IFSWF
International Forum of Sovereign Wealth Funds

Concentration and Convergence:
Sovereign wealth fund investment in an age of geopolitics and AI





Welcome to the 2026 IFSWF Annual Review.

Sovereign wealth funds began this year navigating two major forces: increasing geopolitical fragmentation and a technology cycle reshaping investment in the real economy.

These developments are interconnected. Each pulls capital towards a narrower set of transactions. Fragmentation pushes it towards a handful of trusted markets, while the AI boom draws it towards a single technology complex. For a long-term investor, that raises one unavoidable question: where, and in what, is our capital truly concentrated? This question underpins IFSWF's flagship projects this year: the Resilience Playbook, chaired by Australia's Future Fund, and the AI Flagship Initiative, led by Mubadala.

The following two chapters address this question using IFSWF's first concentration index for sovereign wealth fund investment. When applied to geography, the index shows capital focusing on a smaller group of trusted markets as fragmentation increases. When applied to sectors, it reveals the opposite: despite the AI boom, sovereign funds remain highly diversified, even as the distinction between physical and digital economies fades.

In addition, three guest op-eds provide analysis and insights from Africa, the Americas, and Europe. Because geography has become the main axis along which sovereign wealth funds move, where a member sits increasingly shapes what it sees, and sovereign wealth itself is spreading to new regions. These regional views complement the data chapters with the judgment of investors living through those shifts.

These regions are no bystanders to the AI story that runs through our data chapters. They sit at its foundation. The physical AI build-out, from data centres and chips to power and grids, depends on a supply chain of critical minerals, and Africa holds much of it: close to a third of the world's non-fuel mineral value, half the world's cobalt, and most of its platinum-group metals. That places our resource-rich and lower-income members upstream of the very build-out that the largest funds are now financing. This is why this Annual Review carries a full guest op-ed on the African sovereign opportunity, and another on Brazil's subnational funds financing industrial policy and the energy transition across Latin America.

A note on the scope of this Annual Review: our analysis draws on publicly disclosed sovereign wealth fund direct investments, the deals our members or other funds choose to make visible, which reflect strategic intent. This is a sample, as direct investments make up only a portion of total assets; most of the remainder sits in listed and passive mandates that we cannot observe. Given the limited history of data, we read patterns as indicators of movement and direction, not causation. We make this scope explicit on purpose; the value lies in tracking trends and applying our concentration index consistently each year.

The index also delivers an early, clear finding. In previous Annual Reviews, our analysis focused on sector themes. This year's data show that sovereign capital remains broadly diversified across sectors, while the main structural shift is happening in geography. As in past years, the Annual Review draws on the IFSWF database and primary sources. We hope you find it valuable.

Duncan Bonfield
Chief Executive Officer, IFSWF Secretariat

Chapter 1

Sovereign Capital in a Fragmented World

Measuring Geographic Concentration in Sovereign Wealth Fund Direct Investments, 2018–2025

In brief

Since 2021, sovereign wealth fund investment has become increasingly geographically concentrated. For the first time, IFSWF calculated a sovereign wealth fund Herfindahl-Hirschman Index, showing concentration rising from 0.110 in 2021 to 0.192 in 2025, the highest level in our 2018–2025 dataset. The effective number of destination countries fell from roughly nine in 2021 to just over five in 2025. This trend aligns with increased geopolitical risk and is primarily driven by the United States, whose share of disclosed sovereign capital rose from about 28% to over 41% during this period. This pattern is consistent with a strategic recalibration toward a smaller group of trusted markets.



The New Geography of Risk

To better describe the increased geopolitical issues every sovereign investor in the world faces today, we borrowed the words of Lim Chow Kiat, Chief Executive Officer of Singapore's GIC:

"The forces shaping today's investment environment go beyond any market cycle or structural trend. They strike at the foundations of the global order. They are rewriting the rules of global investing."

He said this in his 2024/25 annual letter to stakeholders.

"Politics and geopolitics now influence economies and financial markets directly and immediately..." he continued, "Financial systems are dividing along geopolitical fault lines, complicating cross-border investing."

A year on, GIC hardened this message rather than softening it. Under the heading 'Geopolitical Risk: Structural Not Episodic', its 2025/26 letter states that geopolitical risks are 'no longer episodic disruptions but structural changes, with more persistent and uneven market effects', as 'countries are prioritising resilience and strategic autonomy, reshaping supply chains and capital flows in the process'.

The globalisation of the post-Cold War era, with expanding trade flows, relatively open capital markets, and a broadly shared international rule of law, has given way to a more fragmented and unpredictable environment. An increasing divergence in regulatory and political frameworks has heightened both the cost and complexity of cross-border investment. Long-term investors have noted that these developments represent a structural condition rather than a temporary challenge. GIC has already begun to reflect this decoupling in its portfolio. It reduced its Asia Pacific exposure from 28% in the year ending March 2024 to 24% a year later and to 22% in the year ending March 2026, while its Americas exposure rose from 44% to 49% and then to 53% over the same period.

Regardless of whether this shift reflects a deliberate geographic pivot or the influence of US equity markets and AI investment opportunities, the overall directional trend remains consistent.

To measure the geographic fragmentation of sovereign wealth fund direct investments, we ask a simple yet consequential question: Is the geography of sovereign wealth fund investment changing in response to geopolitical events?

To answer this rigorously, we measured the year-on-year geographic concentration of disclosed sovereign wealth fund direct investments using the Herfindahl-Hirschman Index (see callout box). To place these investment shifts within the broader geopolitical environment, we also draw on the Caldara-Iacoviello Geopolitical Risk Index (GPR), a text-based measure derived from newspaper coverage of geopolitical tensions that provides a continuous, comparable signal of risk intensity over time (see callout box). Sovereign wealth funds, central banks and other institutional investors generally use the GPR to measure geopolitical fragmentation over time.





How we measure concentration: the Herfindahl-Hirschman Index

We track geographic concentration using the Herfindahl-Hirschman Index (HHI), a measure developed in antitrust economics and adapted here to capture the spread of capital across destination countries. For each year, we take every country's share of the total sovereign wealth fund deal value, square it, and sum the squares. The result ranges from zero to one: a score near zero means capital is spread evenly across many destinations, while a score near one means it is concentrated in a single country. The squaring is what gives the index its bite, since large shares are penalised disproportionately. A country holding a 40% share contributes 0.16 to the index on its own.

We chose the HHI over simpler gauges such as the top-three-country share because it is sensitive to the full distribution, is a recognised and citable standard, and produces a single comparable number per year. We compute it once a year rather than month by month because deal flow is lumpy, and monthly readings would swing with the timing of individual transactions rather than reflect any real shift.

We checked the result in three further ways, and all of them agree. Measured by the number of deals rather than their value, concentration still rises. The Gini coefficient, which captures inequality across the entire distribution, also rises, while Shannon entropy, which is higher when capital is more evenly distributed, falls. Because the index is built from within-year shares, any price or currency move that affects all destinations equally cancels out, so the index is robust to uniform revaluation; what it cannot remove is relative valuation, since a year in which US assets reprice upward against others lifts the US share for reasons that are not reallocation. The index also reacts to a single very large deal, as the 2024 Egyptian transaction shows, so we read it alongside the deal-level data.

When we set the index against the Caldara-Iacoviello Geopolitical Risk Index, we standardise both series to z-scores. Hence, they share a common scale, and we interpret the relationship as co-movement only. With eight annual observations, the series is too short to support a correlation statistic or a causal claim, and we make none.

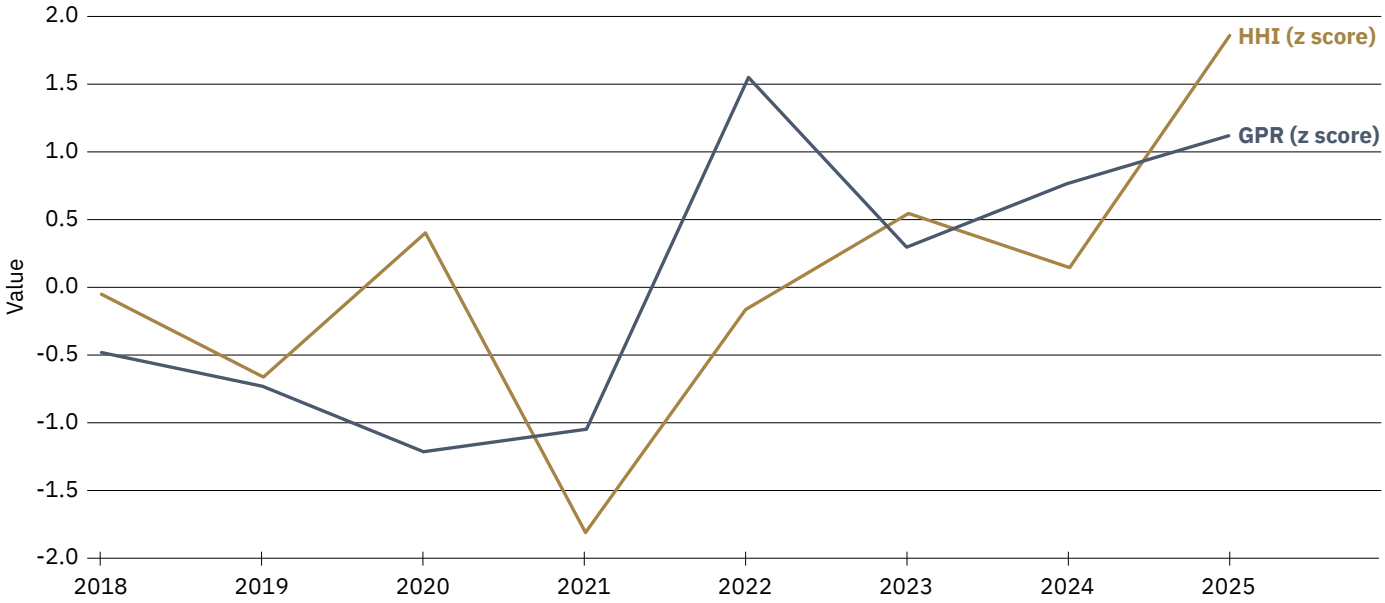
This is the first year we have measured sovereign wealth fund concentration in this way. We developed the method ourselves and tested it with academic researchers at three institutions across three continents, whose comments improved it. We own the analysis and the errors that survive in it.

How the Geography of Sovereign Wealth Fund Investments Is Shifting

The data points to a clear pattern. Between 2018 and 2021, the geography of sovereign wealth fund investment was more changeable than a single trend suggests. Concentration first rose — the HHI climbed from 0.109 in 2018 to 0.157 in 2020 as capital clustered in fewer destinations — before falling back sharply to 0.110 in 2021. That 2021 reading, alongside 2018, is the most dispersed in the dataset: investments were spread across more countries than at almost any other point in the period.

An example of the cross-border ambition of that era was Qatar Investment Authority's (QIA) January 2021 joint venture with Enel Green Power to develop renewable energy across Sub-Saharan Africa. Through the transaction, QIA acquired a 50% stake in approximately 800 MW of wind and solar projects spanning South Africa and Zambia, including six individual plants at different stages of development, placing the Qatari sovereign wealth fund into a multi-jurisdictional frontier-market portfolio with the attendant political, currency, and construction complexities that entailed. The deal embodied the confluence of forces driving geographic diversification at the time: compressed yields in developed markets, growing appetite for infrastructure assets with long-dated cash flows, and energy transition mandates that made frontier renewables a natural destination for long-horizon capital. Both the geography and the structure, a co-development joint venture rather than a minority stake in a listed company, reflected the risk tolerance of an era that the HHI data captures as the high-water mark of sovereign capital's global reach.

Figure 1.1: Sovereign Wealth Fund Direct Investment Geographic Concentration vs Geopolitical Risk Index – (z) score normalisation



Source: IFSWF Database; Caldara, D. and Iacoviello, M. (2022), "Measuring Geopolitical Risk," American Economic Review, 112(4): 1194–1225; GIC Annual Report 2024/25, p.16. Both series are standardised to mean zero and standard deviation one, shown on a single shared axis, from 2018 to 2025. The GPR series is shown as an annual average.

The early 2020s mark the turning point. At the start of the decade both measures sat near their lowest levels of the period: the HHI at a joint low of 0.110 in 2021, matched only by 2018, and the Caldara-Iacoviello Geopolitical Risk Index at a 2020-21 trough. The two series are built entirely independently, one from disclosed investment transactions, the other from automated text analysis of ten major international newspapers. From 2022 they move together. The invasion of Ukraine that February drove the GPR sharply higher, and sovereign wealth fund concentration moved in the same direction, the HHI climbing from 0.110 in 2021 to 0.168 in 2022. After easing slightly in 2023, the HHI rose again through 2024 and reached 0.192 in 2025, about three-quarters above its 2021 low and the highest reading in the 2018-2025 window. Across 2021 to 2025 the two move closely in step, even though the data behind them share no common source.

The behavioural shift is visible not only in transaction flows but in the strategic communications of the sovereign vehicles themselves. Temasek Holdings' 2023 Annual Review, published as the Ukraine war entered its second year, was among the most explicit in linking geopolitical disruption to investment decision-making. Under a dedicated "Macro and Geopolitical Risk" section, Temasek acknowledged that heightened geopolitical tensions arising from "war and the pandemic, as well as great power rivalry" had placed the presumptive gains of globalisation "under ever greater scrutiny," prompting Temasek to maintain active policy monitoring teams in Beijing, Brussels, Singapore, and Washington to "actively monitor geopolitical risks and anticipate policy developments in our key markets." The Singaporean state holding company noted it had reduced certain positions "where we saw long-term structural risks" in pursuit of a "resilient and forward-looking portfolio."



Funds are adapting to a structurally more fragmented global economy

The 2022–2025 trajectory is notable not only for its direction but for its persistence. Unlike the GPR index, which spiked sharply in 2022 and then partially moderated, the HHI has risen more gradually and consistently, suggesting that the behavioural shift in sovereign wealth fund investment geography is not a short-term reaction to specific events but a structural reorientation. Sovereign wealth funds appear to be recalibrating their geographic frameworks in response to a world that is durably more fragmented, not merely episodically more volatile.

This persistence is not a consequence of a handful of very large transactions. To test that, we recalculated the index using both the number of deals and their value. The two move together: measured by deal count, concentration also rises across the period, from 0.16 in 2018 to 0.22 in 2025. The agreement matters because it reduces the likelihood that the pattern is driven solely by a handful of large transactions rather than capital genuinely narrowing onto fewer countries. Both the value and the volume of sovereign dealmaking are converging on the same destinations.

Two further measures of dispersion point in the same way. The Gini coefficient, which captures inequality across the entire distribution of destinations rather than the weight of the largest one, rises alongside the HHI, indicating that the overall distribution of countries is becoming more unequal, not merely that the United States is growing. Shannon entropy, a measure in which higher values indicate a more even spread, aligns. The one instructive exception is 2024, when the Gini reaches its most unequal reading of the period while the HHI does not peak. That divergence is the Ras El-Hekma effect again: a single enormous Egyptian deal made the distribution maximally unequal that year, yet because two large destinations shared the top rather than one, top-heaviness as the HHI measures it was lower. Excluding that single deal, the 2024 index falls from 0.170 to 0.136, confirming the year's reading reflected one transaction rather than a broad rise in concentration. The measures agree on the trend and disagree only where the disagreement is itself informative.

Figure 1.2: Market Concentration Trend (2018–2025)
Standardised comparison (z-scores) of HHI and Gini coefficients



Source: IFSWF Database. All series are standardised to mean zero and standard deviation one.

Measure	2018	2019	2020	2021	2022	2023	2024	2025
HHI by value	0.109	0.139	0.157	0.110	0.168	0.161	0.170	0.192
HHI by deal count	0.160	0.161	0.143	0.139	0.164	0.158	0.198	0.223
Gini coefficient (value)	0.631	0.726	0.766	0.656	0.790	0.731	0.791	0.721
Shannon entropy (value)	2.605	2.562	2.286	2.818	2.333	2.398	2.279	2.397
Effective number (1/HHI)	9.2	7.2	6.4	9.1	6.0	6.2	5.9	5.2
Number of destinations (n)	28	38	32	40	39	33	37	35

Table. Geographic concentration of sovereign wealth fund direct investment on six measures. HHI (value and count) and Gini increase while Shannon entropy decreases; across the full period the measures broadly support the concentration story, though they differ in specific years: HHI captures top-country dominance, Gini inequality across the distribution, and Shannon entropy dispersion across the destination set. Normalized HHI = (HHI − 1/n)/(1 − 1/n), with n the number of destinations each year. On this basis concentration still rises, from 0.088 in 2021 to 0.168 in 2025, so the trend is not an artefact of the changing number of destinations.



Finding **resilience through concentration** rather than diversification

At this stage, we can only say that the relationship between the two series is simply a co-movement rather than causal or even correlational. The concentration in sovereign wealth fund investment geography aligns with a fragmentation-driven explanation, but is not solely attributable to it. The United States experienced strong equity market performance and currency appreciation during this period, which would have independently attracted additional capital through rational return-seeking behaviour. The GPR overlay cannot fully disentangle geopolitical retreat from return-driven allocation. However, it does establish that rising geopolitical risk and increasing geographic concentration are occurring simultaneously and moving in the same direction across an eight-year window of independent data. This co-movement supports the fragmentation interpretation, though it is not the sole evidence for it.

At the same time, as sovereign wealth funds realise that geographic dispersion declines, diversification benefits across regions diminish. While concentrating on deeper, more liquid markets can offer resilience, it may also limit access to different sources of return.

For example, in November 2025, Raphael Arndt, chief executive of Australia's Future Fund, argued that the instinctive answer to a more dangerous world, wider diversification, no longer offers the protection it once did. *"A traditional response to such uncertain times might be to build resilience through added diversification,"* he wrote, *"however, adding diversification will not be enough."* The reason is precisely the regional contagion that fragmentation produces: there was once a time, Arndt observed, when a portfolio *"spread across a continent or region"* would have been considered adequately diversified, but *"if a flashpoint arose in one part of that region, turning it into a hot war, it soon becomes apparent that the entire region is involved and diversification was lacking."* Faced with that reality, the response of a sophisticated long-horizon investor is not to spread capital more thinly but to concentrate it where resilience is greatest, a behavioural shift that the rising concentration in our own data captures directly.

These are questions IFSWF is actively engaging with: the Future Fund chairs the Forum's Resilience Playbook, whose interim milestone was the IFSWF Chief Risk Officer Forum in London on 25 June 2026, co-hosted with Boston Consulting Group and featuring contributions from Anthropic and Aon.

The repositioning is not a passive benchmarking process. Arndt notes that resilience *"requires serious effort,"* quantifying the Future Fund's own response as *"turning over A$290 billion across our portfolio since 2021"* after concluding, through its New Investment Order framework, that it held *"a portfolio that was optimised for low-inflation, high-growth environments and thus vulnerable to increases in long-term inflation levels and inflation volatility."* The scale of that turnover underscores the central reading of our concentration data: that the geographic recalibration of sovereign capital reflects deliberate strategic change, not drift.

Where are Sovereign Wealth Funds investing?

The HHI tells us that sovereign wealth fund investments are becoming more geographically concentrated. The country-level data tells us where.

The United States has been the single largest destination for sovereign wealth fund capital throughout the period under analysis, but its dominance has grown substantially. In 2021, the year of peak dispersion, the US absorbed approximately 28% of total disclosed sovereign wealth fund investments by value, a significant share but one accompanied by a wide and competitive field of secondary destinations. Singapore, Saudi Arabia, the UK, the Netherlands, India, China, and Brazil all held meaningful positions, and the distribution beyond the top destination was relatively flat. Capital was genuinely spreading.

Figure 1.3: Geographic Share Trends by Country
Annual Rank & Share (2018–2025)

	2018	2019	2020	2021	2022	2023	2024	2025
1	USA	USA	USA	USA	USA	USA	Egypt	USA
2	China	India	India	Singapore	UK	Germany	USA	UK
3	UK	China	Turkey	Saudi Arabia	Germany	India	Saudi Arabia	Malaysia
4	Germany	UK	China	UK	Australia	Turkey	UK	UAE
5	Russia	UAE	UK	Netherlands	Italy	Brazil	China	India
6	Australia	Switzerland	Singapore	India	Japan	Canada	France	France
7	India	Russia	UAE	China	India	UK	Italy	Germany
8	Turkey	Netherlands	Italy	Brazil	Turkey	Saudi Arabia	India	Saudi Arabia
9	South Korea	France	Australia	Czech Republic	Egypt	Japan	Indonesia	Japan
10	France	Australia	Switzerland	Australia	Sweden	Spain	Australia	Australia
11	Spain	Czech Republic	France	Egypt	Saudi Arabia	UAE	Qatar	Denmark
12	Italy	Denmark	Germany	Italy	Netherlands	China	Spain	China
13	Singapore	Italy	Japan	South Korea	China	South Korea	Netherlands	Ireland
14	Denmark	Singapore	Saudi Arabia	Russia	Switzerland	Sweden	Germany	Canada
15	Netherlands	Sweden	Netherlands	France	Singapore	France	Ireland	Ethiopia
16	Japan	Vietnam	Israel	Israel	Brazil	Italy	UAE	Spain
17	Brazil	Philippines	Canada	Malaysia	South Korea	Ireland	Canada	Qatar
18	Ireland	Germany	Russia	Indonesia	UAE	Belgium	Japan	Turkey
19	Malaysia	Turkey	Brazil	Germany	Greece	Indonesia	Belgium	Indonesia
20	Oman	New Zeland	Vietnam	Spain	France	Switzerland	Turkey	Netherlands

Country Share: 0%–14% 16%–20% 27%–41%

Source: IFSWF Database

By 2025, the picture had changed materially. The US share has risen to over 41% (country share, the primary input to the HHI calculation), more than two-fifths of all disclosed sovereign wealth fund direct investments flowing to a single country. The secondary tier has compressed: the UK, Malaysia and the UAE follow at a considerable distance, with the remaining countries holding progressively smaller and more uniform shares. The long tail of smaller destinations characteristic of 2021 has thinned visibly.

This shift should be read against the backdrop of broader capital markets, where the US now accounts for over 60% of global listed equity market capitalisation, up from under 30% in 2007. Sovereign wealth fund direct investment, even at its most concentrated, remains less US-weighted than global public markets as a whole.

To illustrate the increased pull of US private and public equity markets, consider a transaction far from the technology sector. In October 2025, the Qatar Investment Authority joined the American private-capital firms Apollo Global Management, RedBird Capital Partners and Ares Management in providing more than $2 billion of equity for Mari, the new holding company through which the Hollywood agent Ari Emanuel is assembling a portfolio of live events. Mari's purchases span the Frieze art fairs, the Madrid and Miami Open tennis tournaments, the Barrett-Jackson collector-car auctions and the Escape from Alcatraz triathlon. That a Gulf sovereign wealth fund would back a US-domiciled events platform alongside major American private-capital firms shows how far the pull of US markets now reaches, well beyond the artificial-intelligence trade that dominates the headlines. The rise in the United States' share alone, from about 28% to over 41%, more than accounts for the entire increase in the index after 2021; the rest of the distribution became slightly less concentrated.

When a single destination absorbs an ever-larger share of capital, the index rises not because other countries are necessarily receiving less in absolute terms, but because the distribution is becoming increasingly lopsided. The US alone is the primary driver of the 2021–2025 HHI increase.

The intervening years reveal additional texture. The Russian Federation appears as a destination in 2021 and disappears entirely from 2022 onwards, a direct and immediate consequence of sanctions and investment restrictions following the Ukraine invasion. This is geopolitical fragmentation made visible at the transaction level: not a gradual reallocation but an abrupt asset freeze and exit. Germany, Turkey, Brazil, and Egypt rotate through the secondary tier across 2022–2024, with no single country consolidating a durable position, suggesting that, beyond the US, the investment landscape remains contested and opportunistic rather than strategically anchored.

Norway's Government Pension Fund Global provides ample documentation of this dynamic. On 28 February 2022, four days after Russian forces crossed into Ukraine, the Norwegian Ministry of Finance instructed Norges Bank to freeze all GPFG investments in the Russian market immediately and to prepare a plan for complete divestment. At the end of 2021, the sovereign wealth fund held positions in approximately 47 Russian companies and in government bonds, with a combined value of around NOK 25 billion ($2.83 billion). The decision was explicit and unambiguous: Minister of Finance Trygve Slagsvold Vedum stated that "it is important for the legitimacy of both Norway and the Fund that we, together with the international community, demonstrate a clear position by withdrawing the Norwegian savings from the Russian market." What followed was not a managed exit but a forced freeze: Russia's unilateral ban on foreign share sales on the Moscow Stock Exchange meant that full divestment remained incomplete more than a year later. The GPFG's Russian portfolio did not gradually migrate elsewhere; it was locked in place, exemplifying how geopolitical fragmentation can remove markets from the investable universe entirely rather than simply making them less attractive within it.

The 2024 data presents one important clarification. Egypt briefly displaces the US as the top destination by share, driven entirely by a single transaction: ADQ's $24 billion acquisition of development rights for the new city of Ras El-Hekma. It was not a signal of geographic reorientation toward Egypt but a reminder of a structural feature of the HHI when applied to deal-level data: because the index is weighted by capital value, a single mega-transaction can dominate a year's reading. The appropriate analytical response is not to exclude such deals; they are real capital deployments with real consequences, but to read the index alongside the deal-level data, as we do here, rather than in isolation.

Stripped of that single outlier, the 2024 picture is consistent with the broader trend: capital flowing toward a small number of familiar, high-capacity markets, with the secondary tier dominated by GCC funds deploying regionally, a pattern of home-region consolidation rather than global diversification.



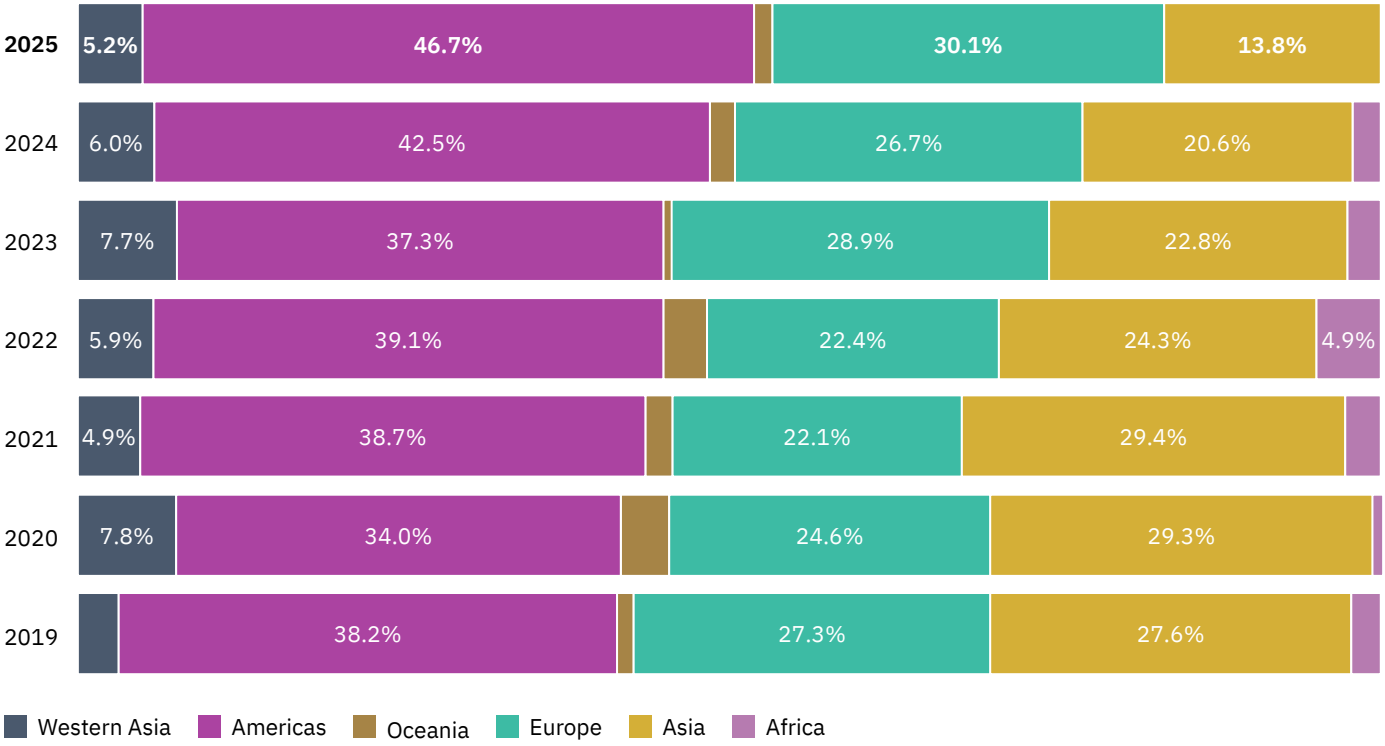
Safety and **opportunity** are pulling capital to the same place

Taken together, the country-level evidence resists a single clean explanation. Part of what drives US concentration is genuine risk aversion, the preference for legal certainty, liquidity, and institutional depth in an uncertain world. But part of it reflects structural investment opportunity: the US AI infrastructure build-out, the Inflation Reduction Act-driven energy transition capital, and the depth of US private equity and credit markets all concentrated deal flow in the US precisely in the 2022–2025 window. The two forces are pointing in the same direction, which is precisely why the concentration signal is so strong. Meanwhile, Russia's complete disappearance from the destination set after 2021 reflects not a choice but a forced exit: sanctions removed an entire investable market from the universe, mechanically pushing capital elsewhere and amplifying the index's concentration effect.

A Regional Dimension: Asia's Retreat

The country-level concentration story has a clear regional dimension. Measured by share of total disclosed deals, the Americas rose from 38% in 2019 to 47% in 2025, a gain of almost ten percentage points in six years. Europe has also strengthened modestly, from 27% to 30%. Together, these two regions now account for more than three-quarters of all disclosed sovereign wealth fund direct investment by deal count. The Middle East remained comparatively stable throughout, in the 5–8% range. Oceania and Africa together account for fewer than five percentage points in any given year.

Figure 1.4: Sovereign Wealth Fund Direct Investment Activity by Region (% of total deals)



Source: IFSWF Database

The sharpest movement is in Asia, which has contracted from roughly 27–29% of all deals in 2019–2021 to 14% in 2025. This decline does not reflect sovereign funds withdrawing from the region as a target; it is more likely due to the impact of the introduction of high US tariffs in strong manufacturing markets such as Southeast Asia.

Taken as a whole, the 2018–2025 data point to a material reorientation rather than a cyclical swing. Sovereign wealth funds have not retreated from the world so much as redrawn their map of it, concentrating capital in a smaller set of deep, liquid and institutionally trusted markets, above all the United States, as geopolitical fragmentation has raised the cost and complexity of operating elsewhere. That this concentration coincides with a once-in-a-generation US investment opportunity, from AI infrastructure to energy-transition capital, only reinforces the trend: for now, risk aversion and return-seeking are pulling in the same direction. The open question is what happens when they diverge and what the consequences of concentration are for different regions of the world. Greater concentration buys resilience and certainty, but at the cost of the regional diversification on which long-horizon investors have historically relied, the very tension Future Fund CEO's Raphael Arndt identified when he argued that "adding diversification will not be enough."

How sovereign funds resolve that trade-off, building resilience without surrendering breadth, will define the next phase of sovereign investing.

It is the question at the centre of the IFSWF's Resilience Playbook Initiative in the year ahead.

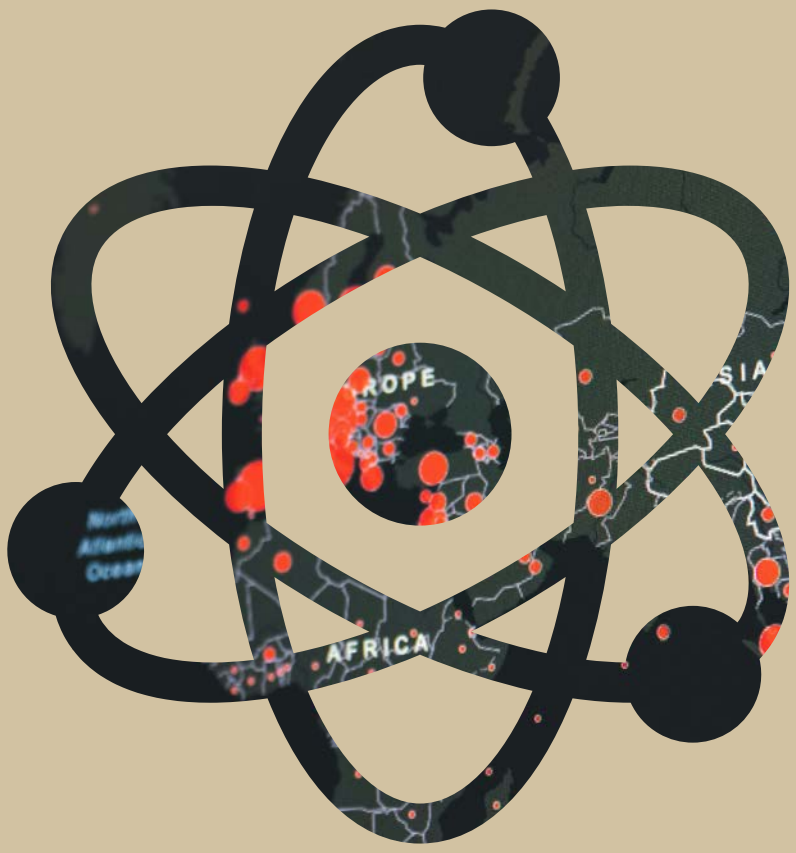
Chapter 2

Atoms vs Bits 2.0

Sovereign Wealth Funds Across the Physical and Digital Economy, 2018–2025

In brief

Since 2018, sovereign wealth funds have held technology at a remarkably steady share of their direct investment. Atoms and bits together have accounted for close to a quarter of disclosed value every year, even as technology has climbed towards half of the S&P 500, so sovereign capital looks underexposed to the digital economy rather than overcommitted to it. By deal count, the digital economy dominates, but by value, a steady physical-infrastructure base sits beneath a digital layer that swings with the cycle. The deeper finding is that artificial intelligence is dissolving the boundary between atoms and bits: much of what funds book as software ultimately pays for data centres, chips and power, so sector labels no longer reveal what sovereign capital is truly exposed to.



"Most information is delivered to us in the form of atoms: newspapers, magazines, and books... We measure trade, and we write our balance sheets with atoms in mind."

Three decades ago, Nicholas Negroponte, founder of the MIT Media Lab, introduced the metaphor of a shift "from atoms to bits" to describe digitisation in his seminal book Being Digital.

"A bit has no colour, size, or weight, and it can travel at the speed of light. It is the smallest atomic element in the DNA of information."

He continued, arguing that the change from atoms to bits was irrevocable and unstoppable. For thirty years, investors treated the two as opposites: "bits" meant asset-light, high-margin software, "atoms" meant the capital-intensive physical economy.

That distinction has now collapsed. Artificial intelligence has sent the frontier of bits back into the world of atoms, rebuilding the physical economy on a vast scale.

For sovereign wealth funds, that convergence creates a portfolio illusion. The familiar Global Industry Classification Standard (GICS)[1] sector labels no longer tell an investor what they are really exposed to. To see where sovereign wealth funds are actually investing, we have to look beyond the official labels and trace the layers of the technology stack beneath them.

1 The same classification we use in the IFSWF Database

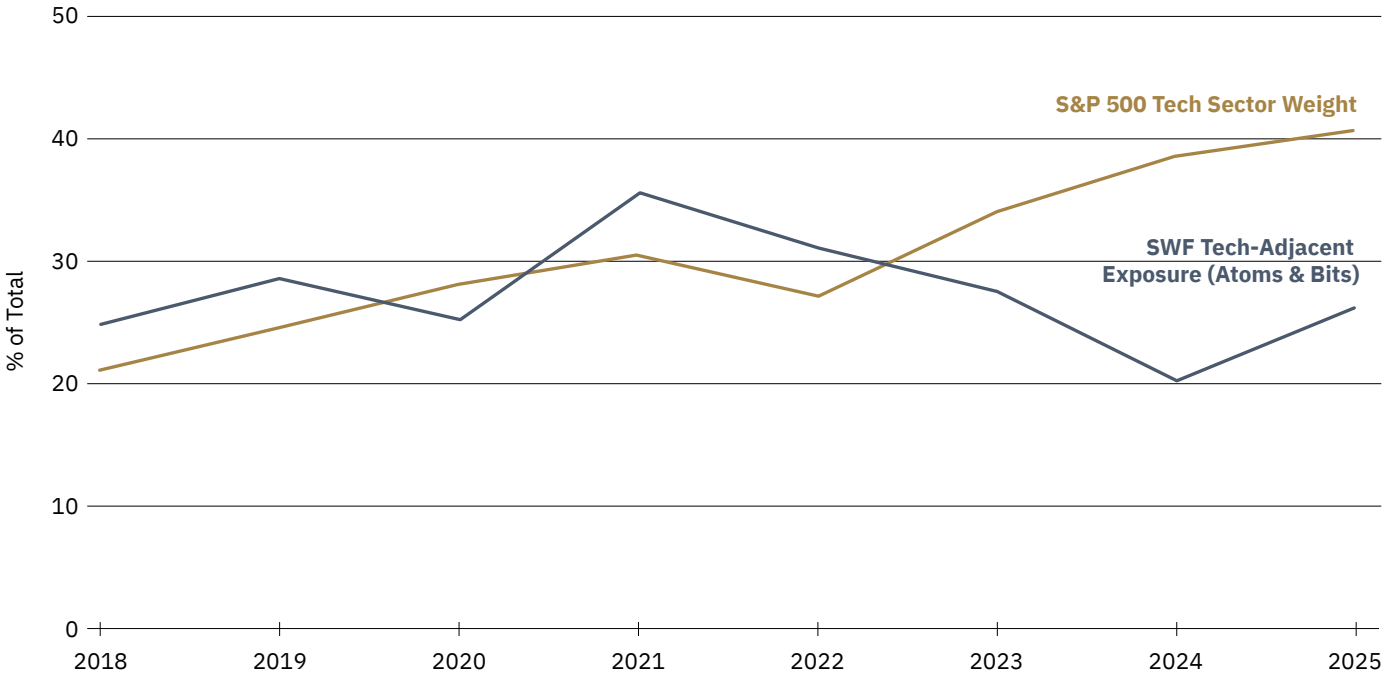
Public Markets vs Sovereign Wealth Fund Direct Investments

The collapse of the boundary between atoms and bits is unfolding against a backdrop of historic sector dominance in public markets. As of mid-2026, the technology sector accounted for approximately 34% of the S&P 500's market capitalisation. When factoring in adjacent tech giants classified elsewhere, such as Amazon (Consumer Discretionary), Meta Platforms, and Alphabet (Communication Services), the total tech weighting rises to approximately half of the index.

With technology now worth roughly 50% of the world's largest stock market, one question follows naturally: have sovereign wealth funds gradually abandoned the physical economy for the digital one?

The answer is more surprising than either yes or no. The chart below sets the technology weight of the S&P 500 against sovereign wealth funds' combined exposure to atoms and bits, year by year from 2018 to 2025. Sovereign exposure has barely moved, a narrow band around a quarter, rising with the market in the 2021 boom, then falling back, while the public-market weighting has climbed steadily above it. The gap has widened, not closed. Far from abandoning the physical economy for the digital, sovereign funds hold technology at well below what public markets now assign it.

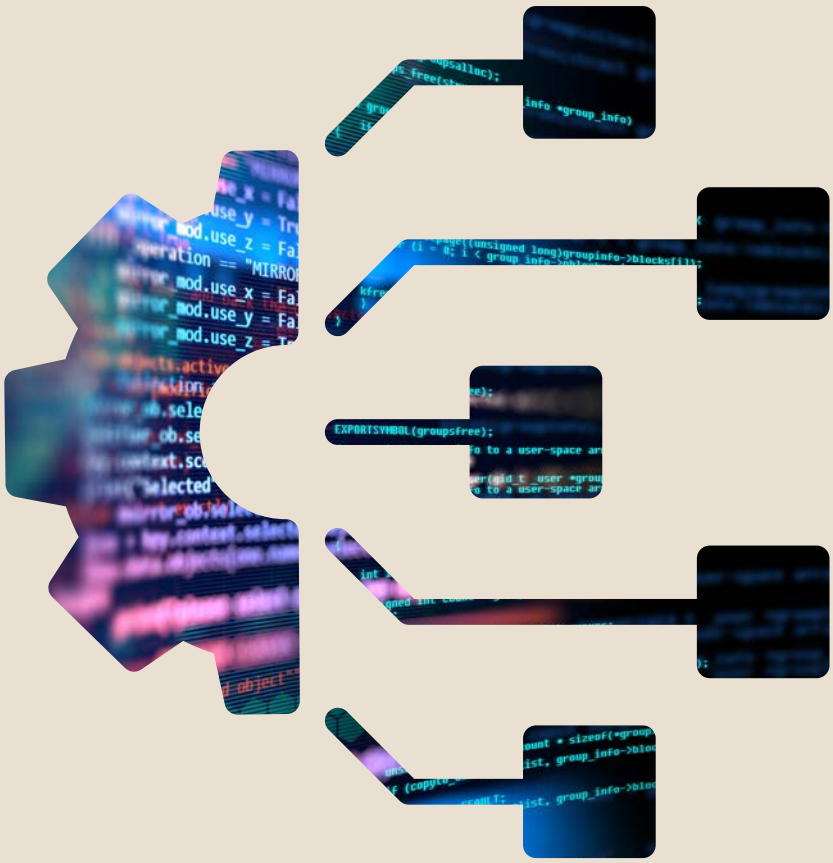
Figure 2.1: Comparing the structural weight of Technology in the S&P 500 against the combined 'Atoms & Bits' Sovereign Wealth Fund Direct Investments in (2018–2025)



Source: IFSWF Database

One qualification matters: we measure direct investment, not entire sovereign wealth fund portfolios.

Many funds hold substantial technology exposure indirectly through passive listed equity allocations that track public markets. In that case, they would mirror the market's tilt.



Concentration is geographic, not sectoral.

There is a prior question worth settling. As sovereign capital has narrowed to a smaller set of trusted markets (see the previous chapter), has it narrowed by sector as well? We put the same Herfindahl-Hirschman Index we use for geography (see the methodology note) on the industries that sovereign funds invest in. The answer is clear: no. Sector concentration shows no trend: over the period, the industry index remains within range, with capital spread across roughly six of the eight effective industry groups; the only departure is the 2024 spike, which the Ras El-Hekma deal explains.[2] We pushed the test further, across some fifty narrower subsectors; the index simply settled lower, about twenty effective subsectors, with the same flat shape and the same 2024 blip. Neither the broad industry grouping nor the narrower subsector grouping shows the upward concentration trend we observe in geography.

Measuring concentration by sector

We apply the same Herfindahl-Hirschman Index we use for geography here across industry groups rather than across countries. Because the index has far fewer categories to spread across, we read it as an effective number of sectors: one divided by the index. In 2025, the industry reading of 0.157 translates to roughly six effective industry groups out of eight. Capital sits in more effective sectors, about six, than effective destination countries, about five on the geographic measure, so geography is the concentrated axis, which is why we treat the sector series as a counterpoint, not as a second concentration story.

The result holds whether we use eight industry groups or roughly fifty narrower subsectors: the index falls to a lower level but keeps the same flat shape, so the absence of a sector trend is not an artefact of how finely we slice the data.

The contrast with geography is itself the finding. Sovereign wealth funds are narrowing the countries they invest in while staying broadly spread across industries: the concentration of sovereign capital is geographic, not sectoral. What the sector data show instead is rotation, not retreat, with leadership passing among Financials, Real Estate, and Infrastructure from one year to the next, while Technology, Telecoms, and Infrastructure climb on the strength of the AI cycle. The ranking moves; it does not narrow.

2 As mentioned in the IFSWF 2025 Annual Review

Figure 2.2: Industry Share Trends by Sector
Annual Rank & Share, 2018–2025 by $ Invested

	2018	2019	2020	2021	2022	2023	2024	2025
1	Financials	Real Estate	Financials	Infrastructure	Infrastructure	Real Estate	Real Estate	Infrastructure
2	Real Estate	Tech & Telecom	Consumers	Consumers	Tech & Telecom	Infrastructure	Infrastructure	Financials
3	Tech & Telecom	Financials	Tech & Telecom	Real Estate	Real Estate	Tech & Telecom	Financials	Tech & Telecom
4	Infrastructure	Infrastructure	Real Estate	Tech & Telecom	Industrials	Financials	Industrials	Real Estate
5	Consumers	Consumers	Infrastructure	Healthcare	Consumers	Energy & Materials	Tech & Telecom	Consumers
6	Energy & Materials	Industrials	Healthcare	Financials	Financials	Industrials	Energy & Materials	Industrials
7	Healthcare	Energy & Materials	Energy & Materials	Energy & Materials	Healthcare	Consumers	Consumers	Energy & Materials
8	Industrials	Healthcare	Industrials	Industrials	Energy & Materials	Healthcare	Healthcare	Healthcare

Industry Share: 10%–14% 18%–26% 27%–40%

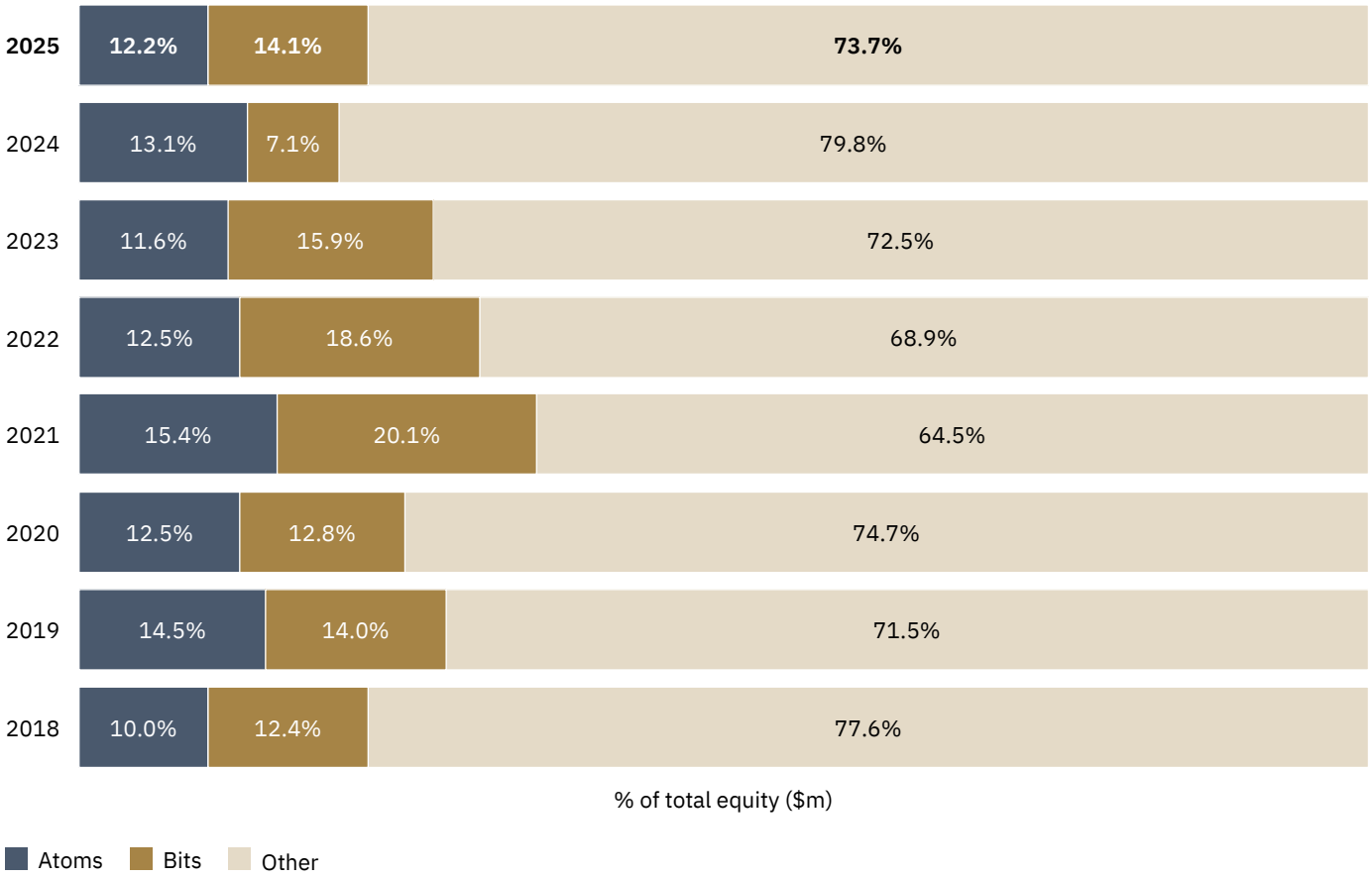
Source: IFSWF Database

Are sovereign wealth funds underweight or overweight in Tech?

From 2018 to 2025, atoms and bits together accounted for close to a quarter of disclosed sovereign direct investment by value every year, with a low of about 20% in 2024, a high of roughly 36% in 2021, and always clustered near 25%. Over the same period, the total deployed ranged from about $36 billion to $75 billion, yet technology's combined share barely moved. Against the 50% weight technology now commands in the S&P 500, sovereign funds carry the sector at about half its market weight and have done so steadily, even as the market's own weighting has roughly doubled.

As we said earlier: "Atoms" here refers specifically to the physical infrastructure of the digital economy, data centres, hardware, and the power behind them, so general real estate deals such as Ras El-Hekma in 2024 fall under "Other", not "Atoms".

Figure 2.3: Atoms vs Bits
Sovereign Wealth Fund Direct Investments Hold Steady at a Combined Quarter of the Total



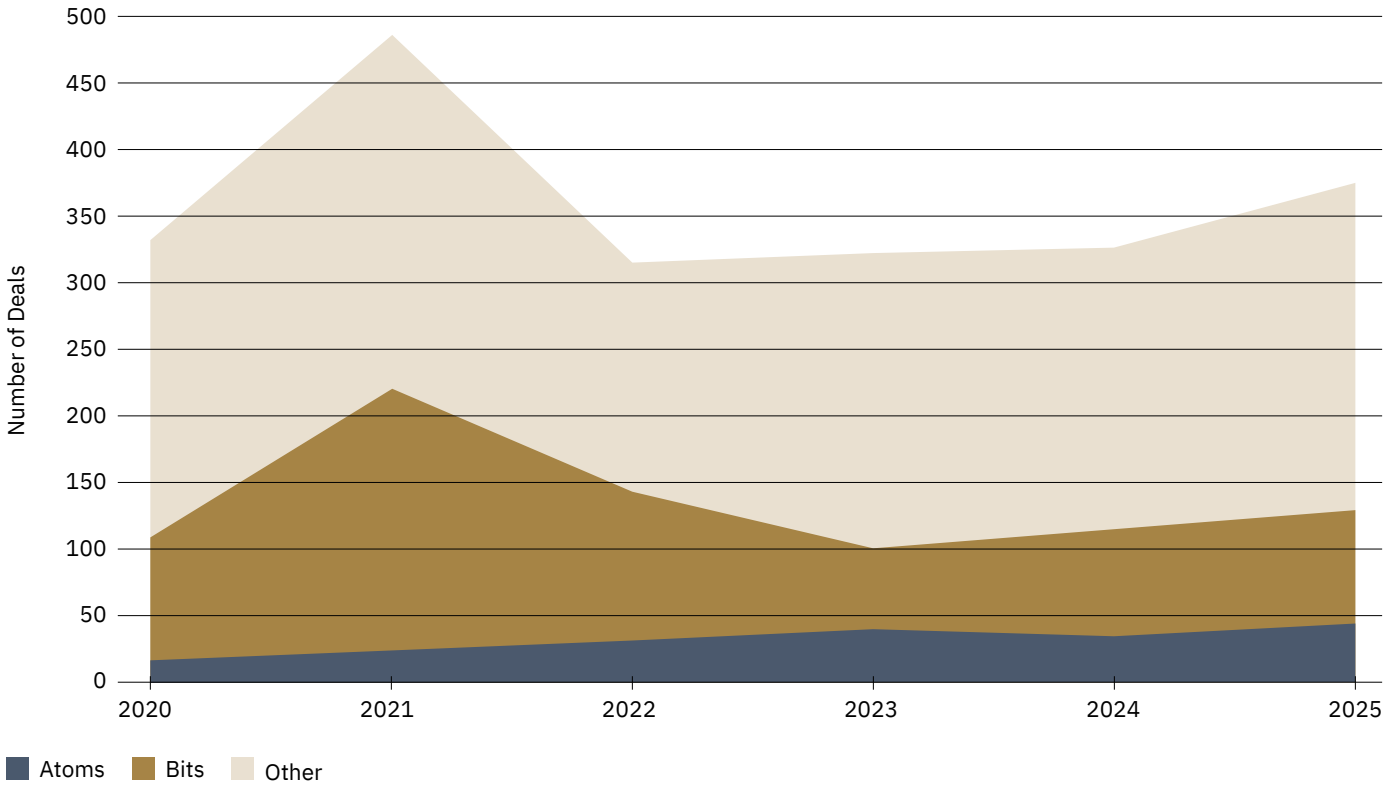
Source: IFSWF Database

Counting the Deals

Within that steady quarter, the balance between atoms and bits depends entirely on how you measure it. Counted by the number of disclosed deals, sovereign funds do far more digital deals than physical ones, and have throughout their transactions outnumber atoms by a wide margin every year — a structural gap, not an accident of timing. Digital deal-making peaked in 2021 at 146 transactions, in the low-interest-rate environment during the COVID-19 pandemic; it then fell to 50 by 2023 as rising rates repriced risk and venture funding dried up, before recovering to 79 in 2025 on the back of the AI cycle. Atoms deals stayed low and flat throughout, in the low teens most years, down to 11 in 2024, up to 23 in 2025. On a count of activity, in short, sovereign funds look like enthusiastic backers of the digital economy.

> Bpifrance is the pattern in miniature: the French public investment bank has backed more than 150 AI companies since 2015, Mistral AI, Poolside, Dust and H among them, each a small cheque, each a separate deal, and exactly the kind of high-volume, low-value venture activity that makes the digital economy look dominant by transaction count.

Figure 2.4: The Steady Rise of Atoms — Sovereign Wealth Fund Direct Investments Shift Focus
Annual number of direct investment deals across Atoms, Bits and Other sectors (2020–2025)



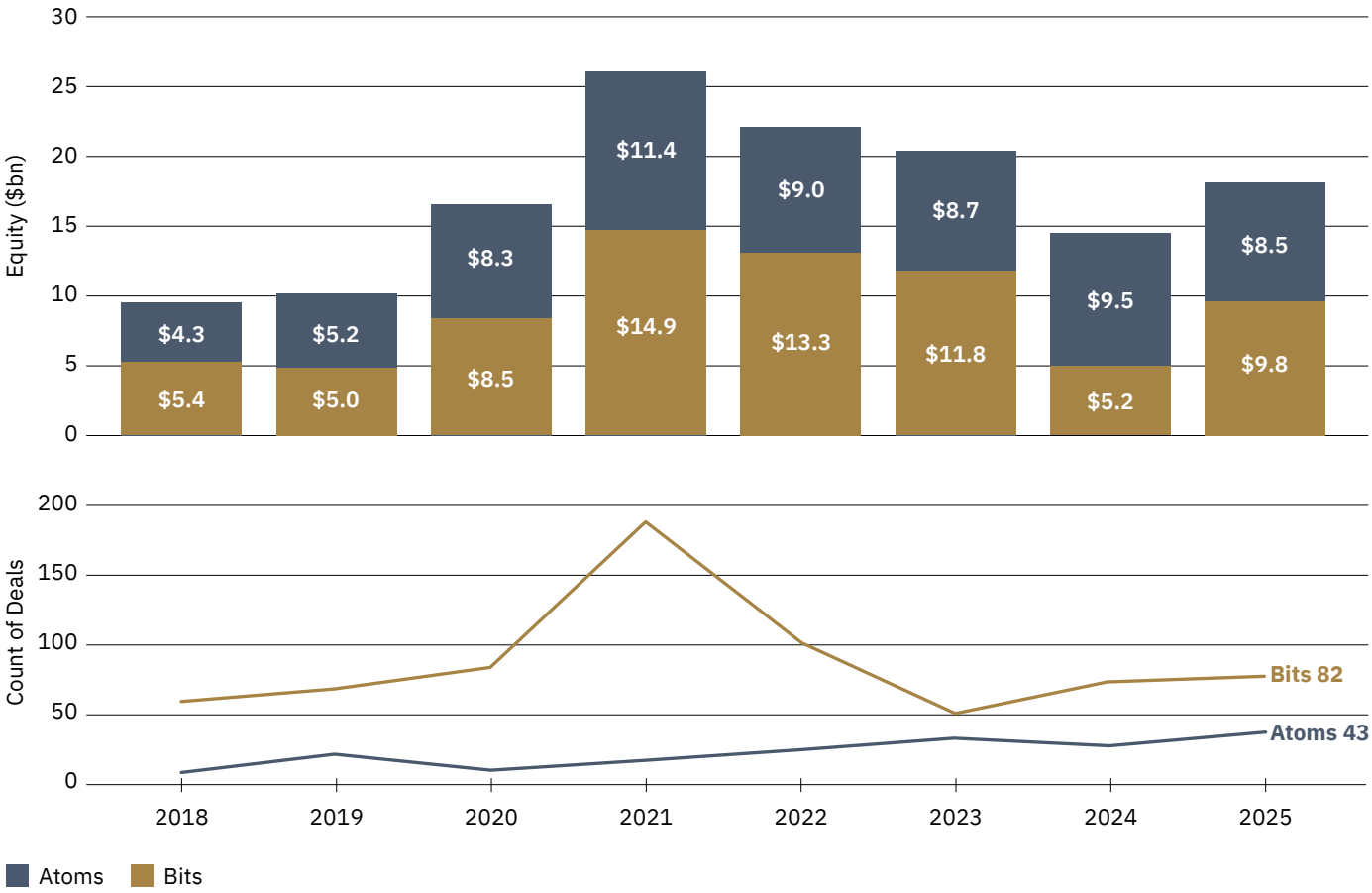
Source: IFSWF Database

Counting the dollars

Weigh the same investments by capital deployed rather than counting them one by one, and the picture changes twice over. First, the gap between atoms and bits narrows sharply. Bits deals may outnumber atoms by five or ten to one, but by value the two usually sit within a few percentage points of each other, and in 2024, with digital deals still far ahead on count, atoms (13.1% of disclosed value) actually outweighed bits (7.1%). A handful of large physical-infrastructure deals carried more money than a swarm of small technology tickets. The deal count, in other words, overstates how digital sovereign capital really is.

Second, the two move very differently over time. Atoms is the steady anchor, holding between 10% and 15% of disclosed value every year. What that steady share buys is large, infrastructure-style commitments. For example, in September 2025, GIC and the Abu Dhabi Investment Authority put $1.6 billion into Vantage Data Centres' Asia-Pacific platform, a single cheque toward a gigawatt of data-centre capacity. A handful of deals on that scale is enough to hold the line on atoms, even in a quiet year for digital deal-making.

Figure 2.5: Capital Concentration — Fewer deals, Higher Value in Atoms vs Bits
Comparing total equity value against absolute deal counts across sectors



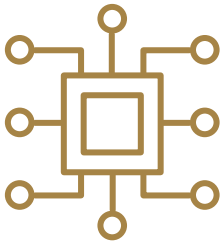
Source: IFSWF Database

Bits is the volatile one: it peaked at 20.1% in 2021 in the post-pandemic boom, collapsed to 7.1% in 2024 as higher rates repriced growth, and recovered to 14.1% in 2025 on the AI cycle.

The calm of the combined quarter, then, hides a fixed physical base beneath a digital layer that swings with the cycle, the reverse of the usual assumption that it is physical assets that are lumpy and episodic.

When Bits become Atoms

The deeper point is that the atoms-and-bits frame has become an unreliable guide to where sovereign money actually ends up. The two categories are converging, and artificial intelligence is what drives them together. The largest bits investments of recent years turn out, on inspection, to be among the most capital-intensive atoms bets ever made. Much of the transactions labelled as software and services, including the stakes in most AI companies, ultimately pays for a vast physical build-out: data centres, semiconductors and specialised servers, power generation and grid connections, cooling and fibre. A dollar in an AI model developer is, traced downstream, largely a dollar in concrete, silicon and power. The label sits at the model layer; the money flows to the hardware beneath it. If anything, the charts above understate how much sovereign capital is reaching the physical economy, because some of the largest digital allocations are, in all but name, physical infrastructure. The frontier of bits is rebuilding atoms.



AI investment is increasingly becoming **infrastructure investment**

The scale is now extraordinary. As of mid-2026, the major hyperscalers, the largest cloud-computing companies, are guiding to approximately $750 billion in combined capital expenditure for the year, almost all of it for data centres, silicon, and power. The cost of atoms does not vanish for the asset-light, it only moves: Anthropic, an AI laboratory valued at $965 billion in May 2026, reports modest capital spending only because it buys its compute from Amazon and Google through equity-and-cloud deals. The data centres are still built; the bill simply sits on a partner's balance sheet. Traditional software firms maintain gross margins of 70 to 80% for the same reason, booking the cost of atoms as an operating expense rather than as their own capital. The accounting differs; the economics do not. The same shows up in individual sovereign wealth fund's stakes. Three members of IFSWF; GIC, the Qatar Investment Authority and Kazakhstan's National Investment Corporation of the NBK (NIC) participated in Anthropic's $13 billion Series F in September 2025, at a $183 billion valuation; Saudi Arabia's PIF, through HUMAIN, is building AI data centres targeting 1.9 gigawatts of capacity by 2030. Each is recorded as a technology investment; each is, at bottom, a bet on compute, data centres and power.

Implications for sovereign wealth funds

For sovereign investors, the atoms-and-bits lens is still useful, but it has become an unreliable guide to actual exposure, and that is the finding that matters. At face value, the data say sovereign wealth funds are underweight technology: a steady 25% of direct investment against 50% of the public-market index. But the same data show why that reading misleads. A large share of what is booked as bits flows downstream into atoms, the data centres, chips and power behind the AI models, while a growing share of the other three-quarters, in infrastructure, real estate and energy, is now pulled by the same AI demand. A sovereign wealth fund that believes it is underexposed to technology and comfortably diversified across infrastructure and property may in fact be making one large, correlated bet on the AI compute-and-energy complex, reached from several directions at once and visible under none of its sector labels.

The practical implication is straightforward. Sector labels no longer tell a sovereign fund what it is really exposed to, so the unit of analysis has to shift from the label to the layer: how much capital, across every sector heading, ultimately rests on the same compute and power. The leading funds have already reached that conclusion and reorganised around the stack rather than the sector. Abu Dhabi's Mubadala co-founded MGX in March 2024 (as a joint venture with G42) to invest across the full AI stack—infrastructure, semiconductors, and core AI models alike—and in September 2024 did exactly that, co-founding the BlackRock- and Microsoft-led AI Infrastructure Partnership (AIP) for data centres and power while taking stakes in OpenAI, Anthropic, and Databricks. The Kuwait Investment Authority, rarely a direct technology investor, entered AI in June 2025 not through software but through that same partnership's compute and energy infrastructure.

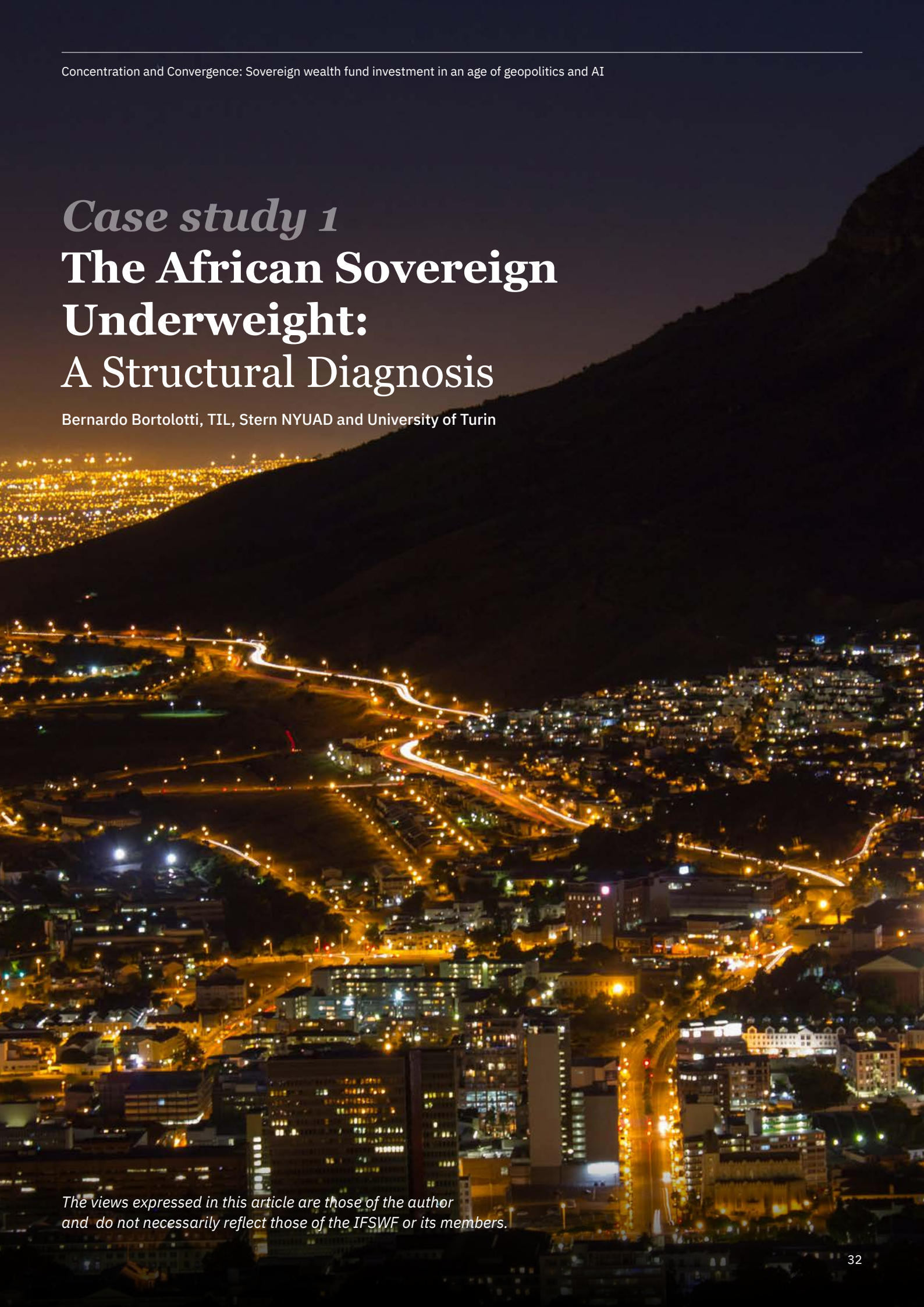
The sharper question for a sovereign investor is therefore not whether to back atoms or bits, but where in the AI stack its mandate, scale and patience give it an edge, and whether it has yet measured how much of its existing portfolio is already, perhaps unknowingly, a bet on the same physical foundation.

It is the question at the centre of the IFSWF's AI Flagship Initiative, led by Mubadala, in the year ahead.

Case study 1

The African Sovereign Underweight: A Structural Diagnosis

Bernardo Bortolotti, TIL, Stern NYUAD and University of Turin



The views expressed in this article are those of the author and do not necessarily reflect those of the IFSWF or its members.

Africa holds one of the largest natural-resource endowments in the world. Proved hydrocarbon reserves amount to roughly 12% of the global total, and the continent holds close to a third of the world's known non-fuel mineral reserves.

Aggregate estimates of the gross in-situ value of minerals and hydrocarbons still in the ground range widely — from around $17 trillion to over $29 trillion at current prices, depending on commodity price assumptions, reserve classification, and whether resources beyond proved reserves are included — with capturable rents, net of extraction costs, estimated at a fraction of gross value, likely in the range of $4 to $10 trillion.

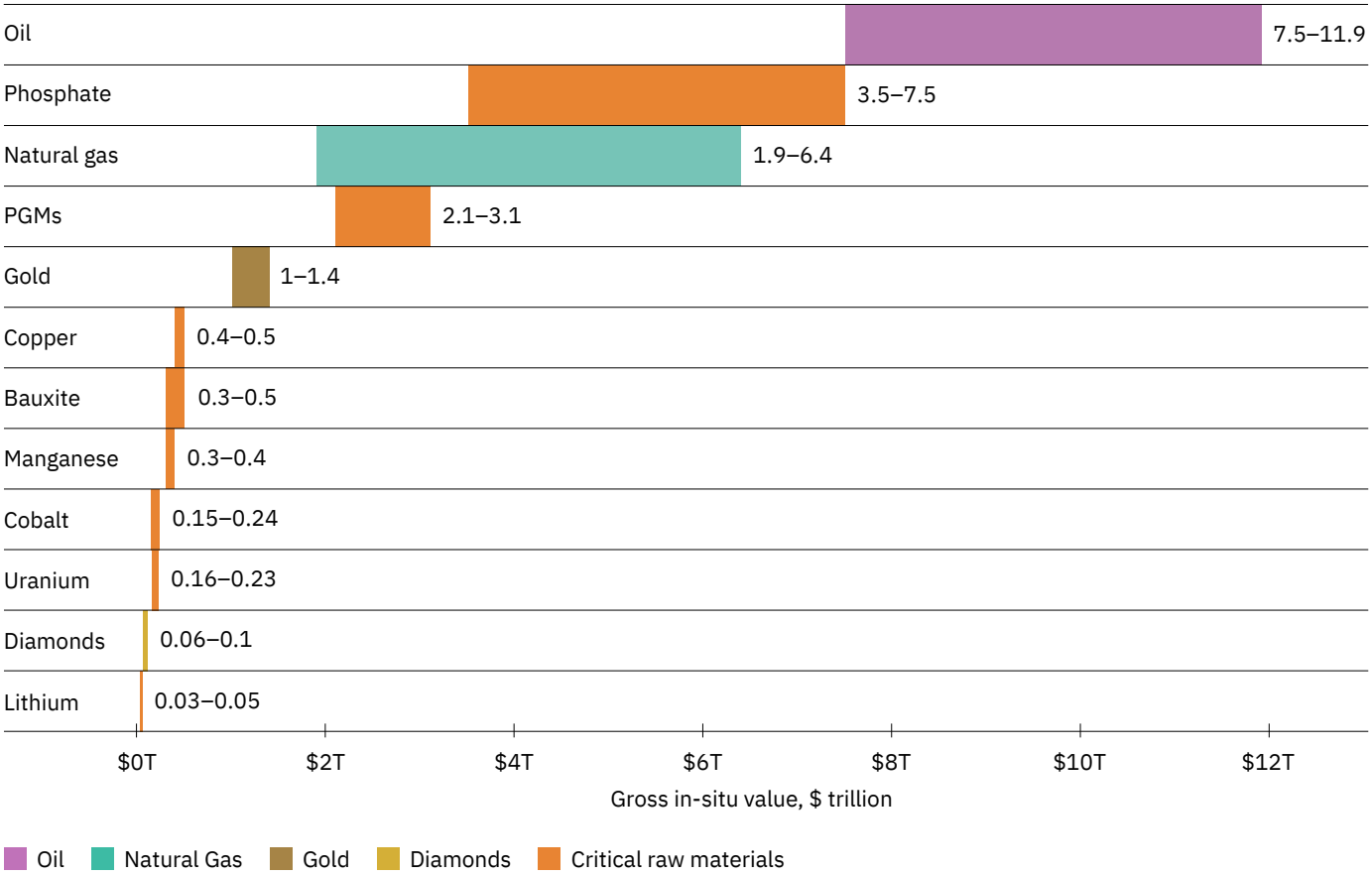
These figures are inherently sensitive to price cycles and carry significant methodological uncertainty: mine-site valuations do not account for processing costs, transport, royalties, or taxes, and rent estimates depend heavily on discount rate assumptions. Nonetheless, an endowment of this order of magnitude would, in principle, support a deep system of sovereign wealth funds — the institutions designed to convert finite resource booms into permanent national capital and to smooth the macroeconomic volatility that commodity dependence imposes.

Figure 3.1: Share of Global Proven Resource Reserve by Country (2025)



Source: United States Geological Survey, for minerals, Statistical Review of World Energy

Figure 3.2: Value of Resource Reserves in Africa (USD Trillion)



Source: United States Geological Survey, for minerals, Statistical Review of World Energy

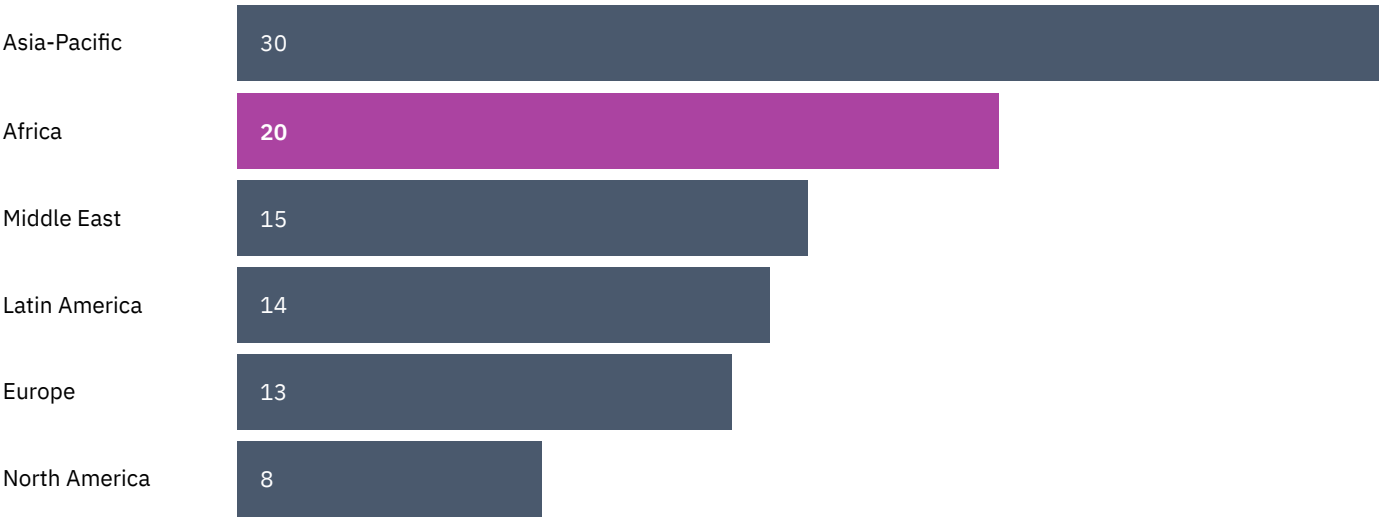
The observed outcome diverges sharply from that expectation. Africa hosts one in five of the world's sovereign wealth funds yet accounts for only 1.6% of global SWF assets under management. Twenty funds are distributed across seventeen countries — leaving 37 of Africa's 54 states without an operational fund — and the majority are small, thinly capitalised, and institutionally fragile. Even with the newly established Ethiopia's $45 billion fund, the aggregate remains marginal against the roughly $10 trillion managed by the global industry. Measured by scale rather than by count, the region is structurally underweight.

Figure 3.3: SWF Regional Breakdown (100 funds, total AUM 10.3 USD trillion, 2026)

By assets under management



By number of funds



Source: Primary sources and Authors' estimates

Figure 3.4: Mapping African SWFs



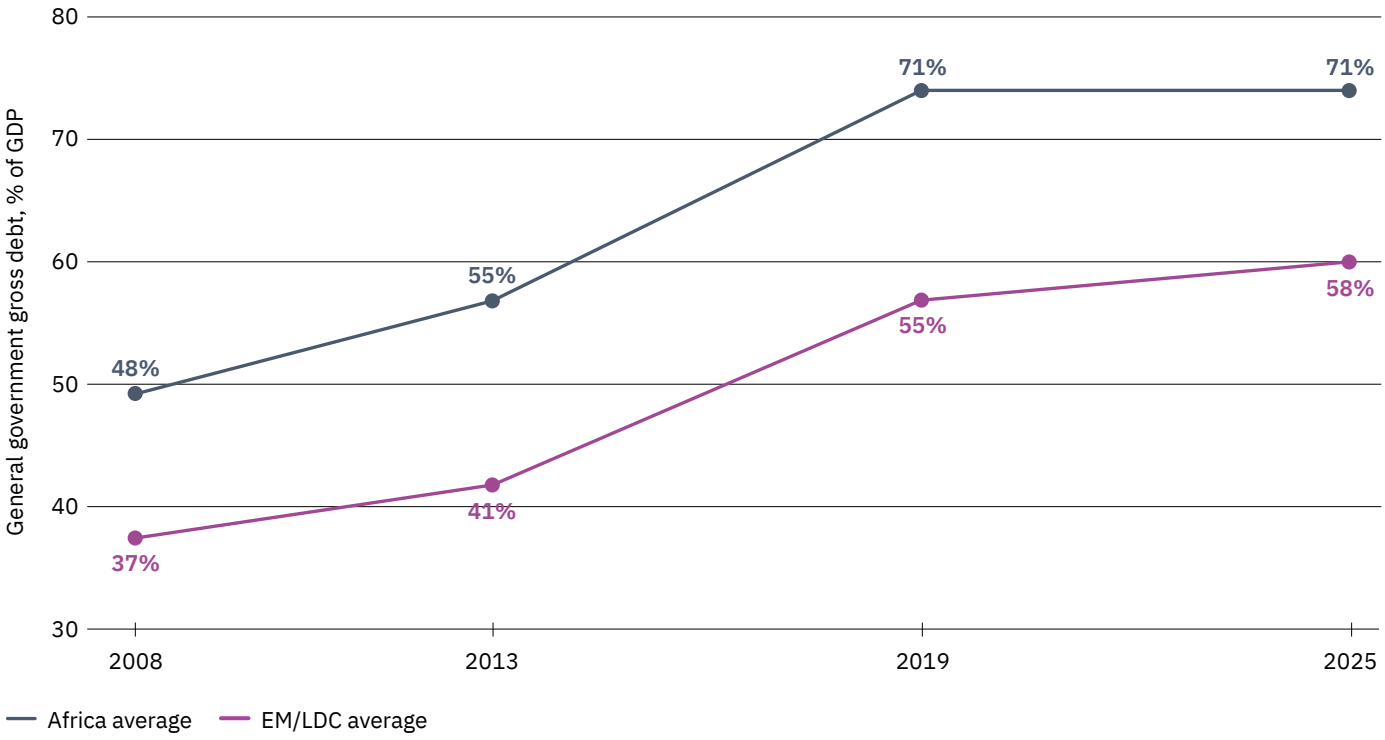
Source: IFSWF

Sources of the gap

Institutional, governance, and political factors are routinely and correctly cited to explain this shortfall. Less attention is paid to a structural macroeconomic determinant: the underlying fiscal condition of the sponsoring states. Sovereign accumulation and sovereign over-indebtedness are difficult to sustain simultaneously, and for much of the continent the second has crowded out the first.

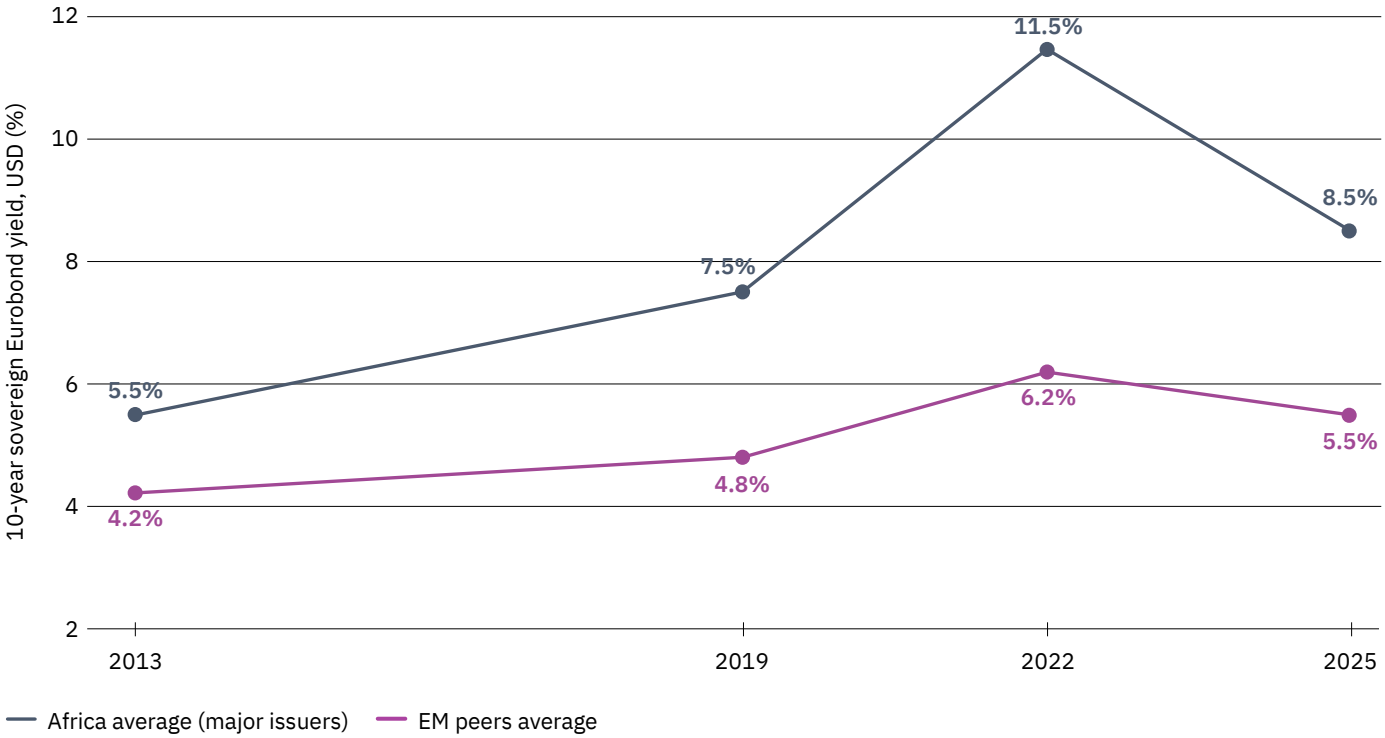
The fiscal data are unambiguous. General government gross debt in Africa rose from 48% of GDP in 2008 to 71% in 2025, against an average of 58% for emerging-market and low-income peers. Funding costs have moved in parallel. Ten-year sovereign Eurobond yields increased from 5.5% in 2013 to 8.5% in 2025, a premium of roughly 300 basis points over comparable emerging markets. At those funding levels, the opportunity cost of capitalising a fund is high: each unit of resource revenue carries a competing and more immediate claim from debt service, deficit financing, and recurrent expenditure. Under such conditions, long-horizon saving is difficult to justify on a present-value basis.

Figure 3.5: Public Debt in Emerging and Less Developed Countries (2008–2025)



Source: IMF

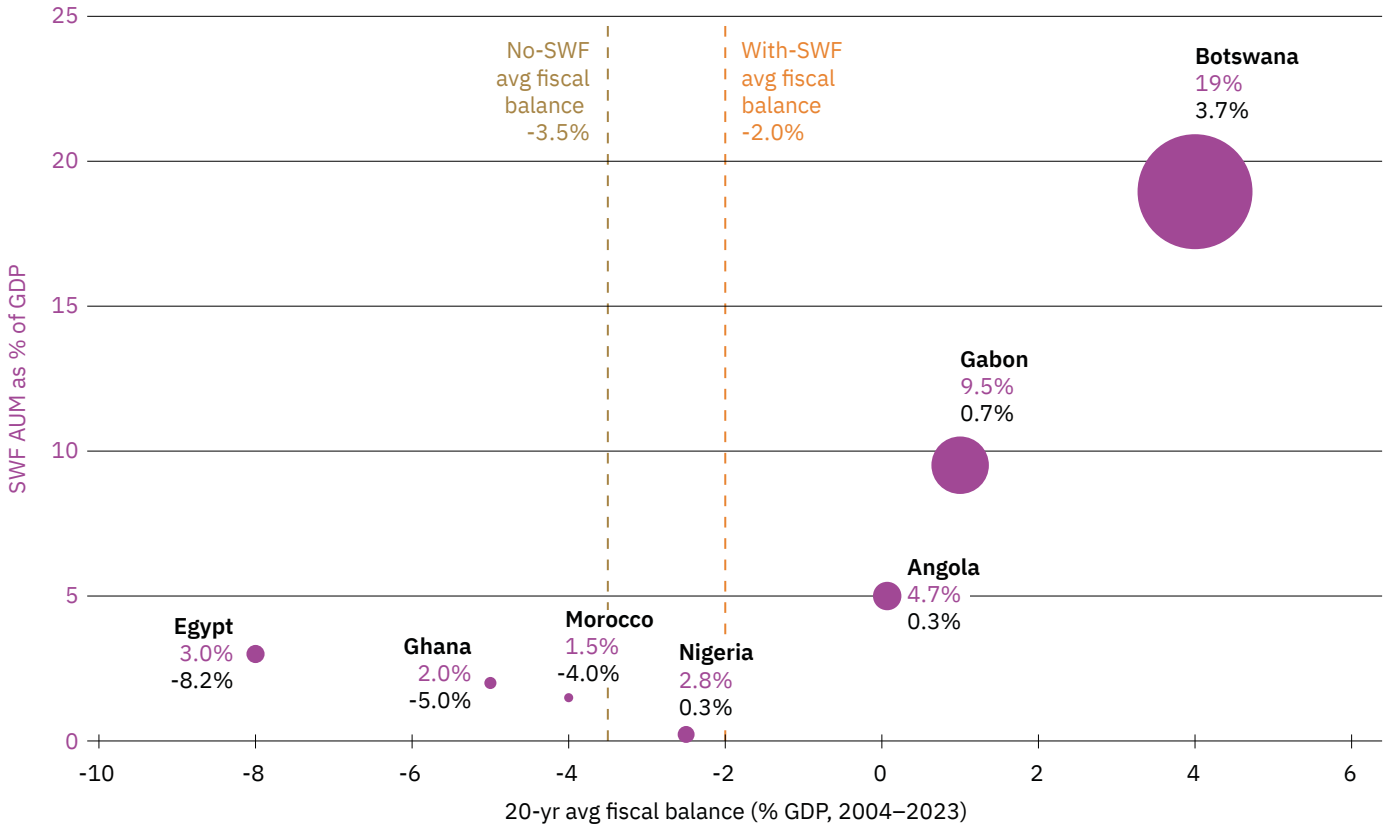
Figure 3.6: 10-year sovereign Eurobond yields (USD-denominated, annual averages)



Source: Bloomberg, J.P. Morgan, and the IMF Regional Economic Outlook

The cross-section is broadly consistent with the mechanism. Plotting twenty-year average fiscal balances against fund size relative to GDP yields a clear positive relationship: the funds that reached meaningful scale were, with few exceptions, sponsored by states that maintained fiscal discipline over the cycle. Fiscal soundness is better understood as a precondition for sovereign saving than as its consequence. Where sovereign borrowing costs exceed plausible risk-adjusted portfolio returns, the arithmetic of debt service dominates the arithmetic of accumulation, and a large fund is unlikely to form.

Figure 3.7: Fiscal Discipline and SWF Size



Values read from chart (approximate). Ethiopia & Libya in averages only (excluded from plot).
Sources: IFSWF; proprietary AUM data (Jan 2026); IMF WEO (Apr 2026); World Bank WDI.

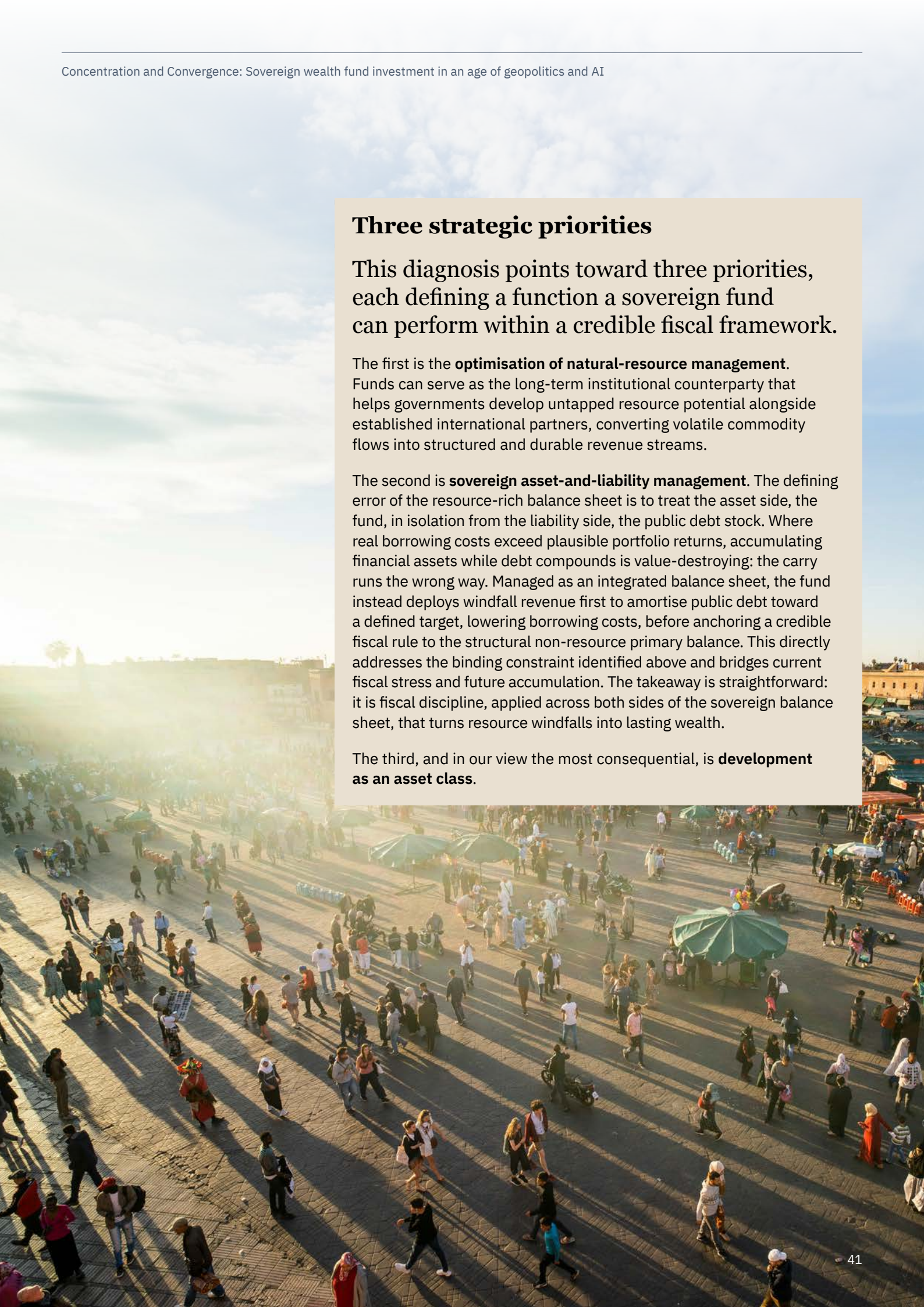
Three strategic priorities

This diagnosis points toward three priorities, each defining a function a sovereign fund can perform within a credible fiscal framework.

The first is the **optimisation of natural-resource management**. Funds can serve as the long-term institutional counterparty that helps governments develop untapped resource potential alongside established international partners, converting volatile commodity flows into structured and durable revenue streams.

The second is **sovereign asset-and-liability management**. The defining error of the resource-rich balance sheet is to treat the asset side, the fund, in isolation from the liability side, the public debt stock. Where real borrowing costs exceed plausible portfolio returns, accumulating financial assets while debt compounds is value-destroying: the carry runs the wrong way. Managed as an integrated balance sheet, the fund instead deploys windfall revenue first to amortise public debt toward a defined target, lowering borrowing costs, before anchoring a credible fiscal rule to the structural non-resource primary balance. This directly addresses the binding constraint identified above and bridges current fiscal stress and future accumulation. The takeaway is straightforward: it is fiscal discipline, applied across both sides of the sovereign balance sheet, that turns resource windfalls into lasting wealth.

The third, and in our view the most consequential, is **development as an asset class**.



Development as an asset class

The conventional framing treats development finance and market returns as substitutes, with development understood as concessional capital deployed at below-market returns in exchange for social impact. The empirical record increasingly contradicts that framing.

African private credit is widely perceived as close to uninvestable, yet pooled loss data from the GEMs consortium, drawn from 29 development banks and finance institutions over the 1994–2024 period, indicate that this perception substantially overstates realised risk. The average default rate on African private-sector counterparties is 5.3%, modestly above the 3.2% recorded for S&P "B"-rated firms and the 3.8% for Moody's "B3" credits. Recovery outcomes are more favourable still: African counterparties recover 78% on average, the highest of any region, compared with 70% for Moody's global loans, 59% for global bonds, and 38% for the JPMorgan emerging-market bond index. The wedge between perceived and realised risk is material and persistent.

That wedge defines the opportunity. Development need not be concessional. Domestic projects in infrastructure, energy, and industry internalise economic, environmental, and social spillovers that purely financial investors do not price, and in private markets they can generate competitive risk-adjusted returns.



The multilateral development banks provide a relevant benchmark in this respect. Their record, reflected in the same GEMs data that reframes African credit risk, demonstrates that disciplined investment in frontier environments can be conducted prudently and profitably rather than as concessional support. The MDB model is nonetheless a reference point rather than a template. African sovereign funds operate from a distinct set of comparative advantages that the development banks do not share, and the case for treating development as an asset class rests primarily on those advantages.

They are considerable. Sovereign funds have strong local footing: domiciled within their markets, they hold superior information on the political economy and can act with greater speed and conviction than an external lender. That proximity confers an origination advantage, allowing funds to source, structure, and de-risk transactions domestically and to use government-to-government relationships to assemble deals that commercial investors cannot replicate. Sovereign funds are also well positioned to mobilise domestic long-term capital. Where explicitly permitted by mandate, funds may use anchor, subordinated, guarantee-like, or risk-sharing structures and crowd in local pension funds, insurers, and other institutional investors seeking duration and yield but lacking origination capacity of their own.

Finally, these effects can be amplified through regional collaboration, as like-minded funds pool capital, share pipelines, and co-invest across borders to achieve a scale and diversification beyond the reach of any single national vehicle.

Taken together, the implication is sequential. Repairing the fiscal foundation is the necessary first step; on that basis, treating development as an asset class and building on the MDB experience while exercising the funds' own advantages in origination, local partnership, and regional cooperation offer a credible route to converting the continent's resource endowment into durable national capital.

Case study 2

FOCO: Mobilising International Capital for Spain's Strategic Transformation



Spain has become a leading destination for long-term institutional capital in Europe. The fourth-largest economy in the EU combines political stability, an ambitious renewable energy agenda and a strategic geographic position bridging Europe, Latin America and Africa.

Its investment fundamentals are equally strong: a total inward FDI stock exceeding €600 billion (equivalent to more than 40% of GDP) and four consecutive years attracting more than €30 billion in foreign direct investment, according to the Spain Innovation Report 2026.



More than **12,200 companies** carry out R&D activities

Beyond macroeconomic fundamentals, Spain's innovation ecosystem adds a further layer of relevance for institutional investors: more than 12,200 companies carry out R&D activities, the country produces 3% of global scientific output and ranks third in returns from Horizon Europe, the EU's flagship research programme, a base of technical capacity that underpins the country's ability to scale companies in deep tech, healthtech and advanced manufacturing. Sovereign investors have taken note: they deployed $4.5 billion in Spain in 2025 alone, more than three times the volume recorded in 2024, according to the 2026 Annual Report on State Investors, with capital flowing predominantly toward renewable energy, digital infrastructure and advanced technology.

FOCO, the Co-Investment Fund managed by COFIDES, was created to channel and scale this momentum. A €2 billion public financial instrument funded through the European programme NextGenerationEU, FOCO operates on a straightforward but disciplined logic built around two core principles: first, every euro of public capital committed must be matched, at minimum, by a foreign co-investor, whether private or public; and second, investments must be directed toward strategic sectors (the green and digital transitions and advanced technologies) that are driving the modernization of the Spanish economy. The fund operates both through direct investments, taking equity or quasi-equity stakes in private companies, and indirectly, through commitments to private equity, infrastructure or venture capital vehicles, provided those funds deploy at least twice FOCO's contribution into Spanish companies.

The co-investment is structured on a pari passu basis. FOCO takes a minority position and aligns its risk-return expectations with those of its partners. This alignment, without preferential treatment or downside protection, reflects a deliberate choice to ensure credibility with long-term institutional investors, including sovereign wealth funds and public pension funds. For a public instrument operating in competitive capital markets, that design discipline matters.

Moreover, all FOCO operations undergo a rigorous environmental and social assessment as part of due diligence, with mitigation measures incorporated into contractual agreements. COFIDES is a signatory to the EDFI Harmonised Fossil Fuel Exclusion List and the EDFI Statement on Climate and Energy Finance. The fund's mandate is explicitly aligned with the Paris Agreement on Climate Change, making FOCO a natural fit for institutional investors with their own ESG commitments and net-zero targets.

COFIDES brings to this mandate three decades of experience managing public financial instruments — more than 1,000 operations across 90 countries and nearly €6 billion under management across internationalization, development finance and impact investing mandates. Critically, that track record includes extensive experience structuring complex financial operations and co-investing alongside international investors, including sovereign wealth funds. This institutional experience allows FOCO to operate at the intersection of public policy objectives and institutional investment discipline, structuring transactions compatible with both. Since becoming operational in late 2024, FOCO has moved quickly. By end-2025, the fund had formalized 15 operations committing €1.2 billion. Based on the current pipeline and positive deal outlook, FOCO expects to deploy its full €2 billion allocation by the time its investment mandate concludes in July 2026. As an open-ended vehicle, FOCO is structured to reinvest capital returns into new operations, with the expectation of continued portfolio growth well beyond the initial deployment period.

The sectoral breakdown of committed capital as of end-2025 reflects both the structure of investor demand and Spain's comparative advantages: digital transformation accounts for 41% of commitments, renewables for 19%, deep tech for 7% and biomethane for 4%, with the remainder allocated to sustainable infrastructure, sustainable agriculture, and other strategic activities.

Among completed operations, FOCO has backed a next-generation renewable hybridisation platform combining wind, solar PV and battery storage, and supported the development of reusable launch vehicles within Spain's emerging aerospace sector, a field where the country's engineering talent and industrial depth are gaining significant international recognition.



The co-investor base that FOCO has assembled is notably diverse.

Sovereign wealth funds have participated alongside corporate strategic investors and leading private equity and venture capital managers. This breadth reflects a broader shift in how international institutional investors are approaching Spain: not as a peripheral European market, but as a platform offering policy clarity, EU regulatory access, a skilled technical workforce and strategic geographic positioning, characteristics that are difficult to replicate elsewhere in Southern Europe. Beyond individual transactions, FOCO's activity is contributing to the deepening of Spain's private capital market, attracting international investors to sectors and companies that would otherwise have had limited access to this type of capital.

The sectors driving FOCO's deal flow — energy transition, digital infrastructure, deep tech, advanced manufacturing and aerospace — closely mirror the deployment priorities that sovereign wealth funds and public pension funds are pursuing globally. This alignment is no coincidence: FOCO was built to attract investors with long-duration horizons and a focus on structural transformation rather than short-cycle returns. The fund offers a concrete case study in how a public co-investment vehicle, designed with institutional discipline from the outset, can mobilise private international capital at scale around national strategic objectives, and do so on terms that long-term investors are willing to accept.

Case study 3

Subnational Sovereign Wealth Funds in Brazil: Building Long-Term Public Capacity

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Leandro Ferreira *Executive Director, FFSB*
Paul Katz *Senior Vice President, JFI Social Wealth*



The views expressed in this article are those of the authors and do not necessarily reflect those of the IFSWF or its members.

Brazil's state and municipal sovereign wealth funds are among the most significant recent innovations in Brazilian public finance.

The seven existing funds have mandates that range from savings and stabilisation to strategic investment and territorial development and, collectively, managed approximately R$9.95 billion (US$1.95 billion as of July 2026[3]; see table on p.52). Their growing relevance at the national level is driven less by the scale of assets under management than by the broader ambition they embody: transforming extraordinary, volatile, or otherwise time-limited revenues into institutional structures capable of advancing long-term public objectives.

Brazil has attempted sovereign wealth management at the national level before, establishing the Brazilian Sovereign Fund (FSB) in 2008 and unwinding it a decade later. The country's new subnational funds, by contrast, respond to a distinct set of challenges and opportunities, bound as they are to local revenues, fiscal pressures, public banks, and diverse territorial needs. Since 2017, seven states and municipalities have become central to this agenda, capitalizing funds from oil royalties, mining revenues, and now non-commodity sources. Despite differences in mandates, regulations, governance arrangements, and management capacity, these funds use structures previously uncommon at the subnational level to align uncertain revenues with local priorities.

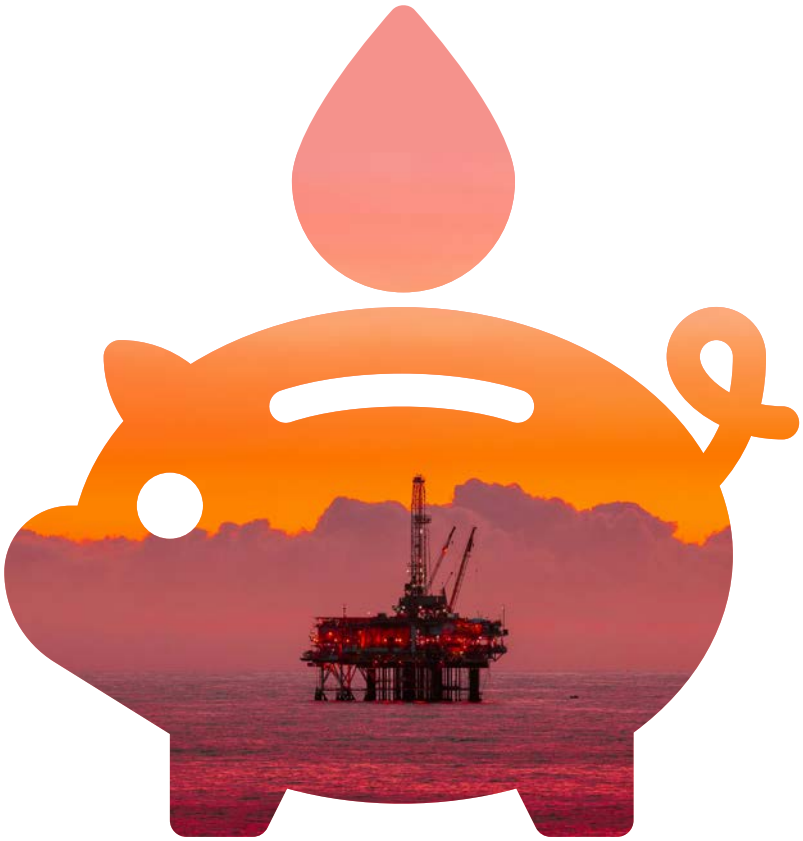
The Forum of Brazilian Sovereign Wealth Funds (FFSB), incubated by the Universidade Federal Fluminense, JFI Social Wealth (the Jain Family Institute's public wealth programme), and participating funds, has emerged as a key institution in this process. Its role is to support peer learning, develop shared principles, strengthen domestic regulation, and connect Brazilian funds to the broader sovereign development ecosystem, nationally and globally.

3 Exchange rate used throughout this document: US$1 = R$5.10 (as at 15 July 2026).

The Emergence of Subnational SWFs in Brazil

The recent history of Brazil's subnational wealth funds demonstrates increasing institutional maturity at the state and municipal levels. The first wave of Brazilian subnational funds emerged in the late 2010s among states and municipalities receiving large oil revenues from offshore production, particularly along the Santos Basin in Southeastern Brazil. From 2017, the cities of Maricá, Ilhabela, Niterói, and the states of Espírito Santo and Rio de Janeiro launched funds. Their creation reflected a specific conjunction of factors: rising royalty revenues, awareness of revenue volatility from the previous commodity cycle, and fresh memories of the acute fiscal pressures that had affected many subnational governments after the mid-2010s downturn.

The agenda has since broadened. Paraná state has created a fund supported by external credit rather than extractive rents, and its capital city of Curitiba has built a rainy day fund from fiscal surpluses. In the state of Minas Gerais, the mining-royalty-recipient municipalities of Congonhas, Itabira, and Conceição do Mato Dentro have begun to explore similar possibilities. Studies are also underway in the North and Northeast, linked to possible new oil production in the Equatorial Margin. This diversification is one of the most important features of the Brazilian experience: subnational funds are increasingly being adapted to different fiscal realities, revenue sources, and development strategies.



Entity	Fund	Year	Source of capital	Status	AUM (BRL)
Maricá (municipal, RJ)	Fundo Soberano de Maricá (FSM)	2017	Oil royalties	Operational	R$2.10b (as of 15/5/26[4])
Ilhabela (municipal, SP)	Fundo Soberano do Município da Estância Balneária de Ilhabela (FSMI)	2018	Oil royalties	Operational	R$635m (as of 23/6/26[5])
Niterói (municipal, RJ)	Fundo de Equalização da Receita (FER)	2019	Oil royalties	Operational	R$1.72b (as of 10/7/26[6])
Espírito Santo (state)	Fundo Soberano do Estado do Espírito Santo (Funses)	2019	Oil royalties	Operational	R$2.69b (as of 13/7/26[7])
Curitiba (municipal, PR)	Fundo de Recuperação e Estabilização Fiscal (FUNREC)	2021	Fiscal surplus	Operational	R$204m (as of 25/03/26[8])
Rio de Janeiro (state)	Fundo Soberano do Estado do Rio de Janeiro (FUNSERJ)	2022	Oil royalties	Operational	R$2.0b (as of 03/26[9])
Paraná (state)	Fundo Estratégico do Paraná (FEPR)	2026	IDB credit	Capitalizing	R$510m (as of 05/26[10])
Total					**≈ R$9.95b**

4 Accessed 17/7/26

5 Accessed 17/7/26

6 Accessed 17/7/26

7 Accessed 17/7/26

8 Accessed 15/7/26

9 Ortiz et al., 2026, p. 1320.

10 As part of this loan, the Paraná Treasury also plans to contribute US$50M in matching funds, which are not included in the table.



As Brazil's subnational funds mature, the **key challenge is implementation**

These experiences stand in contrast to two sovereign fund initiatives at the Brazilian federal level. The aforementioned FSB, created in 2008, was abolished by presidential decree in 2018 and formally liquidated in 2019 after failing to establish a durable role in federal fiscal and investment policy. The second initiative, the Pre-Salt Social Fund (FSPS), remains in operation, with US$11 billion in assets as of May 2026.[11] Created to turn pre-salt oil revenues into long-term resources for social and regional development, the FSPS has faced persistent governance and transparency challenges. Recent reforms introduced new reporting requirements while expanding permissible uses to include housing, water, food security, indigenous rights, and disaster response. It is too early to judge their impact, but they create an opening for a more purposeful next phase.

The subnational agenda, however, is evolving under different conditions: closer to the source of revenues, more exposed to local political economy dynamics, and increasingly connected to development finance institutions.

As the agenda expands, implementation becomes increasingly important. Funds must balance long-term mandates with immediate public demands, preserve institutional continuity across political cycles, and translate formal mandates into operational strategies, including for territorial development. These are the challenges that arise when new public financial institutions begin to mature. Progress is being supported by a growing learning ecosystem, with FFSB playing a domestic coordinating role, IFSWF providing a channel for international peer exchange, and philanthropic partners helping link the agenda to wider work on public finance, climate, and long-term development.

11 R$56.4 billion

Brazilian SWFs in the National Financial Ecosystem

One of the distinctive features of the Brazilian case is that subnational funds are emerging within a dense public financial ecosystem, rather than as isolated investment vehicles. In Brazil, investment financing is characterized by the strong presence of public development banks, particularly when it comes to enabling long-term projects with positive externalities.

The country has a sophisticated public banking architecture in which Brazil's national development bank, BNDES, plays a central role alongside state-level development banks such as Bandes, BDMG, BNB and BRDE. With approximately US$189 billion in assets as of December 2025, BNDES remains one of the world's leading development banks and a key institution for industrial policy, infrastructure investment, and the energy transition.[12] At the subnational level, the other institutions that make up the National Development System contribute local market knowledge and strong project structuring capabilities. For sovereign wealth funds, these institutions can act as counterparties, co-investors, fund managers, and technical partners — a dynamic illustrated particularly well by the case of Espírito Santo discussed below.



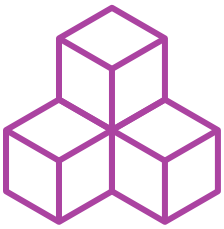
12 BNDES Sustainable Development

From Mandate to Instrument: Espírito Santo and Paraná

A significant portion of sovereign wealth fund capital in Brazil derives from fossil resource revenues. Under Brazil's federal system, compensation revenues, including royalties, are distributed among the federal government, states, and municipalities, allowing subnational entities to allocate part of these revenues to sovereign funds.

This creates both an opportunity and a responsibility. Investment decisions can help determine whether resource-dependent territories remain locked into narrow economic patterns or build greater fiscal and economic resilience over time. When endowed with appropriate mandates, these funds can provide patient capital for objectives that are difficult to serve through annual budgets alone. In some cases, this may mean savings or stabilization. In others, it may mean diversification, decarbonisation, infrastructure, innovation, or territorial development.

Espírito Santo demonstrates the potential of institutional partnerships. Its sovereign fund, Funses, combines an intergenerational savings fund managed by the state's public commercial bank, Banestes, with an economic development mandate led by the public development bank, Bandes. The state has used this structure to launch a sequence of vehicles, from venture capital to debentures and now Funses III, a blended decarbonisation-oriented credit fund tied to the state's decarbonisation plan. Its design reflects Espírito Santo's distinctive emissions profile within Brazil, where energy and industry account for an unusually large share, creating a clear need for productive-sector decarbonisation. Funses III demonstrates how a subnational fund can marshal sovereign capital, development-bank capacity, and private management expertise behind a territorially specific transition strategy.



Paraná has adopted a **three-part structure**: strategic investment, fiscal sustainability and disaster response

Paraná represents a second important case. While Espírito Santo pairs a development-oriented tranche with a savings tranche, Paraná's Strategic Fund, created in law in 2025, is structured around three purposes: strategic investment, fiscal sustainability, and disaster response. Unlike most Brazilian subnational funds, it is not capitalized through extractive revenues. The state and federal governments have approved a US$100 million IDB credit operation to support implementation, subject to remaining federal and contractual steps.[13] The fund is positioned as a response to Brazil's changing tax regime. As states lose scope to use fiscal incentives to attract investment, Paraná's fund offers a different model: a dedicated vehicle to support infrastructure, logistics, technological innovation, and the energy transition in ways that strengthen long-term fiscal capacity. Because external borrowing rather than windfall revenues partly supports the fund, its rationale is less straightforward than its oil-revenue-capitalized peers, depending on the concessionality, maturity, and cost of the financing, the fiscal treatment of the liabilities, and the expected public returns on the investments.

13 Cofiex: Agenda for the 182nd Meeting of the External Financing Committee.

Governance and Risks

As ambitions mount, governance needs and risks scale with the opportunities. Close to the revenues they manage, Brazil's subnational sovereign funds are exposed to the political cycle: as governments change, the democratic responsiveness that gave them their opening can also constrain or redirect them, diluting mandates or prompting withdrawals. Weak frameworks invite capture by interests that diverge from formal mandates. Funds like Paraná's, built on external credit, further sharpen the need for discipline, as they must service their debt whether or not their investments pay off. Smaller municipalities may lack the capacity to govern complex vehicles, and transparency and reporting remain uneven, leaving openings for fragmentation and short-termism.

The public-banking ecosystem that lends these funds their strength carries a further hazard, inviting scenarios where interconnected institutions could act as manager, lender, counterparty, and policy agent. Yet the risk can be tempered. Espírito Santo, for instance, has brought in the venture firm Quartzo Capital and Latin America's largest investment bank BTG to manage Funses I and III, respectively. Finally, because many of these funds are capitalised from extractive revenues, their legitimacy will depend on whether they finance diversification and low-carbon development or deepen that dependence.



The Role of the FFSB

These risks and opportunities explain why implementation now sits at the center of the agenda. As funds move from legal creation to operation, their effectiveness depends on clear mandates, professional governance, technical capacity, and coordination among national and subnational actors and with the private sector.

Launched in 2022 through a partnership between the Universidade Federal Fluminense, JFI Social Wealth portfolio, and subnational governments managing sovereign funds, the Brazilian Sovereign Wealth Funds Forum (FFSB) has become a domestic platform for coordination among funds, public institutions, technical partners, and supporters of the agenda. Its role is to give Brazil's subnational funds a shared institutional space while respecting the diversity of their mandates, revenue sources, and local development strategies.

The Forum's early work focused on principles, peer learning, and practical tools. Together with participating funds, it drafted the Brazilian Principles, based on the Santiago Principles but adapted to the domestic and subnational context. Like their international counterparts, the Brazilian Principles address legal structure, governance and management, and accountability. Their function, however, is different: because Brazil's state and municipal funds primarily manage domestic public revenues and invest within Brazil, they serve less as a framework for global market positioning than as a coordination tool for diverse subnational funds. The aim is to give these funds a common language of legitimacy, transparency, fiscal responsibility, and long-term public purpose.



The FFSB developed a stochastic modelling tool to **support decision-making in negotiations** with external asset managers

The FFSB has also organised a number of events and produced high-quality research that has become a national reference in the field. In partnership with JFI Social Wealth, the Forum also developed a stochastic modelling tool to support decision-making in negotiations with external asset managers, with applications extending beyond sovereign wealth funds to broader public fund management.

The current phase of the Forum's work is regulatory as well as technical. Building on these foundations, the FFSB has supported the development of a federal regulatory framework for subnational sovereign funds, aimed at providing legal certainty while preserving flexibility across different institutional models. This work has advanced through dialogue with the Central Bank of Brazil, the Ministry of Finance, and the Ministry of Planning and Budget, the three institutional anchors of the National Monetary Council, which has been authorized to regulate the funds.[14]

14 Law 14.937, Art. 10, 26 July 2024.

Final Remarks

Brazil's subnational sovereign wealth funds offer a distinctive example of institutional experimentation at the territorial level. Their significance lies in the use of fund structures to convert extraordinary, volatile, or time-bound revenues into longer-term fiscal and investment capacity. They are not defined by a single mandate. Across Brazil, these funds are being adapted to support savings, stabilization, intergenerational equity, fiscal resilience, strategic investment, transition finance, and territorial development.

The next phase of this agenda is implementation. As funds move from legal creation to operation, their success will depend on mandate clarity, professional governance, technical capacity, and deeper integration with Brazil's public financial architecture. The cases of Espírito Santo and Paraná show the breadth of this agenda: subnational funds can help organize partnerships around territorially specific strategies, while also offering new tools for states facing changing fiscal and regulatory conditions. By supporting common principles, facilitating exchange among funds, developing practical tools, and advancing regulatory dialogue with the institutions charged with overseeing the sector, the FFSB is helping build the shared ecosystem these increasingly mature funds require.

Public wealth does not become more useful simply by being placed in a fund.

Its value depends on the mandate, governance, institutional partners, and regulatory framework around it. Brazil's state and municipal funds show how subnational governments can use fund structures to make temporary or uncertain revenues serve longer-term public purposes, while adapting those purposes to the specific fiscal, economic, and territorial realities they face.

Sources

This Annual Review traces its claims to their sources. We link each fact, whether a fund, a transaction or a valuation, to the primary record, normally an institution's own announcement or report. The data behind the charts comes from the IFSWF database, and readers can see how we build it in the IFSWF data methodology. The IFSWF concentration index and the atoms-and-bits lens are the Forum's own work, and we present them as such. We publish the full concentration-index workbook alongside this Annual Review for transparency.

Geography and geopolitical risk
The geopolitical-risk series is the Geopolitical Risk Index, which Dario Caldara and Matteo Iacoviello set out in "Measuring Geopolitical Risk" (American Economic Review, 2022) and update monthly. We take the share of disclosed sovereign capital flowing to the United States from the IFSWF database, and GIC reports the parallel rise in its own Americas exposure in its Report on the Management of the Government's Portfolio 2025/26. Temasek describes how it manages geopolitical risk, including its policy-monitoring teams in Beijing, Brussels, Singapore and Washington, in the Temasek Review 2023. Enel Green Power announced the Qatar Investment Authority's 2021 renewable-energy joint venture across South Africa and Zambia in January 2021. Future Fund CEO Raphael Arndt argues that adding diversification "will not be enough" in his op-ed on resilience.

Atoms, bits and the AI stack
Nicholas Negroponte introduced the "from atoms to bits" metaphor in Being Digital (Alfred A. Knopf, 1995). S&P Dow Jones Indices reports the technology weight of the S&P 500; for a broader figure that places technology near half the index, the IFSWF combines the information technology sector with adjacent names classified elsewhere. Company guidance and BloombergNEF's tracking of data-centre operators set the scale of hyperscaler capital expenditure for 2026. GIC and the Abu Dhabi Investment Authority announced their $1.6 billion investment in Vantage Data Centres' Asia-Pacific platform in September 2025. Anthropic raised its Series F, $13 billion at a $183 billion post-money valuation, in September 2025, with GIC and the Qatar Investment Authority among the investors. Mubadala and G42 launched their AI investment company MGX in March 2024; BlackRock and Microsoft launched the AI Infrastructure Partnership it joined in September 2024; and the Kuwait Investment Authority joined that partnership in 2025. The Public Investment Fund sets out HUMAIN's data-centre capacity targets.

Regional and member perspectives
Members and guest authors wrote the regional and member perspectives, and their charts carry their own source lines. The resource-reserve figures draw on the United States Geological Survey and the Statistical Review of World Energy. Debt, yield and fiscal data come from the International Monetary Fund's World Economic Outlook and Regional Economic Outlook, the World Bank's World Development Indicators, and market data from Bloomberg and J.P. Morgan. The GEMs Risk Database supplies the frontier-market credit evidence.

Acknowledgements

The International Forum of Sovereign Wealth Funds thanks its members, Cofides and the Fórum de Fundos Soberanos Brasileiros, each of whom contributed an article that broadens the perspectives in this year's Annual Review.

Enrico Soddu led the analysis and writing for the IFSWF Secretariat, with Duncan Bonfield and Eline Sleurink acting as sounding boards throughout. Our thanks to Senior Advisor Udaibir Das whose leadership and attention to detail strengthened both the argument and its readability. On methodological questions, and the concentration indices in particular, he sought advice from academics at three institutions across three continents: Professor Thiago Caicedo dos Santos and Professor Håvard Halland at Heriot-Watt University in Edinburgh; Professor Patrick Schena at Tufts University in Boston; and Professor Bernardo Bortolotti at NYU Stern in Abu Dhabi. Their comments sharpened the analysis, and any errors that remain are ours.

In preparing this Annual Review, the team used large language models to assist with drafting, editing and research synthesis, directing that work and verifying the data and sources.

Our warmest thanks go to Abhinav Mangat and the team at NYU Stern Abu Dhabi, whose behind-the-scenes work, building the IFSWF database and the IRIS+ tagging, made this Annual Review possible. It has been a real pleasure to work together.

About the International Forum of Sovereign Wealth Funds (IFSWF)

The International Forum of Sovereign Wealth Funds (IFSWF) is a voluntary organisation of global sovereign wealth funds committed to working together and strengthening the community through dialogue, research and self-assessment.

In 2008, a group of 26 leading state-owned international investors from around the world established the IFSWF's precursor, the International Working Group of Sovereign Wealth Funds, following discussions with global groups such as the G20, International Monetary Fund and the US Department of the Treasury. The Working Group created a set of Generally Accepted Principles and Practices, known as the Santiago Principles, for sovereign wealth funds' institutional governance and risk-management frameworks. Following the Kuwait Declaration in 2009, the International Working Group became the IFSWF with the mandate of helping members implement the Principles.

Today, helping members implement the Santiago Principles remains the foundation of the IFSWF's activity. The Forum now represents a group of almost 40 sovereign wealth funds from all corners of the globe, with a variety of mandates and at various stages in their development. As a result, IFSWF's focus has evolved. In addition to encouraging the ongoing commitment to the Santiago Principles, the Forum also undertakes research, facilitates peer assistance exercises and holds workshops and seminars to help members enhance their existing investment capabilities. The IFSWF also represents its members to the global financial and policy communities.


IFSWF
International Forum of Sovereign Wealth Funds