multiple baskets may be good advice in general, but if you are able to devote resources to designing and watching a few baskets, then it may make sense to allocate preferentially there.

Secondly, larger investors can move away from standard allocation approaches. Again, the theoretical finance literature makes some suggestions here. It was clear in the early days of MPT that rather than there being a single 'market factor' driving returns, there are multiple drivers. *Factor investing* embraces this, leading to portfolios that spread their exposure across different factors. Naturally, this immediately raises further questions: which factors are systematically rewarded with positive expected returns; how should investors spread their risk budget across the resulting factors; and how should they best build portfolios that are driven by these factors? The academic finance literature is replete with papers describing candidate factors.⁷ Investors therefore need to make choices and implement systems for monitoring factor exposures and assessing performance in terms of underlying drivers.

A more recent variation on this theme, but which has arisen from the investment industry rather than from academia, is the **Total Portfolio Approach (TPA)**. Investment strategy ideas are here assessed holistically against their ability to be additive to the portfolio, to bring in new sources of return, or diversify the risks of the current portfolio. Rather than funding new strategies from within predetermined asset class silos, what to sell is determined by assessing the risks and expected returns against all current holdings.

Scale is relevant here because adopting an approach such as factor investing or TPA requires appropriate levels of internal expertise and analytical capacity. In addition, the fund's organisational structure benefits from being aligned with this way of building the portfolio. The resulting portfolio can then be understood by different parties – the Board, the Chief Investment Officer, even the portfolio managers – in similar terms: performance will be explained and understood in a different way to a traditional asset class perspective. Implementing these alternative approaches often requires decision making across asset class silos rather than within them. A larger governance budget enables these approaches.

Investors with a greater governance budget can fine-tune the allocation process, whichever model is chosen, to fit their circumstances. For example, risk and return assessments can be generated internally rather than externally, with appropriate weight given to those elements of the portfolio that primarily drive performance and risk, or informed by the experience of managing the actual assets held. These views can then be readily updated as the market environment changes, enabling more dynamic portfolio decisions and heightening awareness of the opportunities and vulnerabilities faced by the portfolio.

Investors with a smaller governance budget are not entirely locked out of adopting new approaches. The recent growth in outsourcing aspects of the Chief Investment Officer function ("OCIO"), effectively allows pension plans to pool resources with others and gain access to different approaches to designing the investment process as well as gaining access to different investment opportunities. Over time, as new approaches become standard ones, it becomes easier for investors of all sizes to adopt them.

^{7 &#}x27;A Census of the Factor Zoo', Harvey and Liu (2019).

Portfolio Construction and Scale

More governance resources arising from greater scale also allow for superior **portfolio construction**. Manager selection and monitoring can, of course, be outsourced to consultants by investors of all sizes. But larger funds can bring this in-house, enabling more customisation, or active monitoring that is aware of the broader portfolio context. An internal function can more easily build a tailored mix of index and active management styles that is more carefully tuned both within and across asset classes. Risk management of the portfolio can be carried out more thoroughly, both ex-ante and ex-post, with drivers of return identified and assessed across the portfolio, and manager choices assessed against scenarios to provide a richer understanding of the portfolio's overall sensitivities.

A smaller fund will often have a strategic asset allocation benchmark consisting primarily of public asset classes. While the portfolio construction process can be relatively straightforward here, there are still multiple decisions that need to be made within each asset class:

- **Benchmark.** In addition to a choice of standard (market capitalisation-weighted) benchmarks, there may be a preference to tilt away from these, *e.g.*, to account for desired exclusions or to reflect ESG preferences.
- **Style.** Should the fund passively manage an asset class sleeve to track its benchmark index or use active management to seek outperformance? What tracking error risk budget or alpha return target is appropriate or achievable?
- Manager selection. What mix of internal and external managers should be used?

While an index-tracking approach is not usually an investor's preferred choice, it may still end up being part of the final mix – and this decision can be linked to scale considerations. The president of the largest Dutch pension plan, ABP, was quoted in November 2023 saying that "the added value of active investing is zero for us because we are such a large investor. With over \in 100bn in listed equities, we are so large that we automatically become average in terms of returns."⁸

Internal **portfolio management** and tailored benchmark designs will be more realistic options for larger funds able to devote resources to the personnel, systems and oversight that they require. Each fund must judge how well their internal skillset aligns with the required management style. A large fund may for example feel capable of investing in public fixed income but seek to outsource actively-managed equity or private equity programs. Alternatively, the fund may feel confident in its ability to manage particular asset pools actively in-house.

Figure 5 contrasts average (asset-weighted) allocations to passive managers for a range of equity and fixed income markets for small and large plans. Figure 6 makes a similar comparison for allocations to internal (as opposed to third-party) managers. These show that it is rare for smaller plans to manage indexed assets internally. Except for US large cap stocks, most assets are managed actively, usually by third-party managers but with some assets managed internally. Larger plans differ from this in two clear directions: the percentage that is indexed rather than actively managed increases, and the percentage that is managed internally also generally increases.⁹ With options for index-tracking funds readily available at very low cost, it is surprising that internal managers can reasonably compete here: but while it is true there is little scope for cost reduction (see Figure 9 below), the ability to design and track custom indices may remain attractive for some plans.



Figure 5: Large (>\$10b) Plans Generally Allocate More than Small (<\$1b) Plans to Passive Investment

Source: 'Scale Economies, Bargaining Power, and Investment Performance: Evidence from Pension Plans', de Vries, Kalfa, Timmerman and Wermers (2023), Table 1, PMA calculations. Underlying data from CEM pension fund database, details in 'How the world's largest institutional investors leverage scale to deliver real outperformance', A.D. Beath, C. Flynn, R. Jethalal, M. Reid (CEM Benchmarking, 2022).

- 8 ABP is too big to be an active investor, says president. IPE, 27 November 2023 <u>https://www.ipe.com/news/abp-is-too-big-to-be-an-active-investor-says-president/10070290.article</u>
- 9 Only a representative selection of asset classes is shown here. There are two main exceptions not shown: smaller plans are more likely to manage cash internally; and to manage inflation-linked bonds actively.

Figure 6: Large (>\$10b) Plans Generally Manage More Internally than Small (<\$1b) Plans



Source: 'Scale Economies, Bargaining Power, and Investment Performance: Evidence from Pension Plans', de Vries, Kalfa, Timmerman and Wermers (2023), Table 1, PMA calculations. Underlying data from CEM pension fund database, details in 'How the world's largest institutional investors leverage scale to deliver real outperformance', A.D. Beath, C. Flynn, R. Jethalal, M. Reid (CEM Benchmarking, 2022).

Portfolio construction encompasses more issues than just choosing how to implement each asset class allocation decision, and the more moving parts within the portfolio the greater the need for governance capacity to manage them. The interactions between mandates and capital flows into, within, and out of the portfolio require attention. A rebalancing policy will handle day-to-day cashflows and differential returns across sleeves. More complex questions will arise once private assets enter the mix: how should commitments that have not yet been called be invested in the interim, should foreign currency exposures be hedged?

Having a team able to take a portfolio-wide view allows for overlapping exposures to be managed and, where necessary, mitigated. Some asset sleeves may generate alpha by overweighting another sleeve versus the benchmark (*e.g.*, a manager with a government bond benchmark allocating to credit) or multiple managers may tilt towards a particular sector or geography. Does the mix of active styles combine to produce an index- or factor-like return (which can then be replicated more cheaply) or does aggregate active positioning result in increased exposure to specific risks or in mitigation of these risks?

Using a standard top-down portfolio construction process – choosing styles and managers within each asset class sleeve – means that the portfolio's active risk budget is constrained by the asset class weights. An alternative bottom-up approach builds a portfolio to deliver a target mix of active risks as well as asset class weights. Here again, the portfolio must be built as a whole, rather than within silos. For these portfolio-wide questions, the fund faces a *coordination* problem with different teams having to communicate these risks within the investment organisation, which may then require internal bureaucracy. So, large funds face governance challenges as well as governance opportunities.

Allocations to real estate, infrastructure or private equity are often 'lumpy', coming in large lot sizes that do not conform closely to a market-wide benchmark. They can therefore shift the risk profile of the overall portfolio materially and the resulting exposures need to be assessed carefully to determine if mitigation is required. A large fund with dedicated risk personnel and systems is likely to be more attuned to these portfolio-wide issues and engage proactively with them. A small fund may rely on external advisers for selection and periodic monitoring of third party managers, but pay relatively less attention to the portfolio implications, especially if these vary over time.

In addition, the lack of daily valuations and liquidity and uncertain commitment pacing makes the monitoring of performance and management of cashflows more involved, and therefore more practical for larger investors.¹⁰

Diseconomies of Scale in Investment

Large funds also face diseconomies of scale. For a large fund it is more costly to trade large lots or to find sufficient investment ideas or signals to generate outperformance. Scaling up what works at modest size might be challenging, as reflected in the quote from ABP above.

Though different to pension plans, mutual funds provide a related test environment where these diseconomies can be explored. Theoretical models of the competitive mutual fund market predict that, because of diseconomies from trading in large size, inflows to skilful managers will lead to a diminution of performance, ultimately with no net outperformance in equilibrium.¹¹ Empirical studies have indeed found evidence that supports decreasing returns to scale in mutual fund returns.¹²



Figure 7: Adding Value Becomes Increasingly Difficult for Large Mutual Funds

Source: Zhu (2018) tables 5 and 9, PMA calculations. Analysis of active US equity funds, variation of gross and net alpha with fund size for largest 10% of funds.

Figure 7 shows some typical results from such a study which found that each time a large fund doubles in size, its ability to generate alpha falls by 8bp/y. For a median manager, this means that the alpha net of fees becomes negative for a fund size above \$3b; for an upper quartile manager this breakeven level is just below \$10b. Other studies (*e.g.*, Harvey et al (2021)) have found that the fall in alpha is even more precipitous, falling by 20bp each time a fund doubles in size, and that the overall size of the active fund industry also impacts on performance. Simply spreading a large allocation across multiple managers may not be a solution.

A pension plan spreads assets across multiple markets, so the asset scale beyond which positive active return becomes difficult will be larger than for a US equity mutual fund. But greater scale acts as a headwind for investors of all sizes.

Confronting Investment Diseconomies of Scale

How do large funds respond to this challenge? We have described how large funds have advantages and opportunities that small funds do not. We should expect large funds to enjoy reduced **investment costs**, measured as a percentage of assets, compared to small funds. Fixed costs, for example related to IT systems or regulatory compliance, are easier to bear when spread across a greater asset base. Additionally, they should be able to drive down costs through bargaining with external managers – who also benefit from these economies of scale – and devote more resources to selecting skilled managers; and they can build internal investment capability to replace external management. To what extent do these actions succeed in the face of investment diseconomies of scale?

Funds of all sizes benefit from low costs in traditional asset classes (stocks, fixed income). Investment processes in these asset classes have benefited from decades of IT investment, and the quality of active returns profits from competition within the asset management industry. Figure 8, drawn from a recent study of Dutch pension plans, shows that large funds can squeeze these costs even further. For this group, traditional asset classes – fixed income, stocks, and real estate – make up 99% of smaller plans' investment portfolios. Large plans experience lower costs in all these asset classes.

^{11 &#}x27;Mutual fund flows and performance in rational markets', J.B. Berk and R.C. Green, Journal of Political Economy (2004)

¹² For example, 'Diseconomies of Scale in Active Management: Robust Evidence', Luboš Pástor, R. F. Stambaugh, L. A. Taylor and M. Zhu Critical Finance Review (2022), 'Informative fund size, managerial skill, and investor rationality', Min Zhu, *Journal of Financial Economics* (2018), 'Decreasing Returns to Scale, Fund Flows, and Performance', Campbell Harvey and Yan Liu (2021).

Figure 8: Average Investment Costs for Dutch Pension Plans of Different Sizes (in bp/y)

	All plans	Largest plans	Smallest plans
Fixed income	16	14	23
Stocks	23	20	31
Real estate	72	68	71
Other (Hedge Funds, Commodities, Private Equity)	338	340	358
Total	49	58	33

Note: Total investment costs, including performance fees, as a percentage of assets, for Dutch pension plans in 2019. Largest and smallest plans are the 6 largest and 91 smallest within a total dataset of 280 plans, as reported in Bikker and Meringa (2021). The rise in total costs for large plans is explained by differences in allocations: see Figure 4.

Larger funds with greater governance capacity can more easily choose which assets to manage internally rather than relying solely on third party managers. Figure 5 & 6 showed that large funds use internal management for both passive and active investment styles, with external managers employed generally for active management in more niche asset classes where the costs of building up internal expertise are likely to too high.

Figure 9 shows the impact on investment costs of the decision to use internal management. As before, the analysis is split into active and passive styles with stocks and fixed income being shown separately. Surprisingly, even though external index-fund costs (left-hand chart) are very low for all fund sizes (around 5bp/y is what small funds can achieve), large funds can obtain even lower rates from third parties and reduce these further by managing internally. With a cost reduction of around 1bp/y, however, this is unlikely to be at the top of a CIO's list for cost reductions. On the other hand, for active funds (right-hand chart), shifting to internal management is more significant in both percentage terms and in basis point terms.

Figure 9: Large Pension Funds Have Lower Costs either through External or Internal Management



Source: 'Scale Economies, Bargaining Power, and Investment Performance: Evidence from Pension Plans', de Vries, Kalfa, Timmerman and Wermers (2023), Table 6, PMA calculations. Multivariate regression model fitted to CEM pension fund database. 10th and 90th percentile correspond roughly to plans of \$500m and \$50b in size.

Diseconomies of scale, however, result from the *market* costs of trading large portfolios and the cost of sourcing sufficiently many, or sufficiently good, investment ideas, to generate positive return. Reducing *management* costs is obviously helpful but does not resolve this central problem. As has been highlighted, one of the additional actions that larger plans can take, and which overwhelms the cost reduction benefits already described, is to change asset allocation. Larger plans' greater investments in alternative asset classes come, as Figure 8 shows, with higher costs.

Large plans do experience (slightly) lower costs in a range of alternative asset classes, where costs are materially higher, but larger Dutch plans allocate 11%, not 1%, here. This is one way in which pension plans can partially avoid the diseconomies of scale that were described for mutual funds earlier. Mutual funds generally do not have changing asset-allocation available as a lever: they are limited to a particular asset class universe whereas a pension plan is not. Moreover, by tilting towards private asset classes where lot sizes are larger, plans gain access to a source of return which is driven not by frequent trading but instead by assets that are bought and then held for an extended (multi-year) period.

Figure 10: Average Investment Costs for Large Dutch Pension Plans vs. Their Smaller Peers



Note: Difference in investment costs for larger plans compared to all plans or smaller plans. Alternative presentation of data in Figure 8. Source: Bikker & Meringa (2021).

The effect of this asset allocation difference dominates the total, plan-level, cost figure. The cost reductions of almost 40% in individual asset classes flip to become an overall cost *increase* of over 60% (Figure 10). This is a potential problem. Costs are visible, relatively easy for funds to report and then for stakeholders (plan members, regulators, industry commentators, politicians, *etc.*) to compare across plans. But it must be remembered that costs are only part of the picture: ultimately it is the total return net of fees that should matter. Asset owners of course understand this when making their allocations. With index investing vehicles available at very low fees for essentially all investors, the potential change in net return as scale increases is very modest. It is the allocations to active management styles and to more expensive asset classes that have large impacts on return as well as cost. Figure 11 & Figure 12 illustrate the return differences at the asset class and plan level.

Figure 11 shows data from a recent study by CEM of returns of pension plans, as well as other long-term asset owners, across the world from 1992 to 2020.¹³

	Smaller plans (AUM < \$1bn)	Mid-size plans (\$1bn < AUM < \$10bn)	Larger plans (AUM > \$10bn)
Active return, gross of fees	0.47%	0.67%	0.83%
Active return, net of fees	-0.03%	0.15%	0.29%
Active risk	2.91%	2.41%	1.90%

Figure 11: Average Annualised Risk and Return for Funds of Different Sizes, 1992-2020

Note: Gross and Net Value Added relative to benchmarks. Source: Exhibit I in 'A Case for Scale', CEM Benchmarking (February 2022).

Figure 11 shows that larger plans have been able to deliver greater returns, both before and after investment costs, than smaller funds. What is more, they have done this while taking a lower overall level of reported active risk. Digging deeper into the data, the authors run regressions that find that it is not just size that has (economic and statistical) significance for a fund's active return net of fees: the percentage allocated to active management, and decisions around how much a fund chooses to manage internally, are associated with the value generated by a portfolio. They find that each additional 10% actively or internally managed on average adds 2.2bp and 1.9bp to net value, respectively. Internal management is not typically additive in public markets, but holding assets directly is beneficial in private markets.¹⁴

Figure 12 compares returns at the asset class level. Larger plans are generally able to achieve better returns before fees, and therefore even more so after fees. What stands out is the role of the non-traditional asset classes. The barrier to entry is relatively high: more complex management (liquidity, portfolio construction) is required but as a result the impact of scale on return is now felt more keenly: larger plans are able to achieve net-of-fee returns that are as much as 4% higher than smaller plans are able to generate in private equity for example.

^{13 &#}x27;A case for scale: How the world's largest institutional investors leverage scale to deliver real outperformance', CEM Benchmarking February 2022.

¹⁴ Source: Exhibit 2, Beath et al, CEM Benchmarking (2022).

Figure 12: Larger Plans Generally Generate Higher Returns, Both Before and After Fees



Source: 'Scale Economies, Bargaining Power, and Investment Performance: Evidence from Pension Plans', de Vries, Kalfa, Timmerman and Wermers (2023), Table 7, PMA calculations. Underlying data from CEM pension fund database.

As funds grow, they are not just able, but are incentivised to invest differently. They allocate more to more complex asset classes and can contemplate different models for their investment process. Figure 4 showed that these changes are very material in the case of Dutch defined benefit pension plans, for example.

These allocation shifts do result in higher costs. This can be difficult for stakeholders or regulators to stomach. Driving down excessive costs is a worthy goal that has been able to produce significantly better policyholder outcomes. But as funds get larger, this goal risks becoming counter-productive. Fee caps need to be carefully calibrated to the problem at hand. Evolving the investment allocation requires an evolution in governance – in both people and processes. A large global fund will have to pay more to gain access to asset classes that are able to generate higher returns. The large fund will find itself competing for investment personnel with the broader investment industry, and will require technology to manage complex portfolios. Stakeholders therefore need to weigh the benefits as well as the costs of these moves: return net of fees is likely to be a more useful metric than costs alone. This is ultimately what drives outcomes for plan beneficiaries.

Trends towards Larger Funds

Multiple countries have experienced greater concentration of retirement savings assets – both defined benefit and defined contribution – into a smaller number of pension schemes. Even as the total number of beneficiaries and assets continue to increase, there has been a trend towards consolidation with peer schemes or even closure (*e.g.*, liabilities being transferred to a small number of insurers). Figures 13 to 16 show examples from Switzerland, Australia, the UK, and the Netherlands. In all cases there has been a significant fall in numbers of pension plans – and in some cases this has been a very steep drop.

Figure 13: Swiss Pension Plan Consolidation



Source: Oberaufsichtskommission Berufliche Vorsorge, OAK BV, Reports on the Financial Situation of Pension Institutions, 2013-2024.

Figure 14: Australian Superannuation Plan Consolidation



Source: Australian Prudential Regulation Authority, APRA. Annual fund-level superannuation statistics 2023.

Figure 15: UK DC Trust Consolidation



Figure 16: Dutch Pension Fund Consolidation



Source: The Pension Regulator, UK. DC trust scheme return data, DC trust schemes with more than II members. Average fund size shown for those funds with over 5,000 members (50% of all schemes in 2012, 95% in 2023).

Source: De Nederlandsche Bank DNB, dnb.nl statistics. Number of supervised pension funds in each year.

While there is no single cause leading to increased concentration in different pension systems, there are some common themes driving the consolidation:

- Economies of scale. Larger funds are naturally able to spread fixed costs across a wider base, so it should be expected that they should experience higher net-of-fee returns. They also benefit from greater bargaining power with investment intermediaries and the range of asset classes in which larger pools can invest is expected to be wider.
- **Regulatory pressure.** Pension regulators monitor and enforce both market conduct of pension plans (how they behave) and outcomes for beneficiaries (what they deliver). As rules evolve and multiply, compliance and reporting costs mount and tend to discourage smaller market participants. Attention to member outcomes encourages merger or exit both from funds that lack economies of scale as well as from those funds lacking best-practice investment processes.¹⁵
- **Political pressure.** Large funds are more susceptible to government attention and involvement. The larger the fund, the larger the impact of a targeted governmental campaign. Governments expect (demand?) that funds be willing and able to invest in the domestic or local regional economy in private companies, or infrastructure projects, for example. Political or economic planners can observe the domestic impact of some sovereign wealth funds or other large asset pools around the globe and wish to construct similar economic actors in their own countries.¹⁶

- 15 For example, the Chair of the Australian regulator stated in 2022 that "[Size] difference matters. It has real impacts on the outcomes delivered to members... the largest funds are leveraging their scale to reduce expenses and improve operating efficiency. They can lower fees and costs, access higher-yielding investments and better attract new members a virtuous circle." <u>https://www.apra.gov.au/news-and-publications/apra-chair-wayne-byres-and-executive-director-of-superannuation-suzanne-smith</u>
- 16 The pressures to pool resources need not result in full mergers between plans: benefits can arise at an intermediate stage. Consolidation can occur in specific areas at the operational or investment level. The UK Local Government Pension Scheme (LGPS) provides an interesting example. Political pressure has been the paramount force in the LGPS journey. Within England and Wales there are 86 individual funds within the LGPS, typically corresponding to a particular city or county council. (There are exceptions, such as the Environment Agency and the West Midlands Integrated Transport Authority. Beyond England and Wales, there are also a further 11 in Scotland and 1 in Northern Ireland within the scheme, so far unaffected by the pooling dynamic.) Since 2015, the central UK government has encouraged these funds to invest their assets via common pools: 8 pools have emerged and many funds have transferred the majority of their assets to these pools, delivering significant cost savings, estimated to be £180m/y. Encouragement can of course be just a precursor to compulsion, and a deadline of 1 April 2025 has been proposed for pooling *all listed* assets. Furthermore, pronouncements by the (pre 2024 election) government implied that the number of pools should also shrink over time, in order for each to achieve a critical mass of at least £50b. Pensions consolidation is one policy area where the post-2024 election government appears to strongly align with its predecessor, though there are expected to be differences of detail.

Regulatory Focus on Member Outcomes

Size as an important driver for performance also emerges in the defined contribution (DC) space. Comparisons between Australian Superannuation funds demonstrate what scale as well as robust regulatory action can achieve. Each year, under the 2021 'Your Future, Your Super' reforms, the rolling 10y annualised performance of each MySuper product is assessed against its custom benchmark, allowing for the fees and expenses that a representative member would face. If the resulting performance metric falls below -0.5%, then the product *fails* the test, otherwise it *passes*. Figure 17 shows that most products pass the test, as might be hoped, and that the percentiles of performance increase – and therefore the likelihood of failure decreases – as the AUM managed by each product provider grows.



Figure 17: Performance Quantiles Relative to Size for Australian MySuper Funds

Note: Quantile regressions based on performance metrics published by Australian regulator. Source: Australian Prudential Regulation Authority, APRA. MySuper heatmap data, February 2023. PMA calculations.

APRA, the Australian regulator, uses the performance test to hold product providers to account – and publication enables members to do this, too. Failure in two consecutive years means that a product can no longer accept new members until the test is passed; funds that are not delivering will feel pressure to consolidate with others who are.

In recent years many Super products have closed or, more commonly, merged with other providers. This has had a meaningful impact on plan members' asset allocations. Asset allocations for funds that closed in the 4y to September 2024 (Figure 18) had higher allocations to domestic listed equities and lower allocations to private equity and infrastructure compared to funds that remained. Larger funds go in the opposite direction: Figure 19 shows the average impact of a 10-fold increase in AUM for Australian superannuation schemes: increased allocations to private asset classes and reduced allocations to listed equities.





Source: Australian Prudential Regulation Authority, APRA. Quarterly MySuper statistics, September 2020 – September 2024. PMA calculations.

Figure 19: Average Impact of a 10-fold Rise in Size of Superannuation Scheme



Source: Australian Prudential Regulation Authority, APRA. Quarterly MySuper statistics, September 2020 – September 2024. Loglinear regression of fund allocations for funds open at end of 02 2024. PMA calculations.

It is worth re-emphasising that it is net returns, and not costs, that should ideally play the primary role when regulators are seeking to safeguard investors' outcomes and encourage consolidation. But while returns take time to emerge, costs are more immediately measurable and so are often given prominence when assessing whether consolidation should be pursued or whether it has been a success.

APRA does examine net returns – its performance metric uses active returns relative to an SAA benchmark and it publishes net total returns for the products it regulates as well as publishing their costs. This regulatory focus has been effective at driving the consolidation shown in Figure 14.

The earlier data from multiple countries showed that net returns can be driven up despite an increase in costs: a narrow focus on cost therefore risks being an impediment to good investment outcomes. A narrow cost focus can also conflict with broader policymaker goals: assets that support or drive domestic economic reconfiguration or economic growth are often more costly to manage.

In this context, the new UK government recently announced plans for a "Value for Money" framework for trust-based defined contribution schemes, stating that this should "result in consolidation in the pensions market by leaving a smaller number of well-performing, well-governed schemes which will not only improve outcomes for savers but is likely to lead to more productive investment of funds".¹⁷ The reference to "more productive investment of funds" reflects the broader economic aims of the government, and it is noteworthy that larger schemes will also be expected to be "well governed".

Domestic Investment by Private-sector Pension Plans

Market-capitalisation weights often emerge as a natural neutral portfolio choice within academic finance. This perspective is often taken up by practical portfolio advice, too. Overweighting markets that just happen to be located nearby can be readily disparaged by advisers as 'home bias' – in other words, as a defect which should be, and with the availability of low-cost index funds, readily can be, avoided.¹⁸ Just as the index fund industry has grown, so advisers have become more fastidious about these allocation choices.

However, reductions in domestic allocation have been primarily a feature of public market allocations. While these reductions may alarm policy makers, who then increase pressure for a reversal, private market allocations have often been the arena in which domestic investment re-emerges. With a less readily-available capitalisation-weighted index comparator, high allocations to domestic private markets are less vulnerable to challenge. In addition, the expertise that larger investors have built out in private markets often results in teams with many employees based domestically. Such teams are well placed to develop a competitive advantage in their local (domestic or regional) market, where allocations allow this expertise to generate positive investor returns.

UK defined benefit (DB) plans provide a window into this process. The UK may be the sixth largest economy in the world, but it is just 2.2% of the whole global economy, and the UK stock market is 3.7% of global public equity markets.¹⁹ As they have matured and become better funded, UK DB plans' holdings in equities have declined significantly in recent decades: from 81% in 1993 to 23% of total assets in 2023. Yet allocations to UK equities have been falling much more precipitately. Figure 20 shows UK plans' average holdings to UK equities as a proportion of total public equity allocations. Where there had been an exclusive preference for home-grown equities there is now an increased queasiness about home bias. Admittedly, a significant home bias still exists: holding 22.4% of equities in the UK market is still a significant advance on 3.7%.

¹⁷ King's Speech 2024 background briefing document, <u>https://assets.publishing.service.gov.uk/media/6697f5c10808eaf43b50d18e/The_King_s_Speech_2024_background_briefing_notes.pdf</u>

¹⁸ For example, https://professionals.fidelity.co.uk/articles/expert-opinions/2023-08-07-reassessing-home-bias-and-case-going-global-1691402669813

¹⁹ Sources: Global Investment Returns Yearbook, 2024. Dimson, Marsh, and Staunton, UBS Global and IMF <u>https://www.imf.org/external/datamapper/profile/GBR</u>. GDP is measured at purchasing power parity.



Figure 20: UK Pension Plans' Allocation to UK Equities Has Declined Much Faster Than Equities Overall

Source: UBS pension fund indicators for data prior to 2016; PPF Purple Book for data after 2015. Average allocation across UK defined benefit pension plans. PMA Calculations.

The 22.4% figure for UK equities as a proportion of all listed equities is a *simple* average, across plans of all sizes: when *weighted* by asset values, this drops to 10.8%. Larger schemes have moved much further towards globally diversified portfolios than smaller schemes have.



Figure 21: Larger UK Pension Plans Shift their Equity Allocations from Public to Private Markets



Figure 21 shows that mid-sized UK schemes hold around 13% of their listed equities in the UK, while this drops to 8% for larger schemes. But it also shows that while larger schemes have tilted away from listed public markets, they have moved significantly towards private markets. This provides an important counterbalance to the public market story since it is here that a local preference can and does re-emerge, and large plans' UK private equity allocations greatly exceed their allocations to listed UK stocks.

Determining the geographical exposure of UK pension plan portfolios is not straightforward: on the public side, many companies with UK listings have large businesses outside the UK; and data on the private side is much less widely shared. Yet an example serves to illustrate the importance of these allocations and shows that they often exceed the 8-13% that the public equity market data might suggest. With assets of £75.5b, the Universities Superannuation Scheme (USS) is the UK's largest private sector pension plan. It reports investments of £28bn in private markets, with 46% of this being invested in the UK.²⁰ This allows USS to state that across all assets (including bonds as well as growth investments), USS allocates 49.7% of its portfolio in the UK.

It is noteworthy that in addition to the broad geographical split in its private market portfolio – alongside the 46% in the UK, there is 22% North America, 12% Europe ex-UK, 5% Asia Pacific, 15% Other – USS has been keen to communicate more detail on its UK component, using a location map to show how its private market investments are spread across the UK, revealing an awareness of the sensitivities of its key stakeholders – the plan beneficiaries (UK university staff) and UK policymakers – that is shared by other large plans around the world.

20 https://www.uss.co.uk/how-we-invest/where-we-invest/private-market-investments

Private market allocations are typically viewed as more difficult in the DC space, where liquidity is more of a concern (members can in principle move to alternative providers) and higher costs may be less palatable. Nonetheless with increased consolidation of saving into a small number (fewer than 30) of master trusts, similar currents can be observed. The UK's largest master trust, Nest, reported in 2023 that around 45% of its growing private market portfolio was in the UK.²¹ The UK Government is hoping to replicate this using persuasion rather than compulsion. It successfully encouraged several large investors to sign a 'compact' committing to reach a 5% minimum allocation in unlisted equities by 2030, with higher returns as the explicit aim but with the implicit expectation that these will have a significant domestic focus.²²

Other countries beyond the UK provide examples of large funds that are keen to have, and to publicise, their domestic investments. ABP, the largest Dutch pension plan, reports a more modest 5% allocation to Dutch assets, but that 18% of its listed equity and real estate portfolio is in the Eurozone. These are substantial over-weights, though others' are even larger.²³ Australian Super, the largest of the superannuation schemes in Australia – advertises that 21.5% of its flagship Balanced fund is held in Australian shares, compared to 27.5% in other listed shares. The total allocation to Australian assets has been reported to be as high as 50%.²⁴

While it is understandable for policymakers to want large local asset pools to act as vehicles for advancing broader domestic economic or social policy, these goals have the potential to conflict with plans' own financial objectives. Good governance is key to ensuring that these conflicts are avoided or managed. Sovereign wealth funds have also encountered these issues in recent decades and their approach to domestic investment and to governance arrangements offer signposts for pension plans under pressure to consolidate and invest locally.

Closing Thoughts

In summary, differences in scale are strongly associated with differences in organisational structures, investment allocation choices and realised outcomes. Higher returns are achievable by larger organisations, but changes in approach and thoughtful decisions about where to focus resource are required to succeed. It is not surprising that consolidation is being seen, and encouraged, in pension systems across multiple countries. Policymakers should take care to avoid using cost as the sole metric for consolidation and maintain focus on the overall efficiency of outcomes, for both beneficiaries and the broader economy too.

Larger investors should think strategically about which mix of active and passive investments works across the portfolio; about where internal management can play a role and where external partnerships are better placed to deliver value. Value can be delivered through asset origination, ownership, and management – and not just through frequent trading. Asset ownership is likely to be a more reliable route when diseconomies of scale begin to bite. Being open to novel investment opportunities, with the capabilities to assess them, to integrate them into an existing portfolio – as well as establishing a process for how and when they should be sold! – are among the organisational skills that larger investors increasingly seek.

Smaller investors should also play to their strengths. Adding value through active management in liquid markets does not face severe capacity constraints. There are dangers in seeking to replicate the allocations that larger investors make – typical lot sizes may make diversification a challenge and the internal capabilities for selection and management may not be present. But by pooling with other investors, for example through an OCIO arrangement, some of these benefits can still be accessed.

The governance aspects and relative investment benefits of the different asset allocation approaches that large investors have been developing will be explored further in subsequent research.

^{21 &}lt;u>https://capa-data.com/nest-hits-30bn-with-45pc-of-private-assets-in-uk/</u>

²² https://www.theglobalcity.uk/PositiveWebsite/media/Research-reports/Mansion-House-Compact-Signatories-updated.pdf

²³ Dutch stocks make up around 1.1% of the global stock market. The Eurozone makes up around 8% of global stock markets or 6% of the world economy by GDP.

²⁴ Source: Page 35 of AustralianSuper's Economic Contribution to Australia, KPMG report March 2023 available on AustralianSuper website.



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