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Global Public Investors – central banks, sovereign funds and public pensions funds – are widening their radius ever further. The policies of 750 institutions with worldwide investible assets of \$39.5tn have a profound effect on global markets. They are crucially important for growth prospects, the investment climate and capital markets. They will have a significant role in the post-pandemic global recovery. The 2020 annual edition, the seventh, surveys GPIs' performance and practices across a wide range of investments as well as their activities in the digital economy and sustainable investment.





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‘Thin line between success and failure’

GPIs’ role in shaping policy is fraught with hazard, writes David Marsh, chairman, OMFIF

THE 2008 financial crisis thrust central banks, sovereign funds and public pension funds into the limelight. Massive stabilisation efforts ensued, including central banking packages and bail-outs of stock market-quoted groups. 12 years later with the rapid outbreak of still more pernicious economic and social disturbance, state institutions are marshalling an even greater display of force spreading well beyond the purely financial. *Global Public Investor 2020* covers all aspects of these institutions’ make-up and performance. We focus on their fostering of institutional resilience in the face of the biggest international crisis since the second world war. And we multiply references to the need for economic and financial sustainability, a major theme over the seven years of our annual series.

The world could manifestly no longer proceed as it was developing last year, in apparent comfort but increasing precariousness. A year ago, in the *GPI 2019* foreword, I wrote, ‘The much-heralded world recession is nowhere in sight, but history teaches that it may be just over the horizon.’ Now it has arrived, GPIs are no longer mere instruments. In many cases – in the absence of broader international strategies, occasioned by the US retreat from global leadership – they have become source and bedrock

of policy. Governments are demonstrating presence and prowess to counter Covid-19. With their growing firepower, GPIs are in the public eye. But they cannot lose sight of parallel vulnerabilities.

Central banks, through further shifts towards still more unconventional monetary policy, have greatly expanded balance sheets and represent the mainspring of global recovery. However, if the upturn is slower than expected, or if the virus returns with fresh virulence, they will face vast financial and reputational exposure. With this will come a backlash from politicians claiming they misused their independence and leverage.

Sovereign funds have been ultra-active – both in buttressing their own governments’ rescue measures and through opportunistic investments in sectors expected to profit from the turbulence. In some senses against their better judgement, they are making wagers on the future of the world economy from which they would normally shrink back. Coming years will show whether these choices have been master strokes or miscalculations.

Public pension funds have been shoring up incomes and valuations – for workers, retirees and investors a pivotal form of life support. But if their investment processes or governance frameworks break down, stabilisation will go into reverse. For all these institutions and the people and businesses they support, the threshold to fresh travail is low – and the line between success and failure is agonisingly thin. •

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‘Opportunities ahead for those willing to embrace them’



Gerry Grimstone, UK Minister for Investment, Department for International Trade and Department for Business, Energy and Industrial Strategy

THE economic earthquake unleashed by Covid-19 has shaken the biggest and most powerful economies and businesses to their core, triggering a sharp fall in global investment flows.

Global public investors are grappling with the changes accelerated by this pandemic, from the lengthening of supply chains, to the quest for greater domestic economic resilience, and the shift to home working. Questions have arisen about the role of long-term capital in a post-Covid world.

GPIs must start planning carefully for the eventual easing of the crisis. As the world recovers and recapitalises, they must manage the impact of sizeable monetary and fiscal intervention on their portfolios.

Recent reliance on central bank intervention during economic upheaval has supported long duration assets. Asset owners are increasingly integrating real assets into their portfolios. Nonetheless, Covid-19 has created significant changes in the attractiveness for investors of key assets, from airports, to infrastructure, retail and commercial real estate. Difficult decisions will need to be made.

Many areas of change were already well understood before this crisis struck, such as the move to online retail away from physical high street shopping. But there were questions as to whether these were priced in, and whether there may be opportunities for investors.

I strongly welcome OMFIF’s work to raise awareness of the impact that the policies of global public investors have on international markets. This is a time of huge disruption and almost unprecedented challenges for the world’s economy, but there are great opportunities ahead for those investors willing to embrace them. •

‘Intensified interlinkages, search for alignment’



Danae Kyriakopoulou
Chief Economist and
Director of Research,
OMFIF

THE strands tying together central banks, sovereign funds and public pension funds are becoming stronger yet more diverse. As investors closely linked to the state, they are united in their public ethos and purpose of maintaining the safety of, and generating returns on, public assets. They are increasingly expected to promote common economic and strategic objectives. Public scrutiny of inconsistencies in their practices is intensifying.

There are clear divergences between their policy and investment agendas. As monetary policy-makers, central banks’ ultra-accommodative actions responding to the 2008 financial crisis have been suppressing yields on government bonds. This has presented a challenge for their reserves management arms looking for safe and liquid assets. As a result, portfolio managers have diversified away from traditional allocations to fixed income, gold and cash, into equities and corporate bonds. This has placed central banks in direct competition with their sovereign fund and pension fund counterparties.

The pandemic has introduced new scope for making use of global public investors’ policy instruments and investment capabilities. Central banks were among the first to react with accommodative measures to prevent the economic crisis from spreading to the financial sector. Sovereign funds are helping finance research on a Covid-19 vaccine, or buying equity stakes in sectors struggling from confinement measures, such as airlines.

The climate crisis is bringing to light further disparities between central banks’ actions as policy-makers and supervisors, and their practices as reserves managers. They are deploying microprudential tools and climate stress tests to assess risks in the financial system. But many continue to shy away from aligning portfolios with the same sustainability objectives – just one of the areas where, in coming years, the search for sustainable business practices will require changes in policy-makers’ behaviour. •

Weighing safety and risk

Desire to escape low yields runs into Covid-19 flight to safe assets

GLOBAL public investors entered 2020 with the highest level of assets since OMFIF began collecting records seven years ago, at \$39.5tn or 43.4% of the world's GDP. This year's comprehensive analysis of 750 official institutions across 181 jurisdictions includes 490 public pension funds, 174 central banks and 86 sovereign funds.

GPIs added \$1.9tn to their portfolios over 2019, a 5% year-on-year increase. This was supported by a combination of strong returns and boosts to asset bases. While all three institution types saw their assets grow, public pension funds recorded the strongest performance, adding \$960.3bn to their assets (6% growth). Central bank reserves grew by 4.6%, while sovereign fund assets rose by 3.7%. Although this is above the rate of global

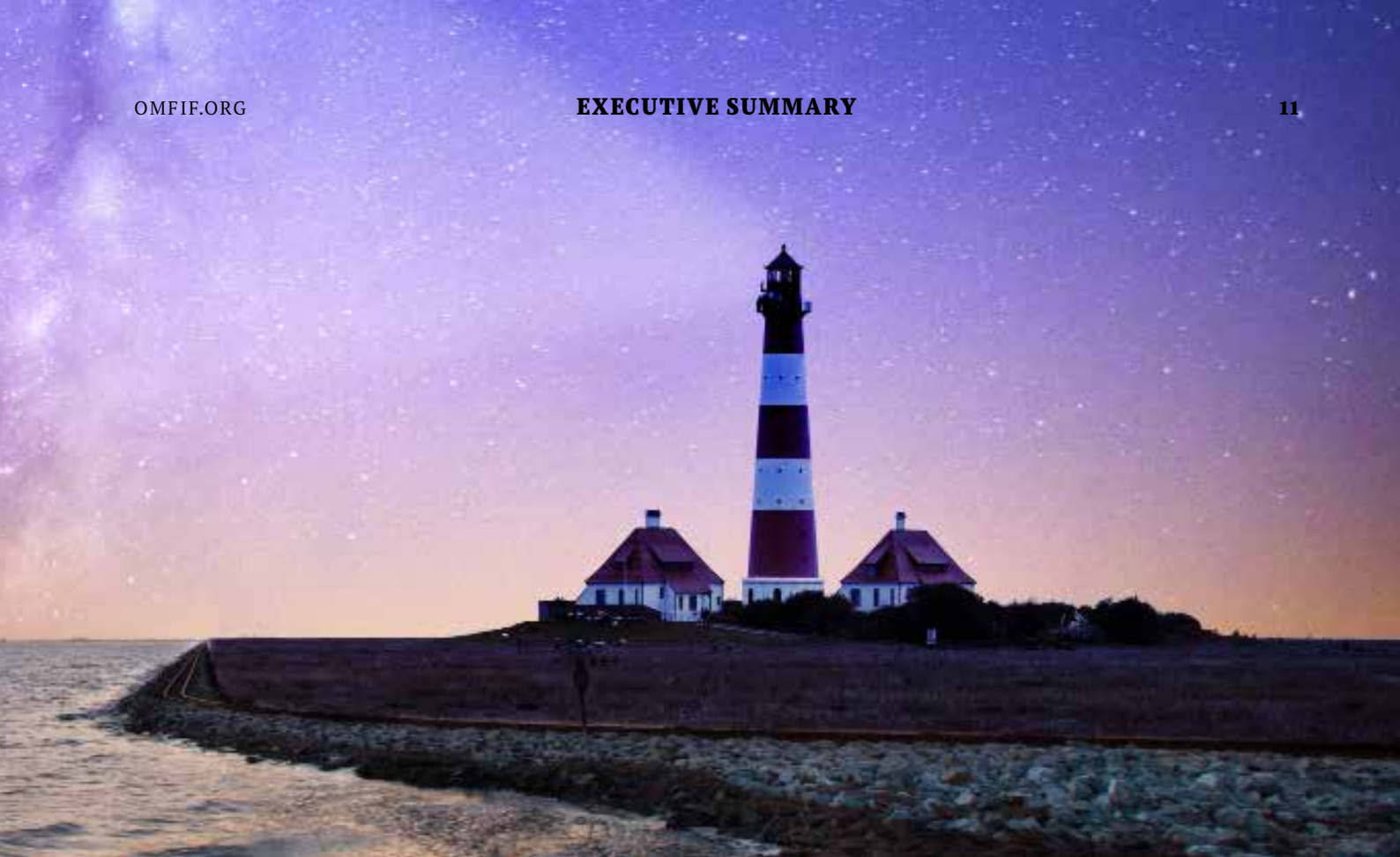
GDP growth in 2019, the 5% increase is an acceleration from last year's 3.7% growth. This increase was supported by a booming year for equities; sovereign funds are the GPI type with the greatest exposure (52%) to the asset class.

The overall figures mask some regional variations. European and Asia Pacific GPI assets grew the most, accounting for around one-third of the total increase. These regions are important GPI hubs, home to 58.9% of assets and 365 institutions, including some of the world's largest such as the People's Bank of China, Japan's Government Pension Investment Fund, Norges Bank Investment Management and the Swiss National Bank. Latin America and the Caribbean was for the second consecutive

year the only region where a GPI group saw assets decline: sovereign fund assets fell by 17.3%, extending the previous year's 15.9% drop; this year central bank reserves also declined by 1.7%.

While the overall level of assets shows GPIs entered the 2020 economic crisis in generally good health, the composition of their portfolios continues to change. Motivated by chronic low yields on liquid and safe assets such as government bonds, GPIs had in recent years started to diversify into riskier and more illiquid asset classes. As a result, more than 40% of GPI assets are allocated to equities, corporate bonds, alternative investments or other assets such as high-yield debt.

Many GPIs are considering a return to safety. For the first time since OMFIF began

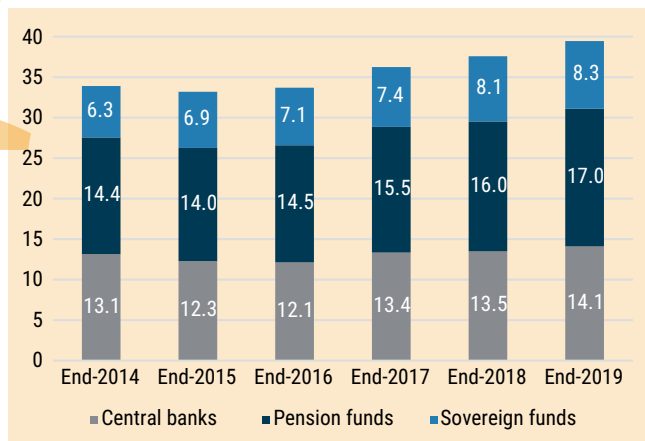


surveying GPIs on their asset allocation decisions, more intend to increase their allocation to government bonds than reduce it. At the same time, many are planning a greater allocation to risk assets such as equities and infrastructure, especially in developed economies. These projections are based on the most robust sample of GPIs ever surveyed. This year's questionnaire, conducted between April and June in the midst of the initial Covid-19 shock, was answered by 78 institutions, our largest sample ever. This analysis was complemented by a further set of institutions for which in-depth interviews were conducted or where data are publicly disclosed in annual reports. This brings the total AUM examined in this year's allocation analysis to \$19.5tn.

Since the start of 2020 many GPIs have begun drawing down reserves to support macroeconomic stabilisation linked to the crisis. Some sovereign funds have acted as 'rainy day funds' in using reserves to aid government stimulus programmes or take over distressed companies in strategic industries such as airlines. The transition to a more digital economy and ensuring a sustainable recovery are guiding themes for their allocations. Other key themes are the changing shape of the global monetary and capital flows landscape, the development of new asset classes such as sustainable infrastructure, and the exploration of new roles and interlinkages among GPIs. All these issues are the focus of analysis throughout *Global Public Investor 2020*.

'The transition to a more digital economy and ensuring a sustainable recovery are guiding themes for GPIs' asset allocations.'

**GPI 2020 →
Top10 findings**



Public pension funds boost global asset growth

Assets under management by institution type, \$tn

Source: OMFIF analysis

Equities and gold buoy GPI holdings

Pension funds propel institutional asset growth

ASSETS under management of the 750 largest official institutions reached \$39.5tn in 2019, growing by \$1.9tn from \$37.6tn the year before. The seventh edition of OMFIF's *Global Public Investor* ranks 490 public pension funds, 174 central banks and 86 sovereign funds by size at end-2019. These institutions' assets represent 43.4% of the world economy.

The 5.0% growth in AUM of the top 750 GPIs outpaces global economic expansion in 2019, estimated at 2.9%. It marks an acceleration from the previous year, when total AUM growth stood at 3.7%, reflecting public investors' gains from strong equity markets and the rising gold price.

Growth was propelled by pension funds, with their aggregate AUM increasing by 6.0% (up \$960.3bn on the year before). Pension funds respondents to the GPI Survey 2020 have 30.4% of assets in equities, indicating that they benefited from strong stock market performance. The increase in pension fund assets was visible across regions, although 95.4% of the collective growth was

'Overall, institutions in Asia Pacific hold 38.2% (\$15.1tn) of total GPI assets, the greatest concentration of any region. Europe leads in volume of institutions, being home to 247 of the top 750.'

concentrated in North American, Asia Pacific and European institutions. Assets of Asia Pacific funds, which includes those in Australia, New Zealand and Pacific islands, increased by 9.0% (\$365.7bn). Those of North American funds grew by 4.3% (\$369.5bn), while European fund assets rose by 6.5% (\$180.7bn).

Central bank reserves, which include gold holdings, grew by 4.6% (\$614.2tn), a significant acceleration from the year before when holdings

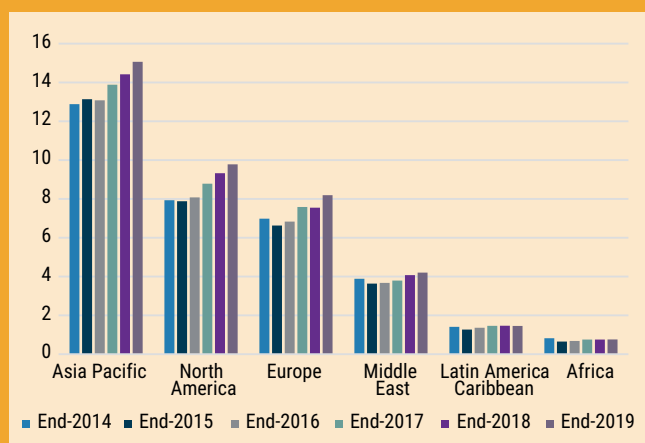
barely changed. Asia Pacific and European central banks account for 85.9% (\$527.6tn) of the increase. This more than offsets a decline of 1.7% (\$15.2tn) in the reserves of central banks in Latin America and the Caribbean.

Sovereign funds had a more modest year, with assets increasing by only 3.7% (\$297.1tn). This contrasts with the year prior, when sovereign fund assets grew most sharply among the three institution types.

Much of the increase can be attributed to European funds, where assets grew by 9.8% (\$169.4bn). Almost one-third of sovereign funds are in Asia Pacific, the most in any region. Their assets grew only marginally, by 1.7%.

Overall, institutions in Asia Pacific hold 38.2% (\$15.1tn) of total assets, the greatest concentration of any region. Europe leads in terms of volume of institutions, being home to 247 of the top 750.

For the full top 750 ranking and further breakdowns by region and institution type, please see p.150-178. •



Larger holdings reap more gains

Assets under management by region, \$tn

Source: OMFIF analysis

Europe recovery boosts overall growth

Chinese institutions among few to suffer a difficult 2019

EUROPE and Asia Pacific each represent around one-third of the \$1.9tn increase in total assets of the 750 largest GPIs. Holdings of European institutions grew by 8.5% (\$644.0bn), the largest percentage increase in any region. Assets grew by 4.5% (\$647.4bn) in Asia Pacific, constrained partly by weaker performance among its sovereign funds.

Central banks account for around half of the asset growth in Europe, with all but eight monetary authorities reporting higher international reserves. In nominal terms, the biggest jump was in the reserves of the Central Bank of the Russian Federation, reflecting increases in foreign currency and gold holdings. Russia's National Welfare Fund grew to \$124.0bn from \$58.1bn the previous year. The finance ministry confirmed in 2019 that both institutions are reducing dollar holdings.

Pension funds in Asia Pacific propelled growth in the region, with Japan's Government Pension Investment Fund and Pension Fund Association for Local Government

'The only decrease in any region was in Latin America and the Caribbean, where assets fell by 0.6% (\$8.7bn).'

Officials responsible for nearly one-third of the AUM increase. Asset growth for sovereign funds in Asia Pacific weakened to just 1.7% (\$48.1bn). Singapore's GIC had the biggest increase, with AUM jumping by 11% (\$42bn). Chinese institutions had a more difficult year, with the National Social Security Fund and China Investment Corporation reporting lower assets.

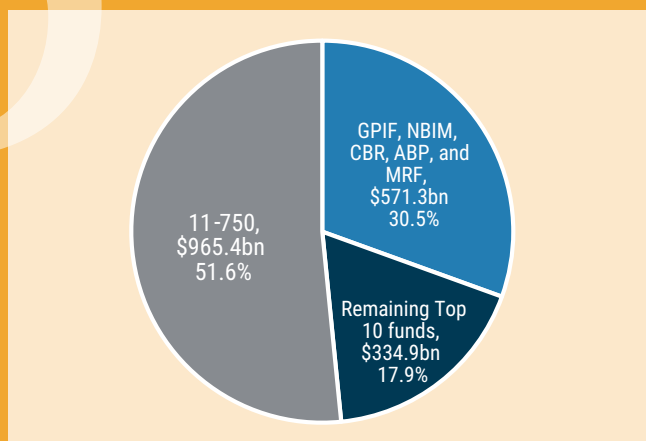
North American institutions recorded significant growth, with assets increasing by 4.9% (\$456.3bn). The region's 210 pension funds were responsible for 81% of the increase. The Military Retirement Fund and Federal Employees Retirement System, the two biggest pension funds in the US, grew their pots by \$82.9bn and \$46.3bn, respectively. US reserves,

which include foreign currency and gold holdings, held by the Federal Reserve, Exchange Stabilisation Fund and Treasury, contributed to overall growth in the region, increasing by 14.5% (\$65.3bn).

In the Middle East, asset levels of nearly all institutions rose. The Investment Corporation of Dubai grew its holdings by 30.6% (\$71.5bn), while several central banks reported increasing reserves. The only exceptions are Lebanon, Oman and Iran. The only decrease in any region was in Latin America and the Caribbean, where assets fell 0.6% (\$8.7bn). Asset growth in Mexican funds was offset by declines in Argentinian and Brazilian institutions.

Regions with larger pools of institutional assets tend to perform better over time. Asia Pacific and North America, which hold 63.0% of total assets and house 345 of the top 750 institutions, have shown fairly consistent growth in the last six years.

For more on regional figures, please see p.150-178. •



Five funds lead global asset growth

Increase in total assets, 2018-19, \$bn and % of total

Source: OMFIF analysis

Five GPIs responsible for almost one-third of total asset growth

All but one of top 10 institutions recorded a rise in assets in 2019

TEN GPIs are responsible for almost half of the \$1.9tn increase in assets in 2019. More noteworthy still, \$571.3bn (30.5%) of the overall increase can be attributed to just five institutions: Japan's Government Pension Investment Fund, Norges Bank Investment Management, the Central Bank of the Russian Federation, Stichting Pensioenfond ABP, and the US Military Retirement Fund.

Among the top five absolute growth leaders, the Central Bank of the Russian Federation posted the greatest percentage increase at 18.3% (\$85.9bn). According to its own review, reserves grew over 2019. The Russian Treasury increased its foreign currency purchases from the central bank under the fiscal rule implementation strategy.

Dutch pension fund Stichting Pensioenfond ABP's assets grew by 16.9%. It achieved an investment return of 16.8%, representing capital growth of €67bn. This was driven by

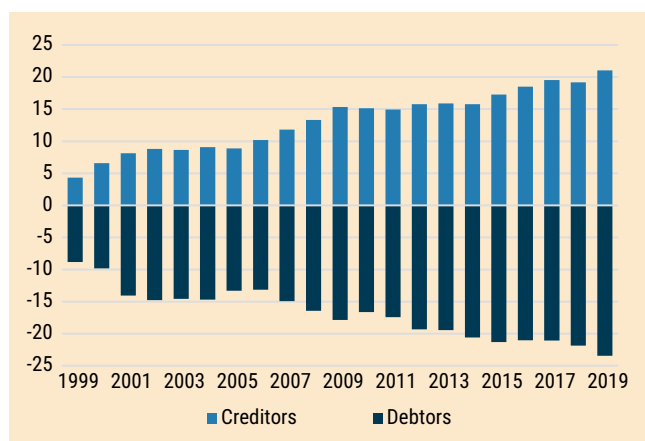
'The 10 largest funds account for 31.4% of GPI assets, slightly higher than last year's 31.2%.'

its strategic investment plan, which emphasises long-term investments in alternative assets, such as real estate, infrastructure and private equity. Japan's Government Pension Investment Fund recorded 14% asset growth, propelled largely by returns on foreign equities (11.2%), domestic equities (9.6%) and foreign bonds (2.6%).

Norges Bank Investment Management's assets grew by 12% in 2019. Last year was the fund's best performing year in history. Returns were driven by equity investments (26%), unlisted real estate (6.8%)

and fixed income investments (7.6%). The US Military Retirement Fund's assets grew 10.2%, mainly as a result of increased contributions to the fund. US Treasury inflation-protected securities comprise 75% of its portfolio, with the remainder being Treasury bills, overnight investment certificates, notes and bonds.

The 10 largest funds account for 31.4% of GPI assets, slightly higher than last year's 31.2%. All showed increases in assets, excluding the slight fall of 0.1% for the China Investment Corporation. For more on top risers, please see p.158. For more on the largest institutions, please see p.159. •



Global investment imbalances continue to widen

NIIPs, creditors vs debtors, % of world GDP

Source: IMF, OMFIF analysis

US bull market widens imbalance

Fiscal largesse precipitated rising NIIP deficits in key debtor nations

GLOBAL investment imbalances widened in 2019 for a fifth consecutive year. The gap between the net international investment positions – a country's foreign assets minus its liabilities – of creditor and debtor nations widened to 44% of world GDP.

US stock market indices outpaced others, with the S&P 500 rising 28% over the year, ahead of the 22% climb in the Europe-focused S&P 350 and the 21% rise in the Nikkei. This was helped by the Federal Reserve's interest rate cuts as it unwound its hiking cycle.

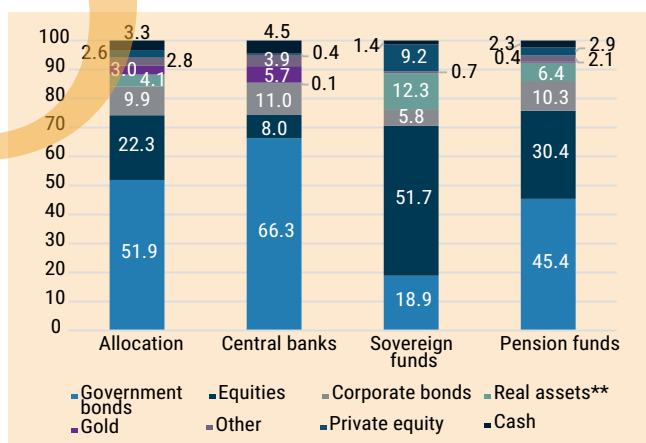
US rate cuts created accounting gains for holders of US fixed income assets. This combination of a soaring US stock market and high US bond prices widened financial imbalances as the holders of US assets saw the value of their foreign assets increase. Because foreigners' holdings in the US rose in value, the US net liability position increased.

France and the US, two of the largest debtor nations, increased the size of their NIIP deficits after

'Changes in the inflationary dynamics of the global economy will create winners and losers in the post-Covid-19 world.'

loosening fiscal policy. However, total changes in the global imbalances were due to asset price changes rather than changes in current account deficits. Aggregate global current account surpluses and deficits shrank slightly in 2019 as smaller deficits in other advanced economies and Latin America offset the results of fiscal largesse in the US and France. Changes in the inflationary dynamics of the global economy will create winners and losers in the post-Covid-19 world. Countries with a large NIIP surplus tend to have a higher exposure overall to fixed income in their foreign assets, while those with big NIIP deficits tend to have greater exposure to equities

in their foreign asset holdings. This means an inflationary post-pandemic economy would tend to benefit deficit countries through equity gains and fixed income losses, while a deflationary economy would have the opposite effect. For more on global trade flows, see Chapter 3. •



Sovereign funds and pension funds most exposed to equity market correction

Asset composition, % of total portfolio*

Source: OMFIF GPI Survey 2020, Institutions' annual reports, OMFIF analysis

*Shares are weighted by AUM.

**Alternatives include private equity, real estate and infrastructure.

Flight to safety complicates low yields...

Where allowed, even the most conservative investors are making changes

OFFICIAL institutions remain fairly conservative investors. Of the \$19.5tn in assets managed by the 92 institutions part of this year's GPI asset allocation analysis, more than half is in government bonds. Still, allocation to the asset class has fallen for all three GPI types. Compared to last year, holdings of sovereign debt fell almost two percentage points across the sample. Motivated by a search for yield, many have boosted allocation to riskier asset classes. More than 22% of GPI assets are now in equities, and almost 10% are in corporate bonds. Around 7% are in alternatives, with the remaining 9% in gold, cash and other assets such as high-yield debt.

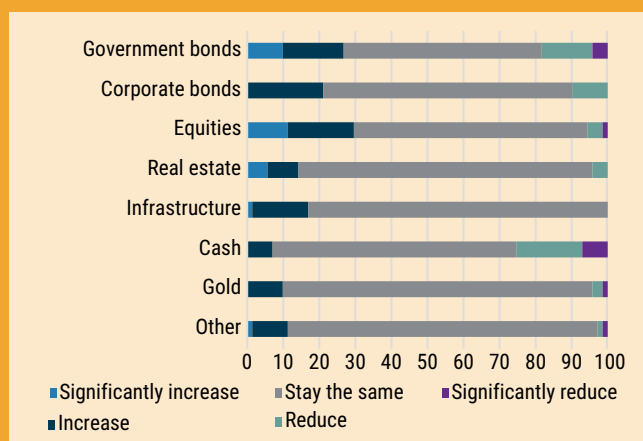
However, the overall figures mask substantial differences among investor types. Sovereign funds have made the biggest pivot away from government bonds and have the lowest exposure (19%) to the asset class. Most of their assets are in equities, while more than one-fifth are in alternatives, particularly real estate and private

'Over the past few years some governments have moved to give central banks more flexibility, and those allowed to have been expanding their allocation to equities and corporate bonds.'

equity. This represents a substantial continuation of their push into risk assets compared to last year's results, where allocation to these alternatives was estimated at 16%. Pension funds are somewhat more conservative, with just under half of their assets in government bonds. Yet their allocation to risk assets, especially public and private equities, is growing rapidly, with concerns around returns and funding mismatches driving these institutions into more exotic products.

Central banks are the most

conservative type of GPI, with more than 75% of their assets in government bonds, cash and gold. Many central banks are legally prohibited from investing in riskier and illiquid asset classes. Still, over the past few years some governments have moved to give central banks more flexibility, and those allowed to have been expanding their allocation to equities and corporate bonds. Almost one-fifth of assets held by the 55 central banks covered in this study are now in these two asset classes. This is substantial considering that more than half of these authorities do not invest in equities or corporate bonds at all. In exploring new asset classes, central banks face familiar obstacles: 49% and 55% suggested that 'governance and administrative set-up' and 'knowledge of the asset class' respectively are significant obstacles to incorporating new portfolio products. Questions on internal capacity-building remain key, especially in the context of private markets and sustainability (see Chapter 7).•



Out of cash, into equities and government bonds

In the next 12-24 months do you plan to increase, reduce or maintain your allocation? % of responses

Source: OMFIF GPI Survey 2020

...with risk assets set to benefit

Market volatility fails to dampen enthusiasm for equities and real assets

FOLLOWING several years of shifting allocations away from low-yielding government bonds, the trend is seemingly reversing. More than one-quarter of the GPIs who responded to this question said they plan to increase their allocation to government bonds, against 18% who said they intend to decrease. This is the first time since this question was introduced in the OMFIF GPI Survey that investors in net terms plan to increase their allocation to the asset class. However, worries persist about low yields. One central bank commented, 'We recently revised our benchmark portfolio and the main change was a decrease in government bonds duration given the drop in yields in the US'.

Swings are more pronounced among sovereign funds, the institution type with the lowest current exposure to government bonds. Just under one-third surveyed said they intend to increase their allocation, while 38% said they plan to reduce it. As was the case in previous years, cash is the least popular asset class among

'Despite concerns around pandemic-related price corrections, 30% of GPIs plan to increase their allocation to equities.'

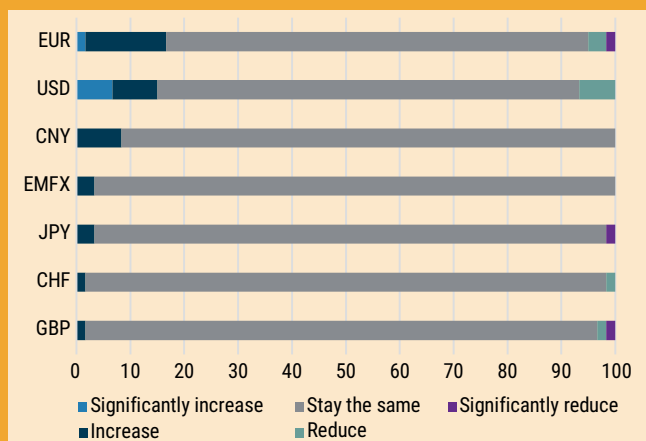
the three institution types, with 25% of respondents planning to reduce allocation. 10% of GPIs surveyed plan to add to their holdings of gold, including 11% of central banks and 13% of sovereign funds.

For some institutions, the cautious embrace of risk continues. Despite concerns about pandemic-related price corrections, 30% of GPIs plan to increase their allocation to equities, many of them significantly so, while only 5% plan to reduce. The trend is particularly evident among pension funds, with almost 80% of those surveyed planning to increase their allocation to equities, compared with 44% of sovereign funds and

just 15% of central banks. For many central banks, the question is one of eligibility. One institution commented that it expects its allocation to remain 'globally unchanged, except if we decide to extend the scope of eligible instruments towards corporate or real estate.'

Real assets are set to benefit over the coming 12-24 months. 33% of pension funds and 38% of sovereign funds intend to increase their holdings of real estate, with 63% of sovereign funds seeking more infrastructure exposure. This continued embrace of alternatives reflects concerns about returns across the GPI universe.

Overall, the majority of respondents plan to keep allocations to all asset classes steady. One central bank said, 'Given the volatility of the market due to the impact of Covid-19, we are in consolidation mode and will not make any major changes at this time.' Other GPIs disclosed that they are responding to the pandemic by launching dedicated private equity funds to help small- and medium-sized enterprises and start-ups through the crisis. •



Constancy expected but major currencies set to benefit

Over the next 12-24 months, are you planning to increase, reduce or maintain your exposure to the following currencies?, % of responses

Source: OMFIF GPI Survey 2020

Faith in core currencies during crisis

Renminbi creeping slowly into key institutional portfolios

ACCORDING to our survey, central banks held around 65% of their reserves in dollars at end-2019. GPIs as a whole allocated 57% of their portfolios to dollar assets, compared to 24% for euro assets. The renminbi, yen and sterling were roughly even at a 2% share of GPI portfolios.

This broad-based composition of currencies is likely to remain in place in the years to come. At times of crisis, institutions show faith in core currencies. Relatively few respondents said they intend to alter their exposure to any particular currency. Among institutions covered, 15% suggested they would increase their dollar allocation, possibly in response to the economic and financial instability caused by the Covid-19 pandemic. The lingering turmoil is reflected in potential inflows into the euro, with 17% of respondents suggesting they would increase their allocation to the single currency. Most of these flows, however, would be driven by public pension funds, the group most eager to rebalance towards the dollar, at

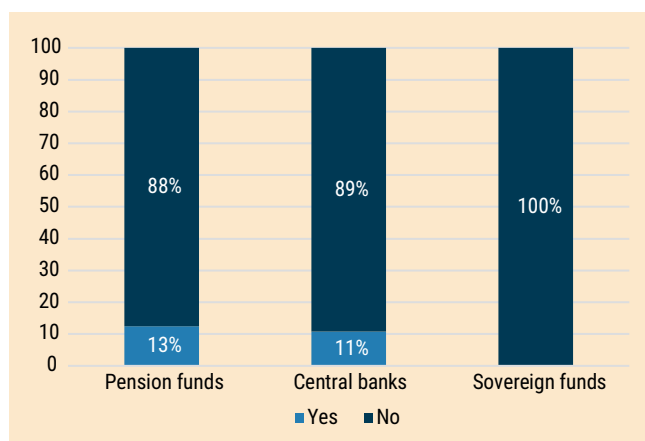
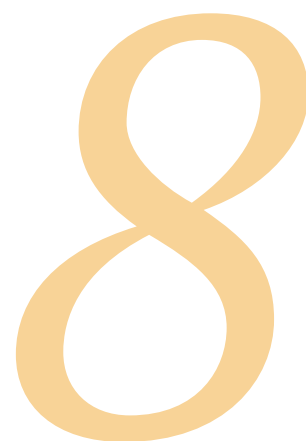
‘Respondents expressed optimism about the future of the renminbi, with 46% believing they will seek to further incorporate it into their portfolios.’

31%. Among central banks, this share stood at 8%.

Respondents’ views on attractive regions point towards similar developments. Most public pension funds said they would increase their share of North American assets, while this share was 33% among sovereign funds and 23% for central banks. Given that fieldwork was conducted between April and June, the convergence of interest rates between the US and the rest of the world is unlikely to have a powerful effect on GPIs’ regional or currency distributions.

Respondents expressed optimism

about the future of the renminbi, with 46% believing they will seek to further incorporate it into their portfolio. This figure stood at 57% for central banks. However, just 10% of central banks said they would actually increase their renminbi allocation over the next 12-24 months, suggesting this will be a creeping process. •



Little support for SDR or 'digital currency basket' models

Would you be open to using a sovereign digital basket of currencies/SDR in a greater share of your reserves?, % of responses

Source: OMFIF GPI Survey 2020

Little appetite for sovereign digital currency basket

Lack of research and investible products to blame

RESPONDENTS to the GPI Survey 2020 suggested they would increase their allocation to the dollar and euro over the coming 12-24 months. Such replies are motivated, in all likelihood, by those currencies' relative safety amid the Covid-19 pandemic.

Responses to other questions intimated that there is broad-based satisfaction with the dollar-centric international currency system. In our sample, 48% of institutions said they would maintain their levels of dollar assets even in a 'less dollar-dominant trade and currency system', underscoring the depth, liquidity and opportunities of the US financial system.

This share also stood at 48% among central banks alone. However, 60% of African respondents suggested they would move away from the dollar in those circumstances, against 39% among Asian respondents.

'Despite the difficulties of the dollar system, policy-makers remain reluctant to embrace basket-based alternatives.'

In the light of such answers, 89% of central banks responded that they are unwilling to use a sovereign basket of digital currencies to a greater extent in their reserves. Despite the vagaries and difficulties of the dollar system, policy-makers remain reluctant to embrace existing or potential basket-based alternatives. Some stated that the notion of a sovereign digital currency basket was intriguing in principle, but most pointed to a lack of research or investible products at this stage. From respondents' comments, official institutions are in no hurry to push this agenda forward.

The notion of a 'synthetic hegemonic currency', suggested by former Bank of England Governor Mark Carney, and its potential future role is explored further in Chapter 2. •



Returns and disruption preparedness drive tech investments

What has been the main motivation behind any potential investments in the technology sector?, % of responses

Source: OMFIF GPI Survey 2020

Push into alternatives, real estate and infrastructure continues

Higher returns and opportunities from disruption drive tech deals

LOW yields on traditional assets continue to frustrate GPIs, with almost one-third of survey respondents claiming they have altered their investment strategy to maintain their absolute level of return. This is reflected in the growing popularity of private market deals among GPIs, a noticeable trend over the past few years. Though this predominantly concerns public pension and sovereign funds, findings from the OMFIF GPI Survey 2020 suggest some central banks have added small shares of private equity to their portfolio.

The momentum behind this shift has weakened. According to data from Tufts University's Fletcher School SovereignNet, private market deal activity decelerated significantly over 2019, despite the promise of higher returns.

However, our study of activity in the technology sector suggests

'Technology transfer and knowledge sharing remain important drivers, as do the strategic, geopolitical priorities of sovereign funds.'

official institutions remain enamoured with private deals, and not strictly because of their profitability. Technology transfer and knowledge sharing remain important reasons for these transactions, as do the strategic, geopolitical priorities of sovereign funds. While 46% of funds responding to our survey noted that returns are the most important motivation behind technology investments, 29% highlighted the importance of benefiting from the opportunities of disruption. A further 25% underscored the importance

of their domestic developmental mandate.

Additionally, 40% of public pension and sovereign funds surveyed suggested that they invest in direct lending and/or private debt, mostly outside of their development mandates. Yet doubts about the sector were widespread, with 60% of sovereign funds remarking that a lack of transparency about market-wide returns was a significant obstacle to investment.

Despite a temporary slowdown, the push into alternatives is likely to continue: 63% of sovereign funds surveyed said they would increase their allocation to infrastructure, while 38% said they would add to their real estate holdings. •



Public investors prioritise 'do no harm' strategies

In which of the following ways do you implement ESG investment?, % of total responses by institution type

Source: OMFIF GPI Survey 2020

Risks drive switch to sustainability

Central banks lag other institutions in implementing ESG

THE Covid-19 pandemic has sharpened awareness of the systemic potential of non-financial risks. Central banks in the UK, France and the Netherlands, among others, are conducting or planning climate stress tests for the institutions they supervise.

GPIs are adjusting their portfolios accordingly. Among respondents to the OMFIF GPI Survey 2020, 'do no harm' strategies were the most popular approach to realising environmental, social and governance goals. These strategies are followed by 26% of central banks, 58% of sovereign funds and 81% of pension funds. Sweden's Riksbank divested of regional debt from Australia and Canada in November 2019, citing concerns over high carbon emissions. The Dutch, French and Italian central banks have adopted formal commitments to align investment activities with sustainability standards.

Actively investing in sustainable assets is less feasible for GPIs given their large size. More than

'More than half of central banks surveyed do not implement ESG in reserves management.'

half of central banks surveyed do not implement ESG in reserves management. In contrast, more than 90% of sovereign funds and all pension funds do so.

Among central banks who do, fewer than 10% do so through thematic or impact investment, although 37% have some holdings of sustainable assets. These are mainly green bonds and tend to be small shares of their portfolios. One survey respondent commented, 'There aren't many green bond issues that conform to our investment guidelines, and the ones that do are small.'

Still, green bonds are popular: 40% of GPIs plan to increase their

allocation in the next 12-24 months. Among sovereign funds, less than 10% invest in sustainable assets, but one-third engage in thematic investments. Pension funds are more advanced, with most deploying a multitude of strategies including active ownership, positive screening and investment in sustainable assets.

The most common barrier to ESG integration is the lack of data, with 51% of all respondents citing this. Some central banks (28%) and sovereign funds (17%) highlighted the complexity of sustainable assets compared with traditional asset classes. Among pension funds, 29% identified higher cost as an impediment.



1 Macro environment shaping GPI activities

A new global economy arose from the ashes of the 2008 financial crisis – one in which interest rates are low, asset prices are high, and the dollar is ubiquitous in cross-border flows. This section examines the past and future macro trends, exploring global investment positions, demographics, savings and prospective alternatives to dollar hegemony.



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1. Data as at 31 March 2020. Assets managed by Capital Fixed Income Investors, in USD. Source: Capital Group

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Chapter 1

A new world economy

‘When Covid-19 struck, governments introduced fiscal policy measures. Swift monetary policy action complemented this’



Work done to increase the resilience of the financial system has made it stronger in the face of the pandemic. But this resilience is limited, writes Sharon Donnery, deputy governor, Central Bank of Ireland.

THE Covid-19 pandemic has resulted in a global economic shock of unprecedented speed and scale. Economies have endured drops in output, spikes in unemployment and, at the onset, disruption in financial markets. However, we have only seen the initial economic effects of the pandemic materialise. There is significant uncertainty over the path of the virus, the duration of the shock and the economic implications. A key role for central banks is to ensure that policies support a sustainable contribution from the financial system so that it can absorb, and not amplify, the shock of Covid-19.

Over the last decade, policy-makers have focused on increasing the resilience of the financial system. Prudential policies have contributed to banks having more and better-quality capital to be used precisely in a crisis like this.

In the euro area, banks have not only more capital but also better liquidity positions and more stable funding structures. Household resilience also increased. On aggregate, euro area households entered the pandemic with strong balance sheets and declining debt and debt service burdens. However, the extent of sectoral scarring and the challenges surrounding the profitability of banks, and the implications that can have for risk taking, may test this resilience.

Covid-19 raises questions on the resilience of other segments of the financial system. The significant redemptions observed in parts of the investment fund sector in March, and the subsequent pressure on markets, exposed vulnerabilities. The question over the extent to which structural vulnerabilities from liquidity mismatches and leverage in the global funds sector contributed to market disruption will

need to be addressed.

When Covid-19 struck, governments introduced fiscal policy measures, including health spending, income support, business loans and guarantees. Swift monetary policy action complemented this. Central banks conducted operations to maintain liquidity, support the flow of credit to the real economy and prevent a tightening of financing conditions.

In contrast to the 2008 financial crisis, counter-cyclical policy actions are reinforcing each other across borders. Recent research shows that for Ireland, both domestic and international fiscal and monetary policy actions

are playing an important role in reducing the possible loss of output and employment. Estimates suggest that these measures will reduce the scale of the decline in output in 2020 by almost four percentage points.

While the focus is now on Covid-19, other risks and long-term challenges have not disappeared. A sudden crystallisation of financial stability risks, such as changing risk appetite or deglobalisation,

would further test the resilience of the financial system. In addition, the collective resilience of the market-based finance sector is an area of ongoing consideration.

Overall, the financial system has withstood the initial shock, but its resilience is not limitless and its continued stability is being heavily supported by policy-makers worldwide. The path ahead is shrouded in uncertainty.

The next round of economic effects will depend on the evolution of the virus, while the full cost and effects of the pandemic will emerge over time as the extent and persistence of the damage become clearer, both to economies and individual sectors. •

‘Euro area households entered the pandemic with strong balance sheets and declining debt service burdens.’



Coronavirus will reverse low-demand policies of the 2010s

With their disinflationary policies and low demand, the 2010s could be known as the ‘not so great moderation’. After the pandemic, high demand is likely to characterise the 2020s, and central banks may face a series of unenviable trade-offs, writes Chris Papadopoulos.

LIKE all major periods of economic weakness, the 2008 financial crisis and slow recovery led to a spell of soul searching in the economics profession. One early conclusion was that emergencies are the wrong time to worry about moral hazard. Another was that banks need more capital in normal times.

By the end of the 2010s, a general agreement began to form that central banks could not propel demand alone; fiscal policy had to play a larger role in responding to recessions. This consensus was crystallising as the pandemic hit and has influenced the macroeconomic policy actions taken in response.

Crises change the economic consensus, altering policy reactions. Major upsets can set long-term economic trends on a new path. This report argues that the pandemic is such a crisis, and a new world

economy will emerge with higher inflation, higher interest rates and the risk of fiscal dominance: a situation where large state debt and deficits hinder the ability of central banks to meet policy targets.

Not so great moderation

The International Monetary Fund calls the 2010s the ‘new mediocre’, but a better name is the ‘not so great moderation’. The world’s major economies pursued the same growth models as they had during the great moderation, the period of stable growth from the early-1990s to the late-2000s, but with not so great results. China remained geared towards exports despite attempts to move more towards domestic demand. It stopped building up exchange reserves and its current account surplus shrank significantly (Figure 1 on p.48).

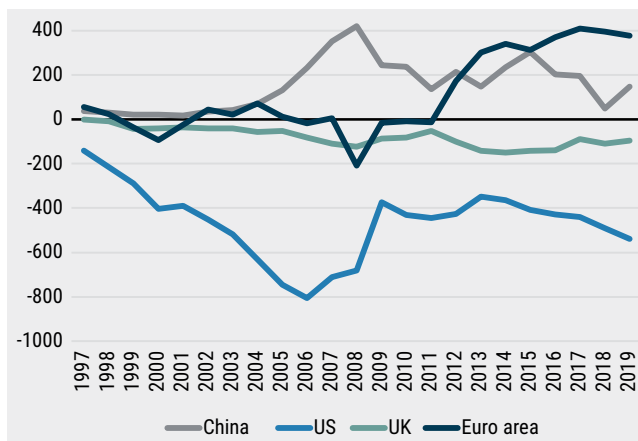
Germany continued with export-led growth and an emphasis on balanced budgets. Its enthusiasm for trade and budget surpluses dominated euro area economic policy and, after a decade of painful readjustment in southern Europe, the currency bloc was running a current account surplus before Covid-19 struck. Germany and China’s export-led growth models meant that Anglo-Saxon economies continued to rely on domestic demand. American consumers were the main driver of the global economic recovery from the 2008 crisis. They were joined by British households and companies from 2013. Bouts of stimulus by the Chinese government in 2008, 2013 and 2016 gave welcome, but temporary, boosts to global demand.

The cash size of advanced economies underperformed relative to the pre-2008 trend, especially in

1. Euro area takes over as main surplus region

Current account balances, \$bn

Source: IMF, OMFIF analysis



the euro area. Annual growth rates dropped to 2%-4% from 4%-6% (Figure 2).

Two key phenomena explain why growth models that worked in the great moderation failed to produce the same growth rates of demand in the 'not so great moderation'. The first is Keynesian. Instead of

accommodating the private and external sectors' desire to save and deleverage, many governments attempted to cut budget deficits. This created a case study of John Maynard Keynes' 'paradox of thrift', in which collective saving lowers income, frustrating initial saving efforts. The second is monetarist. Slow growth

in broad money dampened spending growth, and in some cases, asset prices.

Under these global economic conditions, importing countries were unable to achieve previous growth rates by relying on domestic demand, and exporting countries could not rely as much on others to buy their output.

The monetarist and Keynesian factors did not act independently but reinforced each other, entrenching low demand in a process that has been ended by the pandemic and new economic consensus.

Keynesian truisms

When one country runs a current account deficit, another must be running a surplus. Hence all current account deficits and surpluses must sum to zero. In practice there is a small residual due to deficiencies in data collection. The same is true of the sectors of a national economy. If the private sector runs a surplus, the public sector or rest of the world must run a deficit; this is a truism, an accounting identity. If all sectors of the economy attempt to run a surplus at the same time, an accounting impossibility, then income will fall so that net surpluses are reduced to nil.

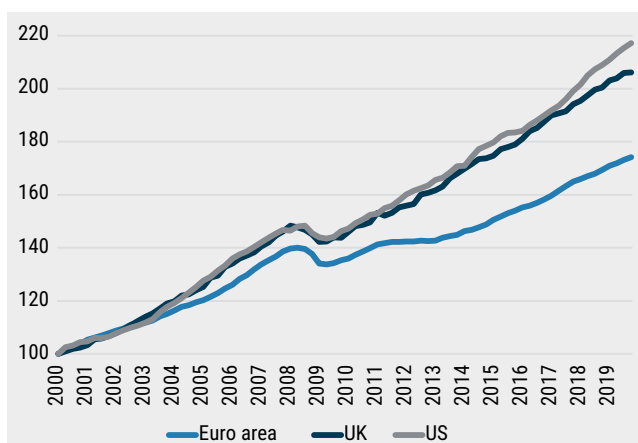
Surpluses and deficits can be put into symmetrical charts like Figure 3. The government deficit is the normal budget deficit. The 'rest of the world' is the current account deficit with the sign reversed. The private sector deficit is the difference between domestic savings and investment. The columns must sum to zero in any given year.

The UK private sector began running large surpluses in 2008 to deleverage. These were initially accommodated by expanding budget deficits. When austerity began in 2011-12, the budget deficit started coming down. Unless the rest of the world was prepared to shrink its surplus, the private sector surplus was going to be lower than desired. Efforts at saving were frustrated by slower income growth, which prolonged private sector deleveraging

2. Cash size of advanced economies on lower trajectory

Nominal GDP, Q1 2000 = 100

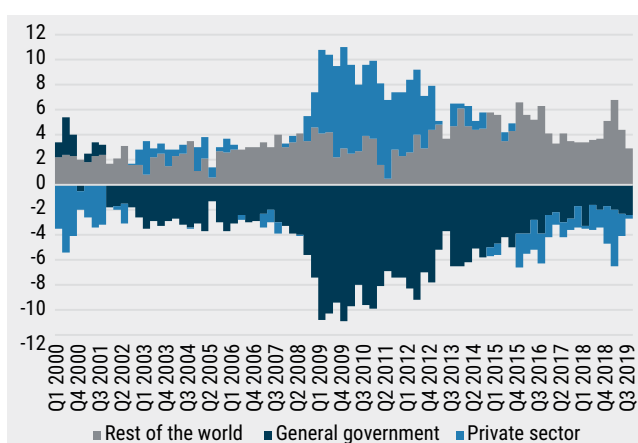
Source: US Bureau of Economic Analysis, UK Office for National Statistics, Eurostat, OMFIF analysis



3. UK private and external savings put onus on state deficits

Sector financial balances, % of GDP

Source: UK Office for National Statistics, OMFIF analysis



and meant governments consistently missed targets for budget deficit reduction.

The US fared better during austerity because it began cutting when private sector deleveraging had been completed. Between 2010-13, it scaled down its cyclically adjusted budget deficit as a percentage of GDP by 5.2 percentage points, almost the same amount as Spain at 6.2 percentage points and more than the UK at 3.2 percentage points. Yet the US outperformed Europe and the UK. By the time the US started cutting its budget deficit, the private sector had deleveraged far more than in Europe, with US households shedding debt equivalent to 10% of GDP in 2009-11. During the same period, household debt stayed flat in Spain and fell by 5% of GDP in the UK.

In European periphery countries such as Spain, public and private sector saving persisted until the external sector turned to surplus. Since Spain was unable to devalue, this readjustment was achieved painfully, with low income growth keeping imports and wages subdued. Spain's imports were flat in 2011-15 and wages did not rise until 2018. For core European countries such as Germany and the Netherlands, the euro was undervalued and they have been able to rely on external demand for growth without needing fiscal stimulus.

Some, if not all, of these deflationary trends are heading into reverse. Fiscal demand management was already gaining in popularity, but the pandemic has thrown remaining budgetary caution to the wind. Governments are spending vast sums to manage the crisis and will spend more to promote the recovery. They have learned over the past decade that debt interest can be kept down by central bank asset purchases. Central banks have learned how to conduct monetary policy in an environment with excess reserves. There are fewer perceived limits to state borrowing than 10 years ago.

A prolonged freeze in world trade will put pressure on Europe's

export-led growth. The coronavirus response will force the bloc into large budget deficits to cushion the drop in external demand. The effect on current account surpluses will be especially marked in Germany and the Netherlands, where surpluses were running at 7% and 10% of GDP respectively at the end of 2019 (Figure 4).

Italy's finances are pushing the euro area towards fiscal risk-sharing, a more conceivable outcome than Italian default. Coordinated spending efforts on a large enough scale to restart growth are doubtful, but if the European Central Bank is flexible enough on the limits of its asset purchases, it can maintain a narrow spread between the region's borrowing costs. This may be enough to encourage larger state budget deficits and temper enthusiasm for surpluses in northern Europe. Alternatively, if other countries begin recovering quickly, Europe's export-

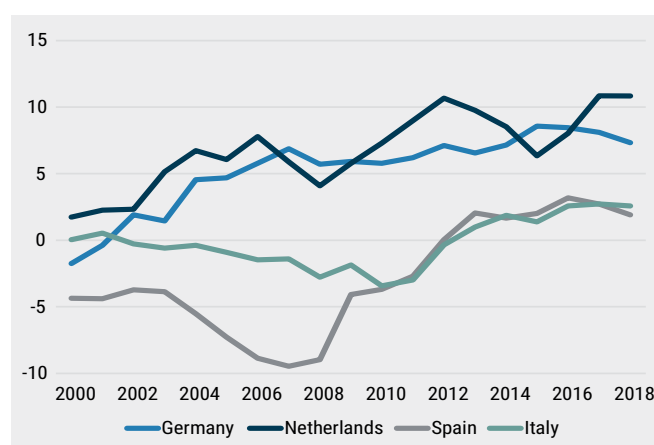
led growth model could be rescued.

Low money growth

Growth in advanced economies during the 'not so great moderation' was one to two percentage points lower than it was during the great moderation. The same has been true of monetary growth (Figure 5). It is also true that regions with higher money growth have had stronger recoveries.

Some of the correlation is explained by weak economic performance. Lower investment leads to lower credit growth, weighing on broad money. But factors other than growth have driven money and bank lending, implying causality from money and credit to growth. One such influence was central bank asset purchase programmes.

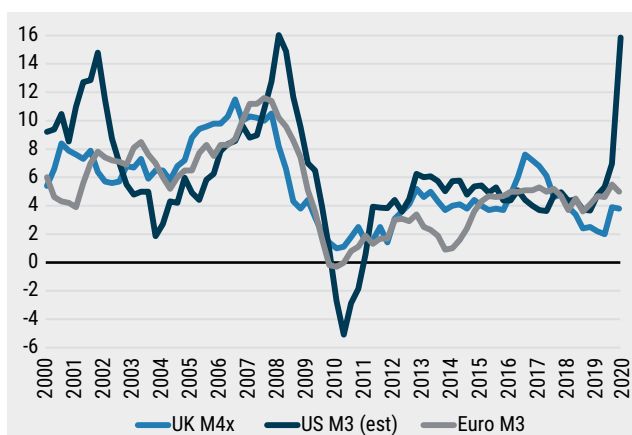
The UK and US undertook asset purchase programmes at various times in 2008-14. Asset purchases did not begin in the euro area on a



4. Germany and Netherlands most exposed to demand drop

Current account balances % of GDP

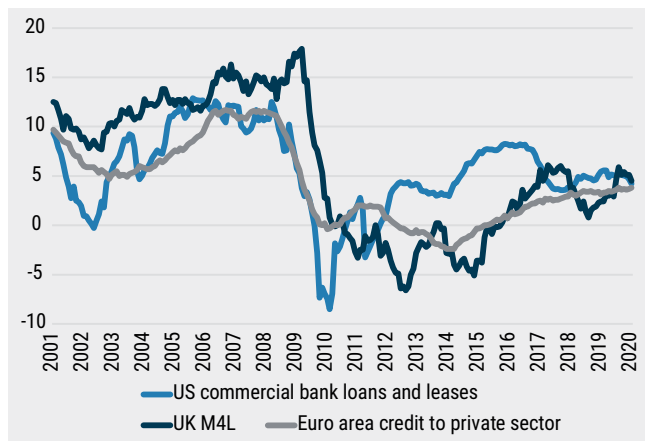
Source: IMF, OMFIF analysis



5. Money growth on slower trajectory up to 2019

Broad money growth, year-on-year % change

Source: ECB, Federal Reserve, Bank of England, OMFIF analysis



6. Stronger growth in US bank lending over 2010s compared to UK and euro area

Bank lending to the private sector, year-on-year % change

Source: Federal Reserve, European Central Bank, Bank of England, OMFIF analysis

comprehensive scale until early 2015 (it did launch a crisis measure called the securities market programme in 2010, but these purchases involved only periphery countries).

Central banks add to broad money when they purchase assets from the non-bank sector. This effect contributed to faster US and UK money growth in the immediate post-crisis years than in the euro area. This may explain why the euro area recovery was weaker. When broader, large-scale asset purchases did begin in the euro area, the annual growth rate of the M3 money supply climbed to 5% and the economy managed to achieve a sustained period of growth.

While asset purchases have positively influenced money growth, macroprudential policy has weighed on money growth. Banks raised risk-weighted capital ratios from the financial crisis until 2014, which involved a combination of raising capital and cutting risk assets. In practice this led to less lending to the private sector (Figure 6).

Western countries have introduced a host of mortgage affordability rules and loan-to-value ratios that cut some potential borrowers out of the market. Firms' use of alternative sources of finance – the bond market, private equity and direct lending – over the last 10 years is evidence that weakness in bank lending is due to policy factors and not just weak economic growth.

The story does not end there. The monetarist and Keynesian

mechanisms loop back on each other. A collective desire to save has weighed on income, curtailing the private sector's borrowing capacity. Collective deleveraging also reverses the normal money creation process.

In the other direction (from money to savings behaviour), slower money growth can weigh on asset prices, as it did in the early years of recovery in the UK and euro area. This increases the private sector's desired surplus via the wealth effect. Evidence for this can be seen in the euro area's consumer-led recovery that began in 2015 with the start of ECB's large-scale across the board asset purchases. The recovery in euro area M3 appears to have had an immediate impact on real estate prices (Figure 7) and shored up balance sheets, reducing the desired private sector surplus.

Two factors are likely to lift broad money growth in the next few years. First, macroprudential policy has

been put on hold. Banks spent the last decade building up capital buffers to protect them from falls in the value of their assets. It will be important for them to keep credit open as their capital falls below regulatory minimums, and resist the temptation to rein in lending.

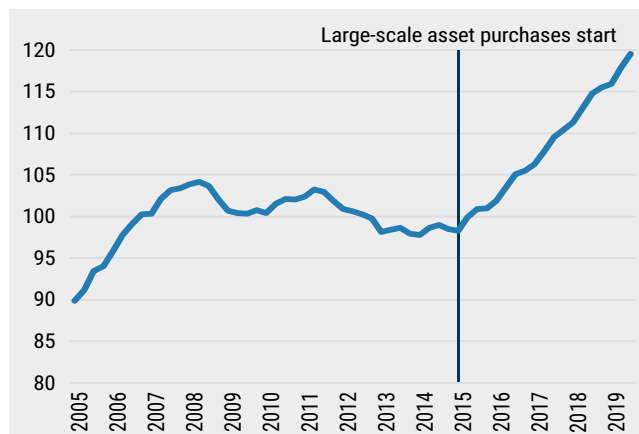
Regulators are therefore likely to show a high degree of flexibility. To ensure the recovery, they must reimplement buffers only very gradually and once the economy is on a strong upward path.

Second, government deficits run in response to the crisis will be partially financed by the banking system, both central and commercial banks, lifting the growth rate of broad money. Annual growth of US M3 surpassed 25% in May, its highest peace-time growth rate.

Demographics add to long-term challenges

In the 1970s and early 1980s, central banks raised interest rates to double-digits to tame inflation. In the 2010s, interest rates were held at record lows to restart demand. Between these two cyclical episodes is a steady decline in long-term interest rates to 4% just before the 2008 financial crisis from around 8% in the mid-1980s (Figure 8). Some of the initial decline would have been due to a fall in inflation expectations, which would have stabilised with inflation targeting in the early 1990s.

Charles Goodhart, emeritus professor at the London School of



7. Large-scale Asset purchases kickstart euro area housing market

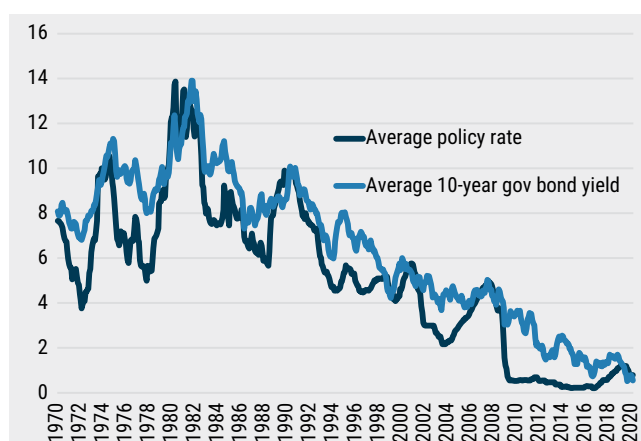
Euro area house price index, 2015=100

Source: Eurostat, OMFIF analysis

8. High savings and low growth weigh on interest rates

Germany (ECB policy rate after 1999), UK and US interest rates

Source: Bundesbank, Bank of England, Federal Reserve, OECD, OMFIF analysis



Economics, and Manoj Pradhan, founder of Talking Heads Macroeconomics, attribute the remainder of the fall to what they call a ‘sweet spot’ in global demographics. Western baby boomers, generally defined as those born between 1946–64, had swelled the labour force and pushed the dependency ratio, the ratio of the non-working age population to working age population, to a post-war low (Figure 9).

At the same time, eastern Europe and China were reintegrating with the world economy. These countries had high savings rates, as many developing countries do, because of a lack of financial safety nets, which tends to weigh on domestic demand. Some, especially China, committed to growing their economies by devaluing their currency and generating external demand. The combination of high savings rates and pursuit of export-led growth resulted in a large build-up of foreign exchange reserves. Strong Chinese growth supported rising commodity prices, allowing commodity exporters to run large trade surpluses and build reserves. Economists called these trade surpluses and build-up of reserves the ‘global savings glut’.

The global flow of savings and investment over a given time must be equal, but falling interest rates imply planned saving was greater than planned investment throughout the great moderation. Goodhart and Pradhan believe the demographic forces that caused the savings glut

and lower rates will begin to reverse as populations age and move into retirement. This has already started, with China’s savings rate at 47% of GDP in 2018, down from a peak of 52% in 2010. Its current account surplus has fallen significantly, and it recognises that reliance on export-led growth is not sustainable for an economy of its size. Without large current account surpluses, China’s trend rate of growth will be lower, which will dampen commodity prices and lead to lower trade surpluses for commodity exporters.

In advanced economies, transfers of income from the working population to the elderly, necessary to meet pension and healthcare commitments, will reduce savings rates. The bargaining power of the smaller labour force should boost wages, adding to inflationary pressure. At the same time, investment will fall because the

economy will need less commercial and residential real estate. However, some of this will be replaced by investment in healthcare.

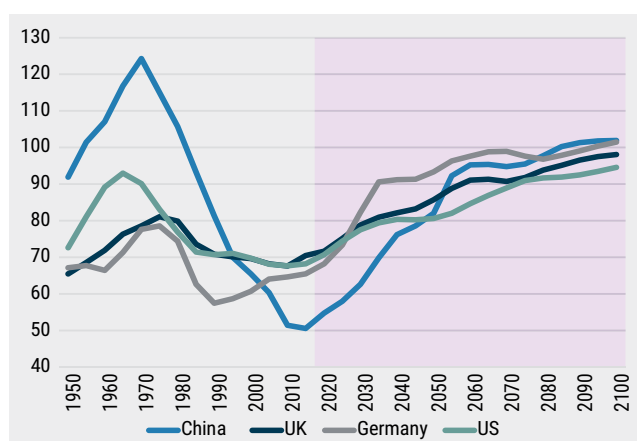
On a more fundamental level, as non-workers consume but do not produce, they tend to be inflationary. Workers produce more than they consume, so tend to exert deflationary influences.

This process will occur gradually in the next two decades. The last of the baby boomers will hit 65 in 2029 but will not retire fully until 2040 or possibly even later. This is because they are more able to work owing to improved healthcare and because pension deficits will ensure their retirement income is less than expected. China’s population will age more rapidly because of its one child policy. But it has more room to increase its urban workforce through agricultural reform; 27% of China’s labour force work in agriculture, compared to 2.5% in the US.

Post-lockdown macroeconomic policy

The deflationary forces that dominated the 2010s – low money growth and collective saving at the domestic and international levels – were at various stages of unwinding before the pandemic. This accelerated as the pandemic coincided with the changing tide of economic opinion.

The result is likely to be above-target inflation over the next few years. Monetary aggregates point to advanced economy inflation



9. Dependency ratios projected to increase

Ratio of people aged 0-19 and 65+ to 20-64

Source: UN World Population Prospects 2019, OMFIF analysis

rates like those of the 1970s, but low commodity prices and labour market slack would temper this to 1980s rates, around 5%-10%.

The strength of the initial inflation burst depends on how long lockdowns last. Much of the additional money is in the hands of households, which have cut spending due to uncertainty and the closure of swathes of the retail and hospitality sectors. A quick reopening of businesses will lead to a spending of hoarded cash balances. Inflation is higher in this scenario. If most closed businesses remain shut, the supply-side of the economy will need to adjust to a new normal, with new businesses creating goods and services that can tempt households to part with their money. In the second scenario, households will spend more slowly, but inflation is still likely to drift above-target because the new pro-deficit economic consensus will support demand against a backdrop of weak supply capacity.

Above-target inflation will then persist. Central banks will be reluctant to tighten policy while unemployment is high. What is more probable is that central banks will tolerate higher inflation for a period, which would require a change in communications. They could announce a temporary increase in the inflation target or a nominal GDP target to show that policy choices will be biased towards growth rather than inflation. Choosing the right tool for the job is another challenge. High levels of private and public sector debt will make raising short-term policy rates a perilous task. Reducing bank reserves by selling off government debt or allowing it to mature could put upward pressure on state borrowing costs.

Instead, central banks could use the macroprudential tools they have developed in the last 10 years to manage demand. These tools, such as capital requirements for banks, are not currently used for this purpose, but there is some precedent. Before 1980, many central banks used controls on financial institutions' balance sheets as a demand

management tool. The purpose of these tools is to directly control the supply of credit to the real economy without having to change its price.

That is not to say interest rates will not rise at all. If market rates drift upwards, banks will need to pay higher interest rates to depositors to maintain their funding base. This will translate into high loan rates. Unless central banks are prepared to follow the market, their policy rates may lose value to the commercial banks as a benchmark, dampening their influence. We are used to market rates following bank rates, but the early 2020s may see central banks following market rates.

If it lasts only a few years, above-target inflation will make public and private sector debt burdens more manageable. This deleveraging will help countries avoid the lost decades that countries such as Spain, Italy and Greece experienced following the 2008 crisis.

Ultimately, the difficulties faced by central banks will depend on the behaviour of long-term market interest rates. If global pension funds and sovereign funds can comfortably absorb 2020's huge debt issuance, market rates should remain subdued, as they were in the 2010s. This allows short-term debt to be refinanced into long-term debt. Short-term government liabilities, including central bank reserves, can be converted into long-term marketable securities, which reduces the inflationary impact of running budget deficits because of the effect it has on the money supply. When bonds are transferred from the banking system to non-banks such as pension funds, the money supply decreases.

If the appetite for advanced economy government debt subsidies and long rates rise, fiscal sustainability issues will increasingly prevent central banks from using their policy tools to meet their targets. •

Demand-led forecasting

BROADLY speaking, the New Keynesian approach to forecasting that has dominated since the early 1990s, focuses on real GDP and inflation, leaving nominal GDP as an implied afterthought. This worked reasonably well during the great moderation when supply-side factors were the main driver of growth and there was widespread confidence in the ability of central banks to meet inflation targets using policy interest rates.

During the 'not so great moderation', demand did the driving rather than supply, which led to significant forecasting errors.

One victim of this change has been the Office for Budget Responsibility, which said after a review that its main forecasting errors in the post-crisis years were due to overvaluations of nominal GDP. Tax receipts rise in line with the cash size of the economy, and overestimates of the cash size of the economy led to overly generous assessments of the UK's tax take. The OBR goes down the wrong track because, true to the New Keynesian approach, it starts with a productivity forecast and assumes the Bank of England will hit its inflation target which leaves nominal GDP implied. This would have worked during the great moderation when it was a fair representation of how the economy worked, but for the last 10 years a different model was needed. When supply is responding mostly to demand, forecasters need to start with nominal GDP and come up with an implied productivity forecast.



‘This is a challenging environment for yield-seeking investors’



Investors have had limited sectors to turn to in their search for higher yield in a time of low growth and inflation. But there are some asset classes that can provide stable returns, writes James Blair, head of fixed income investment services, Asia Pacific, Capital Group.

THE search for yield has defined the current economic cycle. Low growth and inflation suggest that the low interest rates of recent years are here to stay. Government and central bank responses to the pandemic have been swift compared with past disturbances, such as the 2008 financial crisis. Interest rate cuts, bond buying and lending programmes have helped prevent an even greater economic decline. But it will be a long road to economic recovery, measured in years and not quarters.

Central banks will err on the side of being accommodative. The futures market, which represents market participants' expectations, is pricing the federal funds rate at 0%-0.25% well into 2023. The balance sheets of the European Central Bank, Bank of Japan and Federal Reserve are expected to reach a combined \$20-\$25tn.

This is a challenging environment for yield-seeking investors. There are few sectors that provide any kind of substantive yield. In the search for higher yield, it is important to look for assets that have certain characteristics. First, yield-centric assets should be sufficiently liquid. Should there be a large proportion of assets held in a portfolio that are illiquid, the risk is that investors may be gated during periods of market stress, when they might wish to have access to their funds.

Second, having a large investible universe ensures that capacity does not become an issue, and allows active managers to add value through security selection. Third, an established history means credit assets have had their liquidity tested over time, notably during the financial crisis. While markets have experienced challenging periods since then,

these established asset classes were able to ride out the storm.

When it comes to finding higher yielding assets that fit the bill, corporate high yield and emerging market debt markets stand out as contenders. Indeed, they offer a demonstrable yield pick-up relative to other fixed income asset classes. Being able to invest flexibly across different asset classes offers greater diversification benefits and more consistent returns.

The medium-term outlook for these markets depends on the coronavirus outlook. There is the potential for vaccines and therapies, along

with central bank and government support, to reduce its impact, which should drive spreads lower. However, there are more pessimistic scenarios with no vaccines and governments constrained in the support they can provide.

The fastest growing part of the high yield market has been BB-rated bonds, accounting for 53% of the high yield universe. With the influx of fallen angels – derated corporate debt – they're likely to increase or at

least stay at that level. Emerging markets that still have high external debt will benefit from potentially low developed market rates. They are also less dependent on foreign inflows.

Investors, apprehensive about the global economic impact, could be attracted to a multi-sector strategy that has the flexibility to invest across a diverse universe of higher-yielding securities. The income elements of this strategy can provide a stable source of returns in a low rate environment. •

‘Being able to invest flexibly across different asset classes offers greater diversification benefits and more consistent returns.’



The OMFIF Digital Monetary Institute (DMI) is a high-level group which convenes policy-makers, technologists, financiers and regulators to explore the challenges and opportunities of digital finance.

The principal focus will be on payments instruments in wholesale and retail markets, with central bank digital currency being of particular interest. This builds on OMFIF research in the field, including a major survey on trust in monetary institutions which found that central banks were the most trusted institutions to issue digital currency.

Membership of the Digital Monetary Institute includes the following benefits:

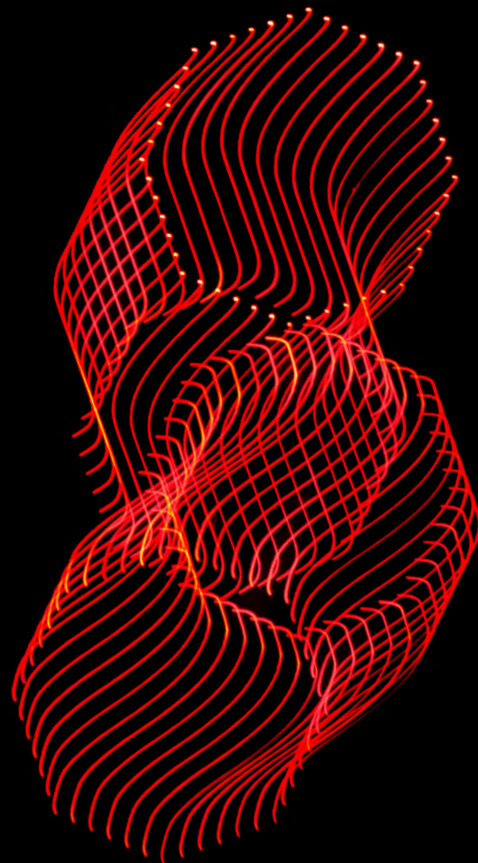
OMFIF roundtables and webinars

Seminars, and networking events

The monthly OMFIF Journal of Digital Finance via email and the annual Guide to Digital Finance

DMI podcasts

**Please contact Julia Demidova for all membership enquiries:
julia.demidova@omfif.org**



‘OMFIF’s Digital Monetary Institute is the intermediary between central banks and the market. As digital currencies become a reality, central banks need the DMI to engage in conversations on policy, technology and regulation with other market participants in a neutral environment.’

Peter Wierds, De Nederlandsche Bank (July 2020)



Chapter 2

Evolving currency system

‘Relationship between dollar rates and economic fundamentals evolving’



Prior to the global financial crisis, dollar appreciation boosted global indicators of economic activity. But that relationship reversed after the crisis, writes Dubravko Mihaljek, head of operations, monetary and economic department, Bank for International Settlements.

MOST economists turn to the textbook trade competitiveness model when thinking about the link between exchange rates and economic activity. A weaker currency boosts demand for exports and stimulates output in import substitution industries. However, changes in exchange rates affect financing conditions too. Depending on how firms and banks fund their operations, a stronger dollar could tighten financing conditions enough to offset any boost to activity.

The relationship between the dollar exchange rate and indicators of real activity has evolved since the global financial crisis, according to BIS research. Activity indicators, such as purchasing managers' indices, correlate with the nominal effective exchange rate of the dollar. Before the 2008 financial crisis, global PMIs (excluding the US) expanded after an unexpected dollar appreciation. This response was in line with the view that US import demand increases after dollar appreciation. After the crisis, however, global PMIs fell in response to an unexpected dollar appreciation. The results are even more striking for trade: unexpected dollar appreciation boosted world trade growth before 2008, but has depressed it since. A variable that displayed the same type of correlation with the real activity pre-crisis, and has lost its significance since, is the Chicago Board Options Exchange's Volatility Index (VIX).

Promising leads that explain the correlation between dollar strength and economic activity have been found by examining the plumbing of international corporate and bank finance. On the corporate side, long production chains make heavy demands on working capital, typically financed by dollar borrowing. The longer the chain, the more added value, and the financing burden is larger. Corporate credit demand falls when the dollar appreciates, and vice versa.

On the banking side, an important factor seems to be the fluctuating lending capacity

of banks that intermediate dollar credit. If a global bank has a portfolio of loans to borrowers worldwide, a broad-based depreciation of the dollar results in lower tail risk in the bank's credit portfolio and a relaxation of the bank's value-at-risk constraint. In this way, a broad depreciation of the dollar is associated with greater risk taking by banks. The result is an expansion in the supply of dollar credit.

Before 2008, the VIX stood out as the barometer of the appetite for leverage in the financial system. This 'fear gauge' was able to capture the way that risk appetite fluctuated in the financial system and translated into lending conditions. The banking sector has become subdued since the crisis. Internationally active firms have started to fund themselves

to a greater extent in corporate bond markets. The relationship between bank leverage and measures of risk appetite has changed.

Since 2009, the broad dollar index has become a good summary measure of the cost of bank leverage. Recent research showed that, following an appreciation of

the dollar, banks with high reliance on dollar wholesale funding tended to reduce credit supply to firms relative to banks with low wholesale dollar funding exposures. Firms that were more exposed to wholesale dollar-funded banks and had longer production chains tended to experience a slowdown in exports. Firms that borrowed from banks that were less exposed to dollar wholesale funding observed a positive effect on exports. Links between the dollar and global economic activity mirror shifts in the pattern of financial intermediation and structural changes that have occurred in the international banking sector. The barometer of risk appetite has shifted from the VIX to the dollar. Banks financing themselves in dollar wholesale markets have become less important as a source of financing, giving way to direct financing by firms in the dollar bond market. •

‘Since 2009, the broad dollar index has become a good summary measure of the cost of bank leverage.’

Central bank digital currencies unlikely to dethrone the dollar

Dollar appreciation has been a theme of the 2020 economic shock, putting pressure on emerging markets and heavily dollarised economies. A synthetic hegemonic currency could provide an alternative to the dollar dominated global system, write Pierre Ortlieb and Bhavin Patel.

IN mid-March, at the height of the pandemic's impact on global finance, markets were playing a familiar tune. Sharp dollar appreciation, a blow-out in cross-currency bases and outflows from major emerging markets appeared in much the same way as during the 2008 financial crisis, though at a much faster pace and on an unprecedented scale. According to University of Cambridge economists Giancarlo Corsetti and Emile Marin, by some estimates, outflows from emerging markets in March were 'double the peak weekly outflows seen around the 2013 US taper tantrum'.

From the perspective of the international monetary system, the dominant theme of the decade between the 2008 financial crisis and the pandemic has been an entrenchment of the centrality of the dollar to the global economy, in

part explaining the greater than ever flight-to-dollar-safety witnessed in March. The dollar's share of global reserves has stayed roughly constant at 63% since 2008. Major challengers, such as the euro or the renminbi, have failed to appeal to international investors. Despite doubts over US leadership and a fairly tepid economic recovery, the greenback's place at the pinnacle of the reserve currency system remains unchallenged.

This position is likely to solidify in the aftermath of the Covid-19 shock. Most importantly, the Federal Reserve's crisis-management efforts will bolster investor confidence in US capital markets. Furthermore, the public health shock has left the structural flaws of dollar challengers more exposed than ever. Discourse continues on potential alternatives to the global dollar system. In 2019,

Bank of England Governor Mark Carney attracted attention when he suggested that a 'synthetic hegemonic currency...provided... perhaps through a network of central bank digital currencies' could 'dampen the domineering influence of the dollar.'

A 'synthetic hegemonic currency' might alter the current dollar-based system, with big implications for global public investors. The dominant status of the dollar is tied up closely – and sometimes lies in contradistinction to – international patterns of trade, securities issuance, and payments. Investors and policy-makers around the world need to recognise that there are potential escape routes from the dollar system. It is worthwhile investigating alternatives, with a focus on Carney's synthetic hegemonic currency proposal.

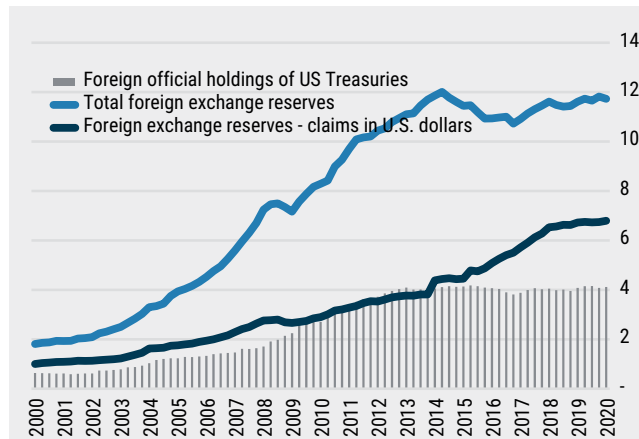
The domineering dollar

The dollar's renewed pre-eminence as the staple of global reserve portfolios since the 2008 financial crisis has been driven by a number of key variables.

First, US Treasuries have been one of the few assets that provided hedged returns to global reserves managers, making them attractive in comparison to negative-yielding assets from the euro area or Japan (Figure 2). The US recovery – although weak in historical terms – allowed rates to lift off from their crisis lows at a much faster pace than in the euro area, where European Central Bank policy has kept euro interest rates mostly in negative territory. There has been a strong yield-driven rationale for reserves managers to strengthen their grip on the dollar. Comparatively few central banks hedge their foreign currency holdings, but even on a hedged basis, dollar returns remained attractive into 2018.

Beyond reaching for yield, fundamental drivers have helped cement the dollar's place in central bank portfolios. Figure 4 seeks to capture these metrics for a sample of countries and provide an aggregate overview of the centrality of the dollar across a relatively heterogeneous group of countries. Looking at trade invoicing, debt security issuance and lending provides a holistic view of countries' dollar liabilities and illuminates why the reserve share of the dollar remains so high.

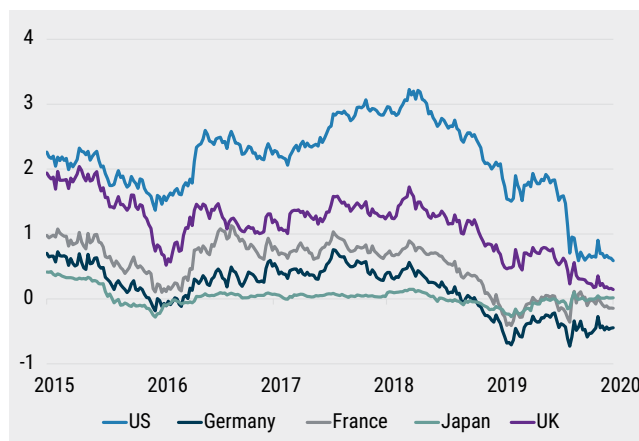
Trade invoicing and payments are central functions of an international reserve currency; global demand for an accepted and reliable means of exchange and unit of account has thrust the dollar into this role. According to data from Swift, the dollar made up 45.3% of international payments in June 2020, up from 42.4% in April 2018 (excluding intra-euro area transactions). Figures for trade finance throw the dollar's dominance into even starker relief – as of April 2020, 85.4% of total trade finance was conducted using dollars. Country-by-country data further demonstrate the dollar's pivotal position. In some



1. Rise in dollar reserves

Total foreign exchange reserves, foreign exchange reserves held in dollars, and foreign official holdings of US Treasuries, \$tn

Source: Refinitiv, OMFIF analysis



2. US return advantage evaporates

Benchmark 10-year government bond interest rates, July 2015-present, %

Source: Refinitiv

99%

99% of exports from Ecuador, Angola and Cambodia were invoiced in dollars in 2019

85%

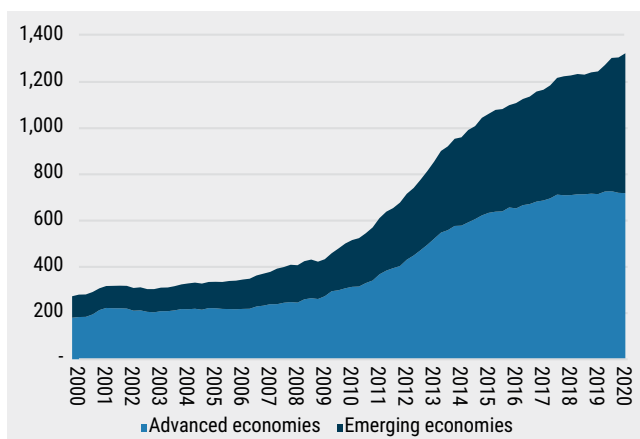
The dollar's share of global trade in April was 85%

emerging markets, particularly in Latin America, almost all trade is invoiced in dollars, such as 99% of exports from Ecuador, Angola, and Cambodia's exports in 2019, according to the International Monetary Fund. According to the same dataset, 51% of Japanese exports were invoiced in dollars in 2017. And even economies that have sought to move away from the dollar still rely on it for trade invoicing – 68% of Russian exports and 36% of imports in 2017 were invoiced in dollars, as is the majority of Chinese trade. While these countries are attempting to shift their reliance on the greenback, the overall picture, according to Swift, is one of greater reliance on the US currency.

This in turn stimulates offshore dollar financial markets, encouraging cross-border lending and debt issuance. According to the Bank for International Settlements, cross-border claims in dollars have more

3. The world runs on dollar funding

Non-financial corporations' dollar-denominated debt issuance, 2000-present, \$bn
Source: BIS, OMFIF analysis



than tripled to \$15tn since the turn of the millennium. Dollar-denominated securities issuance in international markets has boomed similarly. Global non-financial corporations in particular have become increasingly reliant on dollar-denominated borrowing and lending, effectively forcing the hands of central bank

reserves managers (Figure 3).

Issuing dollar debt holds a powerful appeal for governments – for large emerging market nations such as Argentina and Turkey, as well as for smaller advanced economies like Norway and Sweden, all with relatively high shares of dollar-denominated government debt.

Euro area economies use the euro for invoicing and sovereign debt issuance. But even there, corporate sector debt often has a high dollar share, underlining how the global economy overwhelmingly runs on dollars.

The limits of the dollar system are clear. Not only are there geopolitical questions, but dollar-reliant economies face greater policy constraints than if they depended on their own full-fledged sovereign currencies. The urgent question is: what is the alternative to the dollar reserve system?

There have been many private challengers, but few have taken hold. Facebook's original plans for Libra, a privately issued global coin, came close to offering an alternative. Yet policy, financial stability and political issues surrounding a privately issued global reserve currency have dampened Libra's plans. Some

4. Dollar concentration across trade and financial flows

Source: Refinitiv, BIS, IMF, OMFIF analysis. Data on export invoicing is based on Boz et al., 'Patterns in Invoicing Currency in Global Trade,' IMF Working Paper, July 2020

Country	\$ share of exports (2017)	\$ share of government debt (Q1 2020)	\$ share of cross-border lending to non-financial corporations (Q4 2019)	\$ share of cross-border lending to banks (Q4 2019)	\$ share of non-financial corporation debt securities (Q4 2019)
Argentina	97.1%	62.2%	93.9%	51.6%	99.6%
Australia	81.9%	0.2%	49.1%	61.1%	57.1%
Brazil	92.3%	13.0%	75.5%	88.8%	89.0%
China	–	7.3%	70.5%	59.5%	87.0%
Colombia	98.3%	12.2%	79.6%	83.6%	83.9%
Czech Republic	13.9%	0.2%	2.3%	3.9%	8.9%
Denmark	25.3%	5.8%	23.6%	14.6%	17.5%
Finland	23.1%	7.5%	6.3%	28.5%	10.3%
India	86.8%	3.6%	74.9%	69.0%	90.7%
Indonesia	94.4%	29.4%	89.0%	73.0%	93.5%
Israel	82.8%	16.2%	58.7%	68.8%	96.7%
Japan	51.3%	0.6%	58.2%	53.7%	45.0%
Norway	47.6%	30.2%	49.7%	34.5%	45.0%
Peru	–	27.6%	96.7%	57.2%	81.0%
Poland	17.6%	3.9%	4.2%	22.1%	55.5%
Slovakia	2.7%	2.8%	0.5%	26.8%	0.0%
South Korea	84.5%	7.7%	84.1%	76.4%	83.0%
Sweden	27.5%	21.2%	12.5%	38.3%	9.9%
Switzerland	21.0%	0.0%	50.9%	40.7%	28.9%
Thailand	77.1%	2.0%	94.2%	69.3%	48.2%
Turkey	39.6%	36.0%	39.7%	56.0%	93.5%

Digitalising the dollar: effects on the 'exorbitant privilege'

ACADEMICS, market participants, and policy-makers have long suggested that the emergence of central bank digital currency in economically powerful jurisdictions – such as China or the euro area – might accelerate a shift away from the dollar. A 2020 Foreign Affairs article, for example, mused that a Chinese CBDC might help unseat the dollar, suggesting the initiative might undermine US political sway. The US has restricted the use of dollars or forced Swift to prevent cross-country interbank transactions from sanctioned entities; other countries have limited options in working around US restrictions. Digitalising currencies may be one way to achieve this goal. This would provide one means of diminishing the dollar's so-called 'exorbitant privilege'.

Discussion of potential CBDC developments has gained ground in the US in recent years. This has been partly driven by security policy ambitions, but also by a desire to upgrade the cumbersome US domestic payments system. FedNow, the proposed real-time payments system, will not be operational before 2024, but it is one step in upgrading the dollar's payments architecture. So far, the Fed has been reluctant to embrace any large-scale exploration of CBDC, preferring to test the waters and weigh potential implications. Fed Chair Jerome Powell has noted that many of the issues spurring the development of digital currency in other jurisdictions do not necessarily apply to the US, such as dwindling use of cash. In a November 2019 letter to Congressman French Hill, Powell wrote that 'several significant legal questions would have to be addressed' before the Fed 'could contemplate developing and issuing a general purpose CBDC', adding that it feels broadly comfortable with the competitiveness of the US payment system.

In parallel to the Fed's cautious exploration, several private sector initiatives have sought to map out ways in which the dollar might be digitalised. The Digital Dollar Project, a joint endeavour between Accenture and the non-profit Digital Dollar Foundation, is one such initiative. It proposes to tokenise the dollar as an alternative to physical cash distributed via commercial banks. The group leaves questions of technology largely unanswered. This group seeks the design of a CBDC, rather than another simple challenger tokenised dollar in the vein of Tether, meaning that the onus for driving this forward is very much on the Federal Reserve.

While the balance of power in the international reserve currency system is unlikely to change dramatically in the short term, choices made on the journey towards a digital dollar may prove momentous. Foregoing a digital dollar may cause the US to fall behind. A well-designed digital dollar, on the other hand, with world-leading privacy features, could further strengthen the role of the currency, according to Christopher Giancarlo, former Commodity Futures Trading Commission chairman and one of the leaders behind the Digital Dollar Project. Regardless of the outcome, whether the Federal Reserve eventually issues a CBDC or a consortium of private institutions puts together an equivalent platform, the issues at stake are critical.

suggest that gold might serve as a transitional asset in a multicurrency reserve system. Carney's proposal for a synthetic hegemonic currency, based on a network of CBDCs, is one of the most interesting and feasible proposals put forward in recent years.

A synthetic hegemonic currency could offer a means of payment and settlement independent of the US. Additionally, operating it on a new digital payments system could allow for increased functionality, efficiency, security, speed and resilience compared to traditional cross-border payments. Introducing a new synthetic hegemonic currency would require consideration of several practical, policy, financial stability and geopolitical implications.

Countries which are dollarised, or rely on dollar-denominated commodity exports, are vulnerable to changes in Fed policies, as they affect their domestic price stability and the value of export revenues. This issue extends beyond considerations of the dollar. Exports priced in either domestic currencies or in less established currencies with volatile purchasing power in foreign markets are vulnerable. Oil exporters have had to form hard currency pegs to control domestic inflation changes potentially stemming from dollar and oil price movements, requiring large foreign reserves to maintain exchange rates (Figure 5).

Given the role of the dollar as the numeraire of standard commodities, a change in the dollar exchange rate alters the terms of trade between any pair of countries, depending on the ratio of dollar goods to non-dollar goods in these countries' trade structures.

As the difference between the export and import shares of dollar goods is the greatest for oil-exporting countries, their income position is most strongly affected by dollar fluctuations. They have an incentive to react to dollar depreciation by increasing the price of their exports, reducing competitiveness.

Reducing dollar reliance for these countries could allow them to open

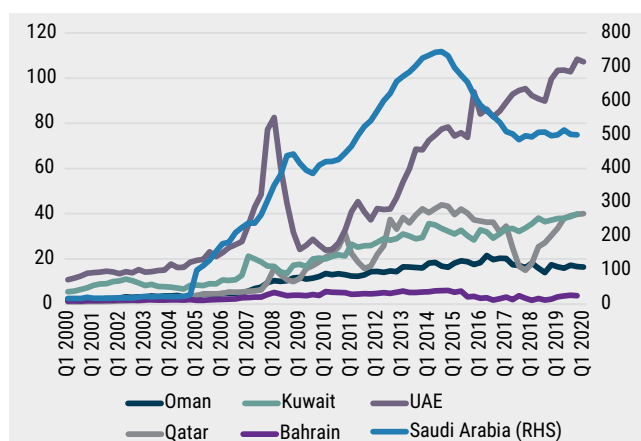
up their capital accounts and follow an independent monetary policy and currency regime. The introduction of a new denomination representing a value based on a basket of currencies, as envisioned in Carney's proposal, could offer greater stability for countries that rely on the dollar. A basket based on the importance of major currencies in global trade would offer the greatest stability. The IMF's special drawing right is an example of such a basket. Using these weights, a synthetic basket can be illustrated with the BIS's trade weighted exchange rate indices (Figure 6 on p.43).

The basket's use of currencies, representing the largest trading currencies, provides a significant degree of stability that should encourage an equilibrium rate that reduces many of the difficulties around clearing dollar-dominated regions' balance of payments. This also reduces much of the pass-through of inflation within domestic economies.

Figure 6 shows that the appreciation of the dollar over the past three years is matched by a relative depreciation of the euro and sterling, and, more significantly, in the mirroring of the renminbi and the yen.

This suggests that the automatic adjustment of the basket allows the exchange rate to assume the burden of exchange rate volatilities. The weighted basket has a volatility (measured in standard deviations) of 3.6, the lowest compared to 6.6 for the euro, 9.0 for the dollar, 10.2 for sterling, 13.2 for the yen and 18.8 for the renminbi.

Liability dollarisation can also be alleviated. Countries with large sums of dollar-denominated debt face increasing debt servicing costs as the dollar appreciates. In this scenario, the assets held in the domestic currency fall in value when the domestic currency depreciates, meaning that the value of a bank's assets would no longer be sufficient to cover the foreign denominated liabilities it holds. This scenario



5. GCC countries hold significant reserves to maintain dollar pegs

International reserves, \$bn

Source: IMF, OMFIF analysis

played out in Chile in 1981, Mexico in 1995, Turkey in 1994 and Thailand in 1997 – foreign currency liabilities held by banks resulted in an insolvent banking sector.

CBDC and the 'synthetic hegemonic currency'

The concept of a denomination based on a basket is not new. The IMF's special drawing right, the Fund's composite currency basket, attempts to provide a reserve asset to supplement the international reserves of its members. However, the IMF notes that while 'the SDR serves as the unit of account of the IMF and some other international organisations... it is neither a currency nor a claim on the IMF. Rather, it is a potential claim on the freely usable currencies of IMF members. SDRs can be exchanged for these currencies.'

When respondents to the OMFIF GPI Survey 2020 were asked whether they would be open to using some kind of sovereign digital currency basket or new 'digital special drawing right' as part of their reserves or investment portfolio, 90% replied in the negative.

The progress on CBDCs signals that a basket-based global unit of account with wide use may be feasible. Carney has suggested that a publicly-issued version could lead to better outcomes through a network of CBDCs. CBDCs would inherit trust from their sovereign issuers, removing credit risk and

providing relatively stable value. This is crucial if a CBDC is to act as medium of exchange and store of value. In addition, liquidity risk would be removed as the central bank could issue new CBDC through the traditional means of purchasing securities to increase the money supply. This is in contrast to private digital currencies, where liquidity cannot be injected unless the underlying asset is purchased.

Developments are still in their early stages. Designs focusing on domestic operations with cross-border applications have been largely left for future implementation. There are a number of practical and technological factors a new sovereign-issued global currency needs to consider.

First, the global infrastructure for cross-border payments is fraught with problems. A new global payments system could provide additional benefits. The cross-border payments system relies on correspondent banking networks facilitated by financial intermediaries at multiple levels with payments messages facilitated through Swift.

Correspondent banks participating in a transaction must still process messages individually on their back-end and subsequently settle transactions through foreign exchange markets. Consequently, cross-border payments are generally more cumbersome and expensive than domestic ones.

A synthetic hegemonic currency could replace the money that is

“

Towards a synthetic global currency

Mark Carney's proposal for a global synthetic hegemonic currency could help balance out dollar dominance in global trade, but it raises several questions, writes Christian Pfister, deputy director general, directorate general statistics, Banque de France.

LAST year, Bank of England Governor Mark Carney suggested issuing a global synthetic hegemonic currency. He noted the dollar's domineering influence on trade. Most international payments are billed in dollars, although Brazil, Russia, India, China and South Africa account for more than one third of global activity compared with 15% for the US. This exposes other countries to dollar fluctuations, even if they have few or no economic ties to the US. Carney pointed out that new technologies allow payments providers to offer cheaper, more convenient services. He asked whether 'such a new synthetic hegemonic currency would be best provided by the public sector, perhaps through a network of central bank digital currencies'. A basket of currencies would back the SHC.

This proposal raises two sets of questions. The first concerns its chances of success. The International Monetary Fund's special drawing right already plays the role of an SHC. The network effects that support the dollar have hampered the adoption of SDR in international commercial and financial transactions. Similar arguments could act against a proposed SHC. Countries issuing reserve currencies, starting with the US, may have resisted the use of SDR as an SHC. Countries that do not issue reserve currencies may fear that the SHC would replace their own currency in international and domestic exchanges, and therefore oppose the initiative.

The second set of questions relates to issuance procedures and governance arrangements. Who would decide on the make-up of the basket and according to what criteria? Who would issue the SHC and how would it be managed? The term 'network of CBDC' suggests that CBDC-issuing central banks – or at least some of them – might co-operate to create a 'super central bank' that would issue the SHC. How would issuance of the SHC be combined with that of the currencies in the basket? A potential configuration, given the 'over-determination' of the SHC's short-term interest rate by currencies in the basket, might be perfectly elastic issuance (as with cash currently, all SHC demanded would be provided or destroyed). Finally, how would the SHC be distributed: by central banks issuing the currencies in the basket, by banks and payments services providers or by a combination of both? •

'Most international payments are billed in dollars, while emerging economies account for 60% of global activity compared with 15% for the US.'

used to settle interbank or retail transactions with a digital token. It could be a bearer asset, meaning that transactions between accounts would transfer actual value. It could be recorded on distributed ledger technology and a decentralised system could work outside of standard central bank operating hours. A central operator is no longer needed to verify, validate and settle transactions, as all participants share this task; this is helpful when liquidity pressures build up in the system. Bank-to-bank transfers could allow for a degree of anonymity for the user institution, depending on privacy regulations.

Similarly, smart contracts could enable these transfers, boosting the system's functionality. These are contracts written directly into lines of code that exist across the decentralised network. They can be self-executing between buyer and seller, and there is no need for a central authority, such as a central securities depository.

Using a decentralised payments system to move the synthetic hegemonic currency could offer greater security and resilience, potentially preventing disaster spreading from a hack of a single, central point. If a single node is brought offline, the system can continue to function.

Essentially, a digital synthetic hegemonic currency could provide greater functionality, speed, efficiency and resilience, while lowering costs, increasing payment transparency and enabling 24/7 payments.

Governance and practicality of SHC

At the same time, governance and policy questions will take precedence over issues around technology, and these remain far from settled. First, which institution convenes and drives this concept forward? An international body, such as the IMF or BIS, is a natural choice, but tepid sentiment towards the current SDR suggests this might not be the best choice. It could be driven

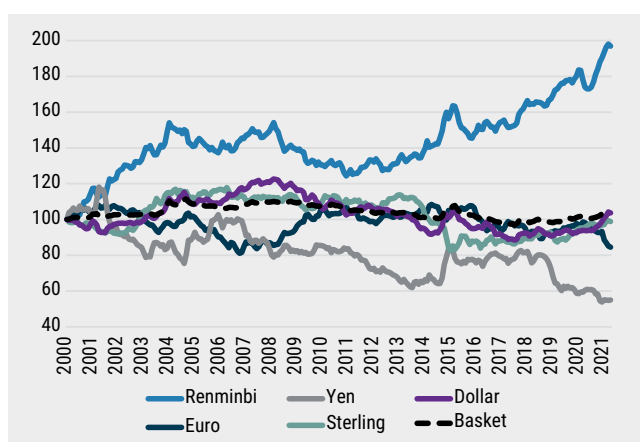
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6. An SHC based on a basket of currencies would offer greater stability

Basket of currencies, real trade-weighted value, Jan 2000 = 100

Note: Basket weight based on IMF SDR calculations

Source: BIS, OMFIF analysis



by a consortium of central banks, leveraging network effects by growing the consortium over time.

These central banks could underwrite the value of the synthetic hegemonic currency by offering convertibility in proportion to the agreed weight in the currency basket.

The consortium central banks' national policies will inevitably affect the synthetic hegemonic currency, for instance through changes in the domestic money supply and interest rate pass-through from currencies included in the basket. Furthermore, these institutions will have to work across jurisdictions to guarantee convertibility and fungibility of the currency as well as ensuring important know-your-customer and anti-money laundering regulations are enforced.

Another key decision has to do with access and function. Will the SHC be available to general retail consumers for cross-border payments or will access only be granted to registered businesses that comply with existing regulations?

If the synthetic hegemonic currency becomes universally available and is used as a store of value by retail clients, it could compete with domestic currencies, especially in developing economies. These have relatively lower capital bases and are attractive to international investors looking for short-term returns. This money supply is procyclical and

‘The US has the most developed and liquid financial market in the world which ensures its reserve currency status, and we take this into consideration as a qualitative factor in our strategic asset allocation.’

attracted to low wages and natural resources.

Low interest rates in developed markets lead to higher capital flows and credit booms in developing ones. As inflation is high and convertibility options are low, residents of these countries would most likely want to use the SHC. Free flow of it would decrease domestic money demand relative to the money supply and boost inflation. This cycle would gradually decrease the effectiveness of the central bank's operations in the domestic currency, posing important questions about monetary policy.

The value of the synthetic hegemonic currency would be based on the basket, but would become sensitive to each participating currency's respective interest rates. The participating central banks will

experience a significantly expanded balance sheet. There would be an impact on central bank holdings of reserves and the status of the dollar, probably a long-term shift as more and more supply chains and trade invoices move away from the dollar to the synthetic hegemonic currency.

In reality, the dollar is unlikely to be replaced as the global reserve currency in the short-term. A synthetic hegemonic currency, or a network of interoperable CBDCs, however, could give countries the ability to operate outside the dollar-led system, by serving as a means to create independent payment mechanisms that link financial institutions together without the need for correspondent banks and Swift. China's move towards a digital currency provides an impetus for other central banks to accelerate their efforts. Although China's planned digital currency is to remain operable only domestically, solving for cross-border use and access will provide a route for China to open its capital account and truly internationalise the renminbi, if it chooses.

Modernising the global payments system and dethroning the dollar would allow countries to establish their own independent monetary systems, reduce vulnerabilities and export revenue volatility from changes in Fed policy, allow for more democratic decisions on financial transaction sanctions, and circumvent US payments restrictions.

Progress towards a single global payments system will be slow. However, strides in CBDCs from an increasing number of central banks, as well as solving interoperability issues, open the way towards users of global payments systems gaining greater autonomy in processing transactions and payments. From the private sector, a multitude of digital currencies (and some fiat ones) are likely to emerge in the next five years, many carried on peer-to-peer messaging networks across borders. This may bring greater financial stability risks to the global system, many of which are yet unknown. •

'Gold's long-term performance can help guide official sector investors'



Official sector investors look for safety and liquidity during times of economic stress. Gold has these necessary attributes, writes Shaokai Fan, director, central banks and public policy, World Gold Council.

THE extraordinary market turbulence triggered by the Covid-19 pandemic has refocused attention on financial behaviour during acute stress events. For official sector investors, painful memories of past crises have resurfaced as policy rates are slashed, liquidity is pumped into the financial system and emergency swap lines are established. In times like these, the famous trinity for official sector investors, safety, liquidity and return, is summarily abridged to the first two. Traditional haven assets, such as US Treasuries, other G10 sovereign bonds and gold are pressed into service.

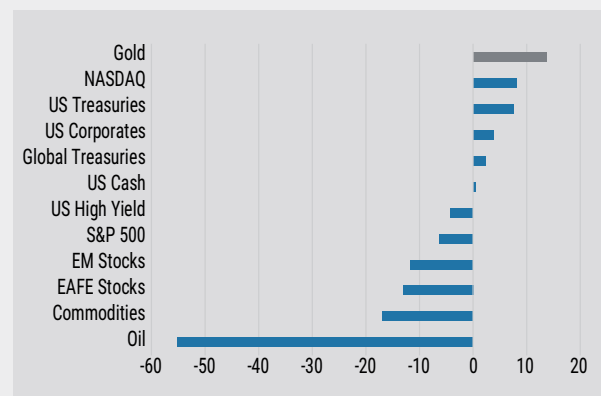
Haven assets share two essential requirements. At times of stress they must preserve their value when risk assets sell off and remain liquid at all times. Historically, gold has fulfilled both requirements.

This has prompted questions about gold's haven status. After all, it is supposed to move in the opposite direction to risk. Even though this trend might seem counterintuitive, it is not without precedent. During the darkest days of the 2008 financial crisis, gold declined alongside risk assets on sharp sell-off days. However, it ended the year as one of the few asset classes to achieve a positive return. Gold produced an annual return of 4.3% in 2008 to end the year at \$869.75 per ounce.

The key to this phenomenon lies in the second requirement for a haven asset: liquidity. As the scale of Covid-19's economic impact became apparent and markets experienced sharp declines, investors were forced to meet margin requirements and raise cash for redemptions. Liquid assets were the first to be sold and gold is one of the most widely traded assets in the world, outstripping even major sovereign bond markets in terms of daily trading volumes. In other words, gold was sucked into the maelstrom, simply because it was easy to sell.

Underlining this trend, other haven assets also sold off during these acute periods of stress, including US Treasuries, as investors rushed to liquidate assets and meet obligations elsewhere.

Looking ahead, gold's long-term performance can help guide official sector investors as they plan their next steps. Previous episodes of financial

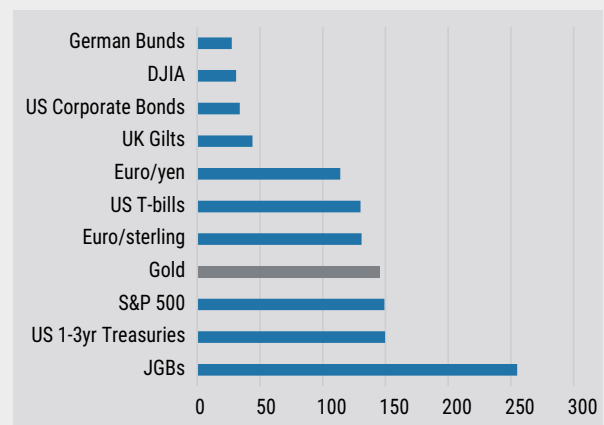


1. Performance of major assets since 22 January

The announcement of the Wuhan lockdown

*As of 25 March 2020. Returns based on the LBMA Gold Price, Bloomberg Barclays US Treasury Index and Global Treasury Index ex US, S&P US Treasury Bill 0-3M Total Return Index, Bloomberg Barclays US Corporate and High Yield Indices, MSCI EM Index, Bloomberg Commodity TR Index, MSCI EAFE Index, S&P 500 & NASDAQ Indices, and Bloomberg Oil TR Index.

Source: Bloomberg, ICE Benchmark Administration, World Gold Council



2. Average daily trading volumes

Dollars*

Data as of 31 December, 2019. *Based on estimated one-year average trading volumes as of 31 December 2019, except for currencies that correspond to March 2019 volumes due to data availability. **Gold liquidity includes estimates on over-the-counter (OTC) transactions and published statistics on futures exchanges, and gold-backed exchange-traded products. For methodology details visit the liquidity section at Goldhub.com

Sources: Bloomberg, Bank for International Settlements, UK Debt Management Office (DMO), Germany Finance Agency, Japan Securities Dealers Association, London Bullion Market Association, World Gold Council



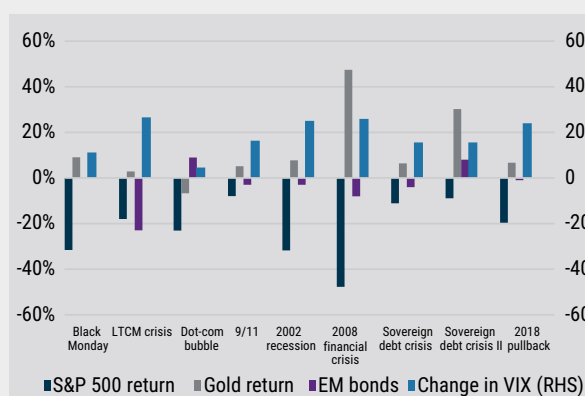
stress have demonstrated gold's resilience. Gold rose during all but one episode of systemic risk in the past three decades. While gold historically shows no correlation with risk assets during normal periods, the correlation swings sharply negative when risk assets experience strong sell offs. This relationship has persisted for several decades, a trend that official sector investors may want to bear in mind, as they consider their response to the pandemic.

While the depth of the economic damage wrought by the virus remains unknown, the policy response has already begun to coalesce. Central banks around the world have embarked on massive monetary easing programmes. The Federal Reserve slashed rates to zero before moving into uncharted territory: unlimited buying of government bonds as well as partial buying of corporate bonds. Other central banks have announced similar measures.

These actions will be in place for the foreseeable future and they are likely to prove supportive of gold, as monetary easing devalues fiat currencies. On the day that the Fed announced unlimited bond purchases, for example, the gold price rose by 4%. The fiscal response from policy-makers around the world pushes the boundaries of debt sustainability for already stretched government budgets. These measures are necessary to stave off economic collapse, but investors may begin to lose confidence in sovereign bond markets, which form the backbone of official sector investments.

These factors make gold an indispensable asset. A number of central banks have already added significant amounts of gold to their reserves, with purchases in both 2018 and 2019 reaching 50-year highs. Nevertheless, many central banks, particularly in developing countries, still have suboptimal gold holdings, compared to their peers. With the world economy facing a highly uncertain future, official sector investors must return to their core strategic purpose – investing in safe, liquid assets that can be readily deployed during disorderly market conditions. Now more than ever, gold stands ready for the task. •

‘While the depth of the economic damage wrought by the virus remains unknown, the policy response has already begun to coalesce.’

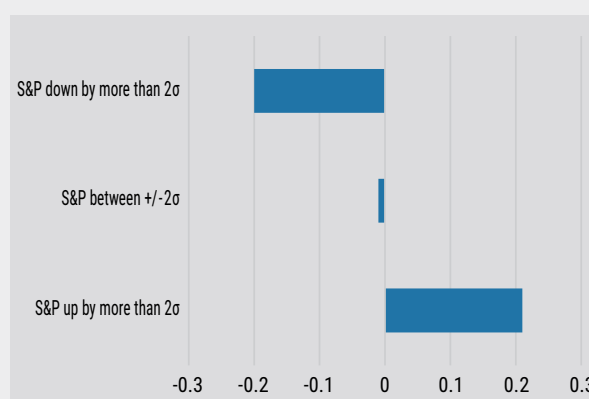


3. Performance in periods of systematic risk

S&P 500 and gold return vs change in VIX level*

The VIX is available only after January 1990. For events occurring prior to that date annualised 30-day S&P 500 volatility is used as a proxy.

Source: Bloomberg; World Gold Council



4. Correlation between gold and US stock returns in various environments of stocks' performance*

*As of 31 December 2019. Correlations computed using weekly returns based on the LBMA Gold Price PM since January 1971. The middle bar corresponds to the unconditional correlation over the full period. The bottom bar corresponds to the correlation conditional on S&P 500 weekly return falling by more than two standard deviations (or 'σ') respectively, while the top bar corresponds to the S&P 500 weekly return increasing by more than two standard deviations. The standard deviation is based on the same weekly returns over the full period.

Source: Bloomberg, ICE Benchmark Administration, World Gold Council

BARINGS

‘Facilitating access to foreign currency key to more stable monetary system’



The pandemic could be an opportunity for major economies to develop a co-operative framework and lessen dependence on the dollar in times of stress, writes Joe Hoefer, managing director, Barings Investment Institute.

THE 2008 financial crisis highlighted the importance of holding adequate reserves. In the aftermath international reserves showed rapid growth. But the accumulation of reserves for precautionary purposes exposes the international monetary system’s failure to remedy imbalances and provide a suitable global financial safety net. Before the pandemic, the only way to reduce these risks was a broad agenda of reform that encouraged more reliance on the euro and, possibly, the renminbi. However, these were distant prospects in a low-volatility world that was retreating from globalisation.

Since 2008, dollar credit to non-bank borrowers has doubled to \$12tn and, as a percentage of global GDP, risen to 14% from 9% (Figure 1), creating stress on the financial system. In 2020, as the pandemic gained ground globally, the dollar jumped on

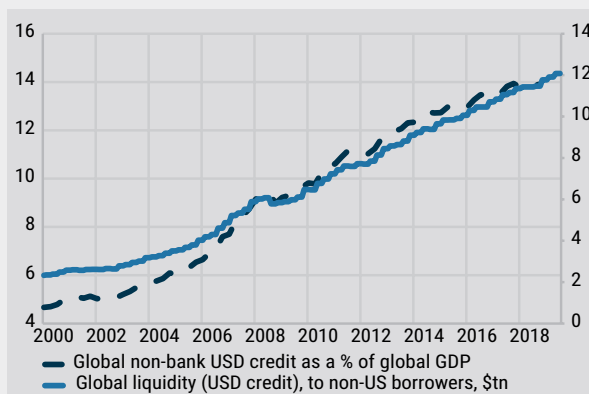
‘In the absence of a suitable alternate global monetary architecture, especially in the wake of Covid-19, the continued deepening of capital markets outside the US offers promise.’

haven demand amid the mass liquidation of positions across markets. Foreign exchange volatility increased and financial conditions tightened. Higher rates make dollar debt servicing more expensive and can serve to export inflation at precisely the wrong time. This was evident when looking at major

currency returns over the first three weeks of March as the crisis hit. Similar to 2008, it was not until the Federal Reserve opened up broad access to other central banks to obtain dollars through swap lines that pressures seemed to ease and the dollar weakened.

Developing mechanisms to handle external financing shocks and facilitating access to foreign currency are key

to establishing a more stable international monetary system. A combination of self-insurance, bilateral agreements, regional arrangements and multilateral pacts are needed. The 1985 Plaza Accord saw policy-makers work in a coordinated fashion to counter the destabilising effects of a surging dollar. However, disparate interests of the world’s largest economies highlight the challenges in achieving a meaningful and effective co-operative framework. In the absence of a suitable alternate global monetary architecture, one area that offers promise is the continued deepening of capital markets outside the US. China and Europe have been building up the capacity of their capital markets, which should eventually relieve some dollar strain and diversify capital flows. The continued growth of non-US public and private markets could lessen dependence on the dollar during times of stress. •



Dollar credit to non-bank borrowers

Global nonbank USD credit, % of global GDP, LHS, and global dollar liquidity to non-US borrowers, \$tn, 2000-present, RHS

Source: FactSet and BIS as of 30 September 2019



Chapter 3

Global flows

‘Covid-19 highlights importance of strong regulatory framework’



The first round of Basel III reforms has helped the banking sector cope with the crisis, and demonstrated the need for international standards, writes Isabelle Vaillant, director of regulation, European Banking Authority.

IN 2019, the group of central bank governors and heads of supervision, the Basel Committee's oversight body, endorsed the final piece of the regulatory review of the so-called Basel III framework. This international accord between 28 jurisdictions addresses the weaknesses observed during the 2008 financial crisis.

The first stage of the review has already been implemented in European law via the capital requirements directive and the capital requirements regulation. It introduced two new liquidity ratios and a leverage ratio, as well as flexibility on the overall minimum level of capital. These buffers are designed to increase capital requirements during economic boom, while reducing them during periods of economic stress.

The second phase of the review aimed to improve the calculation of risk-weighted assets to provide risk sensitivity and comparability of the solvency ratios. In addition to a complete redesign of the operational risk framework, the finalisation of the Basel III framework enhanced the standardised and internal ratings-based approaches for credit risk. The most emblematic part of the reform is the output floor, which ensures that risk-weighted assets calculated using the most sophisticated methods are not below 72.5% of the risk-weighted assets calculated using the standardised approaches.

The Covid-19 outbreak provides a real stress test scenario to assess whether the framework is sufficiently robust to support a

resilient banking sector, and flexible enough to maintain the vital financing provided by the banking sector to the real economy. To this end, European Union regulators and supervisors clarified how the pandemic should impact all three pillars of the regulatory framework.

First, the European Banking Authority clarified the prudential treatment of ad hoc virus response measures. In effect, the identification of non-performing obligors should reflect their true economic situation, without being impacted by the general moratoria on loan repayments. Capital ratios should reflect adequately the risk-reducing effects of public guarantee schemes.

Second, the EBA recommended using fully the flexibility introduced in the Basel III framework. During the crisis, capital and liquidity buffers have allowed the banking sector to ensure continued lending.

The full impact of Covid-19 remains uncertain, but this type of event underlines the importance of a strong regulatory framework and resilient banking sector.

Overall, the first elements of the Basel III reforms have helped the banking sector cope with the Covid-19 crisis. In the light of the pandemic, the GHOS postponed the implementation of the Basel III standards by one year. This reflects the need to prioritise banks' and supervisors' short-term operational capacity. Nevertheless, the new standards must be implemented fully and in a timely, consistent manner. •

‘During the crisis, capital and liquidity buffers have allowed the banking sector to ensure continued lending.’

‘A fully-fledged banking union requires institutional change’



The European banking union has succeeded in its first aim, of safeguarding the euro, yet more needs to be done to create a fully integrated European banking sector, writes Margarita Delgado, deputy governor, Banco de España.

THE declaration by the French Foreign Minister Robert Schuman, which kick-started the European project was commemorated on 9 May. Its 70th anniversary was celebrated in incongruous fashion, with people isolated in their homes because of Covid-19.

The health crisis has ravaged our economies, and above all, has had a dire human cost. Institutions are depended on in this uncertain environment to bring stability and support. Governments, regulators and the European Union have responded to this call. The European Central Bank has taken decisive action to help companies and people. The EU recovery fund demonstrates the European commitment towards citizens and businesses.

Crises have helped shape the European project. The banking union, the latest addition to the project, was created to address flaws in the design of the euro, revealed by the sovereign debt crisis, which threatened to break the single currency. Five years after its creation, the banking union has successfully safeguarded the euro's integrity but it has not been able to produce a truly integrated banking sector. The crisis has highlighted the importance of this second objective, yet some things stand in its way.

A fully-fledged banking union requires institutional change. It still lacks one of its three fundamental pillars, the European deposit insurance scheme. This would contribute to increased stability in times of stress. The banking union will not be a single financial system until a euro deposited in any institution has the same backing, regardless of the home country of the bank. The EDIS is necessary for this.

‘It doesn’t make sense that national governments remain liable for the losses of a failing bank, while the responsibility for supervision falls on pan-European institutions.’

There are other hurdles that need to be overcome to reap the economic benefits of increased cross-border banking activities. First, cultural, institutional and regulatory obstacles perpetuate the ring-fencing of national banks, restricting or preventing the free movement of capital and liquidity across the euro area. It doesn’t make sense that national governments remain liable for the losses of a failing bank, while the responsibility for supervision falls on pan-European institutions.

Second, the lack of harmonised regulation perpetuates an unlevel playing field. Banking regulation is common across the EU, but there are other rules that are critical in establishing a sufficiently uniform legal basis, in particular those covering the prevention of money laundering, fit and proper supervision, and bank insolvency. Third, to ease integration of the sector, supervisory expectations, which are key in assessing the business case of a hypothetical merger, need to be communicated more clearly.

The completion of the banking union and the implementation of the related capital markets union would enhance private risk-sharing channels across Europe, helping European companies and citizens overcome current and future crises.

Confronted with previous upheaval, Europe has always delivered and it will do so again. Robert Schuman’s words 70 years ago remain as pertinent today:

‘Europe will not be made all at once, or according to a single plan. It will be built through concrete achievements which first create a de facto solidarity.’*



Creditors versus debtors in the post-lockdown economy

A sustained rally in global stock markets in 2019 widened further the gap between creditors and debtors. The impact of fiscal policy on net international investment positions is set to become still greater this year, writes Chris Papadopoulos.

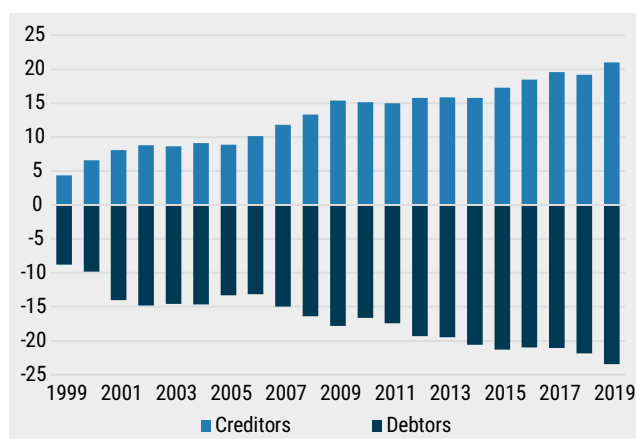
GLOBAL financial imbalances widened in 2019. The gap between creditor and debtor net international investment positions – an economy's stock of external assets minus liabilities – climbed for a fifth consecutive year to 44% of global GDP.

The main reason for this was a sustained rally in global stock markets, with US indices outpacing others, and Federal Reserve interest rate cuts. The S&P 500 jumped 28%. The Europe-focused S&P 350 rose 22% and the Nikkei 21%. The market rally was supported by the Fed's interest rate cuts as it unwound its nascent interest rate increase cycle, making three rate cuts in the second half of the year. These would have created accounting gains for holders of US fixed income assets. The combination of a booming US stock market and low interest rates tends to

widen financial imbalances as foreign holders of US assets see the value of their assets increased, while the US will find the value of its foreign liabilities has risen.

The dollar exchange rate was not part of the story last year despite

US interest rate cuts. The Federal Reserve's measure of dollar strength against a basket of currencies was little changed in December 2019 compared with a year before. A stronger dollar generally increases the US NIIP deficit position by lifting



1. Global investment imbalances continue to widen

NIIPs, creditors vs debtors, % of global GDP

Source: IMF, OMFIF analysis

Note: Creditor and debtor positions do not exactly balance due to deficiencies in data collection

the value of its liabilities by more than the value of its foreign assets. For other countries, the reverse is true. A stronger dollar boosts the value of foreign assets, denominated mostly in dollars, relative to foreign liabilities, denominated mostly in local currency.

In 2019, austerity gradually started to reverse in advanced economies as governments adopted a more pro-growth stance. The US ran its largest budget deficit since 2012 at 5.8% of GDP. France's deficit increased to 3% of GDP. Running large budget deficits will usually increase foreign liabilities and the current account deficit as extra demand pulls in imports from abroad. This led to a further decrease in the NIIPs of the US and France, two of the largest debtors in 2019 (Figure 2).

However, this was not a global trend. Overall there was a slight contraction in the aggregate size of current account deficits and surpluses (Figure 3). Larger deficits in the US and France were offset by smaller deficits in other advanced economies and Latin America. Given this, the widening of 2019 NIIPs was not due to an overall shift in current account surpluses and deficits.

Flat current account surpluses conceal changes in the underlying story of the 2010s. Of the main surplus countries (Figure 4), China's surplus fell to 1% of GDP in 2019 from 4% of GDP in 2010. Germany's rose to 7% from 6%. The UK and US ran large deficits over the decade, while Spain's deficit of 3.9% was converted into a surplus of 2%.

The impact of fiscal policy on global NIIP will become more exaggerated this year. The International Monetary Fund forecast in early April that the US was set to run the largest budget deficit among advanced economies. The scale of its borrowing compared with other countries is shown in Figure 5. The situation is changing, but it remains the case that borrowing by the US will outpace borrowing by most other economies, entrenching its position as the world's leading debtor economy.

Winners and losers

There is great uncertainty over how the economy will look during the second half of 2020. It is possible that the threat from the virus lingers, and households and businesses restrict spending while governments keep parts of the economy closed, leading to an economy with deflationary tendencies. It is also possible

that demand recovers faster than production, leading to higher inflation.

An inflationary macroeconomic environment tends to benefit holders of equities and punish holders of bonds, who may achieve higher interest rates on future investments but suffer capital losses and lower real earnings on their bond holdings. The

Country	NIIP, \$bn		NIIP, % of GDP		GPI top 750 ranking 2020		
	2019	2018	2019	2018	assets \$bn	% of top 750	No. of GPIs
US	-10,949	-9,555	-51%	-47%	8001	20.3%	206
Spain	-1,069	-1,106	-75%	-78%	86	0.2%	2
France	-660	-441	-24%	-16%	554	1.4%	6
Australia	-659	-719	-46%	-51%	921	2.3%	19
Brazil	-641	-594	-33%	-32%	557	1.4%	4
Mexico	-633	-591	-51%	-48%	411	1.0%	4

2. Largest debtors

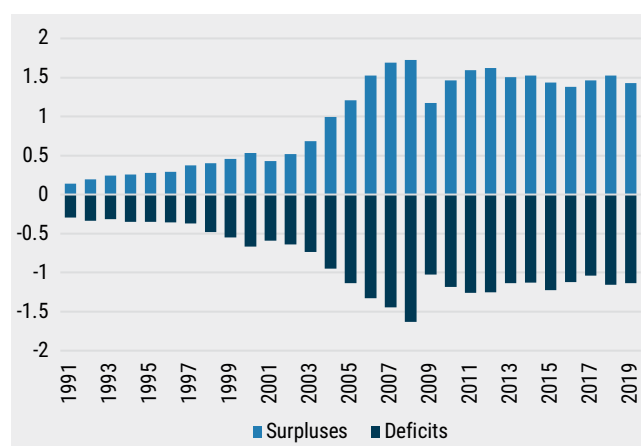
NIIPs, % of GDP, top six debtor economies
Source: IMF, OMFIF analysis

3. Global current account surpluses and deficits stable

Aggregate current account surpluses and deficits, \$tn

Source: IMF, OMFIF analysis

Note: Surpluses and deficits do not exactly balance due to deficiencies in data collection



Country	NIIP, \$bn		NIIP, % of GDP		GPI top 750 ranking 2020		
	2019	2018	2019	2018	assets \$bn	% of top 750	No. of GPIs
Japan	3,431	3,081	66%	62%	3,402	8.6%	8
Germany	2,546	2,374	64%	59%	374	0.9%	4
China	2,156	2,130	15%	16%	4,653	11.8%	3
Hong Kong	1,425	1,283	373%	353%	483	1.2%	3
Taiwan	1,281	1,281	213%	217%	649	1.6%	4
Norway	997	799	233%	184%	1,290	3.3%	4

4. Largest creditors

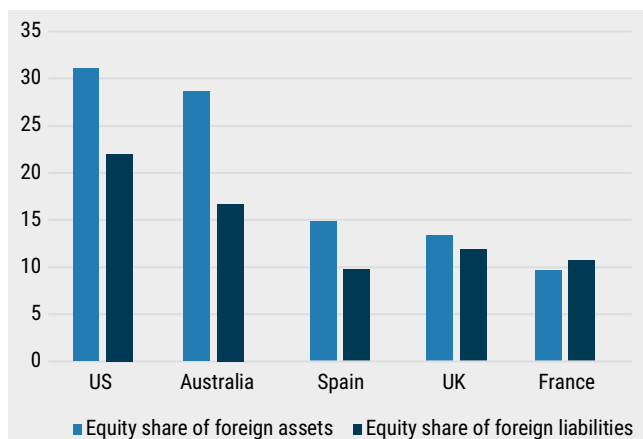
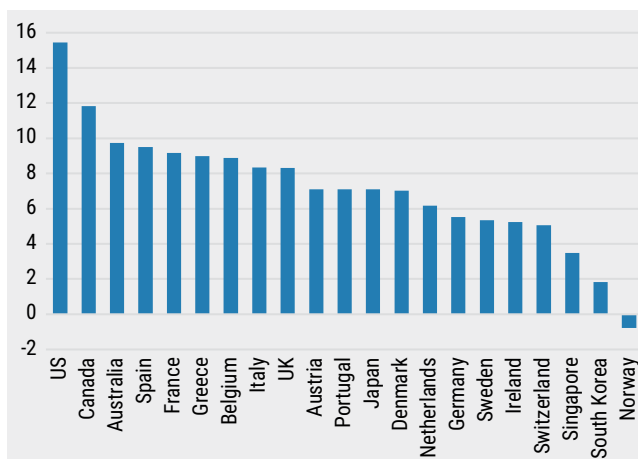
NIIPs, % of GDP, top six creditor economies
Source: IMF, OMFIF analysis

‘The rapid expansion of Canadian and Japanese banks into the US may well prove to be a huge form of insurance to them in the Covid-19 crisis.’

5. US projected to run largest 2020 advanced economy budget deficit

IMF projected 2020 budget deficits, % of GDP

Source: IMF, OMFIF analysis



6. Advanced economy debtors benefit from equity gains

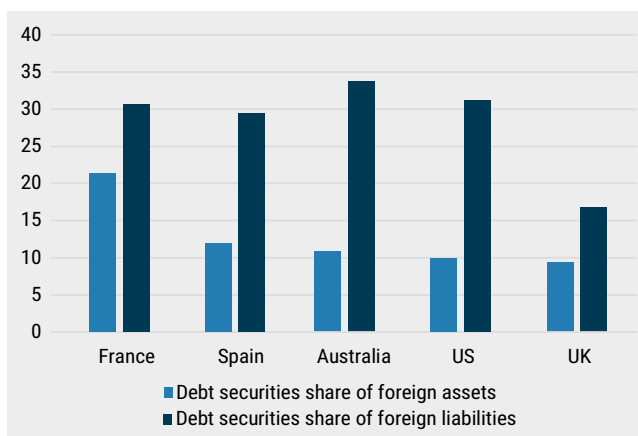
Equities, % of foreign assets and liabilities, 2019

Source: IMF, OMFIF analysis

7. Advance economy debtors gain from fixed income losses

Debt securities, % of foreign assets and liabilities, 2019

Source: IMF, OMFIF analysis



US would be well positioned in an inflationary environment. Its foreign assets are weighted more towards equities, which account for 31% of its assets and 22% on the liabilities side. Debt securities make up only 10% of foreign assets compared with 31% of foreign liabilities. Australia has a similar composition; 29% of its foreign assets are equities compared with just 17% on the liabilities side. Debt securities make up 11% of assets and 34% of liabilities.

The main debtor countries all have one thing in common – their exposure to fixed income on the liabilities side far outweighs their exposure on the assets side (Figure 7). The exception is Ireland. Its balance of payments data are distorted by the tax arrangements of multinational companies, clouding the underlying macroeconomic and financial picture.

For most advanced debtor economies, equities take up a higher share of foreign assets than foreign liabilities, though there are exceptions to the rule, such as France, which has a low share of equities in its foreign assets.

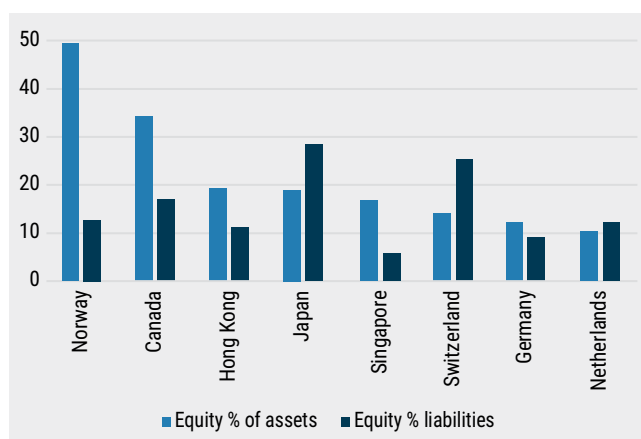
Winners from price changes imply losers on the other side. Advanced economy creditor countries tend to be weighted towards fixed income on their foreign assets compared with their foreign liabilities. There are some outliers. Canada has a higher proportion of debt securities in its liabilities than assets, as does the Netherlands. China too is heavily exposed, though through its foreign exchange reserves rather than portfolio investment. Foreign reserve assets typically play a larger role in the NIIPs of emerging economies, where reserve assets safeguard fixed or pegged exchange rate regimes.

The breakdowns of assets and liabilities give an idea of which countries are set to gain or lose from unexpected changes in the world economy. A more inflationary world economy will benefit the main debtor economies. A deflationary one will tend to benefit the creditors – at least from a short-term balance sheet perspective. An inflationary world

8. Advanced economy creditors have mixed exposures to equities

Equities, % of foreign assets and liabilities, 2019

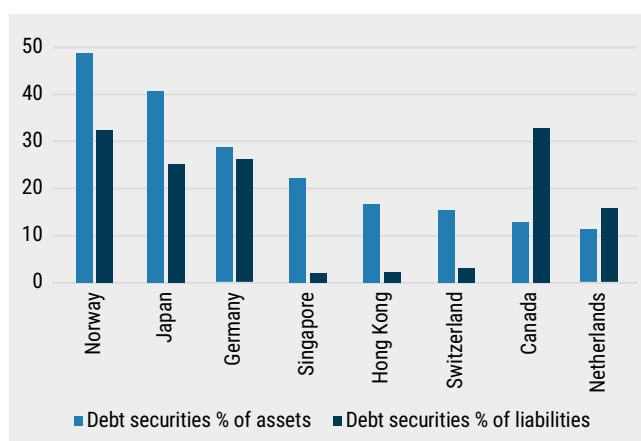
Source: IMF, OMFIF analysis



9. Creditors weighted more towards fixed income

Debt securities, % of foreign assets and liabilities, 2019

Source: IMF, OMFIF analysis



economy will hit private and public sector balance sheets in creditor nations. Debtor economies would benefit from a lower real private and public sector debt burden and stronger balance sheets overall.

No retrenchment in Japan or Canada

The 2008 financial crisis and following regulatory changes caused banks across Europe to retrench, reeling in their cross-border business. Global business by European banks has not improved much overall over the last decade, only rising by a small amount in 2016-19 (Figure 9). The situation in the US has been somewhat better. Figure 6 shows end-year data, which slightly mask a strong 2019 average figure of \$3.5tn. US banks have moved in where European banks have moved out, gaining market share across Europe.

While US banks expanded into

Europe, Canadian and Japanese banks expanded into the US. They have rapidly increased their cross-border investments over the past decade. Canadian banks' foreign claims have increased more than five-fold, and Japanese banks' more than three-fold. Most of this investment has gone into US assets, with banks tempted by higher net interest margins than in their home markets.

The rapid expansion of Canadian and Japanese banks into the US may well prove to be a huge form of insurance to them in the Covid-19 crisis. Canadian banks will be partly protected from the weakness in the Canadian economy that results from the crash in oil prices. Japanese banks will be somewhat shielded from worse domestic performance as a slowdown in global demand hinders the performance of export-oriented domestic businesses.

These financial linkages could

31%

Equities account for 31% of the US' foreign assets and 22% of its liabilities

spill over into geopolitics, affecting the relationship between the US and Europe, and among Canada, Japan and the US. The Bank of Japan and European Central Bank have been heavy users of the Federal Reserve's dollar swap lines, use of which has been insulated from geopolitics thus far.

Target-2 returns

A separate issue may return to the fore in the euro area. A significant slice of some euro area NIIPs are Target-2 balances; the overdraft for national central banks embedded in the Eurosystem's payments infrastructure. The Bundesbank's balance has risen to almost €1tn and is likely to climb further in response to the latest rounds of asset purchases. This is because national central banks buy their own government bonds, but not always locally. For example, the Banca d'Italia may buy an Italian bond from a German investor or an international investor that keeps its main euro accounts with a bank in Frankfurt, which widens the Target-2 imbalances.

The imbalances will probably persist until there is some reversal of payments flows – Germany must start buying more from Italy and Spain than vice versa. This looks a long way off. One indicator of competitiveness, real effective exchange rates based on unit labour costs, shows that the loss of competitiveness in southern Europe that occurred over the 2000s has been largely reversed in Spain, but persists in Italy.

While the numbers involved are significant, they are not a

major problem economically. The Bundesbank has created bank reserves against an asset (claims against the Eurosystem) which produces no interest. Target-2 balances pay out or charge interest at the ECB's main refinancing rate, currently 0%. It could potentially have bought some other asset, though bunds have not yielded more.

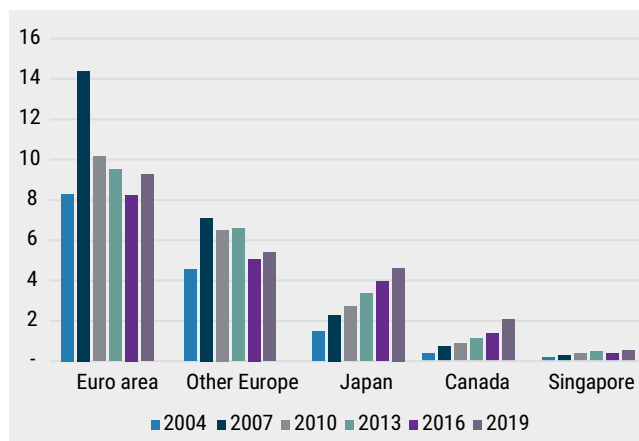
If Italy were to exit the euro area and default on its Target-2 balance, its unpaid Target-2 liabilities would be more of a political and legal problem than an economic one. The Eurosystem would become technically insolvent, but this is not a major issue. Central banks are not profit-maximising institutions with shareholders chasing returns. Having negative equity is only a minor hindrance to their operations. Governments can shore up their central banks easily in principle by gifting them government bonds. As most central banks are typically owned by their governments, this

€1tn

The Bundesbank's Target-2 balance has risen to almost €1tn

is just an accounting exercise. However, euro area finance ministries face greater restrictions in their transactions with their central banks than in other jurisdictions. A simple accounting exercise may be difficult in practice. Target-2's economic problems are solvable. If a default occurs, it is the legal and political hurdles that will require the most attention. •

'If Italy were to exit the euro area and default on its Target-2 balance, its unpaid Target-2 liabilities would be more of a political and legal problem than an economic one.'



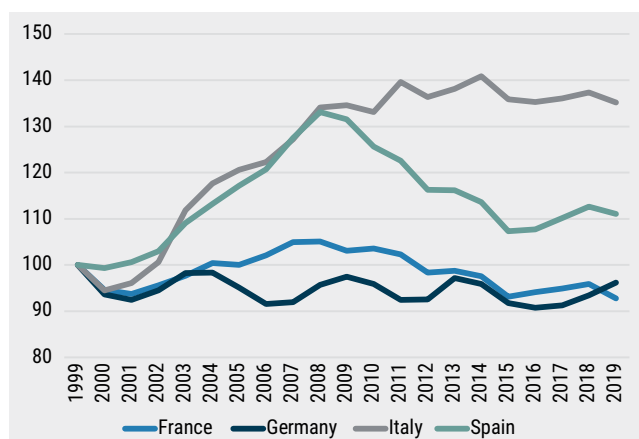
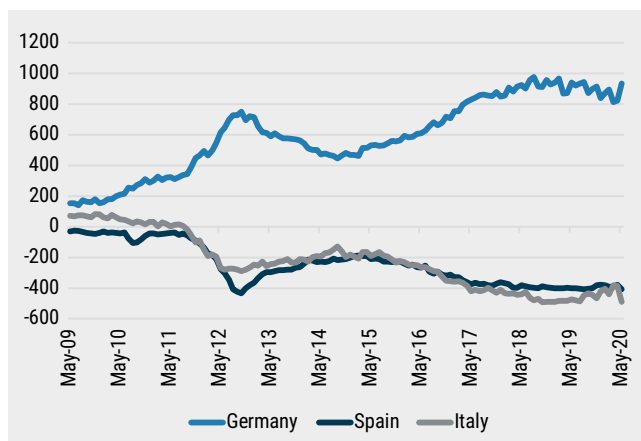
10. Canadian and Japanese banks ramp up cross-border business

Banks' foreign claims by nationality of bank, \$tn

Source: BIS, OMFIF analysis

11. Target-2 imbalances resume widening

Target-2 balances, \$bn
Source: ECB, OMFIF analysis



12. Italian labour costs remain overvalued

Real effective exchange rates, unit labour costs, 1999=100

Source: Eurostat, OMFIF analysis

Breakdown of NIIPs

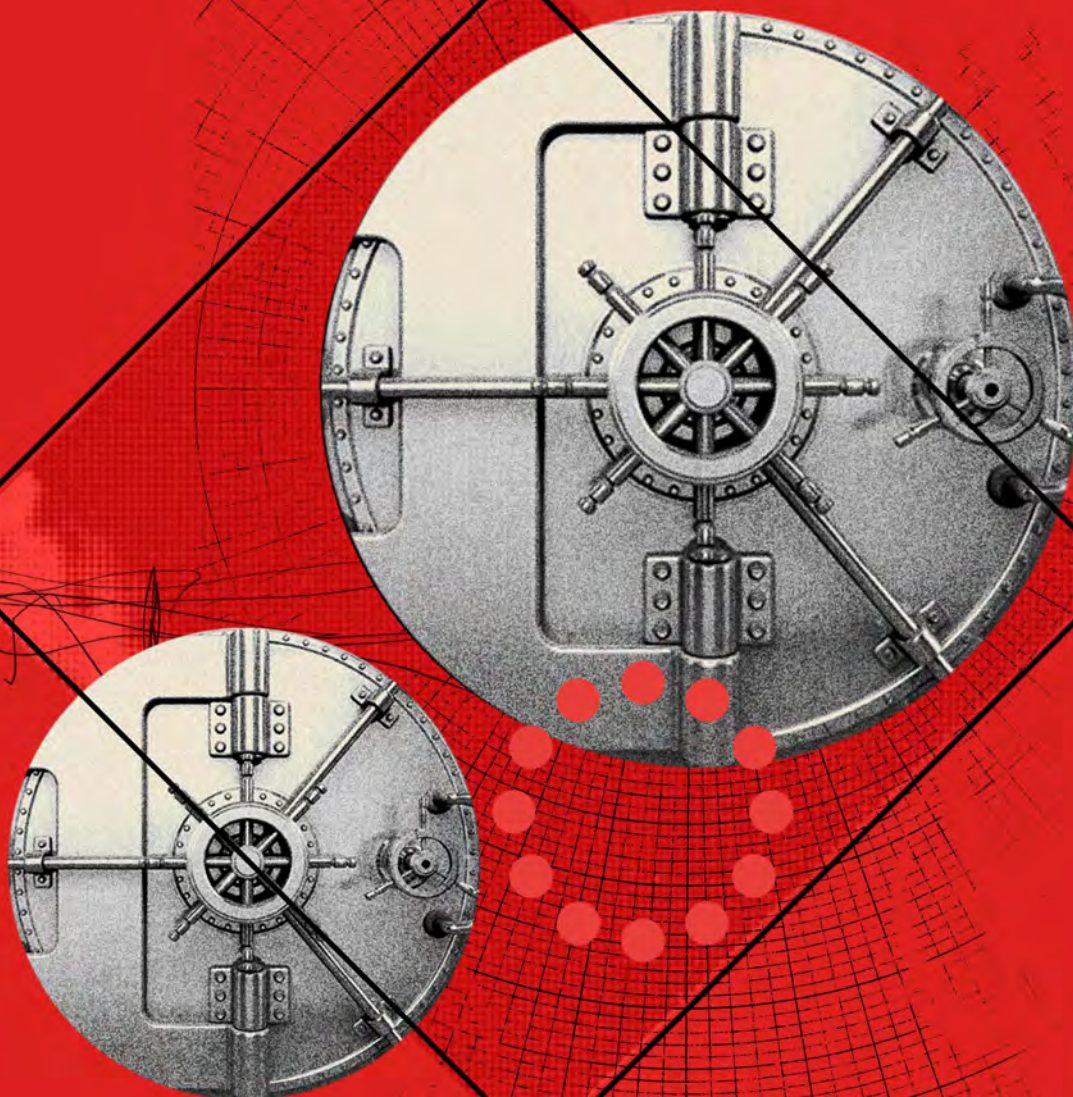
Top 25 economies by sum of foreign assets and liabilities, 2019

Source: IMF, OMFIF analysis

			Assets, \$bn					Liabilities, \$bn				Total foreign assets and liabilities, % of GDP
	Total foreign assets, \$tn	Total foreign liabilities, \$tn	FDI	Portfolio - equity	Portfolio - debt securities	Loans and other	Foreign reserve assets	FDI	Portfolio - equity	Portfolio - debt securities	Loans and other	
US	28.3	39.2	8,368	8,782	3,863	4,665	505	9,919	8,632	12,236	6,375	316
UK	14.9	15.4	2,231	1,997	1,441	5,655	159	2,344	1,832	2,583	5,320	1,070
Luxembourg	12.4	12.3	5,483	2,408	2,657	1,649	1	4,705	5,047	1,224	1,205	35,544
Netherlands	10.1	9.4	6,075	1,037	1,065	1,343	42	4,926	1,138	1,483	1,323	2,133
Germany	10.5	7.9	2,457	1,287	2,279	3,407	220	1,719	724	2,078	2,533	464
France	8.6	9.2	1,886	832	1,967	2,757	185	1,237	997	2,830	3,140	645
Japan	10.1	6.7	1,903	1,916	2,709	1,947	1,323	320	1,902	1,688	2,467	324
Ireland	6.8	7.5	1,641	1,408	2,172	1,448	5	1,692	3,540	534	1,537	3,744
China	7.5	5.3	1,970	319	266	1,702	3,204	2,777	747	474	1,302	90
Switzerland	5.3	4.3	1,898	739	673	1,014	838	1,765	1,106	136	1,238	1,359
Hong Kong	5.4	4.0	1,967	1,050	662	1,197	439	2,066	445	93	1,291	2,466
Canada	4.4	3.7	1,712	1,516	467	650	85	1,097	624	1,198	740	465
Singapore	4.0	3.1	1,060	678	696	1,246	273	1,544	181	62	1,254	1,923
Italy	3.2	3.3	664	1,002	638	628	171	543	282	1,185	1,093	319
Spain	2.4	3.4	751	351	409	655	74	892	337	1,010	1,055	405
Australia	2.0	2.7	571	576	290	309	53	726	446	901	376	330
Belgium	2.4	2.1	995	435	392	515	29	905	235	481	495	848
Sweden	1.6	1.5	503	508	142	343	57	441	275	417	305	568
South Korea	1.7	1.2	440	345	227	249	408	239	498	244	189	175
Norway	1.9	0.9	252	935	436	202	67	200	114	288	291	652
Russia	1.5	1.1	473	8	69	369	531	550	187	82	249	157
Denmark	1.2	1.0	277	331	209	192	67	178	248	262	178	624
Austria	1.0	1.0	341	145	208	303	25	306	66	359	257	440
Finland	0.9	0.9	180	222	148	291	11	126	155	293	275	674
Saudi Arabia	1.1	0.5	114	202	75	244	501	234	49	72	109	210

2 Frameworks for reserves management

The past decade saw central bank foreign exchange reserves continue to rise. In spite of this overarching trend, however, reserves management practices have diversified. Specifically, this section looks at the new role of sovereign funds. As asset owners and potential debt issuers, they play an important part in foreign exchange management.



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Chapter 4

Central bank – sovereign fund co-operation

‘Reinventing borrowing and investing in the post-Covid era’



The economic shocks of the past decade provide an opportunity to rethink, redesign and reposition the role and management of sovereign funds, writes Udaibir Das, assistant director and regional adviser, monetary and capital markets department, International Monetary Fund.

A state is an influential borrower and investor in the global financial system. Its stature stems from its important public policy responsibility: it is a custodian and manager of state-owned financial liabilities and assets. The 2008 financial crisis and the Covid-19 pandemic have reinforced the importance of this responsibility, reminding sovereign fund managers that they must help strengthen countries’ resilience, protecting against downside risks and abrupt market disruptions.

A key element is how funds approach this responsibility. Sovereigns’ risk tolerance and time horizon differ vastly, as does their ability to find an optimal risk-return metric or robust models for funding, liability and asset management. Proper integration between their economic policy framework and their balance sheet structure is a constant concern, requiring continuous adjustments and evaluation of sustainability considerations.

The aftermath of both the 2008 crisis and the pandemic presented a severe stress test for every government’s balance sheet. For sovereign investors that typically operate with explicit or implicit liability considerations, the context has proven even more challenging.

To prevent short-run sociopolitical and fiscal considerations from dominating sovereigns’ longer term goals of financial management and good governance, there are calls to allow funds to independently manage intergenerational savings.

More than any ordinary institutional investor, a sovereign fund has to carefully weigh its strategies across various investment horizons and evaluate the possible outcomes mindful of its policy goals. After the 2008 and Covid-19 shocks, the balance of returns and risks is likely to have shifted permanently, and each fund will need to be more conscious about liquidity needs and its ability to

meet capital commitments.

Thus, funds face two challenges in managing their financial assets: how best to configure dynamic and longer term strategic asset allocation priorities, and how to be candidly accountable for lower levels of risk-adjusted returns, volatility, and prospective erosion of wealth. Some funds have been reinventing themselves to succeed for the long term. They have been actively adjusting their institutional and governance framework alongside more effective ways to manage duration, maturity, credit, liquidity and leverage risks. Nevertheless, although assets could serve any economic

purpose, evaluating the associated costs, benefits and policy trade-offs is becoming even harder.

Sovereign debt management is the other side of the coin. The more aligned the SDM and the sovereign’s asset or wealth management functions are, the stronger its financial readiness to deal with the unforeseen. An appropriate SDM helps reduce any abrupt recourse to financial assets for servicing liabilities and domestic financing, especially where the foreign currency component of liabilities is large.

Several sovereigns have demonstrated that strengthening the overall SDM function pays off over the long run. The traditional focus on simply financing current cash flow

needs is shifting to proactively structuring sovereign debt to minimise costs subject to risk constraints, determining currency composition and maturity profile, along with the adequate size and liquidity of liabilities. Disjointed sovereign asset and SDM functions can negatively impact the balance of payments and impede sovereign access to financial buffers. Where held in less liquid or more risky assets, buffers can only be sold at a substantial discount or with considerable delay. Some countries use their reserves with their central banks, draw down on foreign currency swap lines, or use liquid

‘As the 2008 and 2020 shocks expose ever-growing economic and social fault lines, investors need to contribute to mending those schisms by encouraging greater social responsibility from their portfolio companies.’

assets in their sovereign funds. Others use their exchange rate and investment regimes. A further option is external borrowing to accumulate financial assets and build up buffers.

Metamorphosis

It will take a while to assess the combined long-term net financial impact of the two shocks on sovereign balance sheets. Some studies suggest that sovereign asset managers have so far fairly successfully handled recent market volatility. Funds seem to have faced few issues with meeting their liquidity requirements, including making good on their capital commitments. They appear to be maintaining their discipline with respect to rebalancing portfolios towards their strategic allocations, thereby serving as a stabilising countercyclical force during times of high asset price volatility. Several sovereigns have been able to raise funds on international capital markets, although they did so by paying a higher risk premium.

From a policy imperative viewpoint, a transmogrification could happen. Sovereign wealth, particularly the liquid portion, could be more actively called upon as a reserve and balance-of-payment complement to counter adverse macroeconomic conditions and uncertainty. Sovereign funds geared to commodity price stabilisation may need to disburse more cash when commodity prices weaken and may need to support their countries' balance of payments even when they have no explicit function to do so. Some sovereign held assets may provide liquidity for domestic stabilisation or preserving financial stability.

Sovereign fund managers must adopt a more holistic mindset than a typical institutional investor – an approach that preserves wealth, helps foster sustainable living standards and keeps a focus on environmental, social and governance issues. Climate change and technology are causing rapid shifts in financial dynamics. Much could be done in this regard to fully maximise the impact of asset management practices.

As the two shocks expose economic and social fault lines across and within countries, investors need to contribute to mending those schisms by encouraging greater social responsibility from their portfolio companies. That would entail giving a greater weight to entities that are more focused on,

among other things, protecting and developing their human capital. As they invest in the wellbeing of future generations, sovereigns have a clear interest in championing responsible corporate behaviour and promoting it through their investments.

Financial assets are only one part of a country's defences against shocks. A broader approach could help, such as by including swap lines, sovereign funds, contingent financial assets 'below the ground', assets with multilateral institutions, and portfolio reprofiling techniques. A more complete approach would incorporate elements to enhance a sovereign's resilience by including sustainable levels of sovereign debt and liabilities and choice of investment instruments, and an integrated approach to monetary, exchange rate and macroprudential policies. Effective financial system supervision that has the 'will and the ability' to pre-emptively limit any imprudent build-up of contingent risks in the non-financial and financial sectors would also be important.

This approach will allow for the operational independence and flexibility that sovereign liability and asset managers need to focus on their core objectives. While a strong macroeconomic policy

framework is the most direct path to limiting risks to a sovereign balance sheet, asset and liability management outlook could be used to coordinate the risk profile of sovereign assets and sovereign debt and liabilities.

Many countries do take ad hoc ALM considerations into account. Only a few recognise it as a policy tool that could help reduce systemic risks and vulnerabilities.

Finally, the institutional quality of those who manage the sovereign balance sheet – their judgement, agility, and responsiveness – will always remain a key determinant in pursuing such an approach. A growing body of

empirical evidence shows that a country with a higher percentile of institutional quality distribution would have, all else being equal, a lower current account balance. Sovereigns face a confluence of challenging factors that will affect their long-run risk preferences, modelling approaches, and governance.

The 2008 and 2020 global shocks should be seen as an opportunity to adopt more far-sighted ways of managing sovereign wealth and liabilities. This provides the key to ensuring security for future generations while upholding public policy responsibility. •

'Sovereign fund assets, particularly the liquid portion, could be more actively called upon as a reserve and balance-of-payment complement to counter macroeconomic uncertainty.'



Navigating national wealth management

Central banks and sovereign funds are closely interlinked, though how these relationships function, both officially and in practice, varies across jurisdictions, write Danae Kyriakopoulou and Pierre Ortlieb.

IN the inaugural edition of the *Global Public Investor* in 2014, we defined ‘commonality of purpose and practice’ as one of the principles guiding performance and behaviour in this investor community. We argued that this applies across the dividing lines of the three institutional groups as well as within the categories themselves. Today, the interlinkages between the types of institutions making up the GPI community are even stronger. This chapter focuses on central banks and sovereign funds, exploring the evolution of their relationships to governments and to each other. In the sections that follow we investigate models of co-operation and competition between these two types of actors across different jurisdictions when it comes to the fungibility of reserves, their crisis response mechanisms, transparency

and accountability, and investment strategies.

Sketching the legal and institutional landscape

Two broad categories of legal relationships define a fund’s status vis-à-vis the corresponding central bank: the ‘manager’ model and the ‘investment company’ model, defined by the degree of independent legal identity held by the fund.

In the ‘manager’ model, the sovereign fund manages a pool of assets owned by the central bank (or the state) without a separate legal identity. Rather, the legal owner of the assets gives an investment mandate to an asset manager (in this case the sovereign fund) to meet a certain investment or other target. The legally attached asset manager can be either internal or external to the

central bank or ministry of finance.

Norges Bank Investment Management, for example, is best described as an internal asset manager governed by its parent central bank, Norges Bank. Its board consists of central bank staff who appoint senior management, such as the chief executive, giving the monetary authority a supervisory but not executive capacity in the fund’s strategy. Other examples include the sovereign funds of Colombia and Botswana.

Singapore’s Government Investment Corporation can be considered an external asset manager – the central bank or ministry of finance has given a mandate directly to an external fund manager that it has set up, although, per the International Monetary Fund, the government remains the ‘legal owner

of the pool of assets constituting the sovereign fund'. The manager in this case may also hold mandates from other institutions, such as the ministry of finance. GIC, for instance, manages part of the reserves of the Monetary Authority of Singapore. Note that despite its treatment as an asset manager, GIC is a separate legal entity which has nonetheless been given a non-ownership mandate by the central bank (via its client, the government of Singapore).

Figure 1 (on p.64) presents the legal and financial relationships between central banks and sovereign funds. Overall, the general trend since the turn of the millennium has been for sovereign funds to move in a south-western direction along this figure – that is, to become more independent and diversified, distancing themselves from central banks along both axes.

The way the relationship with the central bank is governed has important implications for the fund's institutional set-up. A fund like GIC, which is legally independent of the central bank and government, but manages its assets as a public investor, will typically have clear differentiation between owner, board, and operational management of the fund. Meanwhile, internal asset managers will usually have their operational independence enshrined within a clear legal framework, while also requiring clarity on the decision-making and oversight role of the central bank within which they are housed.

The 'investment company' model contains a clear transfer of ownership away from the central bank or ministry of finance and to the sovereign fund itself. The fund will exist as an entirely separate legal entity and manage assets on its own behalf. Funds such as Australia's Future Fund and New Zealand's Superannuation Fund would fall into this category, as do those parts of GIC outside of the central bank reserves. These funds' governance structure will similarly provide clear distinctions between ownership, board, and management. Given that

these legally and institutionally separate funds tend to have more complex strategic asset allocations, it is important that their governance reflects this – complex assets require more sophisticated risk management.

Even these formally separate relationships are not always clear-cut. The Banca d'Italia is a minority shareholder in Cassa di Risparmio di Roma, for example, while the People's Bank of China is the formal holder of the debt issued to finance the establishment of China Investment Corporation. In both of these cases, there is a non-trivial relationship with the central bank with potential investment and policy implications that adds nuance to the legal status.

This spectrum of options highlights the institutional and legal complexity of the relationship between a central bank and sovereign fund. They can range from entirely distinct with independent, complex governance structures to fully housed within the central bank. In either case, the fund may be tasked with managing its central bank's reserves. The Hong Kong Monetary Authority's Exchange Fund is based within the central bank but manages the reserves separately, as it was established to optimise management of Hong Kong's growing pile of foreign currency liquidity. Other funds, such as GIC, are legally distant from the central bank but tasked nonetheless with managing foreign exchange reserves. Meanwhile, a fund borne out of resource wealth may be entirely separate from the central bank given its potential role as a budgetary stabiliser. At the same time, some, such as Timor-Leste's Petroleum Fund or Norway's Government Pension Fund Global, are housed within the central bank. There is a range of possible constellations that do not clearly depend on either the ultimate source of wealth or the purpose of the fund. The National Bank of Kazakhstan houses the Kazakh National Fund, which is typically considered both a 'stabiliser' and a national long-term savings pool. The

“

A partnership for the long haul

David Park, chief investment officer, Korea Investment Corporation

VARYING estimates put the number of sovereign funds globally between 70-125, depending on definition – and no two are alike. They are all owned by their respective government but differ in terms of funding source, functions, goals and relationship with their central bank.

At Korea Investment Corporation, we manage assets entrusted by the Korean government and Bank of Korea to increase sovereign wealth and contribute to the development of Korea's finance industry.

Our relationship with the BOK is that of sponsor and trustee. The BOK entrusts KIC with foreign reserves, equipping us with funds we need to invest, generate returns on and build sovereign wealth with. The BOK, in turn, benefits from KIC's global investment capabilities.

The president of the BOK is a member of KIC's steering committee. We value the BOK's long-held management knowhow – and we also value our operational independence. Our bylaws stipulate that the asset trust contract between KIC and the BOK may not include any restrictions on KIC's asset management, but that it can include restrictions on investment instruments.

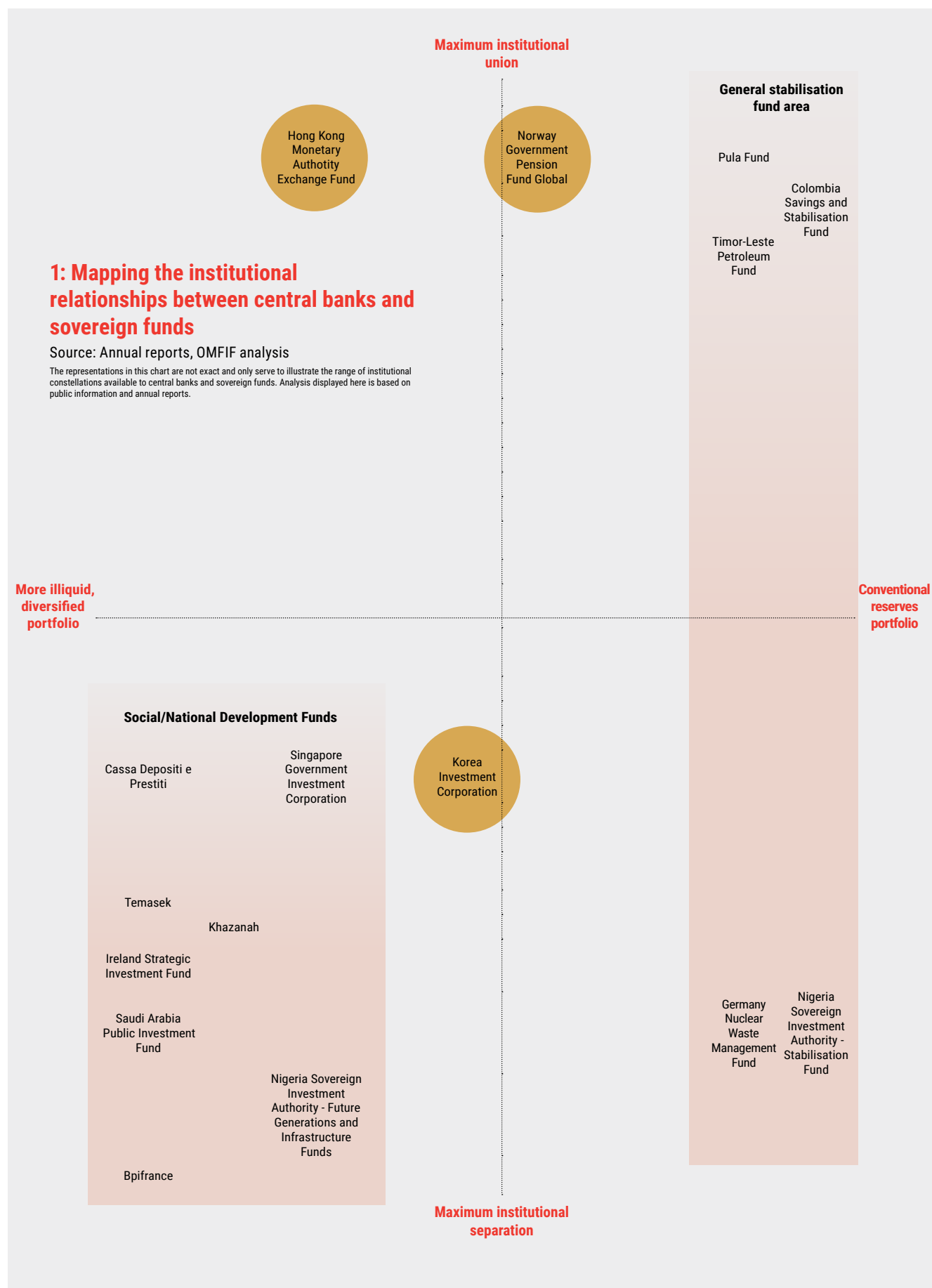
Over the past 15 years, the KIC-BOK relationship has evolved from that of sponsor and trustee into a unique and meaningful partnership, one that will continue to pursue mutual development while preserving KIC's asset management independence. •

”

1: Mapping the institutional relationships between central banks and sovereign funds

Source: Annual reports, OMFIF analysis

The representations in this chart are not exact and only serve to illustrate the range of institutional constellations available to central banks and sovereign funds. Analysis displayed here is based on public information and annual reports.



range of options is broad.

The question of transfers – of reserves, budgetary stabilisation funds, or otherwise – needs to be spelled out clearly in the context of the legal identity of the fund. The legal separation of ownership does not totally clarify this issue, as transfers may still be required as part of a mandate given by the ministry of finance. This is why the contiguity between central bank and sovereign fund is best regarded as a spectrum rather than a series of options.

Competing investment forces

The institutional framework and legal status of central banks and sovereign funds in each jurisdiction will determine the similarities and differences in their respective investment strategies. These can be complementary, distinct, or conflicting. The range of investment strategies available to sovereign funds is a product of national context, mandate, and global investment conditions. Yet the distinctive features of each fund will place them in a particular relationship with domestic monetary and fiscal institutions.

Starting by looking at mandates, stabilisation funds created for the purpose of, say, smoothing an oil price shock typically invest in highly liquid assets such as government bonds, so that they can respond quickly to any unforeseen, exogenous developments. The asset allocation of funds of this type will overlap significantly with that of the accompanying central bank seeking to build up foreign exchange buffers, which are equally held in highly liquid securities.

‘Savings’ or ‘reserve’ funds seek to transform resource wealth into more permanent sources of income, for instance by more aggressively avoiding the onset of ‘Dutch disease’, the tendency for commodity-exporting countries to suffer harmful exchange rate appreciation which arrests domestic economic development. Typically, they will stray further from the conservative, liquid strategies of stabilisation funds, given

10x

The wider set of foreign assets of oil exporters such as Canada, Norway, Kuwait and the UAE is more than 10 times that of their central bank reserves alone

their long-term investment horizons and the absence of any immediate need for fiscal transfers. Their greater risk tolerance is reflected in the high allocation of funds such as NBIM to listed equities, which is one step further away from central bank reserves than stabilisation funds. At the same time, funds carved out of the ‘liquidity tranches’ of foreign exchange reserves, such as HKMA’s Exchange Fund, tend similarly to exhibit higher levels of risk tolerance, with a greater allocation to unconventional asset classes.

This variety of funds extends to the far end of the ‘risk tolerance’ spectrum where the investment strategy is entirely dissimilar to that of the local central bank. For instance, Saudi Arabia’s Public Investment Fund holds a significant allocation to private equity. HKMA’s Exchange Fund, which is housed within the central bank, holds a significant private market allocation, showing the range of options available.

Measuring external resilience

Mapping out these relationships can lead to rethinking ways of assessing exchange rate management and external resilience.

Conventional assessments of countries’ financial strength and vulnerability to external shocks mostly focus on high-level measures of their assets and liabilities: the value of foreign exchange reserves held at the central bank and the levels of public debt. The degree of financial openness is also usually considered.

But such measures do not tell the full story.

On the liabilities side, the modalities of the debt matter: whether the debt is owed to domestic or foreign creditors, to the private or official sector, what interest it carries, when it is due, and how quickly the burden grows compared to the size of the economy.

Most importantly, however, the asset side is deeply misunderstood. Central bank foreign exchange reserves tend to be the first port of call at times of crisis to stabilise portfolio outflows and defend the value of the currency under a floating exchange rate regime. Yet they are not the only source of external liquidity available. In jurisdictions with sovereign funds, their size and legal framework for the use of assets will be an important criterion in determining external resilience. Similarly, there are examples where the foreign assets held in institutional investors’ portfolios have been used at times of vulnerability.

The differences can be stark. Looking at just central bank reserves for a selection of emerging markets would suggest weakness in the position of economies such as South Africa and Malaysia, whose central bank reserves stand at \$52bn and \$104bn respectively. But including the foreign asset share of their pension and sovereign funds increases their total considerably, and in the case of Malaysia more than doubles it. The wider set of foreign assets for Denmark and Singapore, or for oil exporters such as Canada and Norway, is, similarly, many times that of their central bank reserves alone (Figure 2).

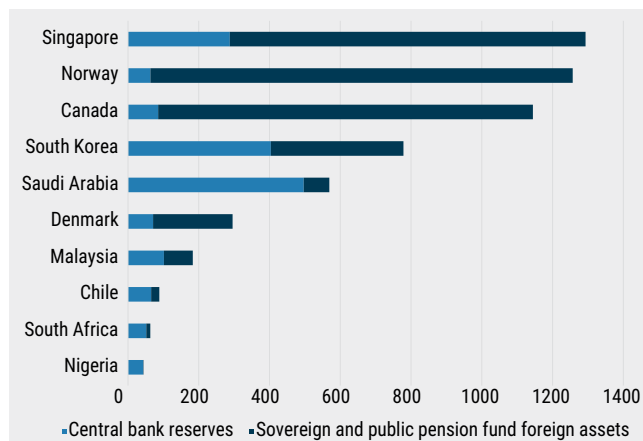
Use of reserves for stabilisation purposes

Considering the totality of foreign assets as opposed to merely central bank reserves will be appropriate in some cases but not in others. The set of institutional and legal frameworks that govern the usability of these assets is an important variable. The origins and purposes of different types of sovereign funds are crucial

2: Potential reserve assets outside the central bank

Central bank reserves, \$bn, and estimates of foreign assets of sovereign and public pension funds where applicable, \$bn

Source: OMFIF GPI 2020; annual reports; Fitch ratings; fund websites, OMFIF analysis



* In some cases, estimates use currency exposure as a proxy for foreign assets. For two small pension funds, we applied a weighted average of other, similar pension funds' foreign assets to the fund's assets. Generally, figures refer to end 2019; in a handful of cases, disclosures were only available for end 2018 or mid 2019.

factors. These often relate to their origins and purposes. Commodity funds are more likely to be used as a stabilisation fund, compared with special investment funds and future generations funds that may not have as favourable frameworks to enable them to be used as intervention liquidity.

This will be possible only for the portion of the fund's liquidity that is allocated to foreign currency assets. Holdings of domestic telecommunications firms, for example, will be of little use in serving as an exchange rate buffer.

The covert use of sovereign wealth (or even pension fund wealth) as a tool for exchange rate management has become increasingly common. For instance, Japan's Government Pension Investment Fund, with more than \$1.6tn in assets, earlier in 2020 was reported to be indirectly assisting the ministry of finance and Bank of Japan in currency management by raising its allocation to foreign fixed income assets, dampening upward pressure on the yen. The GPIF is a moderately conservative investor, with significant allocations to foreign equities and bonds as well as domestic Japanese securities. Yet it is clear that it holds an important role in currency management alongside the BoJ, despite the absence of any direct formal relationship between the two institutions. As a result, investors need to consider the consolidated sovereign balance

'In recent years, global investment conditions have started playing a greater role in determining the overlap between sovereign funds' investment strategies and their respective central banks.'

sheet when thinking about the total assets available for foreign exchange management.

Crisis action

The Covid-19 crisis has prompted further similar actions (See table on p.71). In mid-April, the Nigerian government drew \$150m from the Nigeria Sovereign Investment Authority to defend the naira in the face of the global oil price collapse. Similarly dependent on oil, Azerbaijan mobilised its State Oil Fund assets to protect the currency in the face of downward pressure. In April, Sofaz assets recorded a \$2bn decline, which were reported to have been foreign exchange sales to help stabilise the manat against the backdrop of oil market-related volatility.

In some cases, the use of public investment institutions' assets has taken a more indirect form. For example, in mid-March, the Philippine finance minister ordered

public pension funds to support the domestic stock market that was under pressure from the wider Covid-19 global shock, by increasing their daily investments in domestic stocks. This intervention is different to outright use of foreign assets of the pension funds for stabilisation purposes. But it still presents a case where a national public investment institution is asked to shift its portfolio allocation from foreign to domestic assets as part of crisis response.

Risks to entanglements

While such practices can be necessary and helpful at times of crisis, these cross-institutional entanglements can bring significant risks. These may appear secondary considerations when the focus is on crisis management, but over the long run they can produce serious inefficiencies and conflict.

In recent years, global investment conditions have started playing a greater role in determining the overlap between sovereign funds' investment strategies and their respective central banks. Traditionally, central banks have invested their exchange reserves in liquid, safe, foreign currency assets. Meanwhile, sovereign funds have been growing in sway as asset owners, ballooning in number and AUM. This growth, combined with the global savings glut and a perceived shortage of safe assets, has directly affected investment strategies and may cause tension between the two types of institutions.

Central banks have responded to the conditions created by their unconventional monetary policies and resulting low yields on traditional assets, such as government bonds, by increasingly diversifying into riskier asset classes, such as equities. Even within the liquid government bond market, they may have felt subject to competition from the presence of sovereign stabilisation funds.

Meanwhile, sovereign funds may have believed that central banks were encroaching on their typical territory by seeking out deals in corporate bond and public equity markets.

In some instances, coordination between the central bank and sovereign fund has taken a direct form, explicitly acknowledging the need to take advantage of sovereign funds' expertise and legal frameworks for investing in more sophisticated assets. For example, in April the Saudi Arabian Monetary Authority transferred \$40bn from its foreign reserves to the Public Investment Fund to provide dollar liquidity and enable the sovereign fund to invest more aggressively overseas.

At the same time, the consolidated balance sheet view brings about new responsibilities for the central bank and, more pointedly, the sovereign or public pension fund. For example, if the total balance sheet should be regarded as potential intervention liquidity, it is essential that the exposure of the total reserves portfolio is allocated efficiently.

Optimising balance sheets

This is especially important at times of low global yields on traditional reserve assets. Stabilisation funds are more often prominent in countries with low central bank reserves, and thus their allocation to liquid assets is responsible and even required. Yet in the case of the PBoC, which holds a large volume of reserves, excessively similar asset allocations between the central bank and China Investment Corporation would result in significant foregone earnings. Optimising public sector balance sheets in currency and asset terms is crucial. As such, it is important that the degree of fungibility of reserves is spelled out clearly and coordination strategies are considered carefully.

Uncoordinated transfers can significantly damage a sovereign fund's international credibility as an institutional investor. It may produce the perception that the fund is a politicised agent, and jeopardise its ability to access certain asset classes beyond its borders. This is more urgent for large, formally independent institutions with significant global holdings. Spelling out the rules for fungibility and fiscal transfers, and

\$150m

In mid-April, the Nigerian government drew \$150m from the Nigerian Sovereign Investment Authority to defend the naira in the face of the global oil price collapse

explicitly delineating the liabilities of the sovereign fund is essential to ensuring stable relationships between central banks and sovereign funds regardless of their legal relationship.

Policy implications and safeguarding against entanglement risks

There is evident potential for conflict between the roles and strategies of different types of sovereign investment institutions.

In considering how to safeguard against entanglement risks, it is not clear that legal proximity to the central bank has any consistent impact on the strategic allocation of a sovereign fund. Rather, mapping out the sovereign funds based on their institutional status and investment similarity suggests that transparency, governance, and institutional design are more important in achieving credibility and efficiency in the investment process. Funds that are legally distinct from the central bank can have both very similar investment strategies and very different ones, yet in either case their standing as a credible institutional investor can be tarred by politicisation and poor governance. A fund like NBIM, housed within its parent central bank yet maintaining an increasingly diversified asset allocation, is a more credible institution. Its investment mandate, governance structure, and supervisory mechanisms are well-designed, producing a consistently stable risk tolerance. This latter factor

is an important variable in allowing a fund to credibly diversify on a global scale.

New sovereign funds established over the past 20 years have tended to situate themselves at arm's length from parent institutions and pursue greater risk-taking, understandably given the continued low yield on government bonds. Yet the case for coordination is clearer than ever. The consolidated sovereign balance sheet remains important for currency intervention and stability, and optimising it holistically should be a key task for central bank and sovereign fund staff. Conceptually, situating sovereign funds in the middle of these extremes – where they are not too distant to serve a public purpose, nor too similar to take advantage of their distinct investment horizons – may maximise the potential of both institutions as public investors.

The rules and realities defining the relationships between central banks and sovereign funds are manifold, complex and opaque. More research is required to provide an exhaustive and systematic understanding of their institutional intertwinement. Ultimately, it is the parent governments that construct the overarching framework in which these organisations interact. Governments have the responsibility and the means to change existing structures – always keeping in mind the wider international environment that can provide both constraint and support. •

After Covid-19, state ownership to the rescue again

THE Covid-19 pandemic has presented countries with public sector assets held in sovereign funds or public pension funds with important dilemmas on whether or not to use them. John Nugée and Gary Smith emphasise (in the comment on p.70) the underlying tension in objectives. On the one hand, these funds are subject to the goal of preserving wealth for future generations. On the other, they also serve the rationale of acting as ‘rainy day funds’ to support the economy in a time of crisis (and indirectly supporting future generations by preventing the economy from plunging into long-lasting disruption).

Questions over sovereign funds

The upheaval raises questions over whether new sovereign funds need to be set up – or additional allocations made to existing ones – as governments engage in financial assistance to the private sector.

State-driven assistance has so far taken the shape of direct aid and company guarantees. For example, the European Commission has approved more than €2tn of state aid, in some cases with conditions covering dividends and executive bonus payments (Figure 3).

The use of a sovereign fund could enable a different model for the provision of state aid. Instead of tax breaks or subsidies, governments could offer support to corporates in the form of buying equity stakes at distressed values, which can then be deposited in the portfolio of a sovereign fund. In March, President Donald Trump responded positively to a question on whether he would support the government taking an

equity stake in companies accepting federal aid. There is a precedent to this. In the 2008 financial crisis, the US government took an equity stake in companies such as General Motors. Middle Eastern sovereign funds were used to plug holes in government budgets during the 2014 oil price collapse.

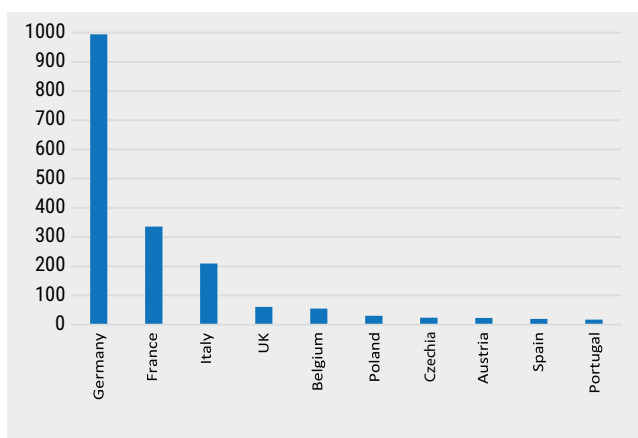
Politically, such practices are more likely to succeed in sectors considered to be of national strategic importance, such as transport and energy infrastructure. This would continue the trend that has seen sovereign institutions raise their allocations to real assets such as infrastructure, as documented in a 2018 report by OMFIF and BNY Mellon. The list of industries considered to be of national importance may grow as the pandemic shock forces companies to shorten their supply chains and governments to balance the importance of self-sufficiency and domestic manufacturing against the benefits of global trade and openness.

Airlines, automobile manufacturers and railway operators, hardest hit by the pandemic shock, would make strong candidates for sovereign fund portfolios. The International Air Transport Association estimates that airlines globally could lose more than \$419bn in revenue this year. Sovereign funds such as Temasek, Khazanah Nasional Berhad and Dubai Investment Corporation have offered financial support ranging from \$2bn-\$13bn to their respective national carriers. In Europe, Germany, France, Austria and the Netherlands have offered or are in the process of drafting support to their respective national airlines (Figure 4). However, this has at times led to tensions,

3: Governments ramp up support to corporate sector

Approved state aid in March-June 2020, highest 10 EU economies, €bn

Source: European Commission, Eurostat, Financial Times, OMFIF analysis



‘Airlines, automobile manufacturers and railway operators, hardest hit by the pandemic shock, would make strong candidates for sovereign fund portfolios.’

Figure 4: Airlines prime candidates for state support

Government support to carriers in response to Covid-19 pandemic

Source: Transport & Environment, Bloomberg, OMFIF analysis *These bailouts are currently under discussion/pending parliamentary approval

Airline Group	Country	Actor	Value, \$m	Type	Conditions
EasyJet	UK	Government	750	Loan	No conditions
Regional carriers in Norway	Norway	Government	137	Loan guarantee	No conditions
All airlines operating in Sweden	Sweden	Government	359	Loan guarantee	No conditions
SAS	Denmark/Sweden/Norway	Governments	460	Credit guarantee	No conditions
TUI Group	Germany	Government	2034	Loan	No dividend payments in loan period
Norwegian Airlines	Norway	Government	313	Recapitalisation	No conditions
Finnair	Finland	Government	933	Credit guarantee/Recapitalisation	No conditions
Condor	Germany	Government	622	Loan	No conditions
Wizz Air	Hungary	Government	389	Loan	No conditions
Lufthansa	Germany	Governments	10170	Loan / Partial takeover	No conditions, but seats in supervisory board
Austrian Airlines	Austria	Government	509	State aid and loan	Some climate conditions
Swiss Airlines	Switzerland	Government	1605	—	No dividends until repayment
British Airways*	UK	Government	388	Loan	No conditions
Iberia	Spain	Government	848	Loan	No conditions
Vueling	Spain	Government	294	Loan	No conditions
Air France	France	Government	7910	Loan and loan guarantee	No dividends in 2020; weak climate conditions
KLM	Netherlands	Government	3616	Loan and loan guarantee	C02 reduction, non-binding
Alitalia*	Italy	Government	3390	Takeover	No conditions
Ryanair	UK	Government	757	Loan	No conditions
Virgin*	UK	Government	647	Loan and credit guarantees	No conditions
TAP	Portugal	Government	1356	Loan	No conditions
Air Baltic	Latvia	Government	283	Recapitalisation	No conditions
Nordica	Estonia	Government	34	Recapitalisation	No conditions
Singapore airlines	Singapore	Sovereign Fund (Temasek)	13000	Equity stake	No conditions
Malaysian airlines*	Malaysia	Sovereign Fund (Khazanah)	2300	Loan guarantee	No conditions
Emirates	UAE	Sovereign Fund (Dubai Investment Corporation)	-	Equity stake	No conditions
American Airlines	US	Government	5800	Payroll aid/Loan	No conditions
Delta	US	Government	5400	Payroll aid	No conditions
Southwest Airlines	US	Government	3200	Payroll aid	No conditions
United	US	Government	5000	Grants and low-interest loans	No conditions
Cathay Pacific	Hong Kong	Government	340	Tax waivers	No conditions

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Funds could go beyond remit

If sovereign funds are unable to help countries through the pandemic, perhaps governments should rethink the way these institutions operate, write John Nugée, senior adviser, OMFIF, and Gary Smith, managing director, Sovereign Focus.

SOVEREIGN funds' expertise, skills and capacity in taking a seat on corporate boards give them a key advantage in being guardians and executors of state influence and support to companies in the post-pandemic period. A complex question is how appropriate it is for governments to use their sovereign funds to bridge the gap between income and expenditure. The key issues are the duration and volume of required budgetary support, and the consequences if it is not forthcoming. It would not make sense for a fund to prioritise the preservation of capital if this resulted in the economy being damaged beyond repair.

In the near term, more funds are likely to provide emergency support to national budgets. The demands on funds may require rules to be rewritten. This is legitimate: whatever the organisational relationship between the sovereign fund and the government, and however independent the former is in theory, in practice any sovereign fund is an organ of the state, and the state can always change the terms under which it operates.

If the fund's ultimate controllers do not feel able to use the fund to alleviate the worst economic decline for 100 years, when will they? •

”

with Lufthansa Chief Executive Officer Carsten Spohr stating that while Lufthansa needs government support, ‘We do not need government management.’

The healthcare sector is rising in importance as a destination for state-driven strategic investments. The Russia Direct Investment Fund, the country's sovereign fund, has entered into a joint venture with Russian pharmaceutical and biotech ChemRar Group to help finance the development of a Covid-19 drug.

Where no sovereign funds exist, their creation could be facilitated by depositing existing government-owned corporate stakes into these vehicles. For example, the French and Dutch governments own stakes in the KLM-Air France Group, while Germany and the UK partly own Commerzbank and RBS, respectively.

Opportunities and risks to delivering state aid through sovereign funds

A key advantage to deploying sovereign funds as guardians and executors of government influence is the existing expertise, skills and capacity in taking a seat on corporate boards. This can support governments' objectives to align companies with a more sustainable economic model. Sustainability goals have gained great prominence in the agenda of both central banks and sovereign funds. The Central Banks and Supervisors Network for Greening the Financial System has grown to 68 members from eight in just over two years, and operates workstreams focusing on climate risk supervision in the financial services industry and mobilising finance to support the green transition. Meanwhile, sovereign funds have set up the One Planet Sovereign Wealth Fund Group to share best practice among the community in allocating investments to green assets. According to the OMFIF GPI Survey 2020, 92% of sovereign funds implement ESG strategies, and 50% of them do so through active ownership and shareholder engagement strategies. The importance of ESG-minded direction as conditions for state aid is already visible, for example through the conditions for French support for Air France which included that the carrier should ‘reduce its CO2 emissions on long and medium-haul routes by 50% per passenger and kilometre by 2030; on flights within France until 2024’.

However, there can be downsides to using the need for state aid as an opportunity to create or boost sovereign funds, particularly when such strategies are followed with the objective of supporting national champions, thus harming the benefits from global competition.

The Covid-19 crisis has added to tensions in an already hostile geopolitical landscape. In the pre-crisis period, western economies such as the US and EU member states moved to tighten foreign investment screening mechanisms to enable them to further insulate strategic industries from targeted investment from state-owned enterprises and sovereign investment vehicles, especially from China. These tensions are occurring at the EU-US level, with the latest example being EU action to prevent a US acquisition of CureVac, a German company testing for a Covid-19 vaccine. •

Key sovereign fund responses to the Covid-19 crisis

Institution	Description
Ireland Strategic Investment Fund	In May, the Irish Treasury announced the establishment of a €2bn pandemic stabilisation and recovery fund, housed within ISIF. Its purpose is to invest in companies with more than 250 employees who have been materially affected by the pandemic with a view to preserving employment in the Irish economy. Shareholders are expected to contribute capital as co-investors.
New Mexico State Investment Council	Governor Michelle Lujan Grisham announced the guidelines and structure of the state's \$100m New Mexico Recovery Fund in March. The programme aims to provide loans to domestic businesses with a focus on firms with 50 or more employees, supplementing smaller business loans provided by the New Mexico Small Business Investment Corporation.
Cassa Depositi e Prestiti	Italy's public investment bank announced €4.5bn fund for the disbursement of new loans for liquidity and working capital. These loans included state-guaranteed medium- or long-term loans and short-term liquidity provision. It also partnered with the European Investment Bank to provide €1.5bn in working capital loans to struggling firms. In addition, CDP issued Italy's first social bond to fund part of its Covid-19 relief efforts.
Bpifrance	France's public investment bank launched the country's first Covid-19 response bond to alleviate the economic shock to French companies. The proceeds will be used to finance loans to small- and medium-sized enterprises. Bpifrance announced a moratorium on repayment of outstanding loans on 16 March, as well as an increase in its loan guarantee level to 90%.
Norges Bank/NBIM	Norway's oil fund increased the sales of foreign exchange in March to help support the government's fiscal efforts in response to the pandemic.
Sofaz	Azerbaijan's sovereign fund has been selling foreign exchange since April to facilitate transferring of assets to the state budget.
Saudi Arabian Monetary Authority / Public Investment Fund	In April, Saudi Arabia's central bank transferred \$40bn from its foreign reserves to the sovereign fund to enable it to invest more aggressively overseas given pressures on revenue sources from declining oil prices.
Nigeria Sovereign Investment Authority	The Nigerian government withdrew \$150m from the sovereign fund in June to support its pandemic response.
Chile Economic and Stabilisation Fund	The Chilean government drew assets from the sovereign fund to support its Covid-19 response programme.
Temasek	Singapore's sovereign fund joined a group of investors to provide a \$13bn rescue package for national carrier Singapore Airlines.
Khazanah Nasional Berhad	As a shareholder in Malaysia Airlines, the country's sovereign fund is in ongoing conversations with the flag carrier around providing \$1.2bn of support in response to the financial hit from the pandemic.
Dubai Investment Corporation	As the state holding company of Emirates, the country's sovereign fund has worked closely with the government in providing financial aid to the airline.
Türkiye Varlık Fonu	Turkey's sovereign fund gained control of the country's biggest mobile phone operator, Turkcell, that was facing financial troubles exacerbated by the pandemic.
Russia Direct Investment Fund	Russia's sovereign fund joined forces with various partners to contribute to the fight against Covid-19, including a joint venture with Russian pharmaceutical and biotech ChemRar Group to finance drug development; a joint project with the Japan Bank for International Co-operation for an EMG diagnostic system; and a project to diagnose pneumonia using artificial intelligence.
Permodalan Nasional Berhad	The Malaysian sovereign fund donated Rm23m (\$5.4m) to the country's government-linked Disaster Response Network. This included ventilators, and cash transfers to finance essential equipment and assist underprivileged patients, and was supplemented by financial support to the domestic Crisis Preparedness and Response Centre.



'A new approach to the role of central banks is needed'



With the crisis caused by the Covid-19 pandemic, a taboo has been broken. The use of 'helicopter money' has become a reality in several countries, writes Didier Borowski, Head of Global Views, Amundi

A tax cut or cheques sent to households by the government, if they are financed by money creation, are forms of 'helicopter money'. Quantitative easing, in its narrowest sense, consists of a central bank issuing money to acquire financial assets. The increase in the monetary base is reversible, since the central bank can decide later to reduce the size of its balance sheet to its initial level.

However, this option differs from 'pure helicopter money', at least as long as the balance sheets of a government and the central bank are separated. Indeed, in the 'helicopter option', the transfer to private agents becomes permanent. The increase in the balance sheet no longer corresponds to an increase in the government's debt to the central bank. Usual public finance metrics remain unchanged. To ensure technical equality between the liabilities and assets of the central bank, the government could issue a perpetual zero-coupon bond. But this claim on the government is fictitious insofar as it has no time horizon. Excluding recapitalisation, the central bank's balance sheet is unbalanced with a negative equity position. This option, therefore, has its limits.

If the money created far exceeds the central bank's assets, there is a risk that the helicopter money could eventually lead to a widespread loss of confidence, expectations of inflation and a flight to real assets.

The fact that central banks are not economic agents like others - they are, in practice, the only economic agents that can issue money to cover their losses - does not change anything. Helicopter money only works, in theory, if it occurs only once or in exceptional circumstances.

However, we can conceive of another form of money creation that looks like helicopter money but has counterparts on the asset side. Money creation can be justified to remedy market

dysfunctions in the financing of public goods, such as education or healthcare. These goods could be included in the assets of the central bank. Indeed, these assets are 'commons' that contribute to growth. Their value, however, cannot be calculated solely based on their market cost. They have a much higher hedonic price. The current health crisis illustrates the huge economic cost of not having effective public health systems. If central banks directly finance projects of this nature by issuing money, they can value these assets at their hedonic price to keep their balance sheet in balance.

That the definition of 'commons' is imprecise and funding them is not within the purview of the central bank are fair objections. However, there is no more reason to finance them through national

public debts since the resulting increase in well-being is general and extends beyond borders. These are goods that can be universally recognised as necessary for sustainable and equitable global development.

The current crisis gives us the opportunity to rethink the role of economic policies. The balance

sheets of governments and central banks have become intertwined in Europe, Japan and the US. Yet it is the state, and the state alone, that is the 'guarantor of last resort'. Its missions go beyond accounting balances. A new approach to the role of central banks is needed.

Nothing would, in theory, prevent the distinction between the financing operations of the 'commons' and monetary policy operations, which could continue to target price stability. The financing of 'commons' would not present the same risks to macrofinancial stability as large-scale asset purchases by central banks, which, it should be recalled, have ultimately enriched capital holders and thus exacerbated inequalities. •

'Money creation can be justified to remedy market dysfunctions in the financing of public goods, such as education or healthcare.'



Chapter 5

Sovereign funds issuing debt

‘Covid-19 may help capital markets overcome safe asset trap’



Massive stimulus measures could create new store of higher-yield assets, writes Edoardo Reviglio, head of international and European projects, Cassa Depositi e Prestiti.

‘SAFE assets’ are a pillar of an ordered financial system. They are a store of value for institutions including pension funds and insurance companies, as they allow them to match long-term assets to long-term liabilities. They are also structural elements of commercial bank balance sheets. More generally, they are used by financial institutions to meet regulatory requirements and provide collateral to borrow additional funds. These stores of value come in many forms: cash, bank deposits, US Treasury bills or European government bonds. They can include high-rating corporate bonds, stocks and real assets such as real estate, infrastructure and gold.

In recent decades the supply of safe assets has not kept pace with global demand. The collective growth rate of the advanced economies that produce these assets has lagged the global growth rate. Tight fiscal policies in advanced economies reduced the supply of safe assets, and central and commercial banks have absorbed much of the high-quality sovereign bond stock. In theory, since the price of government bonds is determined by the interaction between supply and demand in the market, a supply shortage produces lower yields, as happened after the 2008 financial crisis. When bond yields in many economies approached zero, a huge gap in the supply of safe assets was created. Economists developed the concept of a ‘safe asset trap’ to describe the phenomenon.

Owing to strong volatility, there has been a flight to safety and liquidity among investors, and government bond yields in core European nations and the US have fallen sharply. As a consequence of central banks easing policy, rates in several advanced economies fell

close to zero, and government bond yields are expected to stay low for even longer. The stock of government bonds with yields of less than 1% doubled to around 80% in March from around 40% outstanding at end-2019.

Covid-19 may help capital markets overcome the ‘safe asset trap’. Rising national public debts among European Union member states, as well as new virus-related instruments, may create large amounts of sovereign and EU bonds. The vast sums of money that public funds are putting into the recapitalisation of stressed enterprises may provide higher-quality stocks while raising the calibre of corporate bonds issued. The US has committed to raise its debt by \$3.7tn through September to cover increases in spending and the decline in revenues.

Sovereign funds are becoming increasingly important issuers in global capital markets, adding to the stock of quasi-governmental debt. Some issue to reach their target portfolio size. Many do so for leverage, others to spur the development of local capital markets. Some funds have tapped capital markets to bolster their response to the pandemic. CDP’s Covid-19 social response bond is one example. Greater issuance of debt by sovereign funds in

highly rated jurisdictions helps promote good macroeconomic policy-making by adding to the stock of available safe assets.

The question is, are the yields of these new safe assets going to be high enough to maintain the long-term value of assets managed globally by pension funds, insurance companies, endowment funds and the like? If the economy recovers and demand for safe assets surpasses supply, then institutional investors may escape the safe asset trap and enjoy the long-term higher yields they require. •

‘Owing to strong volatility, there has been a flight to safety and liquidity among investors, and government bond yields in core European nations and the US have fallen sharply.’

Funds explore liabilities side of balance sheet

Most sovereign funds have not issued debt. But more are starting to innovate in this area, as they seek to develop their local bond markets and innovate through specialised issuance, write Danae Kyriakopoulou and Pierre Ortlieb.

NOT only the assets, but also the liabilities side of sovereign funds' balance sheets are starting to matter. Their growing debt issuance is adding considerably to their overall investment potential.

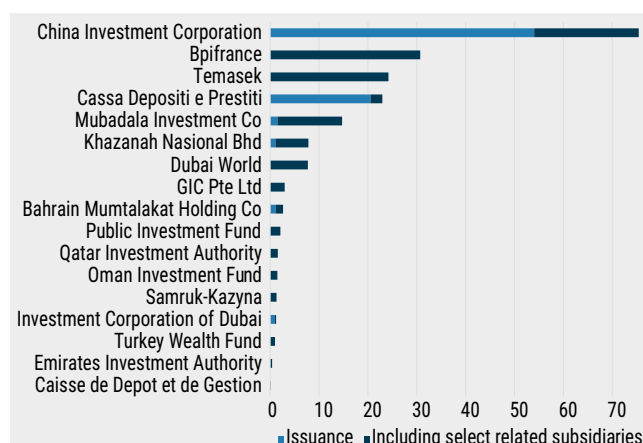
Prior to the 2008 financial crisis, few sovereign funds issued debt; only three had done so before 2005. Yet their issuance took off after the crisis, as these institutions sought to develop their local bond markets, acquire leverage, or diversify their funding sources. In spite of this, their outstanding bonds are still a fraction of the total global bond market.

An important distinction that needs to be drawn is between sovereign funds as asset managers and sovereign funds as holding companies. From the asset-side perspective, these are functionally equivalent. Yet important differences emerge when looking at the liability

side of their balance sheets. Issuance by the latter, especially through subsidiaries, is more like corporate debt than supranational or agency debt. For instance, Dubai World is a minor bond issuer as a holding company, but its shipping subsidiary Dubai Ports World has significant

debt. The latter should be considered distinct as it is fundamentally corporate debt.

However, bond sales through specific issuance vehicles, which Temasek achieves through its subsidiary Temasek Financial, is qualitatively different and more



1. Sovereign funds explore liability side of balance sheets

Debt issuance by sovereign wealth funds and related subsidiaries since 2015, \$bn

Source: Dealogic, Refinitiv, OMFIF analysis

akin to agency or supranational debt. This makes up a significant part of issuance (Figure 1).

China Investment Corporation follows a hybrid model in that it manages excess wealth and acts as a holding company for state-owned enterprises. It has issued through both arms, although the bulk of its debt is through Central Huijin, the asset management vehicle through which it acquires and controls domestic firms (including the major four state-owned banks). These different flavours of debt issuance, while all ultimately linked to sovereign funds, highlight one of the important dimensions of sovereign fund debt use.

Issuance remains concentrated among the largest funds, with the bulk of debt issued by Central Huijin at \$757bn over the course of its existence. The other major issuers among the largest 20 sovereign funds are Italy's Cassa Depositi e Prestiti, the UAE's Mubadala, and Singapore's Temasek, each of which has issued roughly \$10bn–\$20bn of debt.

Few other funds have leapt directly into debt issuance, though many issue debt through relevant subsidiaries. Mamoura Holdings, a subsidiary of Mubadala, is a significant issuer. In these cases, it is important to consider the relationship of the subsidiary to the parent sovereign fund, as this differs on a case-by-case basis. Mubadala guarantees Mamoura Holdings' debt, but this is not always the case. It does not apply, for example, to the PIF or Dubai World, as mentioned previously. This web of guarantees and obligations is important in weighing the sovereign characteristics of issued bonds.

Of the 62 largest sovereign funds in the 2020 GPI ranking, only 30 have issued or have permission to issue debt in their own name or through holding company subsidiaries. They are concentrated heavily among the 10 largest funds, seven of which have issued debt (either themselves or through related subsidiaries). This means that most sovereign funds have not explored this space,

30

Of the 62 largest sovereign funds per the 2020 GPI ranking, only 30 have issued or have permission to issue debt

either out of a lack of interest or because their mandate prohibits them from tapping capital markets.

In some cases, exceptions can be made to the frameworks determining whether sovereign funds can issue debt. One of these exceptions is when acquiring leverage for investments in asset classes that require the use of debt. For example, the Kuwait Investment Authority is prohibited from issuing debt, but its subsidiaries are allowed to do so if debt is used as leverage for sectors such as real estate. According to economists Fabio Bertoni and Stefano Lugo, similar rules apply to Norway's Government Pension Fund and the Alberta Heritage Saving Trust Fund.

A broader, glaring issue in this space concerns transparency. It is inordinately difficult to source thorough, reliable information on which funds have the permission or capacity to issue debt in their own name. Any future update of the Santiago Principles should home in on the opacity that pervades this space.

Issuance as a funding strategy and credit risk debate

One motivation for sovereign funds to act as issuers is to help them diversify their funding sources and increase their portfolio size. This is particularly relevant for non-commodity sovereign funds that may not receive regular government inflows. Sovereign funds such as Temasek, Mubadala, or CIC receive contributions only from the government on an ad-hoc basis, and

these have been infrequent since their creation. This is in contrast to commodity sovereign funds such as the Kuwait Investment Authority or Norges Bank Investment Management, which receive regular contributions from the proceeds of commodity exporting. Similarly, proposals for a UK sovereign fund have often suggested an initial debt issuance push to provide start-up capital to the fund.

Even in cases where they do not issue debt themselves, the strong asset bases of sovereign funds have implications for the issuance plans of their parent governments and subsidiaries. For instance, data provider Morningstar noted in a 2019 research piece that Norway and Singapore's credit rating relied heavily on their sovereign funds' investment power. The same is true of many countries in the Gulf Co-operation Council. Ratings agency Fitch estimated that 'Sovereign fund assets in Kuwait, Abu Dhabi and Qatar would remain large even under an adverse scenario involving a combination of significant further declines in oil prices, continued pressure on hydrocarbon production volumes, and weak financial returns.' Sovereign funds' purpose as strategic asset holders is solidified by their ability to issue debt, especially where it is politically difficult for governments to do. This gives governments with sovereign fund backing greater fiscal space, even where sovereign fund assets and liabilities are considered as part of a broader public sector balance sheet.

Ratings agencies will typically treat a sovereign fund's credit risk as explicitly or implicitly linked to that of the government. For example, in May ratings agencies downgraded Italy's CDP following a downgrade on the Italian sovereign. In its report, Fitch explained that 'CDP's issuer default ratings move in tandem with those of the Italian sovereign', because CDP's retail deposits and certificates guaranteed by the state account for more than the 75% threshold of liabilities. The agency

also noted, ‘CDP is credit-linked and equalised with Italy through the strength of its links with the sovereign and Fitch’s assessment of the sovereign’s willingness to provide extraordinary support if needed’ and that ‘this also results in rating equalisation irrespective of the CDP’s standalone credit profile.’

The word ‘assessment’ is key here: in many cases market participants such as ratings agencies will assume such governmental guarantees would be enforced ‘if needed’, even when they are not formalised. According to Bertoni and Lugo, only four sovereign funds have an explicit guarantee on their debt from the government.

Capital market development

A more important motivation for sovereign funds to act as issuers is to leverage their expertise with more niche asset classes and currencies to support capital markets development. In jurisdictions where this expertise is lacking in debt

management offices, sovereign funds can complement DMO efforts, and may have more appetite for innovation and skills to underpin implementation. The development of capital markets is often a key objective for countries that create sovereign funds in the first place.

A division along this axis already exists in portfolio management. Central banks tend to be more conservative investors guided primarily by the principles of liquidity and safety (see Chapter 6). Sovereign funds have greater room to venture into more innovative asset classes. Similarly, DMOs will typically be tasked with the more straightforward task of providing financing for mainstream government activities.

Islamic finance

Asian sovereign funds such as Singapore’s Temasek and Malaysia’s Khazanah Nasional Berhad have been frequent issuers. For Khazanah, several issuances have been aligned with the Malaysian government’s objective to advance Islamic finance. The sovereign fund first issued sukuk (Islamic bond) in Singapore in 2010, via its subsidiary Danga Capital Berhad. This was the largest sukuk issuance in Singapore, and the largest issuance in Singapore dollars by a foreign issuer in Singapore. A year later it issued the first renminbi-denominated sukuk, a three-year instrument raising Rmb500m,

aimed at developing both renminbi-denominated finance and Islamic finance.

Middle Eastern sovereign funds have also supported the Islamic finance agenda through debt issuance. Bahrain’s Mumtalakat chose the Malaysian ringgit as the currency for its sukuk issuance programme in 2012, and has since issued several sukuks, most recently in January this year.

Climate and social bonds

Europe presents examples where innovation in issuance has traditionally taken place outside DMOs. Supranational issuers have been strong players in deepening capital markets. In 2007, the European Investment Bank issued the world’s first green instrument, a €600m climate awareness bond. It has since raised around €27bn across 13 currencies, remaining a world leader issuer of green bonds. In late June this year, the European Stability Mechanism, another supranational issuer, published a framework to issue social bonds in line with the International Capital Markets Association’s social bond principles to finance its pandemic crisis support credit line.

European sovereign funds can complement national and supranational efforts to advance the ‘environmental’ and ‘social’ investment agendas. In November 2017, Italy’s CDP launched its

‘This [issuance by Khazanah] is a further step forward for our initiative to evolve Malaysia into a multi-currency issuance platform for Sukuk’

Zeti Akhtar Aziz, governor of Bank Negara Malaysia (2000-13)

Date	Institution	Bond description	Volume
Aug 2010	Khazanah Nasional Berhad [Malaysia]	Sukuk	Sgd1.5bn
Oct 2011	Khazanah Nasional Berhad [Malaysia]	Renminbi-denominated Sukuk	Rmb500m
Oct 2012	Mumtalakat [Bahrain]	Ringgit-denominated Sukuk	\$1bn
2017	Investment Corporation of Dubai [UAE]	Sukuk	\$1bn
Sept 2018	Cassa Depositi e Prestiti [Italy]	Sustainability bond	€500m
2017 & 2019	Cassa Depositi e Prestiti [Italy]	Social bond	€500m & €750m
2020	Cassa Depositi e Prestiti [Italy]	Social housing bond	€750m
Jan 2020	Mumtalakat [Bahrain]	Sukuk	\$500m
2020	Cassa Depositi e Prestiti [Italy]	Covid-19 social response bond	€1bn

2. Issuing with purpose

Selected examples of thematic bonds issued by sovereign funds

Source: Dealogic, OMFIF analysis

inaugural social bond, the first such bond to be issued in the country. A year later, CDP issued a €500m sustainability bond, the first and only sovereign fund to have done so. According to the Climate Bonds Initiative, the bond was the first sustainability bond issued by an Italian issuer, with the proceeds intended to finance projects related to the development and modernisation of Italy's water and wastewater infrastructure. Since, CDP has issued several environmental, social and governance bonds focused on energy and environmental sustainability, small- and medium-sized enterprise financing, social housing and urban development initiatives. During the coronavirus outbreak, CDP responded by issuing a Covid-19 social response bond to support companies and regions hit by the pandemic.

Sovereign funds and the safe asset debate

The broader macrofinancial context makes a strong case for higher issuance volume.

Since the Asian financial crises of the late 1990s, global reserves manager demand for reliable government debt has produced a so-called safe asset shortage. This has been exacerbated by developed economy quantitative easing policies over the course of the 2010s, which have further reduced the available supply of haven assets. The fall in debt issuance by many top-rated

borrowers such as the German and Dutch governments has added to this. As a result, global incomes and capital investment have fallen, in what economists Ricardo Caballero and Emmanuel Farhi refer to as a 'safety trap'.

While not a particularly significant holder of global safe government debt as a share of their overall asset allocation, sovereign funds' broader clout as investors means that they have played a important role in buying up safe government debt. Many have engaged in securities lending to some extent as a way to boost returns and alleviate the global shortage of safe debt.

An alternative approach may be for sovereign funds to simply issue their own debt. This would allow them to source attractive funding rates in depressed fixed income markets (generating a higher return for their constituents in future). As mentioned previously, only a minority of sovereign funds have tapped capital markets; many have the legal right to do so but have chosen not to. Enhancing sovereign fund debt issuance would provide a significant boost to global supranational issuance, which has historically been low. While this would probably only contribute a very small volume of additional debt, it could still play an important role at the margin. Debt issued by sovereign funds in jurisdictions with low sovereign credit ratings would be of little importance here. However, if

€500m

CDP issued a €500m sustainability bond, the first and only sovereign fund to have done so

sovereign funds in major advanced economies were to tap capital markets to a greater extent, the new supply would prove useful.

Between 2019-21, US government debt is expected to rise to 31% from 23% of global GDP, with European Union core government debt rising to 7% from 5%, according to Fulcrum Asset Management. Yet demand has risen in parallel, as central banks enhanced asset purchase programmes, reserves continue to rise, and excess private savings reduce investment. As such, greater sovereign fund issuance would be welcome – not just to develop capital markets or bolster public sector balance sheets, but also to rebalance global bond markets.

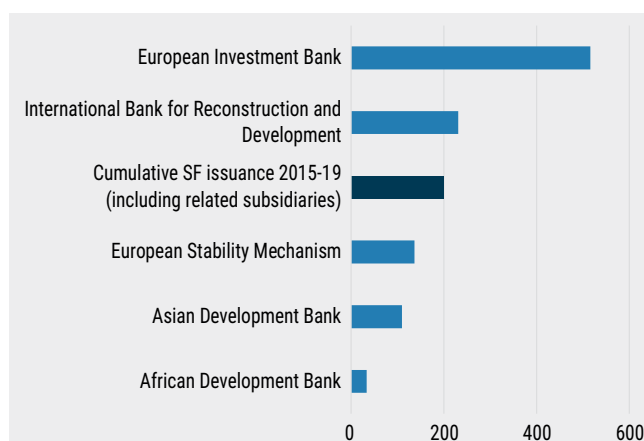
Assets and liabilities

For sovereign funds, liabilities will never be as important as their assets. Yet as the Santiago Principles state, sovereign funds are institutions designed to 'improve the management of public finances and achieve macroeconomic stability,' as well as support 'high-quality growth' and 'bring important diversity to global financial markets.' Through well-structured, coordinated, and careful debt issuance, sovereign funds can enhance their contribution to these objectives by alleviating the global safe asset shortage and promoting the development of niche global capital markets, including in Islamic finance and green assets. •

3. A drop in the bucket

Outstanding debt of select supranationals and debt issued by sovereign funds between 2015-19, \$bn

Source: Refinitiv, OMFIF analysis



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Roberto de Oliveira Campos
Neto, Governor, Banco
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3 Focus on asset classes

Low yields on traditional assets, a burning planet, and global infrastructure needs have brought new, alternative asset classes into the spotlight. This section looks at public investors' relationship to sustainability through the lens of active ownership and real assets, and examines how and why sovereign funds have become powerful players in private technology markets.

ESG

GREEN investments are gaining importance, and financial regulators and central banks are revising their supervisory frameworks and portfolios accordingly.

Public investors decarbonise portfolios

IN November 2019, Sveriges Riksbank decided to divest its reserves portfolio from carbon-intensive Canadian and Australian local bonds.

European Central Bank President Christine Lagarde has been vocal about shifting the ECB's asset purchase programmes to account for climate criteria. However, these changes would depend on pushing through broader regulatory reforms introducing objective criteria to define green impacts and measure risk differentials.

Progress in harmonising sustainable taxonomies in the EU and China

THE European Union and China are leading on developing classification systems. These aim to facilitate consistent green finance policies and investment and risk management at the asset, activity, borrower and sector level. In June, the European Parliament adopted the sustainable taxonomy regulation, a framework for 'environmentally sustainable economic activities' aligned with six objectives. The taxonomy creates a common language for investors and is expected to help boost private sector financing of sustainable projects.

The People's Bank of China has issued green bond guidelines and oversees the 'green bond endorsed

project catalogue', intended for structuring green investments. In May, the PBoC revised the framework and removed clean coal from eligible projects.

Asset owners adjust investment strategies

IN January, Norges Bank Investment Management issued policy guidelines for investing in unlisted renewable energy infrastructure. This represents a major change in the fund's investment mandate. Previously, its private market exposure was limited to companies seeking public listings. Under the revised mandate, the Norwegian parliament has initially approved \$13bn for this purpose, or around 1.3% of the fund's capital.

In March, Japan's Government Pension Investment Fund raised its allocation of foreign bonds to 25% from 15% in reaction to negative interest rates in Japanese government bond markets. This has enabled the GPIF to support the development of international green bond markets. It has partnered with institutions such as Germany's KfW to expand green bond investment opportunities.

Central banks and supervisors move forward with climate risk regulation

IN May, the Central Banks and Supervisors Network for Greening the Financial System published a guide on integrating climate and environmental risks into prudential supervision.

The Banque de France pledged to carry out climate stress tests this year, to be published in aggregate format and anonymously for regulated banks and insurers.

In April 2019, the Bank of England became the first central bank to outline supervisory expectations for banks and insurers to embed the financial risks from climate change into their governance frameworks, risk management, scenario analysis and disclosures. The Prudential Regulation Authority's June 2019 stress test incorporated an initial 'exploratory exercise' on how various climate scenarios would affect insurers. In May, the BoE postponed the climate biennial exploratory scenario until mid-2021 because of Covid-19. In June, the Bank released its first ever climate-related financial disclosure.

DIGITAL FINANCE

THE Covid-19 pandemic is accelerating public and private sector digital currency projects. Central bank digital currency could soon become a reality in China. In emerging markets, sandboxes are proving a popular tool to trial financial technology.

Digital currency gains momentum

THE People's Bank of China began pilots of its central bank digital currency in May. The Digital Currency Electronic Payment project is taking place in Suzhou, Shenzhen, Chengdu and Xiong'an. Trials for the digital renminbi are being conducted on a small scale, ring-fenced from conventional money circulation. The launch of China's CBDC trials comes as Covid-19 prompts policy-makers to reduce reliance on cash in favour of contactless payments. In the US, there is renewed debate on the viability of a digital dollar system to promote financial inclusion and distribute economic stimulus payments.

Libra adapts to regulators and institutional investors

DESPITE recent progress in central bank digital currency, institutional investors and regulators have been cautious in their engagement with the private sector. Facebook's Libra Association is the most prominent example among private sector currency initiatives that have attracted intense regulatory scrutiny. Major financial regulators such as the US Securities and Exchange Commission have been wary of allowing Libra to develop a free-floating global coin. However, Libra's status among regulators and public investment institutions could soon change. In April, it reviewed its ambitions, in an effort to appease central banks. Libra's makeover is seemingly working. In May, Temasek, one of the two big Singapore state investment funds, joined the Libra Association as the first major global public investor to be involved in the project.

Emerging markets embrace sandboxes

EMERGING markets are embracing sandboxes to trial financial technology. Nigerian non-profit Financial Services Innovators has teamed up with venture capitalists and the Central Bank of Nigeria to foster a new generation of fintech companies. CBN Deputy Governor Adegbisi Shonubi said innovators could use the sandbox to test ideas using existing companies' application programming interfaces. China launched a regulatory sandbox initiative at the end of 2019, with two batches of projects announced so far. The scheme forms part of China's three-year fintech development plan. In March, Mexico granted its first sandbox licence to Nvivo Pagos, an electronic payment services company.





STRATEGIC REVIEWS

CENTRAL banks across developed and emerging economies began strategic reviews over the course of 2019 and early 2020. Key themes include communication with a broader set of stakeholders as well as thorough examination of inflation-targeting policy frameworks.

Federal Reserve

The Federal Reserve began its strategic review in 2019 as it was closing in on its targets: inflation was stable and unemployment was reaching new lows monthly. Nonetheless, there were concerns about the suitability of the inflation target. Late last year, Federal Open Market Committee members suggested they would tolerate somewhat higher inflation to ‘make up’ for past underperformance. At the same time, Chairman Jerome Powell said the Fed had become more aware of the benefits of ‘hot’ labour markets.

Covid-19 has delayed the end of the strategic review and raised important new issues. Corporate bond purchases and new bouts of quantitative easing have raised new questions about Fed independence. Policy-makers have started considering new tools such as negative rates and yield curve control.

Reserve Bank of India

In 2016, the Reserve Bank of India adopted a flexible inflation target, which is reviewed every five years. While deliberations were initially expected to be completed by March 2021, this has been pushed back by the pandemic.

The 2020-21 review examines the merits of the flexible inflation-targeting model and whether the benchmark policy repo rate is the best target for its fulfilment. There has been significant discussion on whether this should be relaxed in the wake of Covid-19, with some stakeholders arguing that growth has been sacrificed in favour of an excessively hawkish inflation target. These same voices have proposed adding a target growth rate or financial stability goal to the mandate.

Bank of Canada

The Bank of Canada reviews its monetary policy framework every five years.

Two overarching themes will define the forthcoming review, due to end in 2021. First, the global low interest rate environment has raised questions about the bank’s monetary policy strategy and toolkit. The BoC has announced that it will explicitly weigh the merits and weaknesses of alternative policy frameworks, including higher inflation targets.

Second, the bank will home in on financial stability issues arising from the low-rate environment, such as excessive retail risk-taking. It will seek to grapple with these questions in discussions with a broader range of stakeholders than ever before, involving civil society, academia, and other parties in an open and consultative process.

European Central Bank

The start of the European Central Bank’s strategic review coincided with the beginning of Christine Lagarde’s tenure as president.

The main goal is to understand the persistence of low inflation dynamics and the ECB’s seeming inability to hit its inflation target. The bank is quantifying the costs of systemically below-target inflation and considering new targets. It may shift to an inflation target range (such as between 1.5% and 2.5%) or raise the objective. The ECB is also due to scrutinise the tools used to achieve price stability.

There is much interest in the longer-term challenges – specifically, the role of climate change in monetary policy and the future of digital currencies – and their impact on the outcomes of the strategic review.



Chapter 6

GPI survey analysis



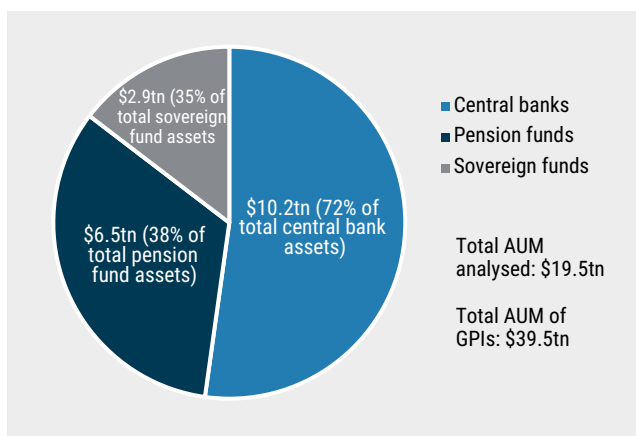
Balanced expansion, embracing sustainability

Financial markets have so far been broadly shielded from the pandemic shock. But concerns over this misalignment have made it even more difficult for global public investors to find the balance among the objectives of liquidity, safety and return, write Danae Kyriakopoulou and Pierre Ortlieb.

GLOBAL public investors are a powerful force in financial markets. With assets under management at \$39.5tn invested across many countries, currencies and asset classes, shifts in their preferences can move existing markets and help develop new ones. Our analysis of dynamics in GPI asset allocation confirms that these investors are fairly conservative, prioritising safety and liquidity, and preferring government bonds and developed markets. Challenged by low or negative yields on these assets in recent years, many are starting to venture more forcefully into riskier and less liquid asset classes such as equities, a trend that continues cautiously. However, the pandemic shock and related policy responses, including the accelerated expansion of central bank balance sheets, is

leading GPIs to re-evaluate their priorities. Covid-19 has made clear the serious threat that non-financial risks pose to economic and financial activity, prompting GPIs to accelerate the alignment of investment strategies with sustainability objectives.

This year's asset allocation analysis results are based on the most robust sample of GPIs ever examined. A total of 78 institutions responded to the OMFIF GPI Survey 2020. In-depth interviews with a further set of institutions, as well as data disclosed publicly in annual reports,



1. Widest coverage yet

Breakdown of institution types examined in asset allocation analysis, AUM \$tn and % of total

Source: OMFIF GPI Survey 2020

complement our research. This brings the total number of institutions to 92 funds from 61 jurisdictions, covering \$19.5tn of AUM (Figure 1).

This year's questionnaire posed 31 questions to central banks and 35 questions to sovereign and public pension funds. It covers investment strategy, asset allocation and diversification decisions. The survey includes a more focused investigation of strategies related to sustainable, technology and alternative investments. It also interrogates perceptions of broader macroeconomic risks and their impact on portfolios. For central banks, the report explores questions on reserves adequacy and the importance of reserves management in terms of institutions' relationships with the public.

Shifting priorities

GPIs' reserve management practices follow a variety of guiding principles depending primarily on institution type, and, to a lesser extent, jurisdiction.

Central banks are the most conservative investors, guided mainly by the objectives of capital preservation and liquidity. The remarks of one central bank from Asia Pacific that 'securing liquidity and safety is a top priority' were echoed by many other central bank respondents. Overall, 72% of central banks selected 'capital preservation' as their investment objective (Figure 2). This typically translates into investments in low-maturity bonds issued by highly rated issuers such as developed market sovereigns or agencies and supranationals. A Latin American central bank specified that 'capital is invested in safe, short-term (12 months) fixed deposits offered by reputable institutions'. Only once these objectives are satisfied do some central banks let return considerations guide their decisions. Central banks from Europe are the most adventurous in embracing additional objectives. One respondent revealed that 'at portfolio manager level, there are nominal yield (spread)

targets above the benchmarks to encourage active portfolio management, to gain excess returns, and maintain and improve managers' investment management, analytical and trading skills'. A Eurosystem central bank explicitly mentioned that it follows 'sustainability and responsibility principles'.

Given the recent realities of negative-yielding developed market government bonds, more central banks have had to reassess their investments, even if they are still driven by the objective of capital preservation and not necessarily prioritising returns. A central bank from Europe disclosed that 'before the era of negative interest rates, liquidity and capital preservation considerations drove the strategic asset allocation process at given monetary policy inputs. The main objective of the strategic asset allocation exercise was to reduce the probability of loss on foreign exchange reserves to a very low level. Negative interest rates, technically implying loss with 100% probability, retired this approach by putting more emphasis on loss minimisation and yields earned on reserves.' They added, 'The search for yield at portfolio manager level shifted portfolios to less liquid instruments, indicating the importance of active investment strategies.' A European central bank stated that 'As nominal yields are in negative territory in most of our investment universe, yield earned on foreign exchange reserves has gained more attention in recent years at strategic asset allocation level to minimise or at least decrease the potential loss.' A central bank from Asia Pacific commented that it 'does not have an explicit return objective, but aims to avoid material capital losses by investing in high credit quality assets with low duration'.

A sizeable minority of central banks (38%) have responded differently to negative yields on traditional assets, by accepting lower returns. Still, as this phenomenon persists, more and more central

banks are looking to increase their risk budgets and diversify into higher yielding assets (Figure 3). In some cases, this is done selectively. One Latin American central bank said, 'We have maintained our risk approach and accepted lower returns. Nevertheless, in the negative rates markets we increased slightly the tolerance to credit risk.'

Central banks are often legally prohibited from following these diversification strategies, as explored in detailed questions in last year's GPI survey. Even then, reserves managers are innovating to circumvent obstacles. One respondent disclosed that they are restricted by their constitution in only being able to invest in sovereign debt. They said, 'In that sense, the search for higher yield has been

72%

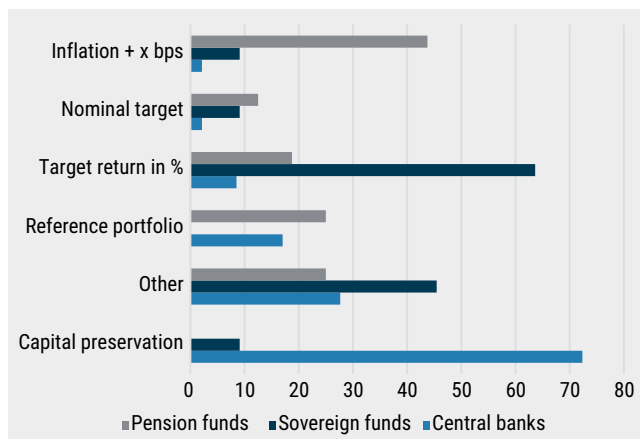
72% of central banks selected 'capital preservation' as an investment objective

restricted to countries that offer a higher return. One noteworthy trend is the share of euros in our reserves and its evolution. More than a decade ago, the euro constituted 40% of the portfolio. In time, that percentage has dropped to 11%. Countries such as South Korea, Canada, Australia and China have gained significant portions of our strategic asset allocation benchmark.'

The picture is quite different for public pension and sovereign funds. The most common objective for pension funds is a benchmark (usually inflation) plus a target for excess returns, chosen by 44% of respondents. A quarter of respondents are guided by a reference portfolio. Their response to negative

2. Institutional investment objectives vary across GPIs

What is your investment objective?, % of total responses by institution type
Source: OMFIF GPI Survey 2020

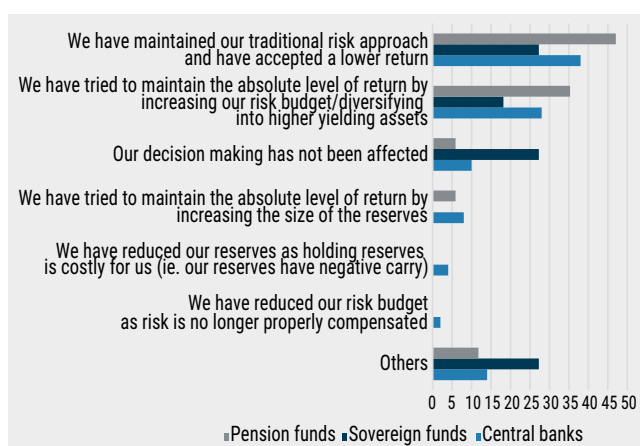


‘We recently revised our benchmark portfolio and the main change was a decrease in government bonds (duration) given the drop in yields in the US, as well as a redistribution of our foreign currency allocation different from dollars into government bonds.’

Central bank survey respondent

3. In low-yield environment, most central banks simply accept a lower return

How has the extremely low level of yields on traditional reserve assets in recent years affected your decision making?, % of total responses by institution type
Source: OMFIF GPI Survey 2020



yields has correspondingly been different to that of central banks. While they have always had lower allocations to government bonds compared with central banks, negative yields have widened the gaps. More than one-third of pension funds have been diversifying into higher yielding assets in response to this trend.

Most sovereign funds’ investment objective is a target return in percentage terms. Some also listed developmental objectives. One sovereign fund from Europe mentioned that ‘Our mandate is to contribute to the development of our national economy by providing credit, equity and other types of financing to domestic firms to support their development in the country and abroad’. Others explained that there can be different tranches of investment portfolios with various objectives, such as

balancing infrastructure funding and stabilisation. A respondent explained that the fund is broken into a stabilisation fund investing in short-term assets to act as buffer against short-term macroeconomic instability, a future generations fund, and an infrastructure development fund.

Optimism on advanced economy risk assets

Looking at asset allocations in more detail, holdings are concentrated in developed markets, at 88% across our sample. In parallel, among sovereign and public pension funds, holdings of foreign assets stand at 68% on a weighted average basis. Central banks surveyed hold over 90% of their assets in the euro area and North America. This suggests that in pursuing its role of managing and diversifying national wealth, the official sector tends to concentrate on

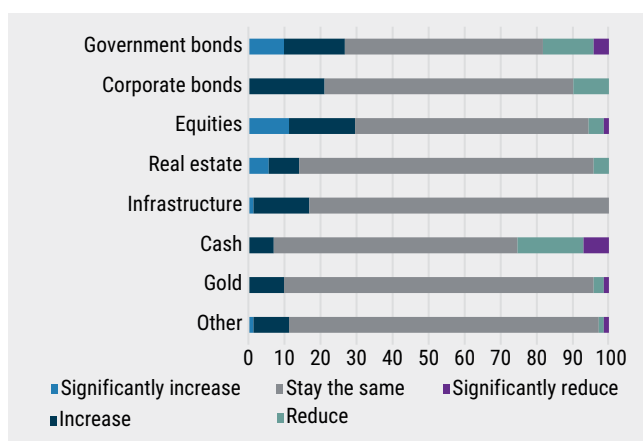
assets in the US and Europe.

In terms of asset classes, official institutions remain fairly conservative investors, with more than half of the \$19.5tn analysed in government bonds (Figure 4). This masks important differences among the three types of institutions, ranging from 19% for sovereign funds to 45% for pension funds and 66% for central banks. Importantly, this share has been falling for all three types of investors in recent years, with the mirror image of this development being growing allocations to equities, corporate bonds and alternatives. Central banks hold 11% of their assets in corporate bonds and 8% in equities. While the absolute holdings of each have grown, they have declined as a relative share of global reserve assets. For sovereign funds and pension funds, their combined equity and corporate bond portfolios stand at 57% and 41% respectively.

4. GPIs look to risk assets as well as government bonds

In the next 12-24 months do you plan to increase, reduce or maintain your allocation?, % of responses

Source: OMFIF GPI Survey 2020, institutions' annual reports, OMFIF analysis



The shift out of government bonds that has dominated allocation changes in past years seems to be coming to an end. For the first time since the GPI Survey began, more GPIs plan to increase their allocation to the asset class than reduce it. One central bank from Europe noted that changes in allocation were going to be moderate 'as we are nearing what we consider to be an optimal allocation'.

Responses to more forward-looking questions suggest that the move into riskier asset classes is likely to continue, as there is high demand for equities, real estate, and infrastructure. Of the sovereign funds surveyed, 63% said they would increase their allocation to infrastructure, compared to 44% for equities and 38% for real estate. Sovereign funds also noted that they would reduce their allocation to fixed income products, with 38% saying they would move out of government bonds and 31% for corporate bonds. At the same time, 78% of pension funds said they would increase their equity allocation; 22% said they were moving out of government bonds over the next 12-24 months, alongside 33% moving out of cash.

On the whole, this indicates that risk assets in developed markets are likely to experience voracious demand from the official sector.

Importantly, this move does not appear to be driven by the so-called safe asset shortage which is often cited as a factor behind the surge in

private market investment. Among the institutions surveyed, central banks and public pension funds are two groups that have previously been captive buyers of government bonds, valuing them for their liquidity, safety, or duration. Only 4% of respondents said that the 'shortage' had materially affected their desired asset allocation, concentrated among public pension funds (Figure 5). A further 28% stated that it had had a moderate, but not significant, impact. Another 12% disagreed with the claim that the 'shortage' exists at all. One pension fund noted that there are enough safe assets, but that the real problem is their low to negative yield. While it is perhaps difficult to entangle questions of yield from the supply of safe assets, it is clear that many GPIs view the 'safe asset' problem through the lens of returns rather than quantity.

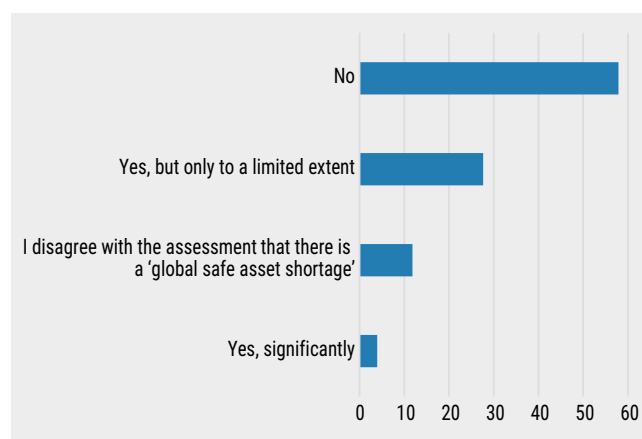
For those institutions looking

to incorporate new asset classes, internal knowledge is a key concern, with 55% of respondents recognising this as one of the main obstacles to their diversification. A further 50% selected board approval as a hurdle. Another 49% pointed to the administrative and governance procedures involved with new asset classes as the main barrier. This implies that internal variables are the main roadblocks towards diversification. For one central bank, size is a problem – 'Most small central banks maintain exposure to safe assets. One cannot expect [the introduction of new assets] if foreign reserve balances remain low.' Sovereign and public pension funds were on the whole more likely to identify obstacles at all, suggesting that they might already be at the outer frontier of diversification. The knowledge required to diversify even further may be niche and hard to access.

Still, most respondents plan to keep allocation steady for most asset classes. One central bank from Latin America stated that 'given the volatility of the market due to the impact of Covid-19, we are in consolidation mode and will not make any major changes at this time'.

Currencies and the myth of de-dollarisation

This narrative about the prospects for developed market risk assets is further borne out by probable changes to the currency



5. Who's afraid of the safe asset shortage?

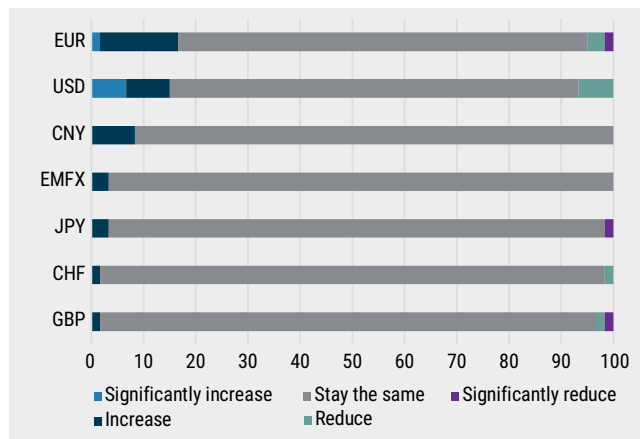
Has the global 'safe asset' shortage materially affected your ability to meet your desired asset allocation?, % of total responses

Source: OMFIF GPI Survey 2020

6. Currency composition expected to stay roughly constant

Over the next 12-24 months, are you planning to increase, reduce or maintain your exposure to the following currencies?, % of total responses

Source: OMFIF GPI Survey 2020



distributions of GPI portfolios. Sovereign and public pension funds both said that they were likely to move into dollar assets, at 28% and 31% respectively (Figure 6). Perhaps surprisingly, central banks expressed a desire to move out of the dollar in net terms, with 10% seeking a reduction in their dollar holdings compared to 8% pursuing an increase. Nevertheless, our findings suggest there will be a strong, continued shift into developed market currencies, adding to GPIs' already heavily dollar-based portfolios. Further research should explore why the US currency appears to be more attractive than ever. We asked respondents whether there would still be a rationale for holding dollars in a less dollar-centric international economic system, and 52% replied 'yes', pointing to other factors, such as the returns on dollar assets, as a potential driver for many of the institutions in our sample. One central bank pointed out that 'the positive yield differential towards the dollar has probably reduced inclinations to diversify'.

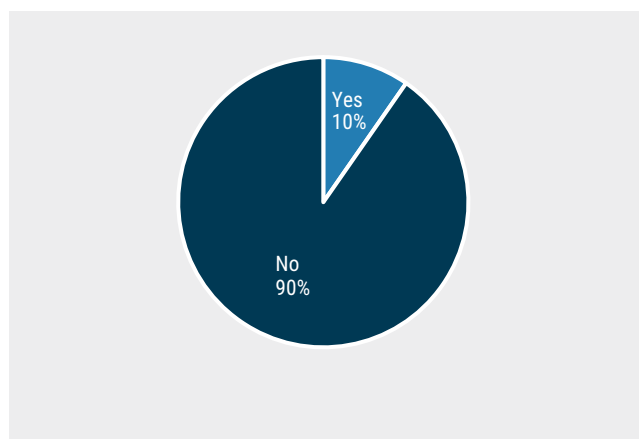
In spite of this heavy dollar concentration, most GPIs were broadly comfortable with the dollar-centric international currency and trade system. When asked whether they would be open to using some kind of sovereign digital currency basket or new 'digital special drawing right' as part of their reserves or investment portfolio, 90% of our sample replied in the negative. This

'The US has the most developed and liquid financial market in the world, which ensures its reserve currency status. We also take it into consideration as a qualitative factor in our strategic asset allocation.'

Central bank survey respondent

response is driven by a number of factors. For one, some central banks suggested that any such basket-based mechanism would be logically less valuable than the strongest currency in the basket, rendering it less useful for currency reserves. Others pointed out that they would first have to see what kind of investable products would be denominated in this basket currency. Several others suggested that a lack of information or knowledge about digital currencies in general was hampering the exploration of this idea. On the whole, however, it is clear that proposals such as former Bank of England Governor Mark Carney's 'synthetic hegemonic currency' or a 'digital SDR' have challenging hurdles to surmount before they are any closer to becoming a reality.

Almost half of respondents suggested the renminbi was likely to gain in global prominence and that they would enhance its share in their portfolio (Figure 8). A mere 10% felt that it would stagnate or weaken. One respondent even suggested it could decline in importance should post-pandemic adjustments in international supply chains materialise. Another underscored that 'The necessary condition is a significant development in the ongoing process of liberalisation of the Chinese economy and markets and renminbi internationalisation.' One central bank noted that it would only consider increasing its renminbi exposure 'provided that the



7. No appetite for greater use of SDR or digital currency basket

Would you be open to using a sovereign digital basket of currencies/SDR in a greater share of your reserves?, % of total responses

Source: OMFIF GPI Survey 2020

institutional framework is improved, transparency enhances, and the government moves towards a more market-friendly policy framework.’

Yet as in GPI 2019, respondents’ enthusiasm for the renminbi was slightly puzzling. Despite the overwhelming belief that the Chinese currency will grow in prominence, only 8% said they would add it to their portfolio within the next two years. This begs the question of who will drive the renminbi to global prominence, perhaps revealing that official institutions do not consider themselves first movers when it comes to shifts in the global currency system. Rather, they appear content to wait for private players to warm up to the renminbi and adapt their portfolios thereafter, over an extended time horizon.

Nevertheless, official institutions are not shy about asserting their role in financial markets and stepping in to preserve liquidity. Among public pension and sovereign funds, 74% felt that they should engage in more securities lending, lubricating collateral and ameliorating liquidity conditions. Some added caveats to their response, highlighting risks such as reputational damage and the internal specialist capacity required to engage in securities lending.

Sustainability driving force

Another area where GPIs are increasingly stepping up their role in financial markets is sustainability. Since the establishment of the

Central Banks and Supervisors Network for Greening the Financial System in December 2017, central banks have been actively developing an understanding of the financial sector’s exposure to climate risks and managing these appropriately. However, when it comes to their reserve management operations, they have been more cautious. In October 2019, the NGFS published a sustainable and responsible investment guide for central banks’ portfolio management coordinated by the Deutsche Bundesbank. It outlined four main challenges for central banks pursuing sustainable and responsible investment, such as the legal difficulties with incorporating sustainable asset classes. Other problems identified included issues on market neutrality and conflict of interest, as well as the trade-offs between investing responsibly and preserving liquidity, and transparency and confidentiality. Central bank respondents to the OMFIF GPI Survey 2020 reiterated these concerns. The majority did not implement ESG at all (Figure 9). Those who engaged in some form of sustainable investment did so mostly through investing in sustainable asset classes, particularly green bonds (see Chapter 8). Still, this is a relatively small market for investors with sizeable reserves such as central banks. Thus, their allocations to the asset class are limited. One central bank respondent from Europe noted that, ‘There aren’t many green

bond issues that conform to our investment guidelines and the ones that do are small.’ An Asian central bank admitted that, ‘Our portfolios are of very high quality. The added benefit of return and diversification from adding ESG may not be very significant.’

When asked about the barriers to investing sustainably, several central banks highlighted the scale and complexity of sustainable asset classes. Almost half reported

8%

Only 8% of respondents said they would add the renminbi to their portfolio within the next two years

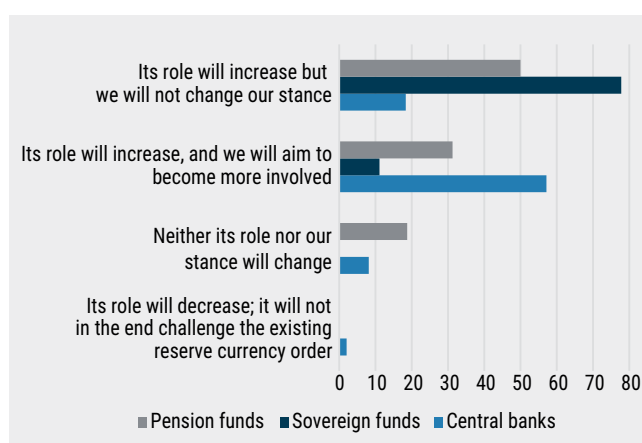
challenges with insufficient data and information. Nearly 40% stated that it does not fit with their investment strategy. One central bank from Europe commented that ‘It is not entirely clear at this stage how well this aligns with our investment mandate of capital preservation and generating income versus potential costs, also in terms of potentially lower expected returns.’

Some central banks have taken on different strategies. For instance, the Banca d’Italia has started integrating ESG criteria in the equity portfolios of its own funds, while the Swiss National Bank has begun exercising its shareholder rights for its equity portfolio through proxy voting. However, these strategies are only available to investors that have equity holdings, which as reported earlier in this chapter applies to relatively small share of central bank portfolios. Another example is Norges Bank, which works closely with the Norwegian sovereign fund to integrate responsible investment.

8. Renminbi bullishness across GPIs

How do you see the role of the renminbi as a reserve currency developing and how will you respond?, % of total responses by institution type

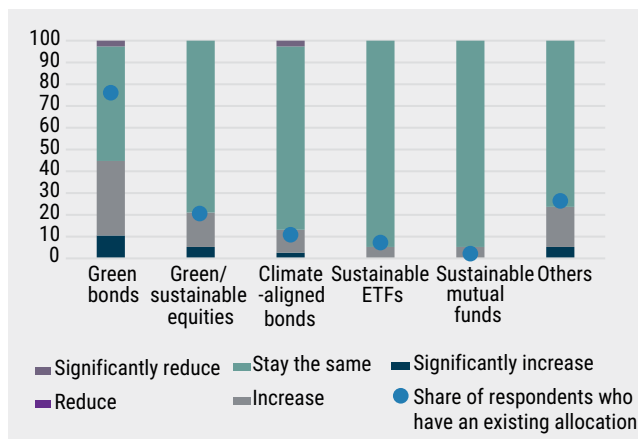
Source: OMFIF GPI Survey 2020



9. Expect even greater official inflows into green bonds

Which sustainable assets do you invest in and are you planning to increase your allocation to 'green' asset investments over the next 12-24 months?, % of total responses by sustainable asset class

Source: OMFIF GPI Survey 2020



The landscape is quite different for sovereign funds and pension funds. Only 8% of sovereign funds responding to the survey said that they do not implement ESG. The majority implement ESG through integration strategies, exclusions and shareholder engagement.

As an example of integration, Singapore's sovereign fund Temasek set 2030 as the target year to halve greenhouse gas emissions in its portfolio and will start reporting on its usage of water, paper, electricity and air miles.

All pension fund respondents implement ESG in some way. More than 80% carried out exclusions, corporate engagement, or ESG integration. Pension funds in Europe and Asia were the most active in integrating ESG among our set of respondents, in line with publicly known initiatives by pension funds in this area.

For example, Dutch pension fund PGGM and asset manager APG set up in September 2019 the SDI Asset Owner Platform, a platform for institutional investors to contribute to the United Nations sustainable development goals.

All three institution types plan to expand their allocation to green investments in the next two years. Among respondents, 43% aim to increase allocation to green bonds, while 3% intend to significantly reduce it. Sustainable equities were the second most popular asset class, with more than one-fifth of investors planning to raise allocation. Others

'The coverage of ESG data is still low for our internally managed portfolios (sovereigns and Supranationals and agencies), which makes ESG integration more challenging.'

Central bank survey respondent

mentioned sharia-compliant bonds and exchange-traded funds. These themes are analysed further in Chapter 9.

Alternative assets – technology, private markets, and direct lending

As part of our exploration of the growing role of private markets in official institutions' investment behaviour, we placed a particular focus on the technology sector.

First, we sought to examine how respondents access technology, with a view to complementing datasets on the popularity of especially private market technology deals (see Chapter 7).

Public equities remain by far the most popular way of accessing technology exposure for public pension and sovereign funds. Public, listed equities are one of the two most popular asset classes in general among these groups. However, the growth of private markets is evident. More funds are establishing in-house venture capital or broader private equity teams. Even more are using co-investment as a way of accessing knowledge, expertise, investment networks, and thus the underlying technology.

To a large extent, this appetite is whetted by the prospect of high returns, which 46% of respondents said was the main reason for their investment in the technology sector (Figure 10).

Many funds identified hedging against disruption risk as an important variable, adding a new dimension to understanding of sovereign funds as 'rainy day' funds. As one respondent noted, 'We consider disruption both an opportunity and a hazard, and incorporate this into our decision-making in assessing the risk-return trade-off.'

Similarly, almost one-third suggested that their domestic development mandates prompted their investment in technology, which also explains the relative popularity of co-investments in our sample of data provided by the Tufts University Fletcher School's

10. Returns the main driver of tech investment, but disruption looms large

What has been the main motivation behind any potential investments in the technology sector, both public and private?, % of total responses, sovereign and public pension funds

Source: OMFIF GPI Survey 2020



‘It seems that Europe may be strongly hit by Covid-19 effects. The pandemic may also significantly impact the US, as the country’s healthcare system may not be efficient enough.’

Central bank survey respondent

SovereignNet. Collaborative strategies are an easy way to gain access to foreign markets for domestic firms, as well as a channel through which expertise on a particular sector, issue, or geography can be transmitted across borders (see Chapter 7).

The prospect of returns has also driven a push into private debt, an asset class which 40% of sovereign and public pension fund respondents have incorporated into their portfolio.

At the same time, transparency and liquidity remain significant issues for the direct lending/private debt market, with 35% of respondents identifying opacity around returns as a major obstacle, alongside 30% selecting opacity around underlying risk and 35% selecting lack of liquidity. In the words of one respondent, private debt is ‘not a very attractive asset class given risk-return and the resources needed.’ Lack of information also remains an issue in the infrastructure asset class, with 59% of respondents noting that they do not have a benchmark for infrastructure investments. The other 41% either use a benchmark index or their own internal benchmark.

Of recessions and pandemics

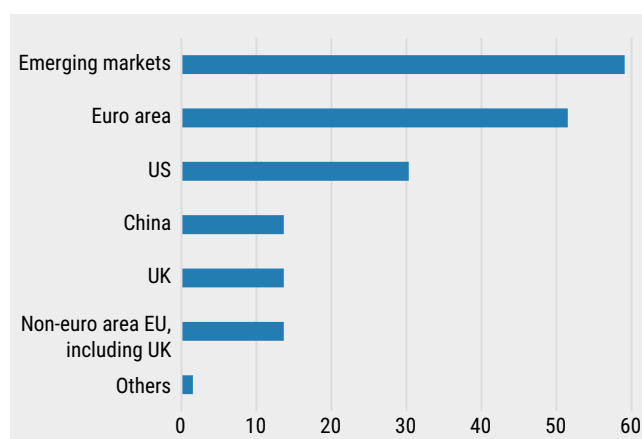
Fieldwork for this study was conducted between April and June. We incorporated a question on which area would probably be most affected by the next recession, aware of the fact that the world was probably

entering one. Several respondents simply selected all regions as the most vulnerable, highlighting the widespread pessimism about the global economy.

As for the regional specificities of this outlook, most respondents were gloomy about the prospects for emerging market economies, with 59% of institutions describing that group as the most vulnerable to shocks (Figure 11). This was borne out by capital flight from these countries during the heavy market disruption that characterised the early phases of the Covid shock. Respondents suggested that potential post-pandemic manufacturing re-onshoring would hit these economies hard, while falling commodity prices and already cramped fiscal space would result in long-term structural budgetary problems. One central bank respondent put it as follows: ‘Some [emerging markets] may not be able to obtain the required funds

to face a public health problem, which will affect their economies. Their economic structures are more vulnerable to a global supply shock such as the one we are facing, and that leaves them in a worse position comparatively.’ This was a widespread concern among respondents.

Many felt that the euro area was particularly vulnerable, with 54% of respondents selecting it as the bloc likely to be hardest hit. One respondent highlighted that the European Union was already, still, weakened by the 2008 global financial crisis, and that the Covid-19 shock would compound its difficulties. Another pointed to the euro area’s ‘high dependence on consumer-related services, large tourism sector, limited potential to implement further easing policies’ as structurally worrying factors making it prone to economic disruption. •



11. No one spared

Which of the following areas will be hardest hit by the next recession?, % of total responses

Source: OMFIF GPI Survey 2020



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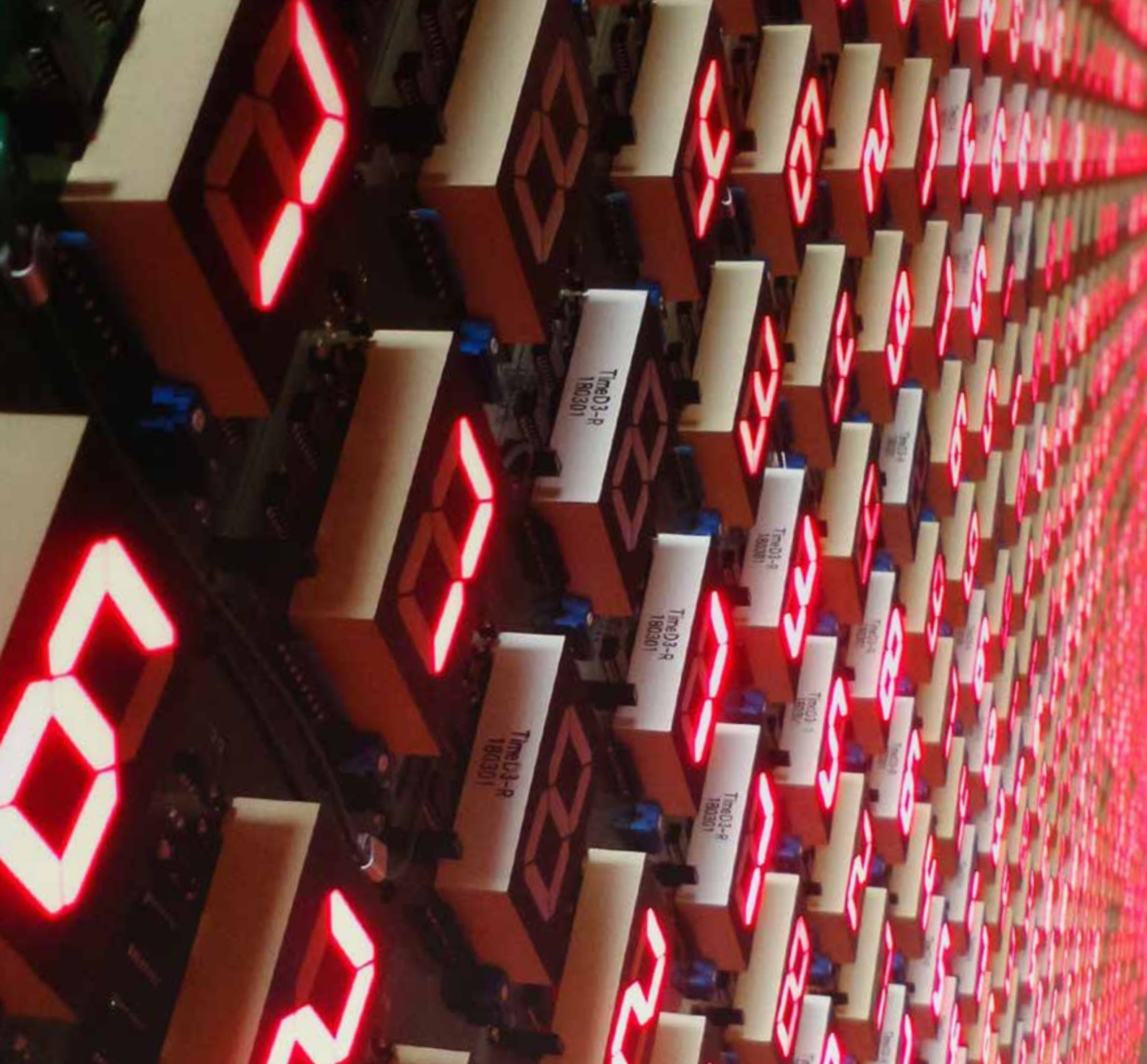
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Chapter 7

Sovereign funds' technology investments

‘Public-private partnerships to overcome start-up obstacles’



Sovereign funds and French public authorities are working together to boost investments in the country’s promising tech sector, writes Alexandre Gazaniol, economist, impact assessment unit at Bpifrance.

THE French technology sector has grown significantly over recent years. In 2019, local start-ups raised around €5bn, almost tripling investments in four years. Between 2015-19, the number of venture capital deals increased by half and the average deal size nearly doubled. All industries have benefited from this trend, from software and internet services to life sciences. The venture capital industry is upscaling, as general partners boost funds under management, develop new business lines, set up offices abroad and invest in their ability to provide operational support to their portfolio. France has a growing network of incubators and accelerators, including ‘Station F’ in Paris.

This trend is partly the result of a long-time effort led by French public authorities to overcome the many obstacles – financial and non-financial – that start-ups face. Public-private partnerships are needed to develop a viable venture capital sector. Venture capital is associated with high financial risks and all actors within the industry, from entrepreneurs to investors, must follow a learning curve so that the asset class becomes profitable.

Venture capital’s positive impact goes beyond the benefits of private investors and is not fully accounted for in investment decisions. These ‘externalities’ include the dissemination of knowledge and innovation, as well as environmental and health benefits. To ensure society reaps the full benefits of venture capital, public authorities must share financial risks with private investors.

Bpifrance, the French public development bank, was designed precisely for this purpose. Its objective is to promote high-growth companies by investing with the private sector, covering all segments of the venture capital market from seed to growth. Operationally,

‘In 2019, local start-ups raised around €5bn, almost tripling investments in four years.’

Bpifrance acts both as a direct investor and a ‘fund of funds’. In 2019, direct investments into start-ups represented around €320m, while commitments into venture capital funds amounted to nearly €600m. The increase of these investments in recent years was in line with market movements, and Bpifrance’s weight in total venture capital funding remained constant.

Bpifrance has partnered with sovereign funds, which are attracted by the French tech sector’s potential and willing to adopt a more flexible and long-term approach than traditional investors.

For example, Bpifrance has a co-investment agreement with the UAE’s Mubadala, which targets fast-growing companies through direct investments and a fund of funds programme. This type of agreement allows the sovereign fund to meet its return expectations, while channelling patient funds into the French ecosystem.

Pandemic-induced lockdown measures have hurt start-ups’ revenues and fund-raising, but the impact varies across industries. Bpifrance has enacted a wide support programme to provide bridge finance for start-ups with little cash runway.

Lockdowns have also accelerated the digitalisation of the economy and will induce structural changes in consumer habits and production processes. Tech sector equity values have outperformed the rest of the economy over the past months.

Bpifrance is committed to help start-ups seize these opportunities and foster the emergence of new actors and industries.

This will ensure the French tech scene remains buoyant over the long run, in an efficient, innovative, competitive and resilient French economy. •

Sovereign funds seek returns and geopolitical clout

Low returns on traditional assets have driven many sovereign funds to invest in technology firms. Yield is not the only motivation, however. Concerns about deglobalisation and disruption are crucial, write Pierre Ortlieb and Brandon Chye.

THE volume of sovereign fund deals in private market technologies fell in 2019, after years of growth. Since the 2008 financial crisis, returns on listed assets have waned. Geopolitical tensions have risen and public listings by major technology companies have declined. As a result, sovereign funds looked for profit and power in direct and indirect private market technology investments. Yet the private market technology rush appears to have cooled significantly even before the onset of the Covid-19 pandemic.

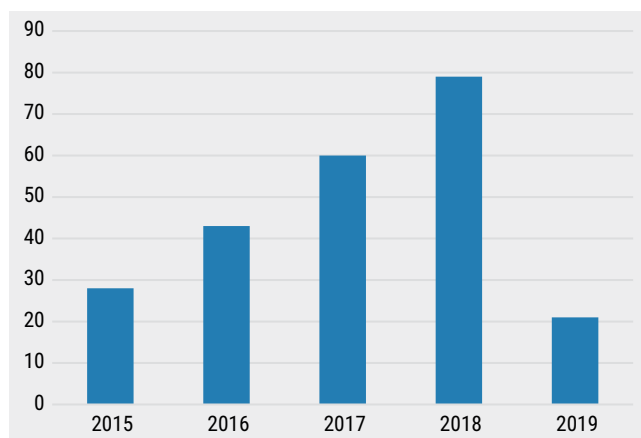
Nonetheless, technology remains of strategic importance for sovereign funds across geographies and sectors. This chapter lays out sovereign funds' existing holdings, strategies and rationales for investment in private market technology, seeking to disentangle the roles of geopolitics, internal investment capacity and governance. As the immediate shock

of the pandemic subsides and its longer-term implications unfold, this sector will take on even greater importance.

Quantifying sovereign funds' technology exposure

Many of the major sovereign fund players in technology come from

emerging market backgrounds and are highly concentrated on specific institutions. In particular, Singapore's Temasek and GIC are prolific investors across this landscape. Together, they were involved in nearly 61% of total technology deals between 2015-19 (Figure 2). The high involvement by Singaporean



1. Momentum slows after years of growth

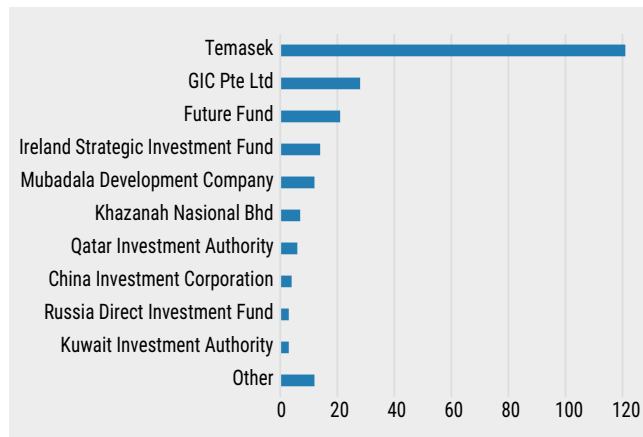
Number of technology investment deals by sovereign funds by year, 2015-19

Source: Tufts University SovereignNet, OMFIF analysis

2. Tech investments highly concentrated among emerging market sovereign funds

Top 10 sovereign funds by number of technology investment deals, 2015-2019

Source: Tufts University SovereignNet, OMFIF analysis



sovereign funds is linked to long-term capacity building within their divisions. Temasek and GIC were some of the first investors to explore early-stage technology investments and venture capital efforts, as early as the 1980s. Other sovereign funds are increasingly engaged in this area. Malaysia's Khazanah Nasional Berhad is a notable sovereign technology investor. A trio of Gulf state sovereign funds, the Qatar Investment Authority, the Kuwait Investment Authority and Mubadala, were involved in around 9% of deals between 2015-19. The profile of these major sovereign technology investors suggests that countries lacking natural technology bases have tried to acquire, import and reverse-engineer expertise from abroad via strategic sovereign investments. These funds' activities underline financial and political competitive pressures across the sovereign investment sector.

Examining the major target countries for technology deals highlights that techno-nationalist motives are often combined with more return-driven priorities. Even though major technology-focused sovereign funds typically originate from developing countries in Asia and the Middle East, the target countries receiving private market technology investment from sovereign funds are slightly more diverse. The lion's share of sovereign fund technology investment (51%) is spent on companies in the US (Figure 3). This is in line with America's highly

developed ecosystem. Other major recipients of sovereign fund deals are from emerging markets in Asia Pacific. China has attracted about 15% of deals, reflecting China's push towards indigenous technological innovation. Singapore and India are major target countries for deals, reflecting bullish sovereign investor sentiment attributed to an expanding young, tech-savvy middle class.

Sovereign investors have prioritised investment into core infrastructure for the digital economy (Figure 4). These areas include companies dealing with business processing software, cloud computing, data centre services, information technology management, security and storage. These investment areas are likely to grow as businesses digitise and accelerate their efforts to adapt to the post-Covid-19 economy. In a demanding balancing act, they involve both investing in new technologies

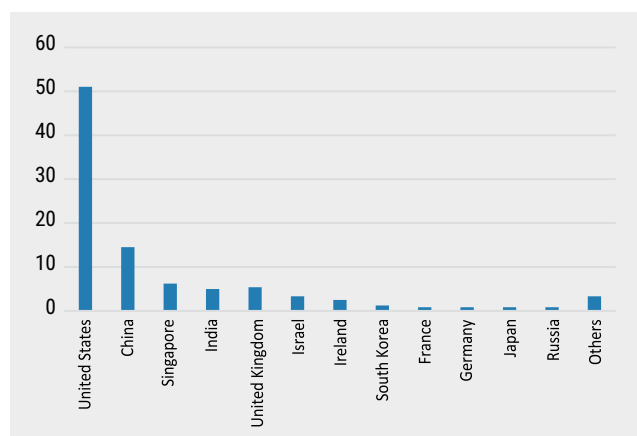
and upgrading existing assets.

Another field that stands out is biotechnology, which has taken on increasing importance as a result of the pandemic. The interplay between biopolitics and cross-border sovereign investment is an area of increasing tension. The Russia Direct Investment Fund is backing the tentatively useful Covid-19 treatment drug Avifavir. In a failed attempt at biopolitical mercantilism, the US administration was rebuffed in its attempt to take over unlisted German vaccine maker CureVac, leading to the German government to acquire a stake itself ahead of a planned US stock market flotation. Beyond the pandemic, however, as advanced economies grapple with ageing populations, investments in life sciences, healthcare and wellness will also be shaped by changing consumption patterns.

Early-stage technology investments may be complex activities for institutional investors to evaluate. But it is clear that investment risk is often tempered with a clear awareness of demographic trends and structural economic transformation that will affect different countries and sectors. The focus areas of sovereign investment are aligned with these trends to maximise the likelihood of long term profitability.

Models and strategies

Sovereign funds have traditionally relied on indirect means of accessing technology investments, including



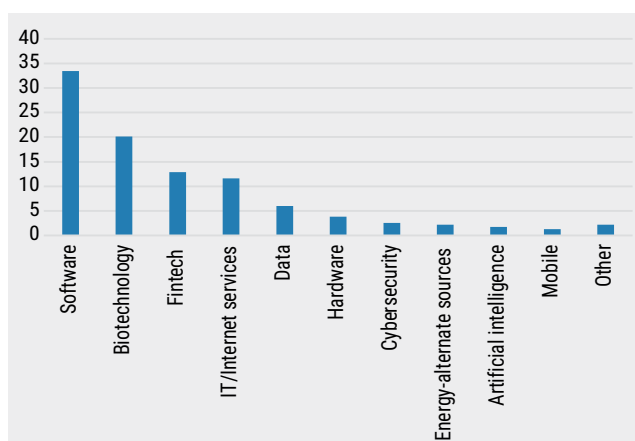
3. US is the most popular destination for inbound sovereign fund tech investments

Top 10 destination countries by % of technology investment deals, 2015-19

Source: Tufts University SovereignNet, OMFIF analysis

listed equities and investment through external venture capital funds. Many funds still maintain the former approach, such as those passive stabilisation funds that are sector-neutral vis-à-vis an index such as the MSCI All Country World Index. Yet the growing clout and scale of some large sovereign funds on the global investment stage has transformed their role and shifted their focus towards direct access.

Since the 2008 financial crisis, sovereign funds have increasingly



4. Tech investments aligned with strategic trends in the digitalised, post-pandemic economy

Top 10 technology sub-sectors by % of sovereign fund investment deals, 2015-2019

Source: Tufts University SovereignNet, OMFIF analysis

Central banks' technology stakes

CENTRAL bank reserves generally do not include investments in private markets, although some central bank-affiliated sovereign funds – such as the Hong Kong Monetary Authority's Exchange Fund and Norges Bank Investment Management – invest in private markets in some capacity.

A growing share of reserves managers, including at the People's Bank of China, the Swiss National Bank and the Reserve Bank of Australia, have allocated some of their holdings towards listed equities. These holdings often include significant shares of listed technology companies,

especially as central banks are generally barred from holding bank equities.

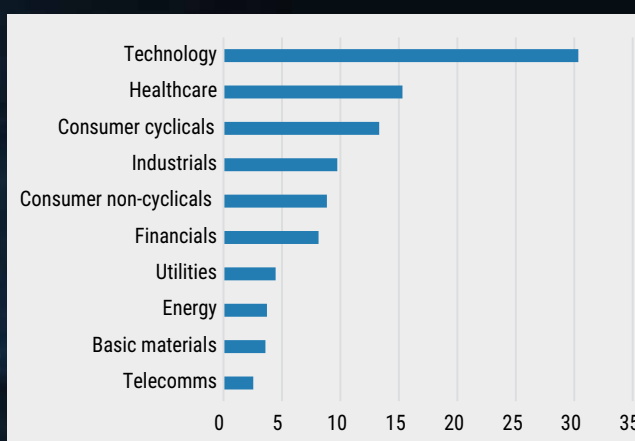
This gives equity-holding central banks a stake in innovative, disruptive processes and a way to reap the benefits of technological advances achieved in other economies. It also raises questions on shareholder activity – how active can central banks be as shareholders, especially on key issues such as assuring adequate corporate governance or promoting sustainability?

These considerations place them at the centre of difficult geopolitical quandaries.

5. Central banks tied up in booming tech sector

SNB listed equity portfolio, May 2020, % by sector

Source: Thomson Reuters, OMFIF analysis



looked to private markets as an entrance point to technology investment. First, the appeal of listed assets has declined across developed markets, forcing significant reconsideration of investment strategies among this group of investors. Second, high-profile and attractive technology firms have become increasingly reluctant to list on public markets. New listings fell 20% between 2018-19. Many of the firms that have gone public, such as Uber, have experienced significant share price drops in the aftermath.

Tepid initial public offering figures are mirrored by a boom for venture capital among sovereign funds. Sovereign funds have contributed vast amounts of funding to so-called external investment 'platforms', including investments by Saudi Arabia's Public Investment Fund in Japanese conglomerate Softbank's Vision Fund I. Typically, external funds are used to access deals at earlier stages, drawing on the expertise and local knowledge of the venture fund manager. For later stages in a company's cycle, sovereign funds will typically draw on their own capacity or establish specialised internal funds, a strategy which will be explored later in this chapter.

These models of delegation have proven popular among sovereign funds given the broader financial market environment and their desire to participate in the immense growth of the technology sector. These modes of access tend to provide a highly diversified, high-quality deal flow. They allow sovereign funds to capitalise on the know-how of venture funds at key points in deal origination and due diligence.

Yet reliance on external, indirect strategies to access private technology markets can prove challenging, especially for smaller funds with less clout and experience. For one, exorbitant fee structures, particularly among the most highly rated venture fund managers, can act as a disincentive for even the most risk-hungry sovereign funds. At the same time, it can be difficult for smaller

sovereign funds to gain access to those sought-after venture investors, reducing potential rewards and their appetite for specialised investments. Finally, sovereign funds may find that indirect participation results in a lack of control and strategic benefit from their technology investments, countermanning a key strategic reason guiding these transactions. Therefore, many funds have turned towards direct market access, often using co-investment or a build-up of internal capacity through in-house venture funds.

The alternative to a delegation-based model of passive participation is direct equity investing, which has risen in popularity among sovereign funds. The least innovative of these, solo direct investment, is the most common. It involves a sovereign fund simply taking an equity stake in a private technology company. Lower

51%

**US-based companies
received 51% of
sovereign fund
technology investments
between 2015-19**

fee structures and greater control are two advantages of this model.

Direct equity investment in private markets has brought about more engaging forms of innovation, institutional development and co-operation among sovereign funds.

Most importantly, sovereign funds have risen to the task of developing the internal capacity required to execute complex direct investments. This practice raises questions about their institutional capacity and the adequacy of their governance structures. This is reflected in the number of sovereign fund offices that have opened the globe.

The most notable city which has a clear ecosystem built around various

aspects of the technology investment lifecycle is San Francisco. One of the salient challenges for early-stage technology investing is that many companies have no tangible assets and are unlisted, lacking an assessment of their potential financial value. Some of the human capital advantages from setting up a regional office in San Francisco are clear; global public investors are closely situated to key companies and technology innovation hubs in Silicon Valley, as well as universities such as Stanford. Global public investors can benefit from access to a pipeline of professionals with the expertise to integrate opaque and complex technology investments into their portfolios.

In addition to maintaining offices in tech hubs such as San Francisco, direct investments in the technology sector require the build-up of internal expertise and often significant changes to governance models. Innovation can be challenging to understand, requiring deep internal specialisation and more careful due diligence. Measuring performance and developing the right risk management models to understand both macro and micro risks involved requires effort and patience. The largest sovereign funds have dealt with this by establishing in-house, specialised venture capital institutions. Temasek established Vertex Holdings in 1988 for precisely this reason – to provide operational support to its network of funds and harness local knowledge in each of its six target regions. Serving as an anchor investor through Vertex allows Temasek to delegate internally, thereby balancing control and strategic benefits with the specialised know-how of indirect or platform investment. A host of other large sovereign funds have emulated this strategy, developing their capacity through establishing in-house, technology-focused investment units.

The appeal of co-investment

In parallel to the establishment of internal venture capital platforms,

sovereign funds have turned to co-operative co-investment strategies among themselves, allowing them to leverage each other's knowledge, networks and expertise. Co-investment implies a 'more dynamic engagement with partner companies' and 'demands a stronger analytical framework and a long-term engagement mindset,' as noted by Javier Capapé, professor at IE Business School. It is a far more hands-on strategy than simple delegation models. Some forms of co-investment, such as two sovereign funds investing with the same venture capital manager, represent more co-incidental forms of co-operation. Those forms of co-investment that involve a sovereign fund as the anchor or lead, and involve more deliberate co-operation, represent an important growing trend. While they are costly and labour intensive, they represent a great opportunity for sovereign funds to further entrench themselves as powerful global investment players and further develop their institutional capacity, gaining expertise and market access from collaboration with their peers.

These strategies have risen in prominence in recent years. According to the direct investment data by Tufts University's SovereignNet, there were 97 unique co-investment deals by sovereign funds between 2015-19. Co-investment transactions make up roughly 14% of the dataset. Bpifrance, one of the world's most active tech investors, is a case in point, having established co-investment opportunities with a number of other leading sovereign funds. Bpifrance and CIC Capital established the Sino-French Third-Countries Investment Fund in late 2016, boosting third-party market access for French and Chinese companies. Bpifrance established similar projects with the Korea Investment Corporation, Bahrain's Mubadala, and the Russia Direct Investment Fund, all seeking to bolster the development plans and economic interests of companies located in France.

Bpifrance's experience underlines

the features and benefits of co-investments for sovereign funds. Typically, these are designed to enhance access to a particular region or investment theme. Bpifrance's agreement with Mubadala sought to enhance access to French tech companies, for example. At the same time, through its partnership with CIC Capital, it has been able to leverage the know-how, network and expertise of Chinese firms and the sovereign fund to access both the Chinese market and third markets.

Clearly defined rules and procedures are required to ensure the fullest possible success for the co-investment. Defining a clear mandate for the group ensures a high-quality and thematically relevant deal pipeline. Ensuring commitment to the co-investment by participating funds is equally important. Preventing the rise of unwanted competition effects between the participating institutions is another key step in helping the success of the endeavour.

In all these cases of direct equity investment, governance concerns are crucial. Some of these can be addressed through more thorough risk management frameworks and internal specialisation. Others are more strategic and geopolitical in nature, alluding to the inevitably political nature of these institutions. For example, political tension may inhibit a successful partnership in cases where there is distrust between the partners or between the partners

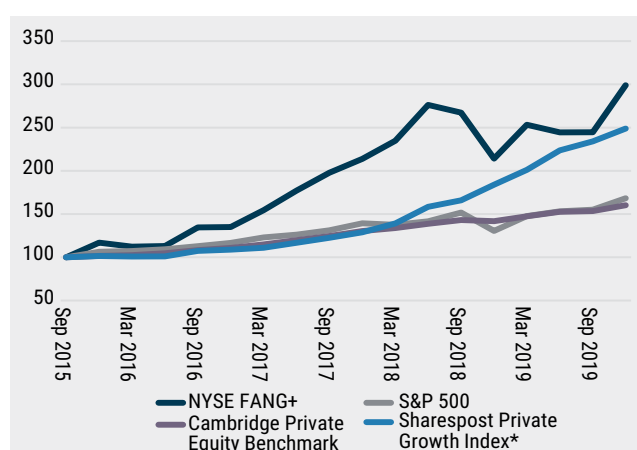
and a target's parent country. This has been a recurring theme over the past decade. Many developed economies have taken an increasingly hard-line stance against Chinese investment, which in some cases may be linked to, say, French investment through Bpifrance. A Sino-French co-investment in the US, for example, might lead to French exclusion under new investment screening rules. Similarly, the distinct fiduciary responsibilities of sovereign funds require them to take a more active stance as shareholders on certain issues, which might breed conflict between partners where there is poor alignment on strategic aims. This makes defining them at the outset all the more important.

Rationales for technology investment

Over the past decade, technology stocks have vastly outperformed the broader market. Returns from private investments in technology companies have been eye-popping (Figure 8).

This is a powerful rationale for seeking out technology investments, especially through direct investments where fee structures are lower. For funds that have long been active in this sector, the appeal is even larger. Temasek, for instance, has leveraged its internal capacity and geographic reach to 'amplify net returns and drive additional exposure to direct investing'.

Proactive investment in technology



*The SharesPost Private Growth Index measures the performance of VC backed, US based, private growth companies across technology driven sectors.

8. Burst in tech outperformance drives GPI interest

Quarterly returns on NYSE FANG+ index, S&P 500, Cambridge Associates Private Equity benchmark, and SharesPost Private Growth Index benchmark, Q3 2015 = 100

Source: Refinitiv, OMFIF analysis

will help sovereign funds stay ahead for the future, enabling them to secure growth for their constituents by anticipating trends. The Abu Dhabi Investment Council's investment in WhatsApp, which allowed it to reap significant returns when the latter was bought by Facebook in 2014, is a notable case. In a similar vein, investing in productivity-enhancing technologies will ensure higher growth and, by extension, higher asset prices in the future.

At the same time, peer pressure can be a powerful force; the vast majority of private market deals are conducted by large, internationally active sovereign funds. The rise of co-investment as a strategy for technology access makes this particularly easy. It allows more inexperienced funds to deploy capital accompanied by a more skilled partner, leveraging the expertise of their peer group. According to the OMFIF GPI Survey 2020, high returns were the main driver behind technology investment for 46% of sovereign and public pension funds, followed by 'preparing for disruption risks' at 29%.

Yet as inherently political institutions, many sovereign funds are driven by instincts that force them into competition with other funds. Innovative investments and high-impact technologies are scarce commodities. Their limited supply will spur sovereign funds on the outside to seek greater access; their appealing returns add to these competitive dynamics. 'Following leaders' has been an important generator of sovereign fund technology investment, fuelled by both collaborative and competitive forces.

Supporting local innovation is a key motivation in sovereign fund technology investments, a feature which is more common among traditional 'development' funds rather than among 'stabilisation' or 'savings' funds. However, even the latter group have become more involved in bolstering domestic tech companies as the sovereign fund

community has developed.

Fulfilment of this mandate can take several forms. Typically, sovereign funds have preferred direct investments to indirect ones; the latter necessarily removes the investor from direct control and may limit the benefits of the investment. On the other hand, sovereign funds have pursued indirect investment as a means for supporting domestic tech firms – for instance, the Ireland Strategic Investment Fund has committed a significant amount of capital to venture capital platforms such as Silicon Valley Bank's Strategic Investors Fund X to develop, scale and lend to small-scale, innovative Irish firms. Similarly, its \$100m commitment to Insight Venture Partners' Fund X seeks to bolster established and growing Irish software businesses.

Direct investments are regarded as a more effective way to lift domestic innovators. They provide a greater degree of control over the investment, developing and maintaining the local technology base. For investments abroad, direct access allows the sovereign fund to ensure that processes such as technology transfers and knowledge-sharing take place. ISIF provides further examples for how direct equity investment can be used to leverage technology, creating employment and productivity gains. In 2017, it invested €19m in Kaseya, a provider of IT solutions for managed service providers and mid-sized enterprises, adding 130 jobs to the company's already-existing 30 Dublin-based employees.

While Kaseya is an Irish company, supporting domestic innovation is by no means limited to investment in local firms. Sovereign funds can invest in foreign firms, encouraging them to expand their operations in the home country. ISIF's investment in Nautilus Data Technologies is a case in point. The California-based pioneer in sustainable data centres will expand its operations in Ireland following ISIF's backing, 'with the aim of constructing a new generation

of leading-edge data centres in Ireland for use in the Irish and global markets'. Here, technology transfer from abroad bolsters domestic innovation and creating employment. While some might argue that this transfer prevents domestic companies from flourishing, the specificity of the technology in question and the aggregate benefit provided to the Irish economy mean that concerns about a form of 'technological mercantilism' should not apply here.

The rise of co-investment strategies has facilitated the use of sovereign funds as a means of nurturing domestic innovation. Many of these co-investments allow technology to flow between jurisdictions, resulting in a mutually beneficial exchange of knowledge and capacity – provided clear rules of engagement are spelled out. Bpifrance's partnership with Korea Investment Corporation, for example, allows French investee firms to gain easy access to Korean capital and know-how, placing them in a stronger position to innovate while remaining intrinsically 'French'. KIC's involvement can facilitate technology transfer to Korea, taking steps towards the fulfilment of their own domestic development needs.

Hedging against disruption

The notion of 'hedging against disruption' might best encapsulate sovereign funds' technology investment strategies. It captures the dual passive and active approach they have taken to innovative forces. Disruption is diffused in two ways: by producing new technologies and altering old ones.

The direct investments described in the preceding sections are generally a good example of an 'offensive' or 'attacking' strategy. By building up internal capacity, seeking access to cutting-edge investments and gaining a stake in the underlying technology, sovereign funds are able to position themselves at the forefront of innovation, ensuring that they reap the benefits of nascent disruptive phenomena. This explains

both the size and scale of sovereign funds' investments in technology. Finding the next unicorn is no easy task and doing so, for both financial and geostrategic reasons, requires an aggressive, all-encompassing and proactive approach.

Sovereign funds also engage in defensive strategies, which involve using direct investments to shield investments in other sectors. This entails taking riskier bets in more conventional sectors, such as real estate or infrastructure, and using those to safeguard against future paradigm shifts. At the same time, it requires applying knowledge gained through technology investments to existing holdings to 'futureproof' them.

GIC's approach to the real estate industry has been an apt example of the former. As Lee Kok Sun, chief executive officer of GIC Real Estate, says, the fund has taken significant forward-looking gambles in property, such as a sizeable bet on the future importance of co-working. This allowed the fund to better understand nascent development in the sector and to profit financially if the trend should become a widespread new reality. This is one way of ensuring that sovereign funds are insured against disruption in traditional sectors.

The other side of this coin is upgrading existing assets and ensuring that they are not left behind by technological advances. Insights gained through investments in the technology sector can lead to change throughout the entire investment strategy, from the application of new data analytics tools to refurbishment of existing building space. Lee Kok Sun describes how GIC had 'decided to convert the banking hall' in one of their portfolio office buildings 'into a hub in which tenants could hold events and showcase their latest products or technology'. In 2018, Australian Future Fund's Chief Investment Officer Raphael Arndt described how the fund had used the knowledge acquired through e-commerce investments, and

61%

Between 2015-19, 61% of global tech deals involved GIC and Temasek

their staff with a background in ecommerce, to upgrade 'a traditional brick and mortar luxury goods retailer that had a pretty basic web offering'.

These two approaches allow sovereign funds to leverage their patient capital and growing internal capacity to take advantage of overarching, non-market risks, such as demographic change. Hedging against disruption in this way is a complex task, but one from which prepared and well-governed sovereign funds can reap substantial benefits.

The development of comprehensive private capital programmes is key for sovereign funds seeking to prepare for, hedge against and reap returns from disruptive technological processes. Several funds, including Singapore's GIC and Temasek, have taken a significant head start in their private market access.

Other funds are catching up, as they shift from indirect platform investments, such as external venture capital funds, to some degree of self-reliance in their private technology investments. This has involved the development of considerable new internal capacity, a process which is changing the way sovereign funds see themselves and operate. The perception that disruption will influence every sector of the global economy has driven many sovereign funds to take a two-pronged approach. They are engaging in a delicate game of 'attack' and 'defence' wherein they aggressively pursue unicorns and upgrade existing assets in more conventional sectors.

The field of agritech highlights the distinctly geopolitical nature of these investments. Both the target and origin country in a deal must weigh important strategic considerations against the prospect of returns. Wide dispersion in returns on investments together with the possible reversal of globalisation in many fields and the broader pandemic fall-out will maintain sovereign funds' technology pursuits in the vanguard of international investment for years to come. •



‘Digital economy could be relabelled Covid economy’



The pandemic provides opportunities for investors, consumers and governments to target capital towards building a sustainable future, writes Tibor Schwartz, senior adviser, asset management, QIC Global Infrastructure.

As a result of the new socially-distanced reality, the digital economy could be relabelled the Covid economy. Investors are seeing an increasing pace of technological change, alongside a growing need to adopt and integrate innovation along all stages of the investment spectrum.

Early-stage technology opportunities are becoming more appealing, despite their high-risk, high-reward profile. Today, institutional and sovereign investors should view the digital economy and technological innovation as a vanguard against disruption and a champion for sustainability.

Before the pandemic, the pace of technological change had begun to restructure the foundations of the global economy. New technologies – such as data and energy storage, and renewable hydrogen infrastructure – are emerging to become tomorrow’s utilities and infrastructure. Institutional investors kept abreast of these technological, regulatory and consumer driven changes by adapting asset classifications. The virus outbreak has highlighted the role of technological innovation as an essential connector as international borders are shuttered and commercial activity disturbed at an unprecedented scale.

Even as the full impact of Covid-19 is still being mapped out, investors, consumers and governments have an opportunity to target capital towards building a sustainable future. Technological innovation is powering climate resilience, decarbonisation and decentralisation. Sustainability drives investment performance through enhanced growth, as well as lower

operational costs and reduced regulatory and legal intervention risks, among others.

The scope of an investor’s support should expand to a ‘technology ecosystem’ rather than individual technology enablers. For instance, the South Korean approach to prioritising investment in the ‘hydrogen ecosystem’ is inclusive of the production, storage and dispensation of renewable hydrogen. South Korea’s plans for a hydrogen ecosystem could transform the domestic economy, and has strong export potential for hydrogen technology such as fuel cells.

To succeed and manage risk, institutional and sovereign investors must understand the level of

continual process improvements that must occur to ensure the resilience of their investments in a constantly changing environment. To build a sustainable business, technological innovation must be embedded across all ‘life stages’ of a company: maintenance, expansion and re-creation. As such, innovation doesn’t just play a role in existing operations; it can

play a positive, disruptive role in the latter stages as well.

Governments, through their fiscal stimulus post-Covid can support the shifting technological landscape to ensure long-term benefits. They can do this by providing regulatory certainty and early-stage funding to help business grow.

At QIC, we seek out innovations and innovators contributing to an investment environment to make the operations of a business fit for the future. All these ingredients can be combined to create growth and relevance for a reimagined, more sustainable future.

‘Technological innovation is powering climate resilience, decarbonisation and decentralisation.’



Navigating pathway through politics of agribusiness

Sovereign funds are exploring more complex and sophisticated investment strategies in an era of heightened scrutiny over their cross-border operations.

STRATEGIC objectives have often dictated sovereign funds' investment approaches. As long-term providers of capital, these financial institutions can dedicate investments to specific industries and sectors seen as contributing to the investing countries' social and economic security. Sovereign funds are adapting their investment approaches as the long-term systemic risks of climate change, overpopulation and food shortages shape public consciousness and the policy-making agenda.

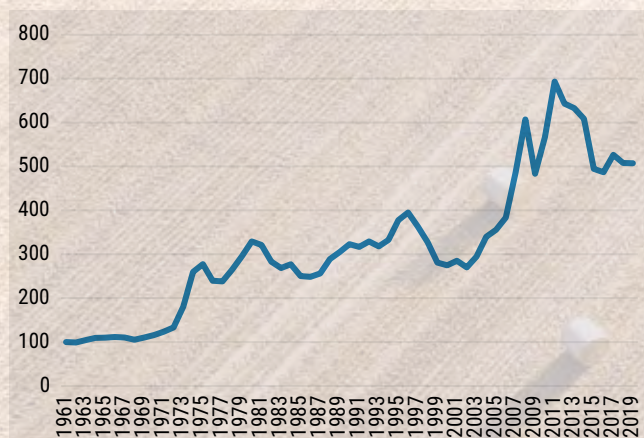
Even as international initiatives try to blunt climate change, mitigation actions could have thorny trade-offs and exacerbate Malthusian pressures on global food adequacy (Figure 6). For instance, a 2019 report from the United Nations Intergovernmental Panel on Climate Change estimates that by 2050, afforestation on a massive scale could create pressures on arable land and increase food prices by as much as 80%. Covid-19 has further underscored potential food supply vulnerabilities. Fragmentation in international supply chains and movement restrictions have jeopardised the production and distribution of food across the world.

Sovereign funds place considerable importance on consolidating and strengthening their states' supply chains of food and similar essential natural resources. Many sovereign funds originate from small, open and resource dependent economies that will be heavily affected by any disruptions and structural scarcity in international food supplies. Emerging market sovereign funds are thus particularly influential players in redefining the landscape of global food security. For instance, the Middle East has been a prolific region for outbound agro-food investments linked to the reorientation of national food security policies since 2007. As water-stressed countries with low arable land levels, they are exposed to supply and price risks for food imports. Private market technology allocations are flourishing amid reductions in traditional investments in public equities and fixed income in an era of anaemic

returns. One intersection between these two strategic trends is highlighted via sovereign fund investment into agricultural technology and agribusiness.

Major investors in agritech and agribusiness include sovereign funds such as Temasek and GIC, China Investment Corporation and Arab Gulf state funds Mubadala, the Investment Corporation of Dubai, the QIA and the KIA (Figure 7). With the exception of NBIM, the largest sovereign

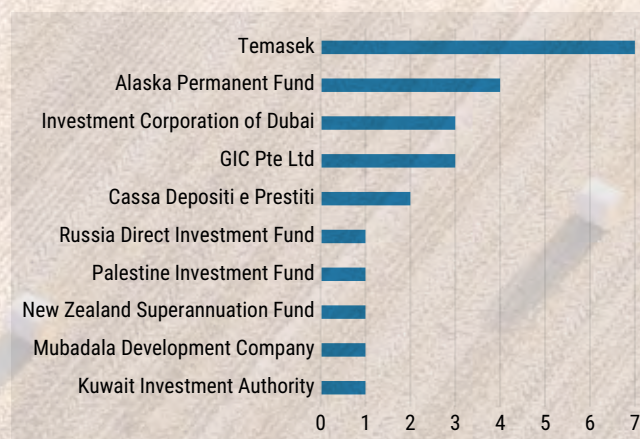
funds have dedicated agricultural investment vehicles, having made direct investments through subsidiary agricultural investment companies. In other cases, agribusiness and food security have been a basis for institutionalised collaboration among emerging market sovereign investors. CIC has collaborated with the RDIF to establish a joint Russia-China Investment Fund, with food and agriculture as a priority investment area. The RDIF has announced similar co-investment plans with



6. Volatility and increase in food prices influence strategic investment policies

FAO Food Price Index, base year = 1961


Source: FAO, OMFIF analysis



7. Sovereign funds from small or resource-dependent economies seek agro-security

Number of sovereign fund agribusiness investment deals by institution, 2015-2019

Source: Tufts University SovereignNet, OMFIF analysis



Mubadala to channel capital to Russian agriculture and food production.

Agriculture and food production are areas of great political and economic sensitivity. Sovereign funds are exploring more complex and sophisticated investment strategies in an era of heightened scrutiny over their cross-border operations. Direct acquisition of land, natural resource supplies and physical assets in foreign countries can be a thorny issue for government-linked financial actors. Amid an upsurge in protectionist sentiment, seen especially in the US-China trade dispute, foreign investment in strategic areas such as digital infrastructure, food, medicine, and energy will become subject to greater scrutiny and regulatory restrictions. Sovereign fund investments in these fields have often elicited considerable backlash. For instance, a QIA-owned subsidiary, Hassad Foods, has been compelled to redefine its investment activities in Australia to lower emphasis on strategic food security. It will instead emphasise commercial objectives perceived as more legitimate by foreign investment regulators.

Investments and projects contingent on market access to agricultural markets or land purchases to repatriate food supplies have often produced disappointing returns. Some funds have experienced success. Bahrain, for instance, was able to achieve a significant degree of agricultural self-sufficiency thanks to the activities of Mumtalakat's portfolio companies, which sparked a rise in domestically produced red meat and poultry. Yet in many cases, sovereign funds have had to take a more hands-off approach, acting as ancillary institutions supporting the agribusiness acquisitions of state-owned enterprise subsidiaries. CIC has opted for a networked investment strategy through co-investments and partnerships with

state-owned enterprises and major domestic agri-businesses to facilitate investment across the entire agricultural value chain.

In a broader sense, sovereign funds' emphasis has shifted to capture investment opportunities further up the global value chain in food production, in a process sometimes dubbed 'strategic financialisation'. In this process, sovereign funds make use of financial vehicles and investment strategies to fulfil state-driven food policies.

This has resulted in largely indirect investment in yield-boosting technologies and new sustainable food alternatives. Frontier areas that have attracted sovereign fund investment range from plant-based meat alternatives, food waste management systems, microbial fertiliser catalysts and digital agricultural business platforms. These projects are less geopolitically contentious than direct investments in offshore land.

This portfolio expansion from strategic agritech investments motivated by food and security considerations to those more centred on technological innovation has important implications for sovereign funds' organisational structures.

Strategic investments into frontier asset classes via unorthodox joint ventures and co-investment arrangements require considerable expertise and dedicated teams to evaluate and structure deals. The strategic imperative of food security continues to be a prime objective of many sovereign fund investments. Yet this overriding goal has to be combined with more financially motivated, return-seeking objectives.

Navigating a pathway amid the often conflicting influences of politics and economics remains, in the agrifood sector as in other fields, an abiding challenge.



‘Geopolitical importance of bond market digitalisation cannot be understated’



Unlike payments or foreign exchange markets, bond markets still rely on arcane financial infrastructure. The industry must rectify this as soon as possible, writes Frank Scheidig, global head of senior executive banking, DZ BANK.

THROUGHOUT the virus-induced lockdowns, even with manufacturing and supply chains at a standstill, the financial infrastructure has kept going. People were able to send and receive money, if not in real-time then usually on a next day basis. The last big step in payments and foreign exchange markets – the switch to real-time – is being implemented across several jurisdictions. Without this connectivity and uptime of payment services, the effects of the Covid-19 crisis could have been much worse.

Yet this efficiency has not spread to all corners of finance. The bond market is as vital to our economies as payments and foreign exchange, but lacks automatisisation, digitalisation and real-time availability. The pandemic has shown how deeply and quickly bond markets can be disrupted. This is in part due to investors’ risk aversion, as well as the fact that bond markets are not used to the level of digitalisation found in payments.

Bond markets would benefit greatly from the next step in the natural evolution of financial markets. The move to straight-through processing with unlimited access points as well as the real-time revolution are ripe for implementation. Solutions to implement all of these already exist. Blockchain is one way, but would require a change in almost all existing systems and the signing-up of all market participants. Leaving aside issues like speed and capacity, blockchain seems highly unlikely to be a real candidate, especially after such a devastating and costly pandemic.

Fortunately, there are other alternatives. The European primary placement facility (eppf) works with existing infrastructure to provide straight-through processing and real-time issuance, as well as standardised issuance documentation. DZ BANK, one of eppf’s founding

partners, is supporting the roll-out of this innovative platform, finding more and more use cases for itself and with other banks, issuers and investors. eppf offers the tools to keep primary bond markets open, no matter what. Like payment markets, it collates all information into a golden copy so that it even goes a step further than payments – no reconciliation is needed and errors are almost impossible since everyone works collaboratively on and with the same data. This financial infrastructure platform is cloud native, which means it can be accessed from any existing system. The benefits of implementing such a system for bond markets are clear. It prevents market disruption.

It allows for a more efficient use of markets, as well as a combination of primary and secondary markets. It offers significant cost savings for banks, issuers and investors, as it reduces the use of own capital, leaves no room for errors, requires no reconciliation and frees up time for staff to do more important

things than administer bond settlements. The system provides a much larger selection of issuers to investors and a larger pool of capital to issuers, benefiting banks though higher fees for intermediating between the two ends of the investment spectrum.

The geopolitical importance of digitalisation of bond markets cannot be understated. It will be one of the most critical pieces of future capital markets’ infrastructure (and can be easily extended to loan and other markets) by providing the portal through which banks – and above all, issuers and investors – will connect. Such plumbing needs to be neutral and fully performing. The financial industry needs to implement it as soon as possible to improve the efficiency and performance of international bond markets. •

‘The pandemic has shown how deeply and quickly bond markets can be disrupted.’



Chapter 8

Responsible infrastructure

‘Governments must not let a good crisis go to waste’



The pandemic is an opportunity for countries to implement meaningful reforms and invest in the sustainable infrastructure they need, writes Jyoti Shukla, director, World Bank Group Singapore infrastructure and urban development hub.

THE Covid-19 pandemic threatens decades of hard-won development gains and demands an urgent, exceptional response. The global economy could shrink between 5%-8% this year and 60m people may fall into extreme poverty, erasing three years of progress.

The global community is focused on the health response and the protection of livelihoods and jobs. As yet, there has been less focus on infrastructure, but these services remain an important element of a comprehensive response. Hospitals need reliable electricity; dependable transport and logistics are needed to deliver medical and food supplies. Digital infrastructure is critical to help businesses survive and provide continued learning for the more than 1bn children out of school. The blue skies, vibrant sunsets and clean air brought on by the lowest levels of emissions in years have rekindled the public's yearning for a cleaner environment.

As the world emerges from the global health emergency, investing in sustainable and resilient infrastructure will present exceptional challenges and opportunities. The Covid-19 response is igniting profound changes in behaviours, preferences and societal trends. Economic activity is likely to remain depressed until the virus is brought under control. Governments and central banks have enacted massive stimulus packages running into trillions of dollars. At a time when healthcare and digital connectivity are strong priorities for government spending, the test will be how best to seize this once-in-a-generation opportunity to prioritise investments in green infrastructure to avert the looming climate crisis.

Governments today have a great opportunity: they must not let a good crisis go to waste. The tax reform elements of stimulus packages could open up new approaches to taxes on fuel, energy and carbon. The social protection measures being rolled out, along with historically low oil prices, provide an excellent opportunity to revisit fossil fuel subsidies. A wide range of investments

in energy efficiency for buildings, water treatment and sanitation, and sustainable transport, could boost shorter term job creation and incomes while generating long-term sustainability and growth benefits. Public works programmes financed by stimulus packages could focus on irrigation, afforestation, soil conservation and watershed development. If these projects are selected carefully, they can facilitate long-term economic transformation.

Beyond such projects focusing on a quick response, a sustainable recovery is likely to include larger investments in energy, transport, water, and urban development projects. The focus should be on mobilising private financing, as public sector balance sheets will remain stretched for some time to come. Institutional investors such as pension funds and insurance

companies need to seek greater risk-adjusted yields even as more than one-quarter of assets globally are now being invested in due accordance with environmental, social, and governance standards. The need for ESG-compliant yields could unlock greater private participation in sustainable infrastructure and drive innovations in business models,

regulatory frameworks, digital platforms and implementation timelines. Developing a green infrastructure pipeline takes time and national infrastructure departments would be well advised to develop these pipelines even as the shorter term focus remains on the health and economic response.

The World Bank Group is deploying up to \$160bn over the next 15 months to help more than 100 countries protect the poor and vulnerable, support businesses, and bolster economic recovery. Within all these phases, the WBG will focus on the four pillars of saving lives, protecting the poor and vulnerable, saving jobs, and strengthening policies and institutions. The aim is to promote a sustainable and resilient recovery and maintain attention on long-term development goals.

‘The Covid-19 response is igniting profound changes in behaviours, preferences and societal trends.’



Building with a conscience, reaching for returns

Over the last decade, awareness of climate change and of investors' influential global role has grown, prompting funds to turn to sustainable infrastructure projects. These investments are varied and still evolving, writes Kat Usita.

SUSTAINABILITY has become a driving force in investment. The shift is motivated partly by growing awareness of climate change and its effects, as well as increasing public understanding of the influential role that the investment community plays on a global scale. The greater focus on environmental, social and governance factors coincides with renewed interest in infrastructure in the last decade.

After the 2008 financial crisis, investors looked to infrastructure and real estate to diversify portfolios. There was also a greater need for financial institutions, especially those with public mandates like sovereign funds and pension funds, to appear as responsible investors in the post-financial crisis world.

Investing in sustainable infrastructure projects was the natural intersection of two goals:

diversification and ESG adoption. By investing in green infrastructure projects, asset owners could achieve two objectives with a single deal. More broadly, investing in sustainable infrastructure makes public investors important enablers of growth in the real economy and crucial partners in improving quality of life across the globe.

Evolving definitions

The infrastructure universe is wide and varied, and the definition of what qualifies as sustainable is still evolving and expanding. The simplest qualification is that the built asset – and the process of developing it – should be designed to meet ESG goals. Because energy and transport are the most carbon-intensive infrastructure subsectors, there has been heavy focus on developing renewable sources of energy and greener

transport facilities.

Mass transit projects like railways, metro lines and bus rapid transit could be viewed as inherently sustainable because they offer an alternative to carbon-emitting vehicles, especially if they are powered by renewable energy. Investments in electric car and ride-sharing companies may also be considered sustainable transport ventures.

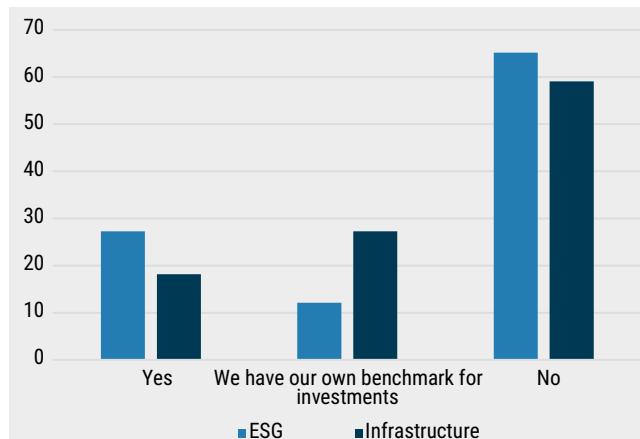
Water and waste management, especially in the context of rapid urbanisation, are critical components of sustainable infrastructure networks. As with energy and other public utilities, they generate a steady income stream but also raise important questions about resource conservation.

Social infrastructure projects, like hospitals and classrooms, are less popular among investors but can be scaled up to form viable packages,

1: Few investors use ESG and infrastructure indices to measure performance

Do you rely on an existing benchmark or ratings index for investments?, % of respondents

Source: OMFIF GPI Survey 2020



especially when bundled with a wider city development plan. Protection of natural resources and sustainable land use also form part of responsible investment in infrastructure. Farmland and forestry, although not built assets, are often included in infrastructure or real estate portfolios.

Different industries' reliance on telecommunications and digital infrastructure during the Covid-19 pandemic accelerated the transition to a more technology-centred workforce, drawing capital to firms providing cloud computing services, data centres and the like. This is an emerging area in sustainable infrastructure. As digital tools and services become more widely used, there is a need to ensure that they are powered by green energy and infrastructure.

Disaster resilience is another aspect of sustainable infrastructure. Changing weather patterns pose a tangible threat, with natural disasters devastating entire communities and their infrastructure networks. In rehabilitating and upgrading infrastructure, there is greater emphasis on 'building back better' to cope with climate change.

Measurement challenge

A major hurdle to greater investment in sustainable infrastructure is one that plagues any growing asset class: measurement. The bespoke qualities of infrastructure have made standardisation difficult. Creating

a universal method of calculating environmental and social impact is still harder. Various indices, metrics and ratings are emerging, and there is much emphasis on transparency and disclosures on the part of both project proponents and investors. Larger sovereign and pension funds are developing in-house capability to understand this field better. Over time, these efforts will help bring in badly needed financing for sustainable infrastructure projects.

As part of the GPI Survey 2020, respondents were asked if they rely on existing benchmark or ratings indices for ESG investments (Figure 1). Only a quarter of respondents use indices, while a slim minority of 12% rely on their own benchmarks. A large proportion of respondents use neither, suggesting that performance measurement remains a challenge in sustainable investments. The same question posed to respondents about infrastructure investments yielded similar results.

Finding the pipeline

A recurring complaint among institutions interested in infrastructure is the low number of bankable projects, or at least a dearth of information on them. The investment need may be large, but often investors are unsure of where to begin, making it costly to enter the sector. More often than not, there is a need for external managers while building in-house capability, both of

which entail additional resources.

Various organisations and platforms have emerged, aimed at connecting projects with interested investors. The G20-backed Global Infrastructure Hub was launched in 2014 with this goal in mind. In terms of breadth and scope, it is perhaps the biggest available repository of information on infrastructure projects around the world. It provides information on nearly 600 projects in 56 countries.

Aside from project information, GIH offers basic tools that could be useful for investors and project proponents alike. It has an index of countries with infrastructure opportunities, evaluating each on a range of metrics associated with investment readiness. To support governments and public sector entities unfamiliar with public-private partnerships, it provides risk allocation matrices that can be used as a basis in structuring projects.

A Swiss entity, Sustainable Infrastructure Foundation, has produced a similar platform using input from multilateral development banks. For decades, these institutions have been financing infrastructure projects in their regions, as well as providing technical assistance to countries that have little experience in the area. In supporting government projects, they bring in expertise and experience that might not yet exist in that country.

The SIF platform Source presents information on 324 projects in 57 countries that are supported by development lenders. Beyond pipelines and case studies, it offers templates for project preparation and management, leveraging development banks' decades of experience in infrastructure development. The platform includes information and recommendations from the World Bank, European Bank for Reconstruction and Development, European Investment Bank, Asian Development Bank, African Development Bank and Inter-American Development Bank.

Global repositories are useful for

information, but regional platforms can be more effective in directly connecting investors with projects. Singapore's Infrastructure Asia was created as a matchmaker between governments, firms and lenders. They act as a connector for capacity building and technical assistance, introducing domain experts to Asian governments that need advice on structuring projects. They also raise awareness on project opportunities in the region, interacting with investors and professional services firms.

Leading the way

Sustainable infrastructure projects give public investors a chance to explore new long-term ventures while offsetting some of their carbon footprint. For decades, the world's biggest sovereign and pension funds have been heavily invested in carbon-invested businesses. Under pressure to divest but unable to do so overnight, they had to find other ways to green their portfolios without harming returns.

Recognising the role that large asset owners had to play in greening investments, French President Emmanuel Macron and Norwegian Prime Minister Erna Solberg gathered a group of leading sovereign funds during the One Planet Summit in 2017. The six funds were Norges Bank Investment Management, the Abu Dhabi Investment Authority, Kuwait Investment Authority, Qatar Investment Authority, Public Investment Fund of Saudi Arabia and New Zealand Superannuation Fund, which collectively hold \$3.2tn assets under management.

They have since formed the One Planet Sovereign Wealth Fund Working Group, which sets out to establish guiding principles on how asset owners and managers can adopt climate change considerations in their investment processes. The framework encourages exercising active ownership to incentivise climate transparency in listed equity and direct investments, as well as other responsible investing strategies.

These funds, with the exception ►



This decade must see the energy transition accelerate

Nandita Parshad, managing director, sustainable infrastructure group, European Bank for Reconstruction and Development

THE impact of Covid-19 on infrastructure companies is severe. Governments are rightly focused on healthcare and supporting vulnerable citizens. But attention is turning to how economies will recover. The recovery will take place against the backdrop of depressed fossil fuel prices and constrained budgets. These threaten the transition to green infrastructure at a critical juncture. This decade must see the energy transition accelerate to avoid an even more devastating crisis from climate change.

The European Bank for Reconstruction and Development is responding quickly to meet the most urgent needs of clients, ensuring that the recovery leads to a decisive and enduring tilt to green.

At the heart of this response is the vital infrastructure support programme. This provides short-term liquidity as well as capital investment to preserve the stable provision and green agenda of essential services: electricity, water, waste management and sanitation, and public transport.

Since its launch in April, the VISIP has provided financing for a range of municipal and national utilities, linking short-term crisis support with longer-term green objectives. Recently approved financing for energy utilities in Greece and Kazakhstan, for example, are directly linked to decarbonisation efforts.

Alongside the VISIP, the EBRD is intensifying its efforts in key areas to deliver the green transition, notably the scaling-up of investment in renewable energy and in its innovative Green Cities programme.

To support the energy transition, the EBRD is increasing investment and policy engagement to draw in private sector investment. For example, with the EBRD's support, Albania recently conducted a successful auction for renewable energy projects that attracted the lowest price for solar photovoltaics seen in the Western Balkans. This signals that the shift to renewables is possible, cost-effective and can attract foreign investment.

As part of this strategy, the EBRD is supporting state-owned enterprises, which are often critical for the functioning of renewable energy markets. The financial stability of these entities is essential in enabling private sector investment in green energy.

Cities play a key role in the transition to low-carbon economies and, given that 60% of population in the EBRD region lives in cities, they are central to tackling the Covid-19 crisis. The EBRD is adjusting the methodology for its Green Cities programme to embed smart city solutions in crisis response. There is increased focus on e-mobility, as cities seek to maintain air quality gains from the lockdown.

Green infrastructure investments are continuing despite the Covid-19 crisis, with new urban transport projects initiated recently in Georgia, Poland and Turkey.

In addition, the EBRD recently unveiled an ambitious plan to devote more than 50% of annual investments to the green economy by 2025. This update of the Green Economy Transition, known as GET2.1, forms part of the EBRD's overall strategy for the next five years and will become effective on condition that shareholders give approval in the autumn.

The challenges posed by Covid-19 are enormous. The EBRD is supporting clients through this crisis while keeping our focus on a green recovery, financing the infrastructure for the world we wish to inhabit when this storm passes.



of NBIM, have sizeable direct investments in infrastructure and their actions will inevitably have a significant impact on how quickly greener built assets are developed. ADIA allocates 1%-5% of its portfolio to infrastructure, and 5%-10% to real estate. Considering that it manages \$828bn in total assets, even its minimum allocations are significant. ADIA's infrastructure portfolio includes investments in leading Indian renewable energy companies Greenko and ReNew Power.

QIA, on the other hand, says that 44% of the infrastructure projects in its portfolio are zero-emission investments. In Davos early this year, QIA Chief Executive Officer Mansoor bin Ebrahim Al-Mahmoud said that the fund wants to move away from oil reliance and does not expect its oil and gas portfolio to expand. In late 2019, it bought a 25.1% stake in Adani Electricity Mumbai, a power company that supplies more than half of the Indian city's electricity supply. The company aims to source one-third of its supply from solar and wind by 2023.

PIF does not disclose details of its portfolio allocation, but domestic and international investments in infrastructure are among its six investment pools. 'Giga-projects' form another pool, which refer to large-scale developments that aim to attract tourists and boost the local economy, akin to 'smart cities' that are being built elsewhere. Among these planned developments is the Red Sea project, envisioned to be a luxury destination that will include marinas and leisure facilities. It will be powered by renewable energy and designed to promote water conservation.

KIA is also active in infrastructure, although it is unclear how much of its portfolio is in the sector. Along with a number of other sovereign and pension funds from across the globe, it owns a minority stake in Kemble Water Holdings, the parent company of Thames Water. It is an investor in London City Airport and owns a quarter of Global Power Generation, an international power generation company with a focus on renewables

'As a long-term investor, we see energy and infrastructure developments as important investment opportunities that provide attractive risk-adjusted returns, especially where they fit with our views around sustainability and climate change.'

Del Hart, head of external investments and partnerships, NZ Super Fund

and natural gas. KIA's London asset management company, Wren House, manages KIA's infrastructure investments, which include energy, digital and social infrastructure.

The NZ Super Fund allocates 2% of its portfolio to infrastructure, which includes digital infrastructure investments in the form of data centres. Another 7% is invested in farmland and timber. It announced early this year that it was buying a 20% stake in Galileo Green Energy, a Swiss investment platform for renewable energy projects. Galileo will focus on wind and solar energy projects, and has already secured its first deal to develop wind farms in Ireland. Australia's Commonwealth Superannuation Corporation holds 20% of the platform.

For a long time, NBIM's mandate allowed it to invest in infrastructure only through listed companies. While the Norwegian government reviewed whether it should foray into unlisted infrastructure, which would allow it to invest directly in specific projects rather than infrastructure companies, pressure rose for NBIM to divest from its fossil fuels.

In 2019, the Norwegian parliament finally allowed NBIM to invest in unlisted infrastructure, but only in renewable energy projects. It also doubled the cap on NBIM's

environment-related investments to Nok120bn. NBIM has yet to make its first investment in this new field, as guidelines for such transactions had to be devised first, but expects to start by 2022. Outgoing CEO Yngve Slyngstad, who steps down in September, will stay on to build up NBIM's activities in this area.

Green transition

Australian and Canadian public investors, pioneers of global infrastructure investments, have also led the shift to greener projects. The Canada Pension Plan Investment Board allocates 8.5% of its portfolio to infrastructure, with its exposure to renewables growing 100-fold in three years. In 2019, CPPIB had Cad3.1bn in renewable energy companies, from just Cad30m in 2016.

Caisse de dépôt et placement du Québec, with an infrastructure portfolio that includes Heathrow Airport and the Eurostar high-speed railway connecting London and Paris, invests 8% of its portfolio in the sector. CDPQ aims to increase its low-carbon investments to Cad32bn in 2020 from a baseline of Cad18bn in 2017. It has a stake in Invenergy, the largest private renewable energy firm in North America, as well as a number of other similar clean energy companies. In 2019, it acquired a 24.9% stake in a public-private partnership contract for the operation of Sydney Metro, a railway system that has an offsetting arrangement with a solar power farm for its operational electricity needs.

Public Sector Pension Investment Board and Ontario Teachers' Pension Plans jointly own Cubico, a renewable energy provider operating in Europe and the Americas. GLIL Infrastructure, a fund backed by local government pension schemes in the UK, bought a 49%-stake in Cubico's UK wind and solar portfolio.

Australia's CSC, the country's largest pension scheme, owns half of Macarthur Wind Farm, one of the biggest wind farms in the southern hemisphere. It also owns a minority stake in Canberra Data Centres, a green-conscious data centre provider.

Future Fund, Australia's sovereign fund, is a co-investor in CDC.

In east Asia, many countries are struggling to build their domestic infrastructure networks. Singaporean funds Temasek and GIC stand out. The two sovereign funds are active global investors in infrastructure, and like other large asset owners they are increasingly focused on greener investments. GIC is a majority shareholder in Greenko, the same renewable energy company that Adia is invested in. Temasek owns one-fifth of Keppel Corporation, which provides sustainable water solutions in Singapore and overseas.

The behaviour of large funds can influence the global investment landscape not only because of the amounts of assets they control, but also because other investors and asset managers tend to follow their lead. That said, direct investments in infrastructure have not always been viable for smaller pension funds. They typically resort to asset pooling, co-investing with other pension schemes through infrastructure funds and other similar platforms.

Swansea Council's pension fund is an example of one such smaller scheme. The local government pension scheme in Wales plans to invest £30m in solar and wind power projects. The allocation, while relatively small, represents 1.4% of its £2.1bn pension assets – not too different from the share of infrastructure in portfolios of much larger pension and sovereign funds.

Farming gains

Similar to conventional infrastructure and real estate, farmland has attracted the attention of investors seeking alternative assets and a hedge against inflation. Infrastructure assets are usually tied to price increases through concession agreements and operating contracts, while farmland income is correlated with the cost of food, at least in the long term. Urbanisation and population growth have also ensured that there will be consistent and growing demand for infrastructure and agricultural real estate.

Although institutional investment in farmland has been around since the

1980s, particularly in the US, interest usually spikes after periods of crisis, following the general trend for real estate and other alternative assets. As investors sought to diversify their portfolios post-dotcom crash, large American pension funds explored opportunities in agriculture. In the early 2000s, the California Public Employees' Retirement System began investing in vineyard farms and has continued to acquire other farmland investments since. Pension funds in North America, Europe and Australia also reported new farmland investments after the 2008 financial crisis.

Farmland investments have complex ethical and environmental implications, stirring controversy when public investors began entering this area. Early examples of farmland investments suffered from backlash, as large pension funds were accused of land grabbing and exploitation of rural communities in developing countries (see Chapter 7).

The initial criticism, along with growing ESG awareness among financial institutions and the



Challenging the status quo

Paul Lam, strategy and policy officer (digital and technology), Asian Infrastructure Investment Bank

DIGITAL transformation and sustainability are the most prominent forces in the 21st-century economy. Both require a similar mindset of challenging the status quo. Unlike previous industrial revolutions, digital transformation changes business models fundamentally by moving them towards sustainability and resilience.

The digital economy focuses on mobilising idle resources, rather than just increasing output. The disruption from Covid-19 shows how digital platforms can democratise access to education and healthcare, support social services and keep many critical business activities running. Digital transformation, if channeled well, could support all sustainable development goals.

Digital infrastructure is the backbone of this transformation. It is split between infrastructure for digital and digital for infrastructure. The former refers to data centres, 5G towers and fibre wires that deliver the internet. The latter refers to digital overlay to traditional

infrastructure: as upgrades of the asset itself like smart grids, or as applications to the construction process like predictive maintenance.

Many infrastructure sectors can benefit from digitalisation. Implementing a smart demand response system for electricity could mean an extra 185GW of the world's generation capacity by 2040. Smart transportation can provide better urban experiences and improve resource efficiency. Efficiency gains in construction could be worth \$1.6tn globally.

Complex ecosystems, misalignment of incentives, reluctance to change, and inadequate skills impede the digitalisation of traditional infrastructure sectors. Governments need to encourage public-private partnerships to bridge the financing gap, and ensure accessibility for an estimated 4bn unconnected people. Investors must recognise the necessity of incorporating digital technology in infrastructure, or face obsolescence. Infrastructure can no longer be treated as simple income-generating fixed assets, only built once and then managed passively forever. A more active management and growth mindset is required for both infrastructure sponsors and operators.



people they serve, have pushed public investors to be more conscious of applying responsible investment principles. As with other kinds of assets, they can promote sustainable practices through active ownership of agricultural assets.

Encouraging responsible farming

In 2011, a group of European and American institutional investors helped develop the United Nations Principles for Responsible Investment guidance for responsible investment in farmland. This guidance encourages investors to promote environmental protection, respect for labour and human rights, and observance of proper land acquisition processes.

Swedish pension fund AP2 has been investing in farmland and timberland since 2010, and was part of the effort to establish guiding principles for responsible investment practices. The pension fund is careful in its choice of farmland. It invests only in countries with clear laws on agricultural real estate and those which are net agricultural exporters, presumably to avoid the perception that its presence is a threat to land and food security.

Public investors in developing regions recognise the potential gains from farming, and investing locally may be more palatable to the community stakeholders. The Fundo Soberano de Angola allocates around 10% of its forestry portfolio domestically, while also investing in the sector across sub-Saharan Africa.

Public investors have both impetus and resources to encourage transition to climate-friendly farming techniques and equipment. Public scrutiny will continue to grow in coming years. Beyond environmental concerns, responsible labour practices form an important part of sustainable farming. The Covid-19 pandemic has highlighted the importance of fair wages and suitable working conditions for essential workers, including those producing food.

The stigma on farmland investments should firmly remain

a thing of the past if pension funds demonstrate that they are responsible investors actively promoting modern, climate-ready and socially conscious farming practices.

Wealth in health

The global health crisis revealed the consequences of weak social infrastructure in many countries. Lockdown measures were implemented mainly to avoid overwhelming medical facilities and healthcare workers. While the pandemic has been a turning point for many sectors and industries, nowhere has this been more acute than in health systems, proving that under-investment has fatal outcomes.

Even before the outbreak in Italy, asset manager Azimut announced that it was launching an infrastructure fund to invest in educational, medical and retirement facilities in the country. It hopes to attract institutional investors keen to include sustainable infrastructure in their portfolios without being limited to climate-related projects.

Investing in medical facilities is not new to public investors that have long been active in infrastructure, as well as those that are increasing healthcare portfolios. GIC's hospital investments include private facilities in Brazil, the Philippines and Australia. Temasek has shares in hospital chains in China and India. In 2019, Adia acquired a stake in Apollo, a leading Indian hospital group.

Private hospitals have an incentive to deliver returns, but publicly funded facilities also offer investment opportunities. Under a public-private partnership model, revenue would typically come from availability payments by governments, guaranteeing a steady stream of income regardless of demand. The return on investment from a public hospital would not be linked to the number of patients, or any margin of profit from treatments.

PKA, which manages Danish pension funds for healthcare and social workers, has invested in several hospital projects through PPP in

conjunction with other funds in the country, including PensionDanmark. Oman's health ministry hopes to develop new hospitals under the PPP model, among them a \$1.25bn Medical City project that the Oman Investment Fund is invested in.

The PPP model is becoming more widely used, especially in emerging market economies where there may be insufficient fiscal space to cover upfront costs. Spreading the cost over a decade or longer through annual availability payments to the private partner eases the burden.

Aside from hospitals and conventional medical facilities, public investors have tapped opportunities in telemedicine platforms. While these have been quietly growing in recent years, the global health crisis has made them vital tools rather than just means of convenience. Video consultation software enables patients to access medical advice without leaving their homes.

In January, the Ontario Teachers' Pension Plan led a €140m fundraising round for Kry, a digital healthcare software application available in several European countries. The Swedish telemedicine company says that use of its platform has more than doubled since February, just before coronavirus cases spiked in Europe.

Home confinement has increased reliance on fitness applications for people who have to exercise indoors. Temasek-backed ClassPass, which normally gives subscribers access to multiple exercise gyms and studios, has switched to streaming of classes and workout videos.

As with hospital chains, telemedicine and telehealth ventures fall under the broad category of alternative investments where there is plenty of room for ESG alignment. The online shift is an opportunity for public investors to modernise their portfolios with innovative investments. These examples show the importance of greening the digital ecosystem – an overarching goal that will become ever more crucial in coming years. •

BARINGS

‘Impact investments can help correct a major flaw of green bonds’



Private sector green investments can help meet the world’s needs for energy-efficient infrastructure projects, writes Agnès Belaisch, chief European strategist, Barings Investment Institute.

As investors increasingly look for ways to contribute to global sustainability, they generally choose from three broad strategies. The first is to invest in issuers that respect environmental, social and governance standards. A second strategy is to subscribe to bonds with proceeds earmarked to directly finance projects that preserve the environment. The best-known type, green bonds, are subject to tight checks summarised in the International Capital Markets Association’s Green Bond Principles. Around 75% of green projects relate to transport, energy and water, and market size is close to \$650bn. However, green bonds have a major flaw, in that they are defined by their use of proceeds rather than a systematically verified environmental impact. Returns are unrelated to the success or failure of the investment’s effect on the environment. Nevertheless, the regulation is evolving, requiring issuers to assess, when possible, their investments’ impact.

The third strategy, impact investments – which represent just under \$500bn in assets under management – correct this flaw. They generate both a financial return and a social or environmental outcome, defined ex ante, measured ex post, and reported publicly, entrenching accountability for impact. Returns depend on how successful the impact of the investment is relative to pre-set targets. In 2019, the World Bank defined nine principles that an investment must fulfil to qualify as impact investment.

Impact investing can be easily embedded in infrastructure projects that make a positive environmental impact and deliver long-term returns. Sectors include power and energy (generation, transmission and distribution) and

core infrastructure – transportation assets as well as water and wastewater systems are the most common. This private, green infrastructure investment model can help meet the world’s needs for energy-efficient infrastructure projects. The construction of solar photovoltaic panels, wind farms, and cleanly-powered incinerators to extract energy from waste are all investments options that raise the proportion of green electricity in the grid. Infrastructure financing can be combined with an impact investment design, where a specific environmental outcome is targeted and, once the investment is deployed, measured and compared to initial targets, to determine rewards for success embedded in the return formula.

The Thames Tideway Tunnel, a new sewage transport system for London in which Barings is involved, treats wastewater while reducing pollution and energy use and protecting biodiversity. It monitors and reports annually on pre-defined environmental targets and embeds a reward for success for investors. While the debt contracts are private, many of these targets have been published for transparency and accountability. For example, quantitative targets aiming to reduce pollution set in cubic meters the amount of waste

discharged into the Thames river when the tunnel is ready to operate, both annually and when the steady state is achieved. Other targets refer to the share of clean energy used for construction work, for example by using the river to transport equipment and spoil, and recycling most of the excavated material from the tunnel.

Global environmental sustainability concerns will only grow. It is up to each investor to choose the green strategy that best fits their mandate. •

‘Impact investing can be easily embedded in infrastructure projects that make a positive environmental impact and deliver long-term returns.’

Bigger role for sukuk in green investment

SUKUK, sharia-compliant bonds, have been used as a way to raise funding for infrastructure projects. When used to finance a climate-friendly project, they are referred to as 'green' sukuk. Indonesia issued a sovereign green sukuk in 2019, after its successful first issuance the year before. Proceeds from green Islamic bonds are being used to finance renewable energy projects, green tourism and waste management.

The world's first green sukuk was issued by Malaysian company Tadau Energy to finance a solar energy project in 2017. Malaysia's Securities Commission introduced a sustainable and responsible investment sukuk framework to encourage more issuance. More recently, the Islamic Development Bank launched its inaugural green sukuk, the first sustainable Islamic bond issued by a multilateral entity. In late 2019, the IsDB issued €1bn in green sukuk to back projects in renewable energy, clean transportation, pollution prevention, and sustainable water management.

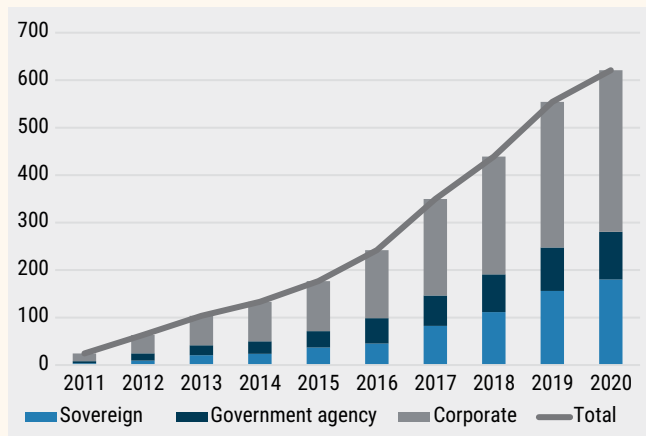
Sukuk issuance in 2019 increased by 29% to \$115bn from \$89bn the previous year. Total sukuk outstanding has grown to \$620bn, but remains small compared with the worldwide investment volumes and is heavily concentrated in the Middle East, Malaysia and Indonesia. As Islamic finance expands, green sukuk could play a bigger role in financing sustainable infrastructure.

Climate-related challenges are inevitable, and they become more tangible as temperatures rise. The Covid-19 pandemic has underlined the pace of world change, bringing considerable economic and social fragmentation. Global public investors should view infrastructure investments as a way to contribute directly to a more sustainable future. Only then would they become truly responsible long-term investors.

2. Sovereign and corporate sukuk growing steadily

Outstanding sukuk by issuer, \$bn

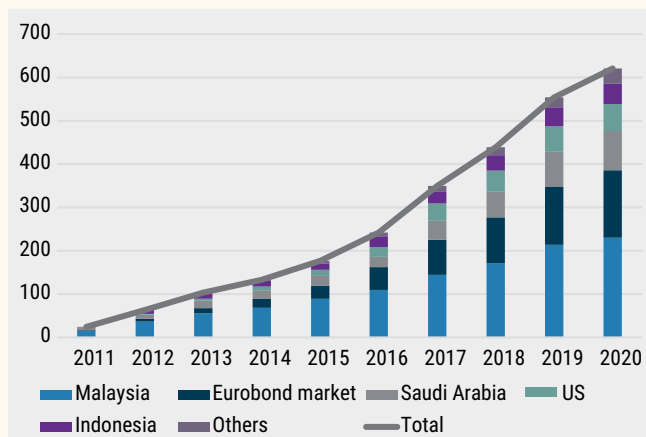
Source: Refinitiv, OMFIF analysis



3. Malaysia remains leading sukuk issuer

Outstanding sukuk by country of issue, \$bn

Source: Refinitiv, OMFIF analysis



A Tadau Energy solar energy project



Chapter 9

Sustainable investment

In partnership with:



‘There has been a clear direction of travel, but progress has accelerated’



Hani Kablawi, head of international and chairman of EMEA, BNY Mellon

SUSTAINABLE investment is high on the agenda at meetings I have with BNY Mellon’s central bank, sovereign fund and public pension fund clients.

Increasingly, global public investors have incorporated ESG factors into their investment strategies and the majority now have specific ESG investment policies in place. There has been a clear direction of travel for many years, but progress has accelerated through initiatives such as the United Nations Principles for Sustainable Investment and the Central Banks and Supervisors Network for Greening the Financial System.

So, this report is timely – and made even more so by the Covid-19 pandemic, which has highlighted the systemic threat from non-financial risks. OMFIF, with its network of relationships with central banks, sovereign funds and public pension funds, continues to be the ideal partner with whom we can explore the evolving role and impact of public investors in the global economy. In embarking upon this fourth joint report, we were keen to understand not only the dynamics driving sovereign and pension funds’ towards ESG strategies, but also the limitations and barriers, and how these might be overcome.

One of the biggest challenges for ESG investment is the ability for investors to analyse their investments against sustainability factors. Though concerns remain around lack of standardisation, this is where technology is increasingly becoming an enabler – using data and data analytics to measure the non-financial performance of investments. This will be an area of heightened interest and development over the next few years.

As some of the world’s largest investors, the impact of the public institutions surveyed in our report goes well beyond their individual investment strategies. Their approach to sustainability has a significant influence across the global investment industry and beyond that into the wider economy and society. This report provides valuable insights into how public investors’ ESG strategies will develop. •

‘Global public investors are rising to the challenge’



Sabine Mauderer, member, executive board, Deutsche Bundesbank and chair, scaling up green finance workstream, Central Banks and Supervisors Network for Greening the Financial System

IF there were a need for evidence of how natural hazards can threaten the global economy – our markets, our investments and our wealth – the pandemic is a perfect case in point.

Societies around the world have taken immediate action required by this crisis. However, as we confront this tremendous challenge, we face another major threat to the global economy: climate change. While its direct effects are not yet visible on a global scale, we need to take action, because the next generation will not be able to reverse the effects of global warming. Unlike Covid-19, climate change will be permanent. The best we can do is to mitigate its adverse effects and adapt. The earlier we act, the better we will fare. In investors’ terms: by acting now, we will reduce downside risks in the future.

This OMFIF-BNY Mellon report is a testament to global public investors doing just that. It highlights that environmental, social and governance aspects have become an essential element in their investment processes. With assets worth \$39.5tn under management, public investors wield significant financial power and can support the transition to a sustainable economy. Despite the many hurdles that remain, such as a lack of data and analytical capabilities, global public investors are rising to the challenge.

As investors, central banks have also started taking account of ESG considerations. They are focusing first on analytical work and gaining a common understanding. The Central Banks and Supervisors Network for Greening the Financial System, a global network of central banks and supervisors, published a guide on sustainable and responsible investment for central banks last year.

More work by the NGFS is underway: we will present a progress report later this year. In doing so, we hope to contribute to the joint efforts upon which the *Global Public Investor* will surely reflect once again next year. •



Emerging from crisis, preventing the next

In supporting the post-pandemic recovery, global public investors have a chance to build on the momentum of the sustainability agenda of the past years. However, they still face significant barriers in scaling up these efforts, write Danae Kyriakopoulou and Brandon Chye.

THIS year has highlighted the material and systemic threats that non-financial risks pose to economies, societies and investments. Global public investors – central banks, sovereign funds and public pension funds – are highly exposed given their large holdings, long-term investment horizons and commitment to the public interest.

As documented in previous editions of this publication, GPIs have gradually incorporated environmental, social and governance factors in their portfolio management and wider activities. Most of them now have specific ESG investment policies in place or are in the process of developing one, according to a study of sovereign funds and public pension funds conducted by OMFIF and BNY Mellon. The survey highlights that over the past

50%

**More than 50% of
global public investors
see insufficient
data or information
as a barrier to ESG
adoption and further
integration**

three years, ESG considerations have become a strong focus in the community. Heightened commitment to initiatives such as the Central Banks and Supervisors Network for Greening the Financial System (which now counts 68 members from an original set of eight in December 2017) and the United Nations Principles for Responsible Investment (grown to more than 3,100 from 86 investors since 2006), has demonstrated the genuine and increased efforts by GPIs to embrace ESG themes.

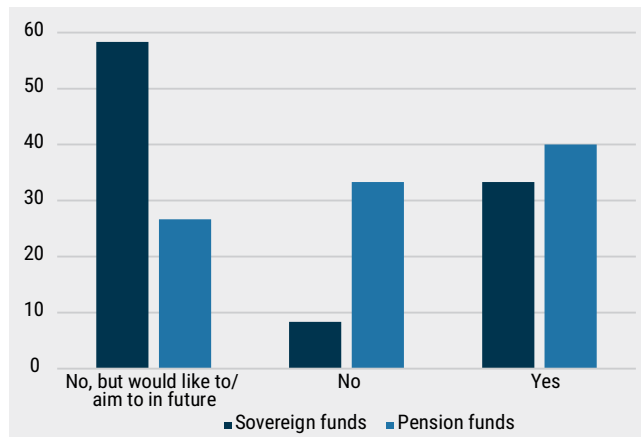
Motivations

Within the GPI community, investors are realising that adopting ESG criteria can protect portfolios from non-financial sources of risk. They are opting to integrate ESG considerations to mitigate the risk of reputational damage, and to better

1. Public investors struggle with measuring impact of ESG

Are you able to measure formally the impact and non-financial performance of your investment decision?, % of total responses

Source: OMFIF ESG integration survey



‘ESG is not a “nice-to-have”, it’s a definite “need-to-have”; we know that good ESG practice is the best barometer for companies that are well run. If you practise ESG well, your company is on the right trajectory to succeed. In making investment decisions, we strongly favour companies that focus on sustainable returns and also actively manage the ESG impact of their businesses. These are the types of enterprises and assets that we want as part of the EPF portfolio in order to achieve our vision of helping create a better world for all.’

Tunku Alizakri Alias, chief executive officer, Employees Provident Fund, Malaysia

align their values and investments.

The expectation of superior risk-adjusted returns was a predominant motivation for ESG criteria integration among GPIs, according to the OMFIF-BNY Mellon survey. Generally, GPIs are aware that ESG factors can present underlying investment risk. For example, non-sustainable investments might become ‘stranded’ or lose value over time, or a company’s operations could become compromised if subject to a climate-related disaster.

Survey respondents also cited the need to align investment strategies with organisational values or minimise reputational risks as a driver of ESG implementation. Given GPIs’ public relevance, the question of materiality of ESG themes extends beyond how these can translate into financial risks to their portfolios to how investments can negatively impact ESG areas or the institution itself.

For example, not just whether holding oil risks owning an asset that could become stranded in the future with damaged return prospects, but also whether the investment will

worsen societies’ and economies’ climate vulnerabilities.

Public investors struggle to formally measure the impact and non-financial performance of investment decisions, even though many aim to do so in future (Figure 1).

Tailoring approaches

To protect their investments or prevent them from exacerbating non-financial risks, more investors are aligning their portfolios with sustainability objectives.

‘Do no harm’ strategies are the most popular across the GPI community. Among respondents to the OMFIF GPI Survey 2020, 28% of central banks, 58% of sovereign funds and 81% of pension funds apply exclusion or negative screening strategies. Tobacco, arms and coal are the sectors most frequently excluded. A minority of investors exclude oil and gas, though only partially, according to the BNY Mellon-OMFIF survey.

For central banks, whose portfolios are on average made up of just 8% of equities and 0.6% of alternatives, exclusion strategies apply mainly to their bond holdings. One central bank from Asia Pacific applies ‘internal negative screening rules for investment in corporates’, a statement echoed by central banks from Europe and Latin America. Publicly known examples of such practices include Sveriges Riksbank, which in November 2019 decided to divest from carbon-intensive municipal bonds from Canada and Australia.

Integration of ESG criteria across an entire portfolio is a common method used particularly among pension funds (93%) and sovereign funds (50%). However, only 10% of central banks integrate ESG criteria

Methodology

The information presented in this chapter is based on responses to two surveys conducted over the past year:

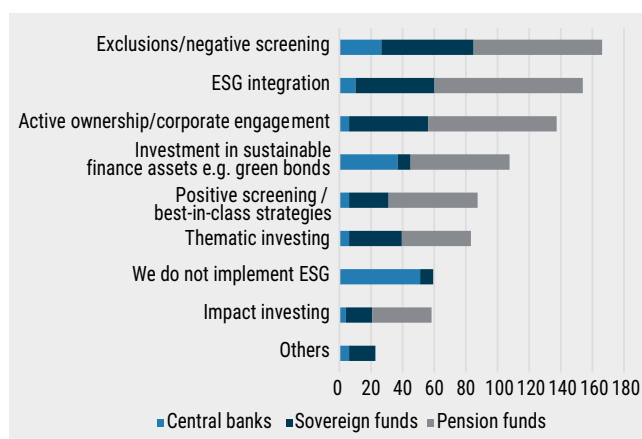
- OMFIF GPI Survey 2020: This was conducted between March-June, and reflects the responses of 50 central banks, 11 sovereign funds and 17 pension funds with combined assets under management of \$7.2tn. Five questions from the survey focus explicitly on sustainable investment issues.
- The OMFIF ESG integration survey: This more in-depth survey included 25 questions on ESG investment and was conducted in association with BNY Mellon between August-November 2019. It reflects the responses of 27 sovereign and pension funds with a combined AUM of \$4.7tn.

For both surveys, institutions responded under the condition of anonymity and were free to opt out of any question.

2. Public investors prioritise 'do no harm' strategies

In which of the following ways do you implement ESG investment?, % of total responses by institution type

Source: OMFIF GPI Survey 2020



across their entire portfolio. Almost half of the 50 central banks surveyed do not implement ESG measures at all. One respondent from Latin America says, 'When investing in an institution, the central bank focuses on the creditworthiness, the credit rating and the yield on investment offered by the institution. ESG is not among those key criteria.'

The relatively weak uptake of ESG criteria for reserves management among central banks compared with their GPI peers is in contrast to their activities as supervisors, where several institutions have taken steps or are planning to introduce regulatory measures such as climate stress tests. One central bank from Europe comments, 'Although carefully monitoring the situation and participating in some initiatives (such as the NGFS), at this stage we do not have an explicitly defined ESG investment policy.'

Among the central banks who do implement ESG policies, investment in sustainable assets is the most common strategy, with green bonds cited often. Sustainable assets are widespread among pension funds (62% of the sample say they invest in them), but less so among sovereign funds (only 8% do). On the other hand, thematic and impact investment strategies are well-established among pension funds, but less so among sovereign funds and central banks.

Managing complexity

Which approach to ESG implementation investors adopt tends

'If you are a global public investor and want to make a difference, active ownership is the way to go. The key to achieving results is to collaborate with global peers, and to use a combination of different engagement methods, such as voting, resolutions and dialogue; even blacklisting can be a part of this approach. The challenge is how to go about evaluating, measuring and reporting on this work, which takes place over several years, and can be expected to have impact at the portfolio level, when influencing specific, chosen companies. The methodology, standards and data to support are still underdeveloped.'

Johan Florén, head of communications and ESG, AP7

to depend on several factors:

- The composition of the existing portfolio: Where portfolios are made up mainly of government bonds (as with many central banks), there may be little scope for shareholder engagement strategies. Investors holding real assets can shift these into sustainable variants more easily. The varying time horizons associated with each asset class can also add complexity. For example, a company issuing both equities and bonds may be treated differently depending on whether the ESG assessment applies to the equity part of the portfolio (where the risk is perpetual) or fixed income (which will have different maturity horizons). Here, even if raw data from the company are available through disclosures, how investors analyse and apply them to portfolios will be critical in deciding which strategies are most appropriate.
- The data availability for different asset classes: Equities and corporate bonds typically have better data availability on ESG criteria given disclosure frameworks for companies, making it easier to perform negative screening or exclusionary strategies.
- The flexibility to invest across asset classes: Investors prioritising safety and liquidity may prefer to not invest in illiquid asset classes such as infrastructure and real estate unless these are available indirectly through a sustainable sovereign or corporate bond.
- In-house capabilities: Accessing more complex asset classes such as green bonds or sustainable real assets requires more sophisticated skills than many public investors have traditionally had access to. Similarly, public investors with more mainstream portfolios may lack the skills required to perform proxy voting for shareholder engagement.

The strategy followed will determine the lens through which investors assess the materiality of ESG data. Those engaging in sustainable, impact or thematic investments will require output or outcome data measuring the actual impact on the

ground. Conversely, when performing ESG integration or negative screening, investors will focus on ESG-related risk to financial performance. These diverging needs contribute to the fragmented nature of the ESG data landscape.

Measuring financial impact

Despite the trend towards more responsible investing and the growing familiarity with ESG strategies and their application to specific portfolios, the path forward is challenging.

Difficulties can arise in the early stages of the ESG integration process, including deciding to embark on it in the first place. When asked about the financial impact of ESG integration, respondents to the OMFIF-BNY Mellon survey are split between those that have seen a positive financial impact from ESG integration and those who claim it is 'too early to tell' (Figure 3). None have seen a negative or no impact. When discussing the barriers to scaling up investment, a minority (45% of sovereign funds and 19% of pension funds) fear that it would hurt financial performance.

However, perceptions among central banks can be more conservative. One respondent from Europe comments that 'it is not entirely clear at this stage how well ESG aligns with our investment mandate of capital preservation and generating income versus potential costs (also in terms of possibly lower expected returns)'. A sovereign fund from Asia Pacific warns that there is a

'perception of lower returns among some investment managers'.

There are two probable explanations for the inability to acknowledge or measure the financial impact of ESG integration. First, the lag between integration and impact. Integrating ESG factors into asset selection or management can be a complex process, where the majority of costs are borne upfront while the benefits are not realised until much later. In the OMFIF GPI Survey 2020, all sovereign and pension funds, along with around one-quarter of central banks, cite the complexity of sustainable assets as a limiting factor to further investment (Figure 3).

Second, it can be a question of measurement ability, given constrained resources and data frameworks. Almost two-thirds of sovereign funds and more than 80% of pension funds in the OMFIF-BNY Mellon survey identify insufficient data as a barrier to further integration. These attitudes reflect the fractured nature of the ESG landscape. This is both in terms of the raw data provision and the lack of standardisation on how to disclose, measure and integrate non-financial data to inform sustainable investment decisions.

Defining materiality

These barriers to transparency, comprehensiveness and comparability in ESG reporting and measurement stand in stark contrast to the universally-defined metrics and

concepts underpinning conventional financial accounting measures, such as firm cost and revenue, capital expenditure, and discount rate adjustment. The data needed to successfully integrate the elements across 'E', 'S' and 'G' in the investment process are still at a relatively early stage.

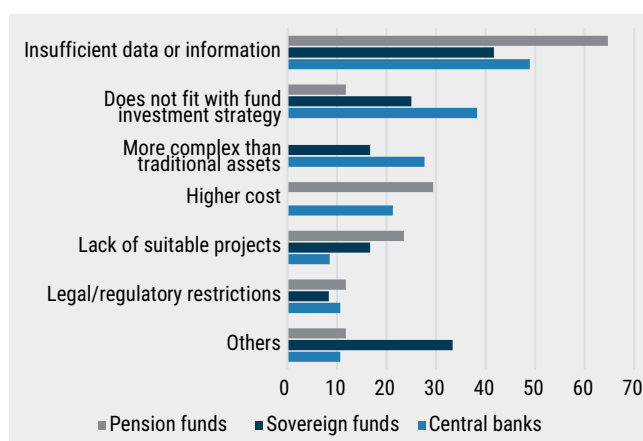
Approaches to determining what constitutes material ESG information vary. Some, such as the Sustainability Accounting Standards Board and the Task Force for Climate-Related Financial Disclosures, favour financial materiality criteria (how ESG themes affect companies). Others, such as the Global Reporting Initiative, have a wider focus including what matters to society more broadly (how companies affect ESG themes). A key question is whether supervisors should prescribe what constitutes material information or whether that should be arrived at through a market-driven, principles-based dialogue between companies and investors.

Internal capacity

ESG scoring is often facilitated by specialist data vendors such as MSCI, Bloomberg and Sustainalytics. Each tends to employ its own proprietary assessments, methodologies and metrics. This can result in divergent measurements of the same concept for the same company, depending on which framework is used. Moreover, ratings agencies may not adequately capture the actual sustainability performance and risks to a company. The unexpected bankruptcy from major California-based utility provider PG&E due to potential negligence from wildfire risks shows the potential blind spots from conventional ESG ratings providers. The shortcomings of uncritical ratings are likely to become even more apparent as systemic risks, such as long-term climate change and pandemic-related shocks, expose hidden company-level risks. One example is the discrepancy in sustainability scores assigned to major US companies, such as Google and General Motors. This can make it

3. Complexity and data concerns top ESG barriers

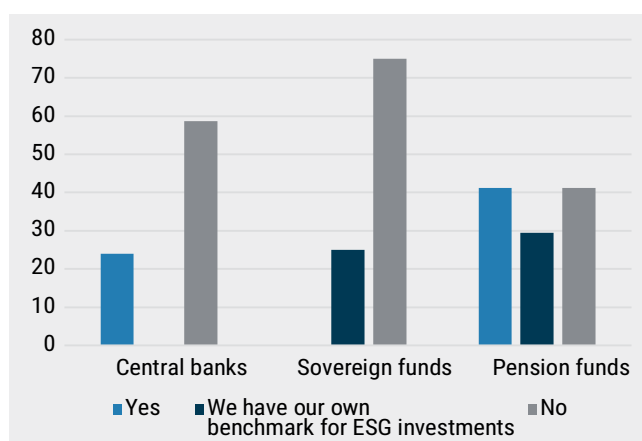
What do you see as the barriers to ESG adoption/further integration in your asset management?, % of total responses by institution type
Source: OMFIF GPI Survey 2020



4. Reliability concerns may discourage ESG benchmarking

Do you rely on an existing benchmark or ratings index for ESG investments?, % of total responses by institution type

Source: OMFIF GPI Survey 2020



difficult for investors to comprehend the nuances of ESG investment, and may discourage them from engaging on such efforts altogether. One central bank from Europe says that, ‘The lack of standard definitions and ESG criteria as well as applied automated algorithms reduce efficiency of external ESG ratings and indices. But we may consider their implementation when the solutions will be further developed and tested.’

Perhaps reflecting similar concerns, most GPIs taking part in the OMFIF GPI Survey 2020 do not use ESG benchmarks or ratings indices for their investments. Those who do mostly use their own benchmarks (Figure 4). In the OMFIF-BNY Mellon survey, only around half of participants incorporate quantitative ESG data in their investment process.

The concerns about the reliability of external data providers, and the associated emphasis on internally produced data and benchmarks, can make it difficult for some investors to participate in ESG integration. It is much easier for those investors who – like most GPIs – can afford to purchase expensive data, patented analytical tools, or have sufficient in-house expertise to develop these functions independently.

‘Competence greenwashing’

The availability of skills and expertise presents another barrier to scaling up ESG investment. Even if access to data ceases to be an issue, it can still be a challenge for investors to use

the information to directly inform investment decisions. Embedded technological networks, such as the internet of things and social media, have generated a vast amount of data that can offer insights to investors. But converting these reservoirs of data into valuable resources to support investment activity requires analytical expertise to ‘translate’ non-financial data into actionable investment information. Investment teams need to learn how to adapt ESG data to each asset class and blend different areas of expertise in terms of the material threat that non-financial risks pose to investment portfolios, ranging from loss of biodiversity to social instability linked to inequality.

A sovereign fund from Europe highlights the need ‘to train investment teams and external fund managers’. But there is little understanding across the community of what constitutes proper training. The need to compete in the sustainability arena has given rise to fears of ‘competence greenwashing’, whereby asset owners, such as GPIs and external asset managers, falsely claim to have the appropriate levels of expertise to conduct these assessments. An industry standard for basic competence may be created, helped by professional and industry bodies who are already working to fill a gap in ESG skills training for investment teams. One example is the PRI Academy, set up to provide ESG education for investors as a pillar of the UN PRI initiative. However, as the

need to incorporate ESG continues to grow, it will be important for investors engaging with these efforts to begin integrating multi-disciplinary teams beyond the usual backgrounds in finance and economics and include natural scientists, medical professionals and others from relevant disciplines.

Investment horizons, size and supply

The disparity between fundamental fund structures and how long it could take for ESG risks to materialise threatens the ability of ESG to scale. According to a pension fund from Asia Pacific, a major hurdle to scaling up ESG investment is that, ‘At the industry level, fund structures and the way incentives have been set do not align asset managers’ time frame with a long-term investor’s mindset, which might hinder further ESG integration. For example, close-ended funds in private equity and infrastructure encourage businesses to think in a five- to seven-year time frame. A similar situation happens with listed equities managers, whose focus is more annual, and companies focus on quarterly reporting. ESG issues such as climate change require a longer term view as many of them play out in longer time frames. We as an industry must think how we can better align asset managers to our position as universal and long-term investors.’

Another impediment to scaling up ESG investment for GPIs is the size of their portfolios. It is not as easy for an investor with a portfolio of more than \$100bn to divest effectively from multiple industries and companies carrying high ESG risks, as there would be little left for them to invest in; more sustainable alternatives may be difficult to find at this stage.

In addition, investing in sustainable assets can run against the lack of supply of such investments in a form that large investors, such as central banks, can access. One Latin American central bank says, ‘There aren’t many green bond issues that conform to our investment

guidelines, and the ones that do are small.’ This is echoed by a central bank from Asia Pacific, commenting on a ‘lack of eligible securities that meet our investment guidelines (for example, corporates that meet our ESG rating criteria); our portfolios are of very high quality and concentrated on sovereigns, supranationals and agencies; the applicability and added benefit (return and diversification) from adding ESG criteria may not be very significant’.

Ways forward

This leaves shareholder engagement as the most promising strategy for investors with large portfolios. They are able to leverage their size to drive interactions with current or potential investees on ESG issues. This can take the form of influencing ESG practices or improving disclosures and can be preferred strategies to divestment, which carries the risk of leaving assets available to investors who do not have a sustainability mindset. Still, it is a difficult policy to implement as it requires engaging with bespoke firm-level or sector-level data, which suffer from challenges described earlier. Moreover, there can be potential reputational issues with using shareholder engagement strategies. One sovereign fund from Latin America says, ‘We follow passive mandates and have only small investments in many companies and as a result are limited in what we can do. Also, we believe that the state

‘The tools and mechanisms that facilitate ESG investing must account for the diversity of investor approaches taken to implementation as an important next step to more tightly align ESG analysis and the investment process. It is key to recognise that the implementation of an ESG investment program is an inherently individual exercise tailored to specific investor requirements and objectives.’

Frances Barney, CFA, head of global risk solutions, BNY Mellon Asset Servicing

engaging with companies may create reputational risk.’

GPIs have strong incentives to integrate ESG considerations into their investment strategies, linked to the need to protect portfolios from non-financial sources of risk and their commitment to maintaining public wealth by limiting their negative impact on areas that could present risks to economies and societies. However, there are no quick ways of doing this. Many ESG-related risks will require huge investments into climate mitigation and adaptation technologies or biodiversity preservation programmes among others, but these are not yet packaged in financial products that can be accessed by investors at scale. All investors cannot simultaneously divest entirely from sectors and companies; this would create financial instability and would only work if implemented gradually. Finally, stakeholder engagement and active ownership strategies, while holding the most promise, require advances in data availability, models and skills.

Optimising ESG investment practices

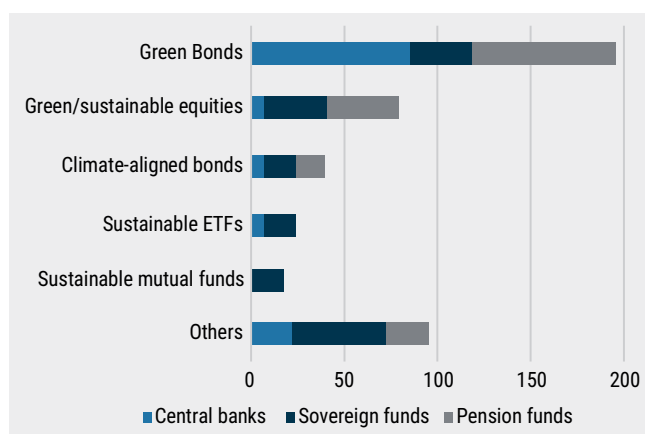
Optimising ESG investment practices will be a multi-stakeholder process which institutional investors will play a key role in advancing. An important dimension to developing ESG investment is improving institutional capacities to invest across a wider range of asset classes. As responses to the OMFIF GPI Survey 2020 indicate, asset classes that already have sustainability credentials, such as green bonds, attract the most capital from risk-averse and traditional GPIs, primarily central banks and pension funds. This preference for green bonds is projected to continue over the short term in respondents’ one- to two-year ESG allocation strategies (Figure 6).

Diversifying GPI investments into other areas will depend on developing investment teams’ confidence to evaluate a broad spectrum of sustainable assets, financial instruments and data. Four trends will shape GPIs’ ESG

5. Green bonds most popular sustainable asset class, central banks notably conservative

Which sustainable assets do you invest in?, % of total responses by institution type

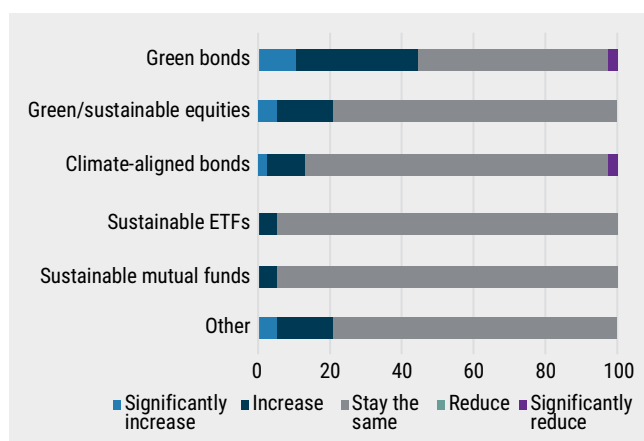
Source: OMFIF GPI Survey 2020



6. Gradual diversification into other sustainable instruments

Are you planning to increase your allocation to 'green' asset investments over the next 12-24 months? % of total responses

Source: OMFIF GPI Survey 2020



investment strategies. First, progress on mandatory and principles-based ESG regulation, combined with advances in data capture and remote sensor technologies, will add more breadth and depth to primary data and corporate disclosures on material issues. Over the next few years, this will give GPIs much more potential information on material ESG issues.

Second, improvement in data analytics, such as machine learning, artificial intelligence and sentiment analysis, will enable more accurate pattern- and sense-making from combining financial and ESG data. This will enable more granular attribution of ESG impact to specific companies and assets, and facilitate actionable investment decision-making.

Third, to truly leverage these two trends, investment and human resource teams within GPIs will need to prioritise developing the human capital and technical capacity to blend financial and alternative data sets. Major sovereign funds have developed in-house capacity to evaluate unconventional assets, such as private equity. Similar specialisations are likely to develop to fully engage with different sustainable asset classes.

Finally, in the medium to long term, ESG investment stands to benefit from the movement towards understanding and using ESG data as a public good. GPIs should be a part of and respond to this. Comprehensive, widely-available data will promote more accessibility and greater

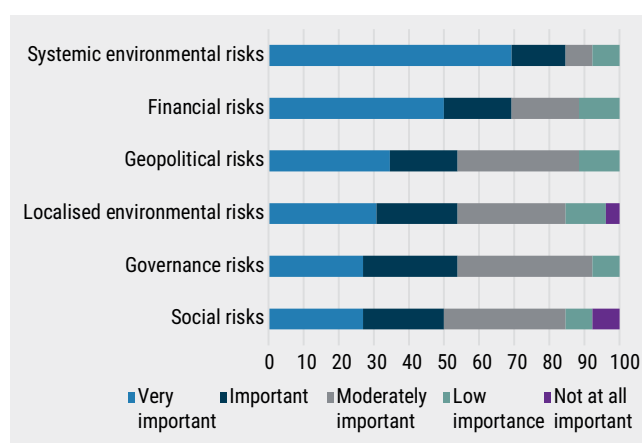
liquidity from increased participation in sustainable asset markets. Asset managers are collaborating with public institutions to develop a common trunk of public ESG data; the World Bank's Sovereign ESG Data Platform released in October 2019 is one step in this direction.

Beyond Covid-19

The pandemic has sharpened investors' awareness of and attention to the potential of non-financial sources of risk to materialise into systemic, global crises. Prior to Covid-19, climate change dominated the ESG agenda, consistently ranking as a top concern for investors. In the OMFIF-BNY Mellon survey, conducted prior to the pandemic, 69% of respondents list systemic environmental risks as 'very important', compared with less than 30% for governance and social risks (Figure 7).

But the pandemic is causing reappraisal and rebalancing, shifting attention to issues such as biodiversity, environmental loss and how these link to zoonotic diseases, as well as public health and social issues. This can create additional challenges, as it can overwhelm investors already struggling to access, understand and integrate the many ESG risks emerging into the public consciousness.

The pandemic shock is exacerbating data challenges in practical ways. Lockdown measures and breakdowns in supply chains and international co-operation are hampering data collection efforts on the ground. Disclosure commitments and associated regulations may slip through the cracks as companies and regulators focus on the immediate requirements of dealing with the crisis. For example, the Bank of England has postponed its climate stress tests to 2021 from 2020. At the same time, governments across the world are reviewing laws on social and workers' health protection and looking into accountability and scrutiny with regard to corporate governance. There is room for optimism that the pandemic may eventually reconfigure regulators' and investors' appetite to tackle these issues over the long term. The huge spending many governments are preparing to kick-start the recovery presents unparalleled opportunities to channel investments towards more sustainable growth. •



7. GPIs watch long-term environmental risks, yet ESG priorities might soon be rebalanced

How do you rank the following risks as material risk to your investment in the horizon of the next 10 years? % of total responses

Source: OMFIF ESG integration survey

‘More transparency, flexibility and responsiveness to investor needs will yield advances in ESG standards in a post-pandemic world’

ONE of the key issues with ESG investing is that it is, by definition, reliant on a broad universe of information. ESG data encompass a huge number of factors that sit underneath the over-arching environmental, social and governance themes. As such, ESG can often mean different things to different people, and the dynamic and multifaceted nature of ESG is reflected in a dizzying array of ESG data and a lack of commonly accepted standards that define it.

Standardisation is a widely recognised problem within the realm of ESG investment. According to research from the Chartered Financial Analyst Institute and United Nations Principles for Responsible Investment, the lack of standards around ESG data verification and the demonstrability of the ESG factors shaping investment portfolios are among the key barriers to greater ESG integration into investment processes. At the investor level, individual preferences can mean handling ESG data can become complex and disparate; one investor may be interested in carbon emissions, while another may be interested in diversity. Anecdotally, we're seeing that investors are increasingly looking for evidence that their specific ESG objectives, preferences and values are reflected in their investments.

In practical terms, achieving greater alignment between investor objectives and the investment process will require a number of things. First, a deeper understanding of investors' interests and concerns when it comes to ESG investing on a mass scale would allow them to define relevance on their own terms, while being better informed. Moreover, the ability to 'open up the box' to explore and identify the underlying components of ESG investing, how they're scored, and how they can inform and support specific investment strategies and objectives would facilitate more rigorous ESG integration. A future state of ESG investing needs to be able to facilitate customised portfolio construction that reflects

investor preferences and needs on a granular level. Mechanisms that support demonstrability would ensure preferred ESG factors are represented in an investor's portfolio or the products they invest in on a more reliable basis.

When it comes to the future of standardisation, considering the disparity across the ESG data universe and lack of existing common standards, a consensus will probably only form through greater transparency into what investors are doing, which will, in turn, inform best practices. Crowdsourced guidance around the preferred ESG factors and priorities could help to determine the materiality of specific data sets and in the process create standards that both guide future ESG investments and continually improve and optimise the effectiveness of ESG metrics to complement

traditional fundamental analysis or facilitate non-financial goals.

BNY Mellon has developed an application that leverages the depth of its network to learn how portfolio managers, asset owners and other business users are using and interpreting ESG data. In time, and as these efforts achieve critical mass, we expect to see a consensus form around the most relevant factors to define certain sustainability themes

‘With greater transparency and a deeper understanding of how information is being applied, users will be better placed to refine standards to meet their specific goals’

like socially responsible investing, as well as the most reliable and valuable data to support these themes, as informed by crowdsourced feedback, with the consequence that data may become more specialised over time. This clarity is likely to expose gaps in the market where current priorities are not being met. With greater transparency and a deeper understanding of how data are being applied, users will be better placed to shape, refine and optimise standards to meet their specific goals and produce the greatest possible impact based on their definition of success.

The benefits of opening the box, which the application facilitates, are also likely to play through into investment portfolio construction. As asset managers gain a deeper understanding of the



factors their investors are interested in, they will take this cue and tailor their portfolios to better reflect these priorities. Ultimately, this has the potential to pave the way for mass customisation, in which a wider range of products tailored to the ESG profiles of individual investors are made available. This will represent a fundamental change in how institutions and individuals invest.

As portfolios are tailored to investors' needs, asset managers will be held more responsible for making sure that their funds are delivering performance and providing demonstrability to validate the factors most supportive of the goals. If fund managers prioritise diversity, for example, they will need to demonstrate the specific diversity factors included in portfolios and report that back to investors. In turn, investors will probably be expected to communicate more detailed information to their stakeholders.

The impact of mass customisation and demonstrability will be wide ranging, influencing everything from how funds and investment products are marketed and distributed, to providing evidence that proxy voting is consistent with the ESG factors that match investor or stakeholders' preferences. This would have a knock-on effect on companies as they would need to ensure the reliability, clarity and alignment of disclosures on relevant ESG factors.

'The impact of the crisis caused by Covid-19 on ESG investing will be interesting to follow. If ESG factors that individuals have always cared about, but never focused on, continue to be exacerbated in a post-pandemic world, this has the potential to heighten the need to understand investments through an ESG lens'

The impact of the crisis caused by Covid-19 on ESG investing will be interesting to follow. If ESG factors that individuals have always cared about, but never focused on, continue to be exacerbated in a post-pandemic world, this has the potential to heighten the need to understand investments through an ESG lens, with greater granularity and definition. It may also highlight that ESG factors are not static as some assume and that people's perceptions and priorities change.

There's an opportunity to better understand and integrate ESG data that could lead to the emergence of more tightly defined ESG standards, mass customisation of ESG products that better reflect investor preferences, as well as improved clarity and accuracy of corporate disclosures. Ultimately these improvements will help to embed ESG principles more fundamentally into the investment process. •

Corinne Neale, global head of business applications, BNY Mellon Data and Analytics Solutions.

To find out more about BNY Mellon's ESG Analytics capabilities, please contact Corinne Neale, head of business applications, BNY Mellon Data and Analytics Solutions at corinne.neale@bnymellon.com, and Frances Barney, head of global risk solutions for BNY Mellon Asset Servicing, frances.barney@bnymellon.com.

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Key sustainable investment developments involving public institutions in 2019-20

Institution	Description	Date
Hesta Super Fund	Australia's \$37.2bn superannuation fund launched its climate change transition plan. It committed to cut absolute carbon emissions in its investment portfolio by 33% by 2030 and be net zero by 2050.	June 2020
GIC	Singapore's \$440bn sovereign fund was the lead investor in a \$250m funding round for food waste company Apeel Sciences.	May 2020
Government Pension Investment Fund	Japan's \$1.6tn pension fund – the world's largest – raised its allocation to foreign bonds to 25% from 15%, enabling it to tap international green bond markets.	March 2020
European Commission	The technical expert group on sustainable finance released its final report and recommendations on the EU taxonomy, providing guidance on company disclosures.	March 2020
Australia Local Government Super	The LGS became the first superannuation fund to issue a certified green bond, raising \$38m to invest in low carbon office buildings with certification.	March 2020
AP1	Following last year's divestments from nuclear weapons, tobacco, coal and oil sands, Swedish pension fund AP1 decided to divest entirely from fossil fuels, citing the need to manage its climate risk exposure. It announced plans to develop a roadmap towards achieving a carbon neutral portfolio by 2050.	March 2020
ABP	Europe's largest pension fund, Dutch ABP, announced its commitment to make its portfolio climate-neutral by 2050. It will start with a 40% reduction in carbon emissions from its equity portfolio in the next five years.	February 2020
California State Teachers' Retirement System	CalSTRS issued its first green bond, raising \$272.6m with a 30-year deal. Proceeds will fund the construction of the first building owned by a pension fund to acquire certification for a green bond issuance.	December 2019
Sveriges Riksbank	Sweden's central bank decided to divest its reserves portfolio from carbon-intensive Canadian and Australian local bonds.	November 2019
Temasek	Singapore's \$373.1bn sovereign fund set 2030 as the target year to halve greenhouse gas emissions in its portfolio. It will start by reporting on its usage of water, paper, electricity and air miles starting this financial year.	November 2019
Central Banks and Supervisors Network for Greening the Financial System	The NGFS, now a group of 68 members, published a Sustainable and Responsible Investment Guide for Central Banks' Portfolio Management.	October 2019
APG and PGGM	Dutch pension fund PGGM and asset manager APG set up the SDI Asset Owner Platform, an artificial intelligence-powered platform for institutional investors to contribute to the United Nations sustainable development goals.	September 2019
Republic of Chile	Chile became the eighth country to issue a sovereign green bond, raising \$1.4bn. This was the Americas' first issuance of sovereign certified climate bonds (the only other two being the Netherlands and Nigeria). Proceeds will be used to finance and refinance electric transportation, solar projects, water infrastructure and reducing carbon emissions in real estate.	June 2019

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Consider Everything



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4 Get to know the GPIs

In support of their roles as investment players, macroeconomic actors and fiduciary agents, global public investors have expanded their remits, both thematically and geographically. This section examines the geographical spread of GPI offices and homes in on central bank art collections.

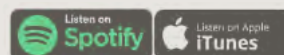




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Chapter 11

World GPI centres



Strategic global public investor hubs take shape

In their quest to generate higher returns and improve their knowledge of foreign markets, global public investors turn to overseas expansion. While New York, London and Beijing are popular locations, other cities are emerging as strategic hubs, write Kat Usita and Brandon Chye.

GLOBAL investments require global presence. Global public investors maintain at least 181 representative offices across 40 cities. These offices highlight the geographic reach of their quest to find new markets, industries and asset classes that generate superior returns.

Major international financial centres like New York and London play host to many GPIs. Together, these two hubs house 58 representative and satellite offices of central banks, sovereign funds and public pension funds. Other cities, offering different kinds of strategic access that feed varying investment needs, have also benefited from GPIs' overseas expansion.

Unconventional asset allocations in real estate, infrastructure and private equity have become more

181

Global public investors maintain at least 181 representative offices across 40 cities

mainstream among GPIs since the 2008 financial crisis. This explains partly the surge in more recent overseas expansion. While bolstering their portfolios with alternative assets and markets, GPIs have grown in size and sophistication, calling on new skills, resources and information. To invest successfully in new asset classes and geographies, GPIs require deep local knowledge, acquired through actual presence and links to pools of talent and expertise.

Sovereign funds and public pension funds keen to invest globally often need to be close to target markets. Central banks have a wider goal. Establishing overseas representation builds direct communication channels with other actors in the global financial system, enabling them to carry out effective

1. GPIs converge in New York and London, but smaller centres drawing attention

Number of institutions with offices or representation, 2019

Source: OMFIF analysis



risk assessment and asset management strategies. Closeness to other central banks taking extraordinary crisis-fighting measures can be an important source of policy assistance during fraught periods such as the 2020 pandemic.

Thriving clusters

Financial hubs like New York, London, Hong Kong and Singapore attract sizable clusters of GPIs. Aside from the size and depth of these markets, other factors draw in public investors. The importance of local currencies, the relative stability of regulatory and political institutions, and the pre-existing talent pool of professionals create an optimal environment for an overseas base. Recent developments, including the UK's departure from the European Union and unrest in Hong Kong, have yet to show a significant impact on GPIs' desire to operate in these locations.

Major financial centres are ideal for GPIs looking at real estate investments. The high level of business activity in these hubs boosts local property markets, and GPIs in the vicinity can find and evaluate opportunities quickly. Sovereign funds and pension funds, which have long been active in real estate, have recently started investing in infrastructure. Because this typically requires specialist skills, GPIs benefit from the depth of expertise present in international financial centres. Opening an office in these locations allows them to

hire in-house specialists, or at least keep a close eye on local external managers. It also enables them to monitor project development on the ground.

Meanwhile, central banks benefit from proximity to their counterparts. There are at least 16 central banks represented in New York, in addition to the Federal Reserve Bank. There are 13 in London and 11 in Beijing. In these cities, monetary authorities have been building interinstitutional links that can become useful when collaboration is needed.

Central banks' presence abroad facilitates two-way information flows. They are kept abreast of important shifts in global finance and monitor significant in-country and regional developments, which they can relay to headquarters, informing risk management activities. Similarly, they can help communicate central bank policy and provide macroeconomic updates to investors and other stakeholders requiring country-specific information.

Unlocking China's capital markets

Hong Kong has been the city of choice for foreign investors keen on expanding China-focused investment activities. Regulation and capital controls in China have previously limited the direct footprint for foreign financial institutions. Quotas like the Qualified Foreign Institutional Investor scheme and the Renminbi Qualified Foreign Institutional Investors programme

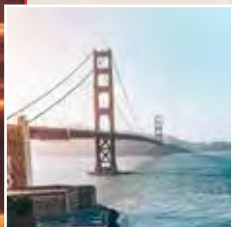
EMERGING GPI CENTRES

San Francisco

San Francisco's Bay Area attracts GPIs due to its proximity to the big tech and venture capital sector. As early as 1986, Singapore's GIC established an office in San Francisco as it began exploring start-ups and tech investments in Silicon Valley.

Other major sovereign and pension funds were slow to follow suit. Asian and Middle Eastern funds established a presence in the city after the 2008 financial crisis, just as tech-focused VC funding started

growing rapidly. In 2013, Khazanah Nasional Berhad chose San Francisco as its first base outside Asia, also intended to be the focal point of its investments in the Americas. The Bay Area counts seven GPIs, and Saudi Arabia's Public Investment Fund has announced plans to open a San Francisco office.

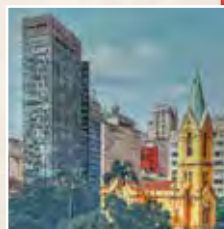


São Paulo

Post-2008, São Paulo attracted funds eager to bet on emerging market economies, particularly those with opportunities in real estate and infrastructure. GIC and CPPIB both opened offices in 2014. CDPQ opened an office in 2019 while increasing infrastructure investments in Brazil, Colombia and Mexico.

Brazil is a central location for GPIs wanting to keep a close eye on Latin America.

The Deutsche Bundesbank has a representative in São Paulo monitoring developments in all South American economies. Present in 12 cities overseas, the Bundesbank is the most widely represented central bank globally. In total, there are five GPIs in São Paulo.

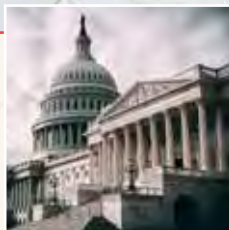


Washington

Washington, more than being the seat of US government, acts as a centre for international financial co-operation. It plays host to the International Monetary Fund-World Bank Group annual meetings, the largest regular gathering of finance ministers and central bank governors.

Six GPIs have offices in Washington, including four central banks. Three of the four central banks – Bank of Japan, Bank of Korea and Central Bank of the Republic of Turkey – are also present in New York. Representation in the US capital grants them access to other monetary authorities and international organisations. The European Central Bank's office in the city facilitates its close working relationship with the IMF and other international financial institutions, as well as the US Federal Reserve Board.

Other GPIs present in Washington are Temasek and the Caisse de dépôt et placement du Québec.



Mumbai

Since the 1990s, the pace of India's economic expansion and population growth has made it an attractive destination for GPIs. In 2004, Temasek established an office in Mumbai, the country's financial capital. Khazanah Nasional Berhad followed in 2008. More recently, governance reforms and regulatory improvements have made it even more appealing. GIC opened a Mumbai office in 2011.

Infrastructure demand in a rapidly growing economy draw in funds looking for long-term returns. The Indian government is capitalising on this. In early 2020 it announced generous tax exemptions for sovereign funds investing in infrastructure. The Abu Dhabi Investment Authority, the world's third-largest sovereign fund, has yet to formally establish an office in India but actively invests in infrastructure and will be among the funds benefiting. At the moment, there are five GPIs in Mumbai, but this may change in the next few years should incentives be successful.



previously constrained the opening of Chinese capital markets to external investors. Hong Kong, with its open capital account, has often functioned as a gateway allowing for greater foreign investment into China. For instance, the Shanghai-Hong Kong stock connect and Shenzhen-Hong Kong stock connect schemes launched in 2014 and 2016, respectively, created cross-boundary investment and trading channels between the Hong Kong, Shanghai and Shenzhen stock exchanges.

Yet Hong Kong's core position as an investment gateway to China may be shifting. The unrest in Hong Kong over the past year has highlighted the practicality of having alternative routes to accessing the Chinese financial system, even as the harbour remains an active financial centre. As

'These expensive international ventures can be a source of domestic criticism and consternation for GPIs that have fiduciary duties and are subject to public scrutiny.'

investment restrictions in China are being lifted, Chinese cities are becoming more suitable for GPI activity. In September 2019, China's financial regulators announced the removal of limits on QFII and RQFII, giving investors greater access to China's financial industry.

Beijing and Shanghai have 22 GPI offices between them, including newly opened offices of Dutch pension fund manager APG in both cities. Canada Pension Plan Investment Board is considering opening an office in Beijing, after more than a decade of investing in China, where around

one-tenth of its \$399bn assets under management is invested.

Shanghai boasts an extensive talent pool alongside its capacity to service local and international markets. As a result, it has emerged as a primary financial services centre. The Government Pension Fund Global, managed by Norges Bank Investment Management, is one of seven funds represented in Shanghai.

The rise of the renminbi and growing importance of China's economy have drawn central banks to Beijing. The currency has been part of the International Monetary Fund's special drawing rights basket since 2016, and the People's Bank of China has established a considerable network

of swap lines with other central banks. Beijing hosts numerous central bank representative offices including those from Australia, France, Germany, Indonesia, Singapore and Thailand.

Despite promising returns, there are long-term structural risks associated with the Chinese economy. While China's growth record is impressive, an aging demographic may also mean that the country falls into a 'middle-income trap'.

Singapore is another active and dynamic international financial centre seen as the doorway to southeast Asia. It has successfully crafted a secure and stable business environment supported by a strong legal system.

The deep expertise of its financial services community, the ease of doing business, its world-class infrastructure, and connectivity to other Asia Pacific markets – including China – make the city-state a viable alternative base for institutional investors. These factors led to the opening of 10 GPI representative offices in Singapore, including those of the Ontario Municipal Employees Retirement System, NBIM and Bpifrance.

Entering other emerging markets

GPIs have been looking further afield to hedge portfolios with diversified opportunities in other emerging markets, as well as to boost their presence in other regional centres. This was a trend observed after the financial crisis as the low-yield, low-growth environment in developed markets drove GPIs outward. It could even be more pronounced in coming years, as Europe deals with the economic and financial blow from the pandemic and major financial centres recover.

Mumbai and São Paulo are attractive cities for investors wanting to establish a presence in south Asia and Latin America, regions with fast-growing populations and high demand for infrastructure investment. While smaller financial centres have nowhere near the same market depth and robustness as bigger cities, they offer alternative opportunities with less international competition. These cities host five GPIs each, notably large funds from Canada and southeast Asia with at least \$350bn in assets under management. GPIs with the resources for overseas expansion can gain first-mover advantage when they enter these markets early.

Having a physical presence in less prominent financial centres helps overcome information asymmetries about lesser known markets. Satellite GPI offices can hire local specialists who know the regulatory environment well, have an established domestic network and speak the language. In-person contact, unburdened by locational and time differences, can contribute to successful deals and joint activities.

However, not all GPIs prioritise having a global or regional representation, depending on their investment mandate and strategic objectives for asset allocation.



For instance, Japan's Government Pension Investment Fund – the world's largest pension fund – has no formal overseas presence. It is legally restricted from direct equity investments, thus precluding the necessity for an on-the-ground international presence.

Opening a representative office is inherently costly, requiring substantial time, effort and money to scale interests in a new location. These expensive international ventures can be a source of domestic criticism and consternation for GPIs that have fiduciary duties and are subject to public scrutiny. In 2019, the Malaysian sovereign fund Khazanah Nasional Berhad decided to close its London office, initially set up in 2015, and scale down its foreign office in Istanbul due to high operational costs and low returns on investments. Overseas expansion needs to be justified by reasonable returns.

In trying and uncertain times, traditional financial centres may face challenges, creating a window for less prominent financial centres to grow. Institutions that successfully establish a global presence can unlock opportunities and maximise locational advantage. •



Chapter 10

Central bank art collections



The art of central banking

For centuries, central banks have collected art. Many regularly host exhibitions and competitions, helping to bridge the gap between institutions and the public they serve, writes Danae Kyriakopoulou.

THE motivations, magnitude and characteristics of central banks' public engagement have changed profoundly in the last decade. Previously hidden away, quietly managing and operating the plumbing of the financial system, these institutions have come into the spotlight through their unconventional policies. Last year's *Global Public Investor* probed how central banks leverage digital communication strategies and social media to strengthen their relationship with the public and safeguard their most valuable resource, trust.

This year, we continue the series on central banks' public engagement by delving into their art collections. This report explores how art can serve as a bridge between institutions and the public, and has manifested itself in different cultures and histories. We look at how art collections function as a tool for central banks to support their local economies and encourage creativity through competitions,

'I am convinced that economic and cultural affairs, and money and literature and poetry, are much more closely linked than many people believe.'

Jean-Claude Trichet, president, European Central Bank (2003-11)

commissions and exhibitions. We examine how it enables them to strengthen their organisational culture, and motivate and support their staff. Finally, we cover art as money, analysing the ways through which some central banks have built investment policies for their art collections, and money as art, looking at how questions on finance have inspired artists.

Diverse origins

The presence of art is a characteristic of most central banks, if only in the form of a painting in the boardroom or a sculpture in the main entrance. But not all institutions document, present and organise their art in the form of a collection. Even fewer provide public information about it or have dedicated curator and investment teams looking after it. The research presented in this report is based on an OMFIF database created for more than 30 central banks across five continents.

Most of the art collections in our sample date from the 20th century. The Banco de España and Banque de France are exceptions, their collections going back to the beginnings of the institutions themselves in the late 18th century and early 19th century, respectively. The Spanish central bank's collection started in 1782 when the forerunner of the central bank was established by King Charles III as Banco Nacional de San Carlos. At that time, the bank commissioned portraits of the royal family as well as of its directors, including a portrait of its first director Francisco Cabarrús painted by Francisco de Goya in 1788 (right).

In the case of the Banque de France, the first set of paintings (The Festival at Saint Cloud by Jean-Honoré Fragonard and three hunting scenes by Francesco Giuseppe Casanova) entered its collection in 1806, when Emperor Napoleon Bonaparte nationalised the bank. The paintings were sold as part of the purchase of the Hôtel des Économats to house central bank officials.

More recently, the Bank of Canada's art collection began in 1938, when on his retirement, Deputy Governor J.A.C. Osborne gave the bank a set of 25 first-edition prints of London scenes by Thomas Shotter Boys. At the same time, Governor Graham Towers authorised the bank to acquire a set of Canadian prints. In the US, the Federal Reserve's fine arts programme was established in 1975 by Chair Arthur Burns in response to a White House directive encouraging federal partnership with the arts. Unlike other collections, the Fed relies on donations of artwork or outside funds to purchase works of art.

Most European central banks' art collections consist mainly of paintings, but this is not a global trend. In Colombia, Costa Rica and the Philippines for example, the central banks are also home to museums with exhibits ranging from archaeological treasures to medieval goldwork and pottery. Colombia's central bank owns an art collection consisting of around 8,000 pieces spanning 500

years. It is exhibited in two museums, the Botero museum and the Miguel Urrutia museum (which includes the numismatic collection in Casa de Moneda). One of Tehran's most-visited museums, the Treasury of National Jewels, is located inside the Central Bank of Iran. Containing some of

the world's most precious jewels – including the Darya-i-Nur, the world's largest pink diamond – the collection was transferred to Bank Melli Iran in 1937. It formed part of the reserves for note issues. It later became collateral for government liabilities to the bank and was transferred to the CBI upon



Banco de España's first director, Francisco Cabarrús. Francisco de Goya, 1788.

1. Diverse origins

Source: OMFIF analysis

*The paintings collection began with purchases. The musical instruments and Botero collections began as donations

** The first paintings were inherited as part of the governors' first residence building

Categorisation of central bank collection origins, by source of first object(s), selected institutions		Categorisation of central bank collection origins, by time period, selected institutions	
Purchases for decoration	Italy, Netherlands, UK	Pre-20th century	Spain, France
Purchases for collection	Austria, Belgium, Canada, Colombia*, ECB, Germany, Greece, Hungary, Trinidad and Tobago, Turkey	1910-29	Colombia, Greece, Netherlands
Commissioned art	Spain	1930-49	Canada, Italy, Turkey
Gift/donations	Canada, Colombia*, US	1950-69	Costa Rica, Germany, Iran, South Africa, Trinidad & Tobago
Inherited/Transferred from other institution	France **, Iran	1970-89	Austria, Bahamas, Belgium, Brazil, Philippines, US
Foreclosures	Brazil	1990-2009	ECB, Morocco
		post-2010	Hungary

‘We’re looking to engage with society at large. As public institutions, we have a sense of commitment to the arts and culture. We also feel that it is crucial to incorporate art into working life, because that brings our colleagues, guests and visitors face to face with artistic expression. Over the years, collecting and exhibiting art has become part of our institutions’ DNA’.

Jens Weidmann, president, Deutsche Bundesbank

the central bank’s creation in 1960.

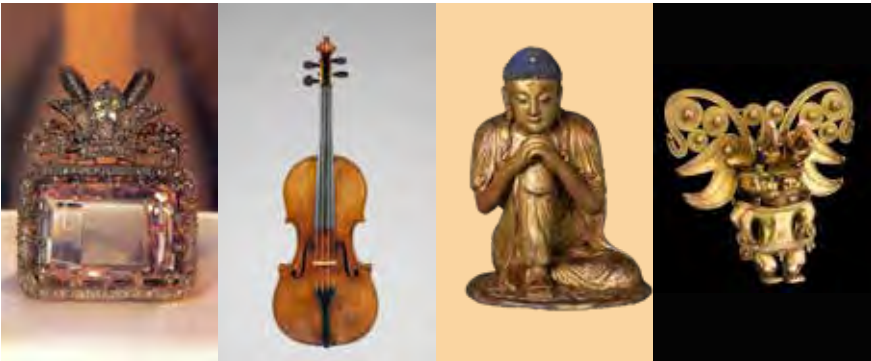
It is difficult to identify why exactly central banks started collecting art. As noted by Paola Della Pergola in her foreword to the catalogue of the Banca d’Italia’s Palazzo Koch collection, ‘The history of art collecting highlights a common aspect of the beginning of the all-significant art collections: the choices of pieces of the initial collection were absolutely by chance.’ Still, most central bank art collection origins can broadly be grouped into the categories of purchases and commissioned art (for decoration or for the creation of a collection), or through inheritance and gifts/donations (Figure 1). The Banco Central do Brasil is an outlier in this regard. It received its first set of paintings, 13 panels by Candido Portinari, from the failing Halles Investment Bank in 1974. That same year, the Áurea investment banks failed and their art went to the BCB. Today, more than 90% of the central bank’s art collection originates from these two episodes.

The Banca d’Italia had a similar

experience during the Great Depression, when it seized 82 pieces from Riccardo Gualino, an indebted Turin industrialist and financier. This includes a collection of 17th century tapestries, the third century Sarcophagus of Ienos, pieces by Claude Monet and Pietro Canonica, as well as ancient oriental art. These form the basis of the bank’s collection at its head office at Palazzo Koch. Its collection overall constitutes around 3,000 items including paintings, sculptures, rugs, tapestries and other works of decorative art. Colombia’s Museo Botero includes a collection of 208 pieces that the artist donated to the central bank in 2000, 123 of which are his works, with a further 85 from his personal collection including pieces by Pablo Picasso, Joan Miró, Edgar Degas and Pierre-Auguste Renoir.

Accessibility, art and technology

Most central banks in our sample operate a museum, generally exhibiting the history of money, as well as the history of the central



2. Stand-out items

Pictured L-R: Darya-i-Nur or Sea of light, the world’s largest pink diamond. **Central Bank of Iran**

Violins crafted by Antonio Stradivari. **Oesterreichische Nationalbank**

Yuan or Ming Dynasty ‘The Buddha Shakyamuni in Meditation’ in gold lacquer. **Banca d’Italia**. Picture courtesy Banca d’Italia

Golden ‘Bat-Man’. **Banco de la Republica (Colombia)**. Picture: Clark M. Rodríguez, courtesy The Museum of Gold, Banco de la Republica

bank and information on central bank operations. With few exceptions (Colombia is one), the art collections are not on display at a museum but are scattered throughout the building to decorate offices. For security reasons, central banks are usually off limits to the public. This may be gradually changing. For example, De Nederlandsche Bank has moved its gold safe to Haarlem to make its main building in Amsterdam easier for the public to access.

Most people never have the opportunity to see the inside of a central bank. Some central banks offer other ways for people to see their art collections when this is not possible physically. The European Central Bank has set up the ECB Art app, which allows users to explore its art collection. It features behind-the-scenes videos and interviews with artists and staff members. The Banca d'Italia offers an extensive virtual experience for visitors, providing information on the artists and works of art in its collection, as well as 20 virtual tours ranging from 'Ancient and Oriental Art' and 'Antiquity and the Renaissance' to 'Futurism' and 'Forms of the Abstract'. Bank Negara Malaysia offers a virtual museum tour of its art gallery, which provides a rotating display of the central bank's art collection.

The central banks of Colombia, Austria and South Africa, among others, host catalogues of their collections on their websites. The Central Bank of Iran's website hosts a video documentary on the Crown Jewels collection. Many other central banks including Greece, Hungary, the Netherlands and the Philippines have physical catalogues of their collections, though these have not been digitalised.

Exhibitions and supporting the arts

Occasionally central banks open their doors to the public. Since 1984, the Banque de France has participated in France's Heritage Days programme, which allows visitors access to the 'Golden Gallery'. Over the past decade, it has gradually opened up other



3. Rural landscape at sunset.
Claude Monet
c.1863-64

Picture courtesy:
Banca d'Italia

'The BSP ensures that outstanding examples of Filipino genius in its gold, art, and numismatic collections are shared with the people through exhibits, books, CDs, social media, and provincial lectures.'

Amando Tetangco, governor,
Bangko Sentral ng Pilipinas
(2005-17)

sections of its headquarters.

Another way to make art publicly available is through temporary exhibitions. In 2019, the Deutsche Bundesbank and the National Bank of Belgium presented their first joint exhibition, 'Building a Dialogue: Two Corporate Collections of Contemporary Art' at the NBB's premises in Brussels. 'This exhibition marks our attempt to spark a special type of dialogue. Not just between visitors and the artworks, but also between two art collections which have evolved at two similar institutions in neighbouring countries', said Bundesbank President Jens Weidmann. The Bundesbank has also lent items from its art collection to exhibitions elsewhere, for example a Victor Vasarely dining room that was shown at the Centre Pompidou in Paris. Earlier this year, the Museo del Banco Central de Costa

Rica hosted an exhibition of 100 engravings by Picasso, on tour from Spain's Instituto Oficial de Crédito. In April-June, the Banco de Portugal hosted an exhibition honouring 16th century artist Francisco de Holanda. In 2014, the Central Bank of Malta joined forces with the Victor Pasmore Foundation to set up the Victor Pasmore Gallery, a permanent exhibition of the works that the British artist created while he lived in Malta.

Some central banks organise contests to support the arts. The Banco Central de la República Argentina has presented a painting contest since 2007 to 'promote and spread Argentine contemporary art, encourage the involvement of plastic arts, and increase the bank's pictorial assets through the purchase of paintings.' The competition has special prizes for young artists below the age of 35. Supporting living artists and the local art scene is not an uncommon motivation for central bank art collections. The National Bank of Belgium's collection consists exclusively of works by contemporary Belgian artists or artists living in Belgium.

The Central Bank of the Republic of Turkey organises international contests to support the photographic arts. The 2019 exhibition featured artists from 74 countries. The central banks of the Bahamas and of Trinidad and Tobago have also run art competitions. The Central Bank of Ireland and the Hong Kong Monetary

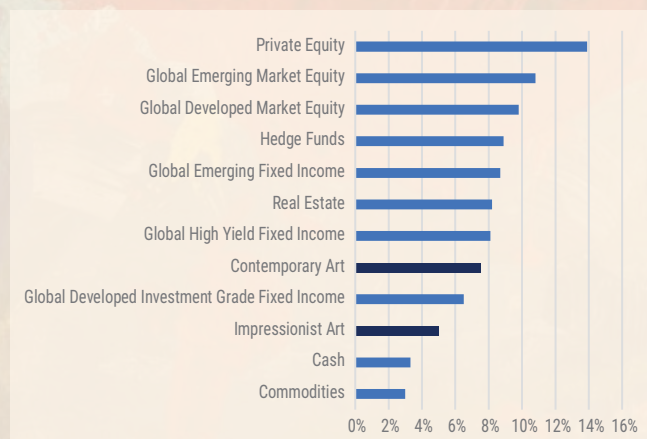
Money as art vs Art as money

Art as money...

Central banks' art collections are usually for enjoyment, rather than an investment. Many do not have investment policies and very few actively sell their art. They generally do not account for them as part of their reserves, in the same way that they do for their equity or other holdings. For example, the Oesterreichische Nationalbank reports its art collection under 'equipment' in its balance sheet, which also includes office equipment, information technology hardware and software, and motor vehicles, and is valued at €33.1bn. Tangible real assets represent a separate category worth €51.2bn, including the coins in the OeNB's money museum and the collection of historical string instruments. Some central banks, such as South Africa's, have explicit policies to add to the collection, with annual investment budgets for purchases. In the euro area these are €125,000-€150,000 for the Netherlands, Germany and Spain. The total value of collections for which information was disclosed as part of the GPI Survey 2020 ranges from under \$3m to more than \$15m. Some central banks said that they have an investment policy when it comes to their art collections. They have expanded their purchases, attracted by a more favourable outlook compared to other asset classes, like gold and fixed income. According to Citi's Global Art Market Report, long-term returns on art stood at over 5% between 1985-2018, similar to those on fixed income portfolios (Figure 4).

4. Art performs similar to fixed income in long-term asset class returns

Estimated annualised returns, 1985-2018



Source: Masterworks, Citi Analysis

...Money as art

Most central banks examined in our sample have a currency museum displaying the history of money and presenting subjects related to their tasks and activities, often through the use of interactive games and multimedia. Coins and banknotes can be thought of as works of art, and since antiquity artists have been commissioned to design these. According to Andrzej Rottermund, chair of the jury choosing the concept of the National Bank of Poland's Money Centre Exhibition, 'The money we deal with every day should be beautiful – everything around us should be aesthetically pleasing. The easiest way to teach people a sense of beauty and good taste is by enabling them to deal with beautiful objects, including money.'

Through the ages, money has served as a motif in art. Pieter Laurens Mol's 'Interest Drawings' use specific materials like lead and gold linked to the process of alchemy to capture behaviours in the world of money. For Alexander Strengers, chair of De Nederlandsche Bank's art committee, these are 'almost poetic works', which outline the artist's view 'on the banking sector's ostensibly mechanistic processes, such as capital growth, speculation and consolidation'.

Between 2012-14, the Reserve Bank of Australia hosted an exhibition on 'Pocket Money' showcasing illustrated literature and comic books from the 1950s and 1960s that encouraged children's interest in saving. In September 2015, the European Central Bank came into the spotlight for installing a 17.5-meter-high tree sculpture by Giuseppe Penone to decorate the primary entrance of its new headquarters. The artwork, titled 'Gravity and Growth', was nicknamed the bank's 'Magic Money Tree', and interpreted by some as symbolism for the bank's quantitative easing programme. The Federal Reserve also holds money-themed art pieces in its collection, including Victor Dubreuil's 'Barrels of Money' and Glenn Fry's 'Visualise Having', a work the Fed commissioned. Even writers have been inspired by central banking. In 1932, Austrian author Stefan Zweig visited the Banque de France's underground vault (where the gold reserves are stored) and wrote an account of his experience entitled 'Besuch bei den Milliarden'.

Authority have run primary school competitions to support children's artistic engagement.

At times, financial support has taken direct forms. In 2015 the Banque de France – at the request of the ministry of culture and communication – helped finance France's participation in the acquisition of the Rembrandt portraits of Marten Soolmans and Oopjen Coppit, a joint operation on behalf of the Louvre and Rijksmuseum coordinated by the French and Dutch culture ministries. A similar practice on a much larger scale is Magyar Nemzeti Bank's depository programme. Set up in 2014, it included a budget of \$100m to be spent on art by the end of 2018 with the explicit aim to repatriate art that was formerly in Hungarian ownership, as well as keep art in the country when the Hungarian owner dies. This put the central bank in the spotlight in 2015 when it acquired 'Mary and Child with St. Paul' (pictured on this chapter's cover) for \$15.8m from a private collector. The Titian painting is now at the Hungarian National Gallery.

Central banks' support of the arts extends to the performance arts and music. The Oesterreichische Nationalbank holds a collection of 44 historical string instruments, which it lends for free to Austrian musicians. The instruments were used in 2018 to record eight concerts in partnership with radio station Ö1. Adding to its extensive gold and art collections, the Colombian central bank began collecting historical musical instruments in 1928. The collection is made up of 85 instruments, including a piano from 1850. The Banque de France, although it does not own a musical instruments collection, has a policy of encouraging musical activities on its premises, and regularly invites new musical formations and young musicians to perform in the Golden Gallery.

Monetary expressionism

Central banks' engagement with art mirrors the way these institutions have evolved as workplaces. This

can be visible already from the most basic form of art present in all of them: their architecture. The Bank of Canada notes in its 2010 publication on art, 'In the early 20th century, banks were designed to inspire confidence and evoke a feeling of permanence. Modelled on Greek temples, they conveyed a sense of timeless tradition and security. In later, more secular times, the solemnity of granite, marble and bronze gave way to towers of glass and steel. While the approach may have changed, the intent to impress and inspire confidence remained.'

Over the past decades, central banks have made the transition into buildings that reflect their commitment to sustainability. Climate change has become a big part of central banks' agendas, as reflected in the operations of the Central Banks and Supervisors Network for Greening the Financial System.

De Nederlandsche Bank is housed in a temporary building as its original headquarters are being renovated to match the institution's climate-conscious ethos. The Central Bank of Ireland moved headquarters in 2017, guided by what the designers described as a 'less autocratic and more open architectural language' to reflect the central bank's changing tradition from one where security and safety dominate to one where the values of transparency and openness are reflected.

Art offers a glimpse into individuals' personalities, tastes and principles. In a 2010 op-ed for the Wall Street Journal, Mary Anne Goley, the founding director of the Federal Reserve's fine arts programme, wrote that Fed Chair Ben Bernanke's characterisation as 'creative', 'innovative' and 'flexible' in his economic management could 'also apply to his taste in art'. She went on to say that 'rather than being predictable, Bernanke's [art] choices changed three times during [his] time at the Fed': traditional landscapes by Thomas Hotchkiss and Arthur Bellows, followed by

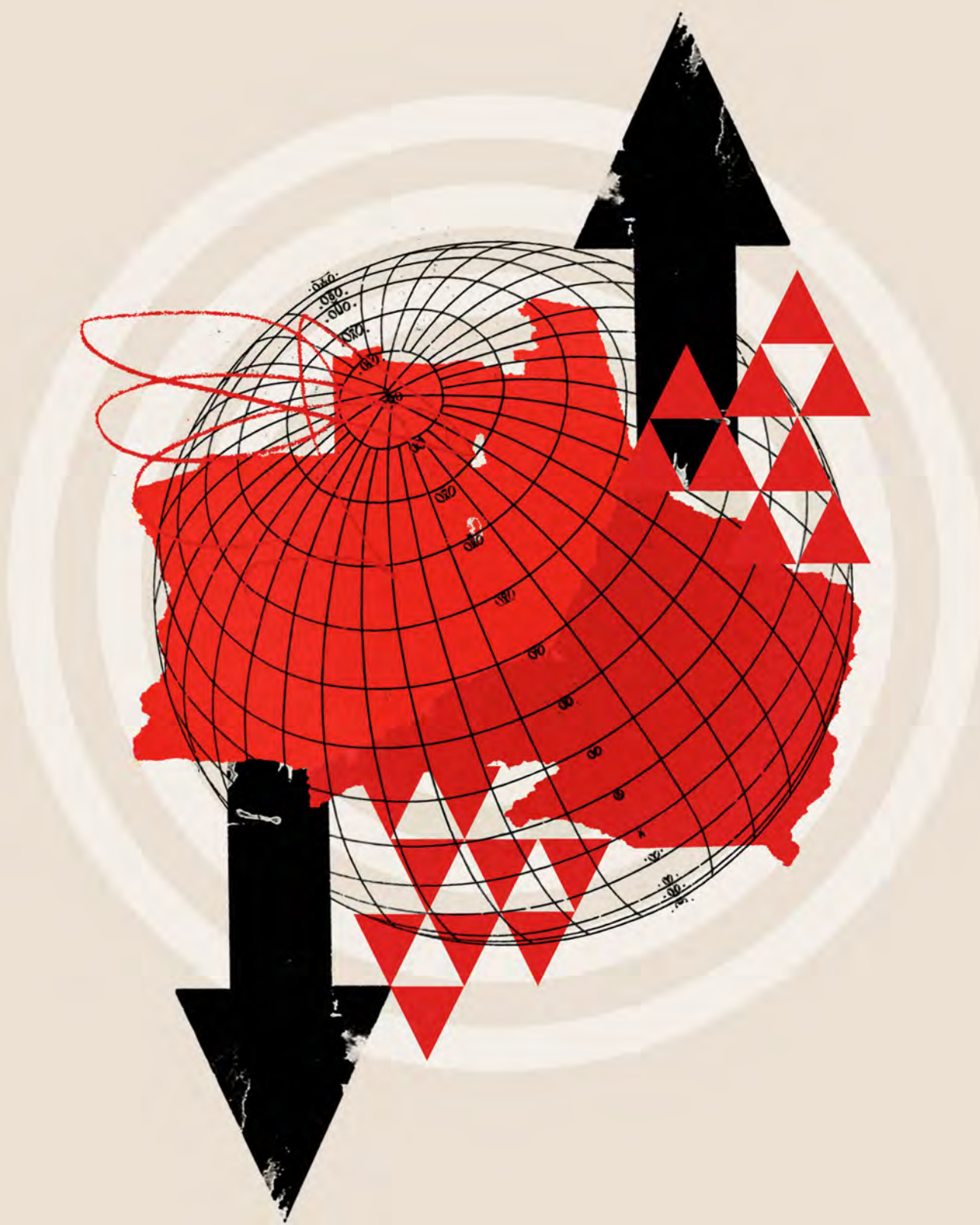
an assembly of Samarkand silks by Robert Rauschenberg, and later Ilya Bolotowsky's 'Double Diamond' and Louis Guglielmi's 'New York 21'. De Nederlandsche Bank Executive Board Member Frank Elderson has decorated his office with a 1989 abstract composition by Willem Oorebeek bearing the words in Spanish: 'Un coctel de competencias y talentos'. Elderson explained, 'To me, they express exactly what the people working at the bank represent: a unique combination of skills and talents.' The bank's Governor Klaas Knot has a 2004 acrylic painting by Dietmar Lutz titled 'The Mosque' in his office. New employee inductions take place in the DNB's art gallery.

Central banks' engagement with the arts has not always been smooth. Several have been put into the spotlight for their choices and actions related to art. In January 2019, amid the #MeToo movement against sexual harassment, the Central Bank of Iceland decided to remove two paintings by Gunnlaugur Blöndal featuring nude women, after a complaint from a staff member. The decision was criticised as prudish and backwards.

Public bodies

Such incidents are part of a broader trend of heightened public scrutiny on central banks, whether this relates to their monetary policies, supervision actions, reserves management or communications. They are no longer viewed as unelected, unaccountable technocratic bodies locked away in a statistical ivory tower. Rather, they are increasingly perceived as public bodies from which citizens expect a strong public service ethos. Their art collections and related activities can be a useful tool in central banks' quest to manage expectations for openness.

In a small but symbolic way, these practices offer a new area for central banks' asset managers to show they are interested in both high investment standards and satisfactory returns. •



5 Databank

Rankings of top 750 GPUs,
featuring breakdown by
geography and performance.

Global distribution of GPI assets

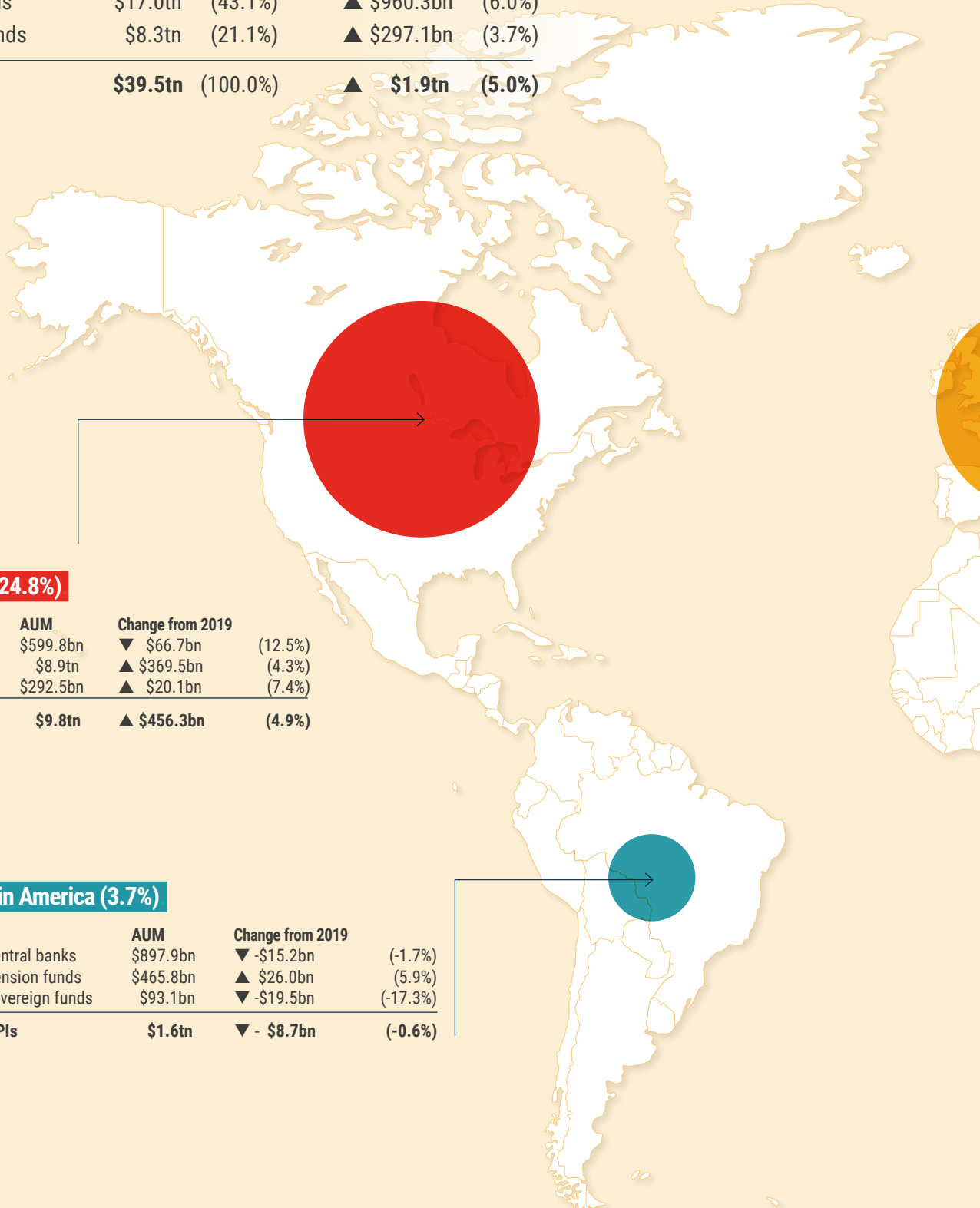
Total GPIs	Total AUM 2020	Total change from 2019
174 central banks	\$14.1tn (35.7%)	▲ \$614.2bn (4.6%)
489 pension funds	\$17.0tn (43.1%)	▲ \$960.3bn (6.0%)
87 sovereign funds	\$8.3tn (21.1%)	▲ \$297.1bn (3.7%)
750 GPIs	\$39.5tn (100.0%)	▲ \$1.9tn (5.0%)

North America (24.8%)

GPIs	AUM	Change from 2019
2 central banks	\$599.8bn	▼ \$66.7bn (12.5%)
210 pension funds	\$8.9tn	▲ \$369.5bn (4.3%)
15 sovereign funds	\$292.5bn	▲ \$20.1bn (7.4%)
227 GPIs	\$9.8tn	▲ \$456.3bn (4.9%)

Latin America (3.7%)

GPIs	AUM	Change from 2019
31 central banks	\$897.9bn	▼ -\$15.2bn (-1.7%)
21 pension funds	\$465.8bn	▲ \$26.0bn (5.9%)
8 sovereign funds	\$93.1bn	▼ -\$19.5bn (-17.3%)
60 GPIs	\$1.6tn	▼ - \$8.7bn (-0.6%)



Europe (20.8%)

GPIs	AUM	Change from 2019	
46 central banks	\$3.3tn	▲ \$293.9bn	(9.7%)
189 pension funds	\$3.0tn	▲ \$180.7bn	(6.5%)
12 sovereign funds	\$1.9tn	▲ \$169.4bn	(9.8%)
247 GPIs	\$8.2tn	▲ \$644.0bn	(8.5%)

Asia Pacific (38.2%)

GPIs	AUM	Change from 2019, \$	
39 central banks	\$7.8tn	▲ \$233.7bn	(3.1%)
53 pension funds	\$4.4tn	▲ \$365.7bn	(9.0%)
26 sovereign funds	\$2.9tn	▲ \$48.1bn	(1.7%)
118 GPIs	\$15.1tn	▲ \$647.4bn	(4.5%)

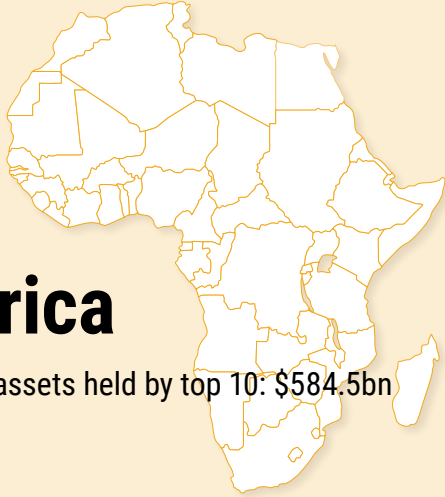
Middle East (10.7%)

GPIs	AUM	Change from 2019	
15 central banks	\$1.1tn	▲ \$33.4bn	(3.2%)
4 pension funds	\$216.0bn	▲ \$15.7bn	(7.8%)
13 sovereign funds	\$2.9tn	▲ \$78.0bn	(2.7%)
32 GPIs	\$ 4.2tn	▲ \$ 127.1bn	(3%)

Africa (1.9%)

GPIs	AUM	Change from 2019	
41 central banks	\$432.7bn	▲ \$1.7bn	(0.4%)
13 pension funds	\$86.3bn	▲ \$2.8bn	(3.3%)
12 sovereign funds	\$242.8bn	▲ \$1.0bn	(0.4%)
66 GPIs	\$761.8bn	▲ \$5.5bn	(0.7%)

Distribution of GPI assets by region



Africa

Total assets held by top 10: \$584.5bn

1 Public Investment Corporation (South Africa)

GPI rank: 60 Type: SF AUM: \$147.4bn

2 Central Bank of Libya

GPI rank: 99 Type: CB AUM: \$78.5bn

3 Libyan Investment Authority

GPI rank: 111 Type: SF AUM: \$67.0bn

4 Bank of Algeria

GPI rank: 120 Type: CB AUM: \$61.5bn

5 Central Bank of Egypt

GPI rank: 130 Type: CB AUM: \$57.3bn

6 South African Reserve Bank

GPI rank: 135 Type: CB AUM: \$55.1bn

7 Central Bank of Nigeria

GPI rank: 165 Type: CB AUM: \$39.0bn

8 Bank Al-Maghrib (Morocco)

GPI rank: 201 Type: CB AUM: \$26.4bn

9 National Pension Commission (Nigeria)

GPI rank: 205 Type: PF AUM: \$26.1bn

10 Caisse de Dépôt et de Gestion (Morocco)

GPI rank: 206 Type: PF AUM: \$26.1bn

Central banks

Rank	Institution	AUM \$bn
99	Central Bank of Libya	78.5
120	Bank of Algeria	61.5
130	Central Bank of Egypt	57.3
135	South African Reserve Bank	55.1
166	Central Bank of Nigeria	39.0

Sovereign funds

Rank	Institution	AUM \$bn
60	Public Investment Corporation	147.4
111	Libyan Investment Authority	67.0
302	Egypt Fund	11.9
423	Fundo Soberano de Angola	5.0
433	Pula Fund	4.4

Pension funds

Rank	Institution	AUM \$bn
206	National Pension Commission	26.1
207	Caisse de Dépôt et de Gestion	26.1
337	La Caisse Marocaine des Retraites	9.5
357	Government Institutions Pension Fund	8.2
416	Botswana Public Officers Pension Fund	5.1



Asia Pacific

Total assets held by top 10: \$10.1tn

- 1 People's Bank of China**
GPI rank: 1 Type: CB AUM: \$3.4tn
- 2 Government Pension Investment Fund (Japan)**
GPI rank: 2 Type: PF AUM: \$1.6tn
- 3 Bank of Japan**
GPI rank: 3 Type: CB AUM: \$1.4tn
- 4 China Investment Corporation**
GPI rank: 5 Type: SF AUM: \$940.6bn
- 5 National Pension Service (South Korea)**
GPI rank: 10 Type: PF AUM: \$631.0bn
- 6 Central Bank of the Republic of China (Taiwan)**
GPI rank: 17 Type: CB AUM: \$479.3bn
- 7 Hong Kong Monetary Authority**
GPI rank: 18 Type: CB AUM: \$470.9bn
- 8 Reserve Bank of India**
GPI rank: 19 Type: CB AUM: \$461.8bn
- 9 GIC (Singapore)**
GPI rank: 20 Type: SF AUM: \$440.0bn
- 10 Bank of Korea**
GPI rank: 22 Type: CB AUM: \$408.8bn

Central banks

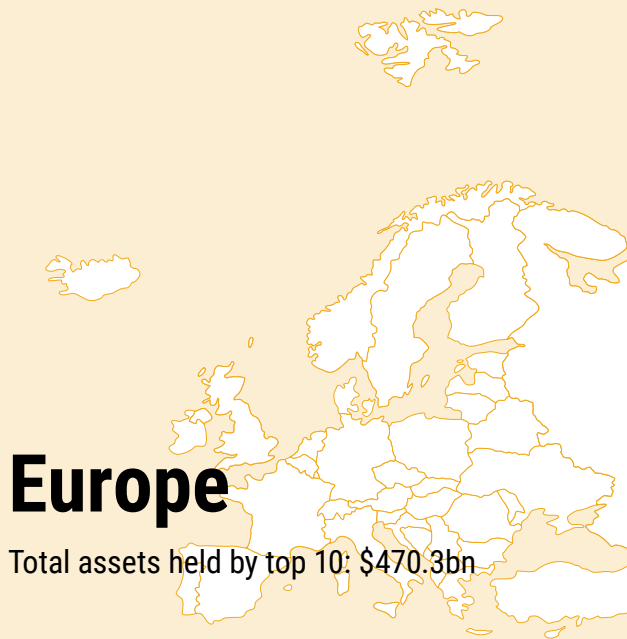
Rank	Institution	AUM \$bn
1	People's Bank of China	3,388.7
3	Bank of Japan	1,368.9
17	Central Bank of the Republic of China	479.3
18	Hong Kong Monetary Authority	470.9
19	Reserve Bank of India	461.8

Sovereign funds

Rank	Institution	AUM \$bn
5	China Investment Corporation	940.6
20	GIC	440.0
25	Temasek (Singapore)	373.0
27	National Social Security Fund (China)	323.4
62	Korea Investment Corporation	131.0

Pension funds

Rank	Institution	AUM \$bn
2	Government Pension Investment Fund	1,556.4
10	National Pension Service	631.0
32	Central Provident Fund	289.5
39	Pension Fund Association for Local Government Officials (Japan)	223.2
42	Employees' Provident Fund (Malaysia)	215.8



- 1 Norges Bank Investment Management**
GPI rank: 4 Type: SF AUM: \$1.2tn
- 2 Swiss National Bank**
GPI rank: 7 Type: CB AUM: \$855.7bn
- 3 Stichting Pensioenfonds ABP (Netherlands)**
GPI rank: 12 Type: PF AUM: \$578.4bn
- 4 Central Bank of the Russian Federation**
GPI rank: 14 Type: CB AUM: \$554.4bn
- 5 Cassa Depositi e Prestiti (Italy)**
GPI rank: 21 Type: SF AUM: \$428.0bn
- 6 Pensioenfonds Zorg en Welzijn (Netherlands)**
GPI rank: 35 Type: PF AUM: \$266.9bn
- 7 Deutsche Bundesbank**
GPI rank: 37 Type: CB AUM: \$225.4bn
- 8 Bank of England**
GPI rank: 43 Type: CB AUM: \$208.3bn
- 9 Caisse des Dépôts et Consignations (France)**
GPI rank: 46 Type: PF AUM: \$202.2bn
- 10 Banque de France**
GPI rank: 48 Type: CB AUM: \$196.8bn

Central banks

Rank	Institution	AUM \$bn
7	Swiss National Bank	855.7
14	Central Bank of the Russian Federation	554.4
37	Deutsche Bundesbank	225.4
43	Bank of England	208.3
48	Banque de France	196.8

Sovereign funds

Rank	Institution	AUM \$bn
4	Norges Bank Investment Management	1,187.3
21	Cassa Depositi e Prestiti	428.0
66	National Welfare Fund (Russia)	124.0
112	Bpifrance	66.9
180	Turkiye Wealth Fund	33.0

Pension funds

Rank	Institution	AUM \$bn
12	Stichting Pensioenfonds ABP	578.4
35	Pensioenfonds Zorg en Welzijn	266.9
46	Caisse des Dépôts et Consignations (France)	202.2
54	ATP (Denmark)	153.9
71	AP7 (Sweden)	110.5

Latin America Caribbean

Total assets held by top 10: \$1.2tn

- 1 Banco Central do Brasil**
GPI rank: 26 Type: CB AUM: \$356.9bn
- 2 Comisión Nacional del Sistema de Ahorro para el Retiro (Mexico)**
GPI rank: 44 Type: PF AUM: \$207.0bn
- 3 Banco de México**
GPI rank: 49 Type: CB AUM: \$183.1bn
- 4 Fundo de Garantia por Tempo de Serviço (Mexico)**
GPI rank: 61 Type: PF AUM: \$134.1bn
- 5 Central Bank of Peru**
GPI rank: 109 Type: CB AUM: \$67.7bn
- 6 Banco Central de Chile**
GPI rank: 117 Type: CB AUM: \$63.9bn
- 7 Banco de la Republica Colombia**
GPI rank: 127 Type: CB AUM: \$58.3bn
- 8 Caixa de Previdência dos Funcionários do Banco do Brasil**
GPI rank: 136 Type: PF AUM: \$49.7bn
- 9 Sustainability Guarantee Fund (Argentina)**
GPI rank: 137 Type: SF AUM: \$49.5bn
- 10 Banco Central de la República Argentina**
GPI rank: 148 Type: CB AUM: \$44.8bn

Central banks

Rank	Institution	AUM \$bn
26	Banco Central do Brasil	356.9
49	Bank of Mexico	183.1
109	Central Bank of Peru	67.7
117	Banco Central de Chile	63.9
127	Banco de la Republica Colombia	58.3

Sovereign funds

Rank	Institution	AUM \$bn
137	Sustainability Guarantee Fund	49.5
300	Fondo de Estabilización Económica y Social (Chile)	12.2
311	Fondo de Reserva de Pensiones (Chile)	10.8
385	Heritage and Stabilisation Fund (Trinidad and Tobago)	6.5
393	Fondo de Estabilización de los Ingresos Petroleros (Mexico)	6.0

Pension funds

Rank	Institution	AUM \$bn
44	Comisión Nacional del Sistema de Ahorro para el Retiro (Mexico)	207.0
61	Fundo de Garantia por Tempo de Serviço (Brazil)	134.1
136	Caixa de Previdência dos Funcionários do Banco do Brasil	49.7
268	Fundação dos Economistas Federais (Brazil)	16.7
284	Instituto Mexicano del Seguro Social	14.4



Middle East

Total assets held by top 10: \$3.5tn

- 1 Abu Dhabi Investment Authority (UAE)**
GPI rank: 8 Type: SF AUM: \$828.0bn
- 2 Kuwait Investment Authority**
GPI rank: 11 Type: SF AUM: \$592.0bn
- 3 Saudi Arabian Monetary Authority**
GPI rank: 16 Type: CB AUM: \$499.5bn
- 4 Qatar Investment Authority**
GPI rank: 28 Type: SF AUM: \$320.0bn
- 5 Investment Corporation of Dubai**
GPI rank: 29 Type: SF AUM: \$305.3bn
- 6 Public Investment Fund (Saudi Arabia)**
GPI rank: 31 Type: SF AUM: \$290.0bn
- 7 Mubadala Investment Company (UAE)**
GPI rank: 36 Type: SF AUM: \$228.9bn
- 8 Dubai World**
GPI rank: 52 Type: SF AUM: \$175.3bn
- 9 Bank of Israel**
GPI rank: 65 Type: CB AUM: \$126.7bn
- 10 General Organisation for Social Insurance (Saudi Arabia)**
GPI rank: 69 Type: PF AUM: \$115.4bn

Central banks

Rank	Institution	AUM \$bn
16	Saudi Arabian Monetary Authority	499.5
65	Bank of Israel	126.7
73	Central Bank of the UAE	109.1
77	Central Bank of Iran	104.6
108	Central Bank of Iraq	68.2

Sovereign funds

Rank	Institution	AUM \$bn
8	Abu Dhabi Investment Authority	828.0
11	Kuwait Investment Authority	592.0
28	Qatar Investment Authority	320.0
29	Investment Corporation of Dubai	305.3
31	Public Investment Fund	290.0

Pension funds

Rank	Institution	AUM \$bn
69	General Organisation for Social Insurance	115.4
102	Public Institute for Social Security (Kuwait)	75.6
282	Social Security Corporation (Jordan)	14.8
324	General Organisation for Social Insurance Bahrain	10.2



North America

Total assets held by top 10: \$4.5tn

- 1 Military Retirement Fund**
GPI rank: 6 Type: PF AUM: \$896.8bn
- 2 Federal Employees Retirement System (US)**
GPI rank: 9 Type: PF AUM: \$733.8bn
- 3 Thrift Savings Fund (US)**
GPI rank: 13 Type: PF AUM: \$569.7bn
- 4 US Monetary Authorities**
GPI rank: 15 Type: CB AUM: \$514.5bn
- 5 Canada Pension Plan Investment Board**
GPI rank: 23 Type: PF AUM: \$399.2bn
- 6 California Public Employees' Retirement System**
GPI rank: 24 Type: PF AUM: \$386.2bn
- 7 Caisse de Dépôt et Placement du Québec**
GPI rank: 30 Type: PF AUM: \$295.9bn
- 8 California State Teachers' Retirement System**
GPI rank: 34 Type: PF AUM: \$272.5bn
- 9 Civil Service Retirement System (US)**
GPI rank: 40 Type: PF AUM: \$222.4bn
- 10 New York State Common Retirement Fund**
GPI rank: 41 Type: PF AUM: \$221.6bn

Central banks

Rank	Institution	AUM \$bn
15	US Monetary Authorities	514.4
90	Bank of Canada	85.3

Sovereign funds

Rank	Institution	AUM \$bn
86	Alberta Investment Management Corporation	91.2
115	Alaska Permanent Fund Corporation	65.1
139	Texas Permanent School Fund	48.5
213	New Mexico State Investment Council	25.2
220	Texas Permanent University Fund	23.8

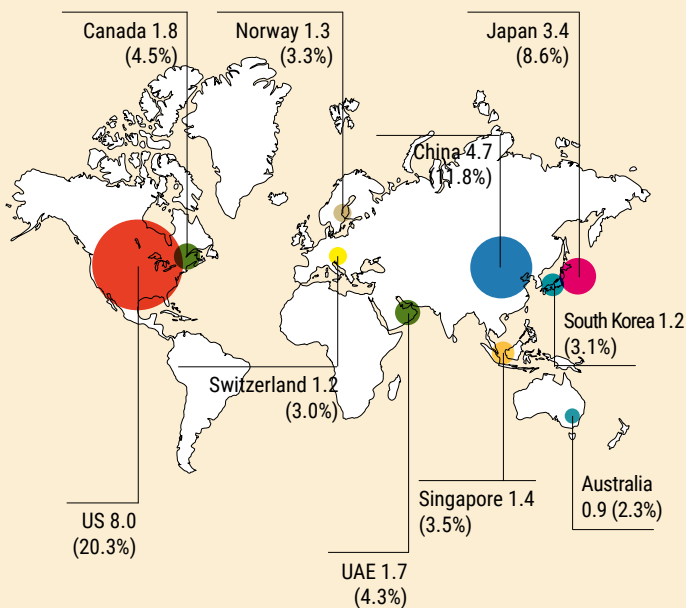
Pension funds

Rank	Institution	AUM \$bn
6	Military Retirement Fund	896.8
9	Federal Employees Retirement System	733.8
13	Thrift Savings Fund	569.7
23	Canada Pension Plan Investment Board	399.2
24	California Public Employees' Retirement System	386.2

Distribution of GPI assets

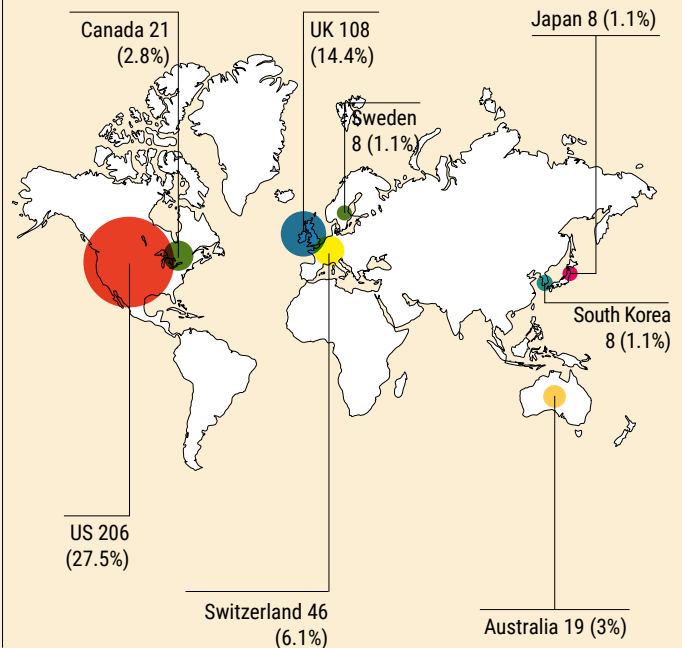
US holds fifth of GPI assets

Distribution of assets by country, \$tn, % of total



US, UK have greatest number of GPIs

Distribution of GPIs by country, % of total



Top five ranking changes

Biggest fallers ▼

Top five GPIs by absolute decrease in assets

Rank	GPI Rank	Change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	\$bn change on 2019
1	40	▼ -6	Civil Service Retirement System	US	NA	PF	222.4	-10.7%	-26.7
2	148	▼ -40	Central Bank of Argentina	Argentina	LA	CB	44.8	-31.8%	-20.9
3	26	▼ -2	Banco Central do Brasil	Brazil	LA	CB	356.9	-4.8%	-17.8
4	120	▼ -27	Bank of Algeria	Algeria	AF	CB	61.5	-21.8%	-17.1
5	27	► 0	National Social Security Fund	China	AP	SF	323.4	-3.7%	-12.4

Highest climbers ▲

Top five GPIs by absolute increase in assets (excludes ten largest GPIs)

Rank	GPI Rank	Change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	\$bn change on 2019
1	14	▲ 2	Central Bank of the Russian Federation	Russia	EU	CB	554.4	18.3%	85.9
2	12	▲ 2	Stichting Pensioenfond ABP	Netherlands	EU	PF	578.4	16.9%	83.5
3	29	▲ 7	Investment Corporation of Dubai	UAE	ME	SF	305.3	30.6%	71.4
4	66	▲ 57	National Welfare Fund	Russia	EU	SF	124.0	113.4%	65.9
5	15	▲ 3	US Monetary Authorities	US	NA	CB	514.5	14.5%	65.3

Top 10 by fund type

Central banks

Rank	GPI Rank	Change on 2019	Institution	Country	Region	AUM \$bn	% change on 2019	\$bn change on 2019
1	1	► 0	People's Bank of China	China	AP	3,388.7	1%	36.7
2	3	► 0	Bank of Japan	Japan	AP	1,368.9	4%	46.8
3	7	▲ 1	Swiss National Bank	Switzerland	EU	855.7	9%	68.1
4	14	▲ 2	Central Bank of the Russian Federation	Russia	EU	554.3	18%	85.8
5	15	▲ 3	US Monetary Authorities	United States	NA	514.5	15%	65.3
6	16	▼ -3	Saudi Arabian Monetary Authority	Saudi Arabia	ME	499.5	1%	2.9
7	17	▼ -2	Central Bank of the Republic of China	Taiwan	AP	479.3	0%	0.1
8	18	▼ -1	Hong Kong Monetary Authority	Hong Kong	AP	470.8	4%	18.7
9	19	▲ 3	Reserve Bank of India	India	AP	461.8	16%	64.0
10	22	▼ -2	Bank of Korea	South Korea	AP	408.8	1%	35.1

Sovereign funds

Rank	GPI Rank	Change on 2019	Institution	Country	Region	AUM \$bn	% change on 2019	\$bn change on 2019
1	4	► 0	Norges Bank Investment Management	Norway	EU	1187.3	12%	126.3
2	5	► 0	China Investment Corporation	China	AP	940.6	0%	-0.8
3	8	▼ -2	Abu Dhabi Investment Authority	UAE	ME	828.0	0%	0.0
4	11	▼ -1	Kuwait Investment Authority	Kuwait	ME	592.0	0%	0.0
5	20	▲ 1	GIC	Singapore	AP	440.0	11%	42.0
6	21	▼ -2	Cassa Depositi e Prestiti	Italy	EU	428.0	-1%	-5.0
7	25	► 0	Temasek	Singapore	AP	373.0	2%	8.8
8	27	► 0	National Social Security Fund	China	AP	323.4	-4%	-12.4
9	28	► 0	Qatar Investment Authority	Qatar	ME	320.0	0%	0.0
10	29	▲ 7	Investment Corporation of Dubai	UAE	ME	305.3	31%	71.4

Pension funds

Rank	GPI Rank	Change on 2019	Institution	Country	Region	Assets \$bn	% change on 2019	\$bn change on 2019
1	2	► 0	Government Pension Investment Fund	Japan	AP	1,556.4	14%	192.7
2	6	▲ 1	Military Retirement Fund	United States	NA	896.8	10%	82.9
3	9	► 0	Federal Employees Retirement System	United States	NA	733.8	7%	46.3
4	10	▲ 1	National Pension Service	South Korea	AP	631.0	9%	51.7
5	12	▲ 2	Stichting Pensioenfondsen ABP	Netherlands	EU	578.4	17%	83.5
6	13	▼ -1	Thrift Savings Fund	United States	NA	569.7	0%	1.9
7	23	▲ 3	Canada Pension Plan Investment Board	Canada	NA	399.2	12%	43.4
8	24	▼ -1	California Public Employees' Retirement System	United States	NA	386.2	2%	7.0
9	30	▲ 1	Caisse de Dépôt et Placement du Québec	Canada	NA	295.9	10%	25.9
10	32	► 0	Central Provident Fund	Singapore	AP	289.5	8%	20.4

The top 750 GPIs ranked

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
1 ► 0	People's Bank of China ¹	China	AP	CB	3,388.70	1%	1948
2 ► 0	Government Pension Investment Fund	Japan	AP	PF	1,556.40	14%	2006
3 ► 0	Bank of Japan ²	Japan	AP	CB	1,368.92	4%	1882
4 ► 0	Norges Bank Investment Management ³	Norway	EU	SF	1,187.32	12%	1990
5 ► 0	China Investment Corporation	China	AP	SF	940.60	0%	2007
6 ▲ 1	Military Retirement Fund	US	NA	PF	896.80	10%	1984
7 ▲ 1	Swiss National Bank	Switzerland	EU	CB	855.70	9%	1907
8 ▼ -2	Abu Dhabi Investment Authority	UAE	ME	SF	828.00	0%	1976
9 ► 0	Federal Employees Retirement System	US	NA	PF	733.82	7%	1987
10 ▲ 1	National Pension Service	South Korea	AP	PF	630.96	9%	1987
11 ▼ -1	Kuwait Investment Authority	Kuwait	ME	SF	592.00	0%	1953
12 ▲ 2	Stichting Pensioenfonds ABP	Netherlands	EU	PF	578.39	17%	1922
13 ▼ -1	Thrift Savings Fund	US	NA	PF	569.71	0%	1986
14 ▲ 2	Central Bank of the Russian Federation	Russia	EU	CB	554.36	18%	1990
15 ▲ 3	US Monetary Authorities ⁴	US	NA	CB	514.54	15%	1913
16 ▼ -3	Saudi Arabian Monetary Authority	Saudi Arabia	ME	CB	499.54	1%	1952
17 ▼ -2	Central Bank of the Republic of China	Taiwan	AP	CB	479.31	0%	1924
18 ▼ -1	Hong Kong Monetary Authority	Hong Kong	AP	CB	470.88	4%	1993
19 ▲ 3	Reserve Bank of India	India	AP	CB	461.83	16%	1935
20 ▲ 1	GIC	Singapore	AP	SF	440.00	11%	1981
21 ▼ -2	Cassa Depositi e Prestiti	Italy	EU	SF	427.96	-1%	1850
22 ▼ -2	Bank of Korea	South Korea	AP	CB	408.82	1%	1950
23 ▲ 3	Canada Pension Plan Investment Board	Canada	NA	PF	399.16	12%	1997
24 ▼ -1	California Public Employees' Retirement System	US	NA	PF	386.18	2%	1995
25 ► 0	Temasek	Singapore	AP	SF	373.05	2%	1974
26 ▼ -2	Banco Central do Brasil	Brazil	LA	CB	356.88	-5%	1964
27 ► 0	National Social Security Fund	China	AP	SF	323.43	-4%	1997
28 ► 0	Qatar Investment Authority	Qatar	ME	SF	320.00	0%	2005
29 ▲ 7	Investment Corporation of Dubai	UAE	ME	SF	305.29	31%	2006
30 ▲ 1	Caisse de Dépôt et Placement du Québec ⁸	Canada	NA	PF	295.88	10%	1965
31 ▼ -2	Public Investment Fund	Saudi Arabia	ME	SF	290.00	0%	1971
32 ► 0	Central Provident Fund	Singapore	AP	PF	289.46	8%	1955
33 ▼ -3	Monetary Authority of Singapore	Singapore	AP	CB	279.45	-3%	1971
34 ▼ -1	California State Teachers' Retirement System	US	NA	PF	272.50	7%	1913
35 ► 0	Pensioenfonds Zorg en Welzijn	Netherlands	EU	PF	266.89	14%	1969
36 ▲ 1	Mubadala Investment Company ⁵	UAE	ME	SF	228.95	1%	2002
37 ▲ 6	Deutsche Bundesbank	Germany	EU	CB	225.42	13%	1957
38 ▲ 3	Bank of Thailand	Thailand	AP	CB	224.37	9%	1942
39 ▲ 5	Pension Fund Association for Local Government Employees	Japan	AP	PF	223.16	13%	1962
40 ▼ -6	Government Officials	US	NA	PF	222.44	-11%	1920
41 ▼ -3	New York State Common Retirement Fund	US	NA	PF	221.64	1%	1786

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
42 ▼ -3	Employees' Provident Fund	Malaysia	AP	PF	215.77	0%	1991
43 ▲ 2	Bank of England ⁶	UK	EU	CB	208.31	6%	1694
44 ▲ 7	Comisión Nacional del Sistema de Ahorro para el Retiro	Mexico	LA	PF	207.04	20%	1994
45 ▼ -3	State Board of Administration of Florida	US	NA	PF	206.36	3%	1943
46 ► 0	Caisse des Dépôts et Consignations	France	EU	PF	202.24	4%	1816
47 ▼ -7	Ontario Teachers' Pension Plan	Canada	NA	PF	198.87	-5%	1990
48 ▲ 2	Banque de France	France	EU	CB	196.83	13%	1800
49 ▼ -1	Banco de México	Mexico	LA	CB	183.07	4%	1925
50 ▼ -3	Teacher Retirement System of Texas	US	NA	PF	181.80	3%	1937
51 ▲ 3	Banca d'Italia	Italy	EU	CB	176.39	15%	1893
52 ▼ -3	Dubai World	UAE	ME	SF	175.30	0%	2006
53 ▲ 7	Employees' Provident Fund Organisation	India	AP	PF	154.89	14%	1951
54 ▲ 1	ATP	Denmark	EU	PF	153.88	7%	1964
55 ▼ -2	Commonwealth Superannuation Corporation	Australia	AP	PF	150.99	-3%	1911
56 ▲ 2	Bureau of Labor Funds ⁷	Taiwan	AP	PF	150.58	6%	2014
57 ► 0	Česká národní banka	Czech Republic	EU	CB	150.16	5%	1993
58 ▲ 1	Public Sector Pension Investment Board	Canada	NA	PF	150.13	9%	1999
59 ▲ 3	Washington State Investment Board	US	NA	PF	147.42	13%	1981
60 ▼ -8	Public Investment Corporation ⁸	South Africa	AF	SF	147.39	-6%	1911
61 ▼ -5	Fundo de Garantia por Tempo de Serviço	Brazil	LA	PF	134.10	-6%	1966
62 ▼ -1	Korea Investment Corporation	South Korea	AP	SF	131.00	-2%	2005
63 ▲ 2	Narodowy Bank Polski	Poland	EU	CB	129.32	10%	1945
64 ► 0	Bank Indonesia	Indonesia	AP	CB	129.18	7%	1953
65 ▲ 1	Bank of Israel	Israel	ME	CB	126.72	10%	1954
66 ▲ 57	National Welfare Fund	Russia	EU	SF	124.00	113%	2008
67 ▼ -4	New York State Teachers' Retirement System	US	NA	PF	122.48	1%	1921
68 ▼ -1	British Columbia Investment Management Corporation	Canada	NA	PF	115.60	3%	1999
69 ▼ -1	General Organisation for Social Insurance	Saudi Arabia	ME	PF	115.41	3%	1932
70 ▲ 1	Future Fund	Australia	AP	SF	113.79	4%	2006
71 ▲ 5	AP7	Sweden	EU	PF	110.54	17%	2001
72 ▼ -3	State of Wisconsin Investment Board	US	NA	PF	109.57	-1%	1951
73 ▲ 2	Central Bank of the UAE	UAE	ME	CB	109.10	10%	1980
74 ▲ 4	Central Bank of the Republic of Turkey	Turkey	EU	CB	105.70	14%	1931
75 ▲ 2	North Carolina State Treasurer ⁹	US	NA	PF	105.60	12%	1941
76 ▼ -3	Pension Fund Association	Japan	AP	PF	105.46	-2%	1967
77 ▼ -5	Central Bank of Iran	Iran	ME	CB	104.60	-3%	1960
78 ▲ 4	Minnesota State Board	US	NA	PF	104.33	16%	1980
79 ▼ -5	Bank Negara Malaysia	Malaysia	AP	CB	104.03	2%	1959
80 ▼ -10	Ohio Public Employees' Retirement System	US	NA	PF	103.15	-6%	1935
81 ▲ 2	Teachers' Retirement System of the City of New York	US	NA	PF	94.73	7%	1917
82 ▲ 4	Ontario Municipal Employees' Retirement System	Canada	NA	PF	92.32	7%	1962
83 ▼ -4	Universities Superannuation UK	UK	EU	PF	91.54	0%	1974
84 ► 0	Virginia Retirement System	US	NA	PF	91.51	5%	1942
85 ▼ -4	Bayerische Versorgungskammer	Germany	EU	PF	91.43	1%	1995
86 ▲ 5	Alberta Investment Management Corporation ¹⁰	Canada	NA	SF	91.16	14%	2008
87 ▼ -7	National Development Fund of Iran	Iran	ME	SF	91.00	0%	2011

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
88 ▲ 2	Bangko Sentral ng Pilipinas	Philippines	AP	CB	89.76	11%	1993
89 ▼ -4	Oregon Public Employees Retirement System	US	NA	PF	86.37	0%	1946
90 ▼ -3	Bank of Canada	Canada	NA	CB	85.30	2%	1935
91 ▼ -2	State Teachers Retirement System of Ohio	US	NA	PF	83.30	1%	1919
92 ► 0	European Central Bank	Eurosystem	EU	CB	82.54	4%	1998
93 ▲ 2	Qsuper	Australia	AP	PF	80.19	3%	1913
94 ▲ 6	Banco de España	Spain	EU	CB	80.15	7%	1782
95 ▲ 7	New Jersey Division of Investment	US	NA	PF	79.73	11%	1962
96 ▲ 1	Massachusetts Pension Reserves Investment Management	US	NA	PF	79.10	2%	1986
97 ▲ 2	Teachers' Retirement System of Georgia	US	NA	PF	78.89	4%	1943
98 ▲ 27	State Bank of Vietnam	Vietnam	AP	CB	78.81	38%	1951
99 ▼ -5	Central Bank of Libya	Libya	AF	CB	78.50	0%	1956
100 ▼ -2	Michigan Retirement	US	NA	PF	78.18	2%	1943
101 ▼ -5	New York City Employee Retirement System	US	NA	PF	77.73	0%	1920
102 ▲ 9	Public Institute for Social Security	Kuwait	ME	PF	75.56	16%	1976
103 ▼ -2	Permodalan Nasional Berhad	Malaysia	AP	SF	75.28	2%	1978
104 ▲ 5	United Nations Joint Staff Pension Staff	US	NA	PF	71.97	10%	1949
105 ▲ 22	First State Super	Australia	AP	PF	71.73	28%	1992
106 ▼ -18	Victorian Funds Management Commission	Australia	AP	SF	71.17	-14%	1994
107 ▼ -4	Samruk-Kazyna	Kazakhstan	AP	SF	69.27	-3%	2008
108 ▲ 4	Central Bank of Iraq	Iraq	ME	CB	68.20	6%	1947
109 ▲ 10	Central Bank of Peru	Peru	LA	CB	67.72	14%	1922
110 ▲ 5	Norges Bank	Norway	EU	CB	67.08	6%	1816
111 ▼ -4	Libyan Investment Authority	Libya	AF	SF	67.00	0%	2006
112 ▼ -6	Banque Publique d'Investissement	France	EU	SF	66.91	-1%	2012
113 ▼ -9	Danmarks Nationalbank	Denmark	EU	CB	66.68	-6%	1818
114 ▼ -9	National Public Service Personnel Mutual Aid	Japan	AP	PF	65.86	-3%	1947
115 ▼ -1	Alaska Permanent Fund Corporation	US	NA	SF	65.05	2%	1976
116 ► 0	Pennsylvania Public School Employees' Retirement System	US	NA	PF	64.87	6%	1917
117 ▼ -7	Banco Central de Chile	Chile	LA	CB	63.93	-2%	1925
118 ▲ 4	Keva	Finland	EU	PF	62.89	6%	1988
119 ▼ -1	Illinois Teachers Retirement System	US	NA	PF	62.56	4%	1939
120 ▼ -27	Bank of Algeria	Algeria	AF	CB	61.50	-22%	1962
121 ▲ 5	Los Angeles County Employees Retirement Association	US	NA	PF	61.40	9%	1938
122 ▲ 2	Kazakhstan National Fund	Kazakhstan	AP	SF	61.12	6%	2000
123 ▲ 37	Brunei Investment Agency	Brunei	AP	SF	60.00	53%	1983
124 ▼ -3	Hydro-Quebec Pension Fund	Canada	NA	PF	59.21	0%	1944
125 ▲ 8	Reserve Bank of Australia	Australia	AP	CB	59.12	10%	1959
126 ▲ 6	Maryland State Retirement and Pension System	US	NA	PF	58.64	9%	1941
127 ▲ 3	Banco de la Republica Colombia	Colombia	LA	CB	58.27	7%	1923
128 ▲ 3	Régime de retraite des employés du gouv. ¹¹	Canada	NA	PF	57.88	7%	1973
129 ▲ 5	UniSuper	Australia	AP	PF	57.57	8%	2000
130 ▲ 6	Central Bank of Egypt	Egypt	AF	CB	57.35	9%	1961
131 ▼ -18	Queensland Investment Corporation	Australia	AP	SF	56.26	-13%	1991
132 ▼ -4	Tennessee Consolidated Retirement System	US	NA	PF	55.85	1%	1972
133 ▼ -4	Régie des rentes du Québec	Canada	NA	PF	55.59	2%	1965

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
134 ▼ -17	Sveriges Riksbank	Sweden	EU	CB	55.55	-8%	1668
135 ▲ 3	South African Reserve Bank	South Africa	AF	CB	55.06	7%	1921
136 ▲ 1	Caixa de Previdência dos Funcionários do Banco do Brasil	Brazil	LA	PF	49.69	-4%	1904
137 ▼ -17	Sustainability Guarantee Fund	Argentina	LA	SF	49.46	-17%	2008
138 ▲ 7	Sunsuper	Australia	AP	PF	48.68	12%	1987
139 ▲ 2	Texas Permanent School Fund	US	NA	SF	48.47	4%	1854
140 ▼ -5	Fonds de Réserve pour les Retraites	France	EU	PF	47.52	-10%	2001
141 ▲ 1	New York City Metropolitan Transportation Authority	US	NA	PF	47.35	5%	1953
142 ▼ -2	Connecticut Retirement Plans & Trust Funds	US	NA	PF	47.31	1%	1999
143 ▼ -4	Colorado Public Employees' Retirement Association	US	NA	PF	46.24	-9%	1931
144 ► 0	Indiana Public Retirement System	US	NA	PF	45.90	5%	2011
145 ▲ 2	Japan Mutual Aid Association of Public School Teachers	Japan	AP	PF	45.81	8%	1971
146 ▲ 27	National Pension System Trust	India	AP	PF	45.19	32%	2008
147 ▼ -4	Emirates Investment Authority	UAE	ME	SF	45.00	0%	2007
148 ▲ 2	Nevada Public Employees Retirement Systems	US	NA	PF	44.88	7%	1947
149 ▼ -41	Banco Central de la República Argentina	Argentina	LA	CB	44.84	-32%	1935
150 ▲ 5	AP4	Sweden	EU	PF	44.68	10%	2001
151 ▲ 12	Illinois Municipal Retirement Fund	US	NA	PF	44.67	16%	1939
152 ▲ 6	De Nederlandsche Bank	Netherlands	EU	CB	44.15	11%	1814
153 ▼ -5	Public School Retirement Systems of Missouri	US	NA	PF	43.24	2%	1945
154 ▼ -3	AP3	Sweden	EU	PF	42.67	3%	2001
155 ▼ -6	Banca Națională a României	Romania	EU	CB	42.07	0%	1880
156 ▼ -4	Arizona State Retirement System	US	NA	PF	42.02	3%	1912
157 ▲ 4	State Oil Fund of the Republic of Azerbaijan	Azerbaijan	AP	SF	41.40	6%	1999
158 ▼ -5	Pensionskasse des Bundes PUBLICA	Switzerland	EU	PF	41.26	1%	1921
159 ▲ 3	AP2	Sweden	EU	PF	40.82	6%	2001
160 ▲ 7	PensionDanmark	Denmark	EU	PF	40.64	9%	1993
161 ▼ -2	British Columbia Municipal Pension Plan	Canada	NA	PF	40.46	2%	2000
162 ▲ 23	Qatar Central Bank	Qatar	ME	CB	39.70	30%	1973
163 ▼ -9	Retirement Systems of Alabama	US	NA	PF	39.55	-3%	1939
164 ▲ 4	Central Bank of Kuwait	Kuwait	ME	CB	39.40	6%	1969
165 ▼ -9	Utah State Retirement System	US	NA	PF	39.08	-3%	1910
166 ▼ -20	Central Bank of Nigeria	Nigeria	AF	CB	39.04	-9%	1958
167 ▼ -1	AP1	Sweden	EU	PF	38.67	3%	2001
168 ▲ 6	Local Authorities Pension Plan	Canada	NA	PF	38.10	11%	1962
169 ▲ 1	Health Employees Superannuation Trust Australia	Australia	AP	PF	37.21	4%	1987
170 ▲ 1	Costruction and Buildings Union Superannuation	Australia	AP	PF	36.83	5%	1984
171 ▼ -6	Compenswiss - Fonds de compensation AVS	Switzerland	EU	PF	36.66	-2%	1948
172 ▲ 3	Iowa Public Employees Retirement System	US	NA	PF	36.09	6%	1985
173 ▲ 4	BVK Personalvorsorge des Kantons Zürich	Switzerland	EU	PF	35.92	10%	1926
174 ▼ -10	British Transport Police Superannuation Fund	UK	EU	PF	35.10	-7%	1970
175 ▲ 11	The Private School Mutual Aid System	Japan	AP	PF	34.67	14%	1998
176 ▲ 2	South Carolina Public Employee Benefit Authority	US	NA	PF	33.91	4%	1945
177 ▲ 14	Texas County and District Retirement System	US	NA	PF	33.40	15%	1967
178 ▼ -2	Khazanah Nasional Berhad	Malaysia	AP	SF	33.34	-1%	1993
179 ► 0	Mississippi Public Employees' Retirement System	US	NA	PF	33.00	1%	1944

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
180 ▼ -23	Türkiye Varlık Fonu	Turkey	EU	SF	33.00	-18%	2016
181 ▼ -9	Kumpulan Wang Persaraan	Malaysia	AP	PF	32.94	-6%	2007
182 ► 0	Folketrygdfondet ¹²	Norway	EU	PF	32.57	4%	1967
183 ► 0	Magyar Nemzeti Bank	Hungary	EU	CB	32.22	3%	1924
184 ▼ -15	Banque du Liban	Lebanon	ME	CB	31.80	-13%	1964
185 ▲ 12	Texas Municipal Retirement System	US	NA	PF	31.45	14%	1947
186 ▲ 13	Government Pension Fund	Thailand	AP	PF	30.66	12%	1997
187 ▲ 2	Greater Manchester Pension Fund	UK	EU	PF	30.50	4%	1891
188 ▼ -1	Versorgungsanstalt des Bundes und der Länder	Germany	EU	PF	30.49	2%	1929
189 ▼ -9	State Super	Australia	AP	PF	30.44	-5%	1996
190 ▲ 8	Nationale Banque de Belgique	Belgium	EU	CB	29.69	9%	1850
191 ▲ 10	Central Bank of Uzbekistan	Uzbekistan	AP	CB	29.20	8%	1991
192 ▼ -4	New Zealand Superannuation Fund	New Zealand	AP	SF	29.00	-1%	2001
193 ▲ 1	ERAFP	France	EU	PF	29.00	4%	2003
194 ▼ -10	National Bank of the Republic of Kazakhstan	Kazakhstan	AP	CB	28.96	-6%	1993
195 ▼ -14	Bangladesh Bank	Bangladesh	AP	CB	28.41	-11%	1971
196 ▼ -4	Bulgarian National Bank	Bulgaria	EU	CB	28.03	-3%	1879
197 ▼ -2	Strathclyde Pension Fund	UK	EU	PF	27.97	1%	1974
198 ▲ 4	Uniform Pension Savings Fund	Kazakhstan	AP	PF	27.87	5%	2013
199 ▲ 1	Teachers Retirement System of Louisiana	US	NA	PF	27.68	2%	1936
200 ▼ -4	Employees' Retirement System of Texas	US	NA	PF	27.35	-1%	1947
201 ▼ -11	Pennsylvania State Employees' Retirement System	US	NA	PF	26.91	-8%	1923
202 ▲ 8	Bank Al-Maghrib	Morocco	AF	CB	26.41	8%	1959
203 ▼ -10	Nuclear Waste Management Fund	Germany	EU	SF	26.40	-6%	2017
204 ▼ -1	Massachusetts State Retirement Board	US	NA	PF	26.38	1%	1993
205 ▲ 4	San Francisco Employees' Retirement System	US	NA	PF	26.27	7%	1922
206 ▲ 2	National Pension Commission	Nigeria	AF	PF	26.11	5%	2014
207 ▼ -1	Caisse de Dépôt et de Gestion	Morocco	AF	PF	26.09	4%	1959
208 ▼ -3	Banco de Portugal	Portugal	EU	CB	25.93	1%	1846
209 ▲ 10	Jamsostek	Indonesia	AP	PF	25.79	12%	1977
210 ▼ -6	National Railroad Retirement Investment Trust	US	NA	PF	25.40	-1%	2001
211 ▲ 12	Government Service Insurance System	Philippines	AP	PF	25.38	17%	1936
212 ▲ 17	National Bank of Ukraine	Ukraine	EU	CB	25.38	22%	1839
213 ▲ 3	New Mexico State Investment Council ¹⁴	US	NA	SF	25.20	5%	1957
214 ▼ -2	Oesterreichische Nationalbank	Austria	EU	CB	25.08	3%	1816
215 ▼ -4	British Columbia Public Service	Canada	NA	PF	24.94	2%	2000
216 ▼ -9	Central Bank of Turkmenistan	Turkmenistan	AP	CB	24.91	0%	1991
217 ► 0	New York State Deferred Compensation Plan	US	NA	PF	24.85	6%	1974
218 ▼ -3	Government Employees Superannuation Board	Australia	AP	PF	24.18	1%	1939
219 ▼ -1	Illinois State Universities Retirement System	US	NA	PF	23.92	3%	1941
220 ▲ 4	Texas Permanent University Fund	US	NA	SF	23.80	11%	1876
221 ▼ -8	Funds SA	Australia	AP	SF	23.77	-2%	1995
222 ► 0	World Bank Staff Retirement Plan	US	NA	PF	23.46	7%	1975
223 ▲ 5	MP Pension	Denmark	EU	PF	23.12	10%	2008
224 ▲ 2	Los Angeles Fire and Police Pensions	US	NA	PF	22.48	5%	1899
225 ▲ 9	Autoridade Monetária de Macau	Macau	AP	CB	22.21	10%	1999

Rank and change on 2019	Institution	Country	Region	Type	Assets \$bn	% change on 2019	Year est.
226 ▼ -5	British Broadcasting Corporation Pension Trust	UK	EU	PF	22.07	0%	1957
227 ▼ -7	Emergency Services and State Super	Australia	AP	PF	22.05	-2%	1986
228 ▼ -1	Kentucky Teachers' Retirement System	US	NA	PF	21.93	3%	1938
229 ▼ -4	Fonds de Compensation de la Sécurité Sociale	Luxembourg	EU	PF	21.24	-1%	2004
230 ▲ 9	Kansas Retirement System for Public Employees	US	NA	PF	20.89	5%	1962
231 ▲ 7	Hrvatske narodne banke	Croatia	EU	CB	20.78	4%	1990
232 ▲ 5	State General Reserve Fund	Oman	ME	SF	20.70	4%	1980
233 ▲ 3	Ontario Public Service Employees Union	Canada	NA	PF	20.42	2%	1911
234 ▲ 1	Super SA	Australia	AP	PF	20.38	1%	1927
235 ▼ -3	Ontario Pension Board	Canada	NA	PF	20.23	-1%	1920
236 ▼ -6	West Midlands Pension Fund	UK	EU	PF	20.07	-3%	1974
237 ▲ 6	Nebraska Public Employees Retirement Systems ¹⁵	US	NA	PF	19.65	5%	1945
238 ▲ 8	Montana Board of Investments	US	NA	PF	19.61	5%	1993
239 ▲ 5	Fundo de Estabilização da Segurança Social	Portugal	EU	PF	19.46	4%	1989
240 ▲ 1	Ordu Yardımlaşma Kurumu	Turkey	EU	PF	19.30	-2%	1961
241 ▲ 1	Oklahoma Teachers Retirement System	US	NA	PF	19.27	2%	1943
242 ▲ 5	Illinois State Board of Investment	US	NA	PF	19.23	3%	1969
243 ▼ -3	Public Service Pension Fund	Taiwan	AP	PF	19.22	-2%	1943
244 ▼ -13	Pensionskassen For Sygeplejersker	Denmark	EU	PF	19.21	-7%	1899
245 ► 0	Alaska Retirement Management Board	US	NA	PF	19.15	3%	1961
246 ▼ -13	New York City Deferred Compensation Plan	US	NA	PF	19.00	-7%	2004
247 ▲ 22	Mumtalakat Holding Company	Bahrain	ME	SF	18.80	22%	2006
248 ▲ 2	Employee Retirement System of Georgia	US	NA	PF	18.77	2%	1950
249 ▲ 27	National Bank of Cambodia	Cambodia	AP	CB	18.76	28%	1954
250 ▲ 10	Los Angeles City Employees' Retirement System	US	NA	PF	18.75	11%	1937
251 ▲ 1	State of Hawaii Employees' Retirement System	US	NA	PF	18.73	4%	1926
252 ▲ 4	State Employees' Retirement System of Illinois	US	NA	PF	18.58	5%	1944
253 ▲ 2	Pensionskasse Stadt Zürich	Switzerland	EU	PF	18.43	4%	1913
254 ▲ 3	Korea Teachers Pension	South Korea	AP	PF	18.39	5%	1974
255 ▼ -6	West Yorkshire Pension Fund	UK	EU	PF	18.34	-1%	1974
256 ▲ 5	Arkansas Teachers' Retirement System	US	NA	PF	18.09	8%	1937
257 ▲ 2	Public Employee Retirement System of Idaho	US	NA	PF	17.99	6%	1963
258 ▼ -4	Reserve Bank of New Zealand	New Zealand	AP	CB	17.96	1%	1934
259 ▼ -6	Connecticut Teachers' Retirement Board	US	NA	PF	17.95	0%	1955
260 ▲ 10	Lærernes Pension	Denmark	EU	PF	17.84	16%	2013
261 ▲ 12	Banque Centrale des États de l'Afrique de l'Ouest	West African System	AF	CB	17.76	19%	1959
262 ► 0	Public Employees' Retirement Association of New Mexico	US	NA	PF	17.48	5%	1985
263 ▼ -12	Valtion Eläkerahasto	Finland	EU	PF	17.43	-4%	1990
264 ▲ 2	Banco Nacional de Angola	Angola	AF	CB	17.24	7%	1926
265 ▼ -51	Ireland Strategic Investment Fund	Ireland	EU	SF	16.91	-30%	2001
266 ▼ -2	West Virginia Consolidated Public Retirement Board	US	NA	PF	16.82	3%	1961
267 ▼ -9	Central Bank of Oman	Oman	ME	CB	16.70	-4%	1974
268 ▼ -20	Fundação dos Economizadores Federais	Brazil	LA	PF	16.67	-10%	1977
269 ▼ -4	Taspen	Indonesia	AP	PF	16.39	1%	1960
270 ▼ -7	Petroleum Fund of Timor-Leste	Timor-Leste	AP	SF	15.82	-4%	2005
271 ▲ 6	Ohio Police and Fire Pension Fund	US	NA	PF	15.76	8%	1965

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
272 ▼ -5	Orange County Employees Retirement System	US	NA	PF	15.75	0%	1944
273 ▼ -2	Maine Public Employees Retirement System	US	NA	PF	15.58	2%	1945
274 ▲ 22	International Monetary Fund Staff Retirement Plan	US	NA	PF	15.52	23%	1944
275 ► 0	Central Bank of Jordan	Jordan	ME	CB	15.49	5%	1964
276 ▼ -4	School Employees Retirement System of Ohio	US	NA	PF	15.44	3%	1937
277 ▼ -3	South Dakota Investment Council	US	NA	PF	15.21	2%	1971
278 ▲ 5	North Dakota Retirement and Investment Office	US	NA	PF	15.18	11%	1989
279 ▲ 9	National Bank of Serbia	Serbia	EU	CB	15.09	17%	1884
280 ▲ 5	Bernische Pensionskasse	Switzerland	EU	PF	14.86	11%	1905
281 ▲ 11	Banco de Guatemala	Guatemala	LA	CB	14.78	16%	1945
282 ▲ 2	Social Security Corporation	Jordan	ME	PF	14.78	10%	1977
283 ▼ -15	Banco Central del Uruguay	Uruguay	LA	CB	14.63	-7%	1967
284 ▲ 21	Instituto Mexicano del Seguro Social	Mexico	LA	PF	14.45	29%	1943
285 ▲ 2	Alberta Teachers' Retirement Fund Board	Canada	NA	PF	14.13	8%	1939
286 ▲ 3	CPEG Caisse de prévoyance de l'Etat de Genève	Switzerland	EU	PF	14.07	9%	2014
287 ▼ -5	Transport for London Pension Fund	UK	EU	PF	14.00	1%	1942
288 ▼ -7	Louisiana State Employees' Retirement System	US	NA	PF	13.74	-1%	1947
289 ▲ 8	Caisse de Pension de l'Etat de Vaud	Switzerland	EU	PF	13.68	9%	1952
290 ▲ 4	Pensionskasse Basel-Stadt	Switzerland	EU	PF	13.67	8%	2000
291 ▲ 9	Water and Power Employees' Retirement Plan	US	NA	PF	13.62	13%	1938
292 ▼ -6	Kentucky Retirement Systems	US	NA	PF	13.60	3%	1958
293 ▼ -2	San Diego County Employees Retirement Association	US	NA	PF	13.50	6%	1939
294 ▲ 1	New Mexico Educational Retirement Board	US	NA	PF	13.11	4%	1983
295 ▼ -16	Employees Provident Fund	Sri Lanka	AP	PF	12.85	-9%	1958
296 ▲ 8	Central Bank of Cuba	Cuba	LA	CB	12.80	13%	1948
297 ▼ -7	National Managing Holding Baiterek	Kazakhstan	AP	SF	12.31	-4%	2013
298 ▼ -5	British Coal Staff Superannuation Scheme	UK	EU	PF	12.27	-4%	1947
299 ► 0	Missouri State Employees' Retirement System	US	NA	PF	12.21	0%	1957
300 ▼ -20	Fondo de Estabilización Económica y Social	Chile	LA	SF	12.20	-13%	2007
301 ▲ 8	Suomen Pankki	Finland	EU	CB	11.97	11%	1811
302 ▲ 424	Egypt Fund	Egypt	AF	SF	11.86	4137%	2019
303 ▼ -5	Public School Teachers' Pension & Retirement Fund of Chicago	US	NA	PF	11.85	-3%	1895
304 ▲ 6	Public Service Pension Plan	Canada	NA	PF	11.61	8%	1947
305 ▼ -3	Subsidised Schools Provident Fund	Hong Kong	AP	PF	11.58	1%	2000
306 ▲ 2	Ircantec	France	EU	PF	11.33	3%	1971
307 ▲ 7	Kåpan Pensioner	Sweden	EU	PF	11.11	7%	1992
308 ▼ -1	Tyne and Wear Pensions Fund	UK	EU	PF	11.07	0%	1974
309 ▲ 12	Instituto Guatemalteco de Seguridad Social	Guatemala	LA	PF	10.93	9%	1985
310 ▼ -9	Cook County Annuity & Benefit Fund	US	NA	PF	10.89	-7%	1926
311 ▲ 11	Fondo de Reserva de Pensiones	Chile	LA	SF	10.81	8%	2006
312 ► 0	Oklahoma Public Employees Retirement System	US	NA	PF	10.79	1%	1964
313 ▼ -2	South Yorkshire Pension Fund	UK	EU	PF	10.77	1%	1974
314 ▲ 1	San Bernardino County Employees' Retirement Association	US	NA	PF	10.76	5%	1945
315 ▼ -12	Merseyside Pension Fund	UK	EU	PF	10.71	-6%	1972
316 ▼ -10	Aargauische Pensionskasse	Switzerland	EU	PF	10.70	-3%	1908
317 ▼ -4	Public Officials Benefit Association	South Korea	AP	PF	10.68	0%	1952

Rank and change on 2019	Institution	Country	Region	Type	Assets \$bn	% change on 2019	Year est.
318 ▼ -1	Lancashire County Pension Fund	UK	EU	PF	10.63	4%	1983
319 ▲ 5	Sacramento County Employees' Retirement System	US	NA	PF	10.49	7%	1937
320 ▲ 12	Basellandschaftliche Pensionskasse	Switzerland	EU	PF	10.37	8%	1921
321 ▼ -3	Delaware Public Employees' Retirement System	US	NA	PF	10.34	2%	1970
322 ▼ -3	Nilgosc	UK	EU	PF	10.30	2%	1950
323 ▲ 4	The National Insurance Board of Trinidad and Tobago	E. Caribbean System	LA	PF	10.29	5%	1971
324 ▼ -4	General Organisation for Social Insurance Bahrain	Bahrain	ME	PF	10.23	2%	1976
325 ▲ 1	IFC Asset Management Company	US	NA	SF	10.10	3%	2009
326 ▼ -3	Russian Direct Investment Fund	Russia	EU	SF	10.00	0%	2011
327 ▲ 40	Banco Central de Costa Rica	Costa Rica	LA	CB	9.94	32%	1950
328 ▲ 6	Military Mutual Aid Association	South Korea	AP	PF	9.93	5%	1984
329 ▼ -13	Coal Mines Provident Fund	India	AP	PF	9.92	-3%	1948
330 ▼ -1	Arkansas Public Employees Retirement System	US	NA	PF	9.92	3%	1957
331 ▼ -1	Fundo de Segurança Social de Macau	Macau	AP	PF	9.88	3%	2011
332 ▼ -4	Social Security Fund	Panama	LA	PF	9.78	0%	1941
333 ▼ -2	Social Security System	Philippines	AP	PF	9.75	2%	1957
334 ▲ 24	National Bank of the Republic of Belarus	Belarus	EU	CB	9.68	24%	1990
335 ▲ 7	Banco Central de Venezuela	Venezuela	LA	CB	9.67	9%	1939
336 ▼ -1	Employees' Retirement System of Rhode Island ¹⁶	US	NA	PF	9.60	4%	1936
337 ▼ -1	La Caisse Marocaine des Retraites	Morocco	AF	PF	9.45	3%	1930
338 ▲ 5	San Diego City Employees' Retirement System	US	NA	PF	9.36	7%	1927
339 ► 0	New Hampshire Retirement System	US	NA	PF	9.25	4%	1967
340 ▲ 13	Central Bank of Kenya	Kenya	AF	CB	9.12	11%	1966
341 ▲ 5	Hampshire Pension Fund	UK	EU	PF	9.05	5%	1974
342 ▼ -5	St.Galler Pensionskasse	Switzerland	EU	PF	8.97	-2%	2014
343 ▲ 1	Essex Pension Fund	UK	EU	PF	8.94	3%	1974
344 ▲ 7	Missouri Local Government Employees Retirement System	US	NA	PF	8.85	8%	1967
345 ▲ 12	Bank of Greece	Greece	EU	CB	8.79	10%	1927
346 ▲ 17	Banco Central de la República Dominicana	Dominican Republic	LA	CB	8.78	15%	1947
347 ▼ -6	Lothian Pension Fund	UK	EU	PF	8.67	-2%	1994
348 ▼ -8	Contra Costa County Employees' Retirement Association	US	NA	PF	8.61	-3%	1945
349 ► 0	Da Afghanistan Bank	Afghanistan	ME	CB	8.60	4%	1939
350 ▲ 2	District of Columbia Retirement Board	US	NA	PF	8.54	4%	1998
351 ▼ -6	Local Government Super	Australia	AP	PF	8.51	-1%	1997
352 ▼ -2	Nepal Rastra Bank	Nepal	AP	CB	8.41	2%	1956
353 ▲ 13	Bernische Lehrerversicherungskasse	Switzerland	EU	PF	8.32	10%	1818
354 ▲ 1	Pension Fund for Nurses and State Employees	Iceland	EU	PF	8.31	3%	1996
355 ▲ 7	Luzerner Pensionskasse	Switzerland	EU	PF	8.29	8%	2000
356 ▲ 36	Národná banka Slovenska	Slovakia	EU	CB	8.21	45%	1993
357 ▼ -9	Government Institutions Pension Fund	Namibia	AF	PF	8.17	-2%	1989
358 ▲ 1	Permanent Wyoming Mineral Trust Fund	US	NA	SF	7.97	2%	1945
359 ▲ 1	Kent County Council Superannuation Fund	UK	EU	PF	7.94	2%	1974
360 ▼ -13	Wyoming Retirement System	US	NA	PF	7.91	-7%	1953
361 ▲ 4	Montana Public Employee Retirement Administration	US	NA	PF	7.72	3%	1975
362 ▼ -1	Banco Central del Paraguay	Paraguay	LA	CB	7.72	0%	1952
363 ▲ 1	Fairfax County Retirement Systems ¹⁷	US	NA	PF	7.68	2%	1955

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
364 ▲ 10	Central Bank of Sri Lanka	Sri Lanka	AP	CB	7.65	12%	1950
365 ▲ 4	Alameda County Employees' Retirement Association	US	NA	PF	7.60	5%	1985
366 ▲ 174	NSW Generations Fund	Australia	AP	SF	7.58	238%	2018
367 ▲ 15	Bank of Ghana	Ghana	AF	CB	7.44	20%	1957
368 ► 0	London Pensions Fund Authority	UK	EU	PF	7.43	-1%	1989
369 ▲ 9	Bank of Central African States	Tunisia	AF	CB	7.40	14%	1972
370 ▲ 41	Banque Centrale de Tunisie	Central African System	AF	CB	7.40	42%	1958
371 ▲ 9	Bank of Mauritius	Mauritius	AF	CB	7.39	16%	1967
372 ▼ -47	State Bank of Pakistan	Pakistan	AP	CB	7.30	-26%	1947
373 ▼ -1	Demographic Reserve Fund	Poland	EU	PF	7.23	4%	2002
374 ▲ 1	Centralna Banka Bosne i Hercegovine	Bosnia and Herzegovina	EU	CB	7.21	6%	1997
375 ▲ 11	Los Angeles City Deferred Compensation Plan	US	NA	PF	7.14	18%	1983
376 ▼ -6	Cheshire Pension Fund	UK	EU	PF	6.99	-2%	1974
377 ▼ -4	Nottinghamshire Local Government Pension Scheme	UK	EU	PF	6.94	0%	1888
378 ▼ -24	Central Bank of Trinidad & Tobago	Trinidad and Tobago	LA	CB	6.90	-15%	1964
379 ▼ -23	Government Employees Pension Service	South Korea	AP	PF	6.90	-14%	1960
380 ▲ 14	North Dakota Legacy Fund	US	NA	SF	6.88	23%	2011
381 ► 0	Seðlabanki Íslands	Iceland	EU	CB	6.79	7%	1961
382 ▼ -11	Boston City Retirement System	US	NA	PF	6.61	-5%	1923
383 ▲ 2	Staffordshire Pension Fund	UK	EU	PF	6.53	6%	1974
384 ▼ -8	Bank of Botswana	Botswana	AF	CB	6.51	-2%	1975
385 ▲ 3	Heritage and Stabilisation Fund	Trinidad and Tobago	LA	SF	6.48	9%	2000
386 ▼ -7	East Riding Pension Fund	UK	EU	PF	6.48	1%	1966
387 ▼ -49	Banco Central de Bolivia	Bolivia	LA	CB	6.47	-28%	1928
388 ▲ 7	Central Bank of the Republic of Azerbaijan	Azerbaijan	AP	CB	6.30	12%	1992
389 ▼ -6	Derbyshire County Council Pension Fund	UK	EU	PF	6.26	1%	1974
390 ▼ -6	Avon Pension Fund	UK	EU	PF	6.15	0%	1974
391 ▼ -4	Hertfordshire County Council Pension Fund	UK	EU	PF	6.13	2%	1974
392 ▼ -3	East Bay Municipal Utility District Pension Fund	US	NA	PF	6.13	3%	1986
393 ▼ -115	Fondo de Estabilización de los Ingresos Petroleros	Mexico	LA	SF	6.00	-59%	2000
394 ▼ -17	Lietuvos Bankas	Lithuania	EU	CB	5.91	-10%	1990
395 ▲ 5	Ventura County Employees' Retirement Association	US	NA	PF	5.89	7%	1946
396 ▲ 1	Previs Personalvorsorgestiftung Service Public	Switzerland	EU	PF	5.88	6%	1958
397 ▼ -4	Central Bank of Myanmar	Myanmar	AP	CB	5.82	3%	1990
398 ▼ -2	Houston Police Officers' Pension System	US	NA	PF	5.75	3%	1947
399 ▲ 26	Banco Central de Honduras	Honduras	LA	CB	5.74	20%	1950
400 ▲ 9	Central Bank of Ireland	Ireland	EU	CB	5.74	10%	1943
401 ▼ -2	North East Scotland Pension Fund	UK	EU	PF	5.71	4%	1999
402 ▲ 4	Philadelphia Public Employees Retirement System	US	NA	PF	5.69	5%	1956
403 ▼ -70	Fondo de Reserva Seguridad Social	Spain	EU	PF	5.65	-41%	1990
404 ▲ 9	Benki Kuu ya Tanzania	Tanzania	AF	CB	5.57	10%	1966
405 ▲ 10	Kantonale Pensionskasse Solothurn	Switzerland	EU	PF	5.56	10%	1957
406 ▼ -15	Bank of England Pension Scheme	UK	EU	PF	5.54	-4%	1694
407 ▼ -2	Surrey Pension Fund	UK	EU	PF	5.51	2%	1974
408 ▼ -6	Leicestershire County Council Pension Fund	UK	EU	PF	5.51	1%	1974
409 ▼ -5	West Sussex Pension Fund	UK	EU	PF	5.50	1%	1974

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
410 ▼ -9	Devon County Council Pension Fund	UK	EU	PF	5.49	1%	1974
411 ▼ -21	Fondo de Estabilización Fiscal	Peru	LA	SF	5.47	-5%	1999
412 ► 0	Montgomery County Employees' Retirement System	US	NA	PF	5.41	4%	1965
413 ▼ -5	Sanabil Investments	Saudi Arabia	ME	SF	5.30	0%	2009
414 ▼ -4	Teesside Pension Fund	UK	EU	PF	5.22	0%	1922
415 ▲ 8	Aizkraukles Banka Latvija	Latvia	EU	CB	5.22	9%	1993
416 ▼ -13	Botswana Public Officers Pension Fund	Botswana	AF	PF	5.14	-5%	2001
417 ▲ 9	Fresno County Employees' Retirement Association	US	NA	PF	5.10	7%	1945
418 ▲ 1	Environment Agency Pension Funds	UK	EU	PF	5.10	3%	1974
419 ▲ 9	Kern County Employees' Retirement Association	US	NA	PF	5.04	9%	1945
420 ► 0	Caisse de Prévoyance du Personnel de l'Etat de Fribourg	Switzerland	EU	PF	5.03	3%	1930
421 ▼ -5	Colorado Fire & Police Pension Association	US	NA	PF	5.02	0%	1980
422 ► 0	Alberta Pension Services Corporation	Canada	NA	PF	5.01	4%	1995
423 ▼ -6	Fundo Soberano de Angola	Angola	AF	SF	5.01	0%	2012
424 ▼ -6	Tayside Pension Fund	UK	EU	PF	4.98	1%	1994
425 ▼ -18	City of Milwaukee Employees' Retirement System	US	NA	PF	4.92	-9%	1937
426 ▼ -2	Norfolk Pension Fund	UK	EU	PF	4.88	2%	1974
427 ▼ -13	Istituto di previdenza del Cantone Ticino	Switzerland	EU	PF	4.82	-4%	2009
428 ▲ 3	San Mateo County Employees' Retirement Association	US	NA	PF	4.74	8%	1944
429 ▲ 5	CPVAL	Switzerland	EU	PF	4.66	6%	2010
430 ► 0	North Yorkshire Pension Fund	UK	EU	PF	4.55	2%	1974
431 ▲ 25	Banco Central de Reserva de El Salvador	El Salvador	LA	CB	4.45	25%	1961
432 ▼ -3	East Sussex Pension Fund	UK	EU	PF	4.44	-2%	1974
433 ▼ -35	Pula Fund	Botswana	AF	SF	4.43	-20%	1994
434 ▼ -2	Jacksonville City Retirement System	US	NA	PF	4.42	1%	1937
435 ▲ 2	Rhondda Cynon Taf Pension Fund	UK	EU	PF	4.42	3%	1974
436 ▲ 7	Zuger Pensionskasse	Switzerland	EU	PF	4.41	11%	1858
437 ▼ -10	CAP Prévoyance	Switzerland	EU	PF	4.41	-6%	2009
438 ▼ -2	Caisse de pensions de la fonction publique du Canton de Neuchâtel	Switzerland	EU	PF	4.41	3%	1950
439 ▼ -1	Houston Firefighters' Relief & Retirement Fund	US	NA	PF	4.36	2%	1937
440 ▲ 23	Autoriti Monetari Brunei Darussalam	Brunei	AP	CB	4.27	25%	2011
441 ▼ -2	Montana Teachers' Retirement System	US	NA	PF	4.24	2%	1937
442 ▲ 16	Bank of Mongolia	Mongolia	AP	CB	4.20	18%	1991
443 ▲ 7	Pensionskasse Thurgau	Switzerland	EU	PF	4.14	11%	2006
444 ▲ 4	Nashville & Davidson County Metropolitan Government Ret. System	US	NA	PF	4.14	10%	1963
445 ▼ -12	Dallas Employees' Retirement Fund	US	NA	PF	4.12	-6%	1943
446 ▲ 8	National Provident Fund	Fiji	AP	PF	4.06	12%	1966
447 ▼ -26	Municipal Employees' Annuity & Benefit Fund of Chicago	US	NA	PF	4.06	-16%	1921
448 ▼ -2	Cambridgeshire Local Government Pension Scheme	UK	EU	PF	4.06	4%	1974
449 ▼ -5	Maryland Supplemental Retirement Agency	US	NA	PF	3.97	0%	1974
450 ▼ -9	AP6	Sweden	EU	PF	3.97	-1%	2001
451 ▲ 29	Banco de Moçambique	Mozambique	AF	CB	3.89	25%	1975
452 ▼ -12	Louisiana Parochial Employees' Retirement System	US	NA	PF	3.87	-7%	1953
453 ▼ -6	Dorset County Pension Fund	UK	EU	PF	3.87	2%	1974
454 ▼ -5	Buckinghamshire Pension Fund	UK	EU	PF	3.86	3%	1974
455 ▼ -20	CDP Equity	Italy	EU	SF	3.81	-13%	2011

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
456 ▼ -5	Durham County Council Pension Fund	UK	EU	PF	3.81	2%	1974
457 ▲ 10	Lembaga Pengelola Dana Pendidikan	Indonesia	AP	SF	3.79	15%	1945
458 ▲ 6	Solomon Islands National Provident Fund	Solomon Islands	AP	PF	3.77	11%	1988
459 ▼ -14	Bankës së Shqipërisë	Albania	EU	CB	3.76	-3%	1992
460 ▼ -7	Suffolk Pension Fund	UK	EU	PF	3.73	1%	1974
461 ▼ -9	Greater Gwent Pension Fund	UK	EU	PF	3.73	0%	1974
462 ▲ 4	Caisse Intercommunale de Pensions	Switzerland	EU	PF	3.71	11%	1924
463 ▲ 86	Central Bank of Bahrain	Bahrain	ME	CB	3.70	72%	2006
464 ▲ 6	Narodna Banka na Republika Makedonija	North Macedonia	EU	CB	3.65	11%	1991
465 ▼ -8	Bank of Jamaica	Jamaica	LA	CB	3.65	3%	1961
466 ▼ -7	San Jose City Police & Fire Department Retirement Plan	US	NA	PF	3.59	3%	1961
467 ▼ -7	AHV-IV-FAK	Liechtenstein	EU	PF	3.59	3%	1958
468 ▼ -13	Worcestershire Pension Fund	UK	EU	PF	3.57	-1%	1946
469 ▼ -1	National Bank of Georgia	Georgia	EU	CB	3.51	7%	1919
470 ▼ -8	Cumbria Local Government Pension Scheme	UK	EU	PF	3.44	1%	1974
471 ▲ 5	Wiltshire Pension Fund	UK	EU	PF	3.35	5%	1950
472 ▲ 5	PKH	Norway	EU	PF	3.35	5%	2013
473 ▲ 1	Fife Pension Fund	UK	EU	PF	3.33	3%	1994
474 ▲ 11	Santa Barbara County Employees' Retirement System	US	NA	PF	3.29	9%	1937
475 ▼ -4	Dyfed Pension Fund	UK	EU	PF	3.28	1%	1974
476 ▼ -4	Kentucky Public Employees' Deferred Compensation Authority	US	NA	PF	3.27	1%	1993
477 ▼ -12	Bank of Uganda	Uganda	AF	CB	3.24	-4%	1966
478 ▼ -5	Alabama Trust Fund	US	NA	SF	3.24	0%	1985
479 ▲ 22	Banco Central del Ecuador	Ecuador	LA	CB	3.24	18%	1927
480 ▼ -19	Chicago Policemen's Annuity & Benefit Fund	US	NA	PF	3.23	-7%	1922
481 ▲ 15	TAP Brunei	Brunei	AP	PF	3.23	14%	1992
482 ▲ 6	San Joaquin County Employees' Retirement Association	US	NA	PF	3.22	10%	1946
483 ▼ -4	Oxfordshire Pension Fund	UK	EU	PF	3.21	2%	1974
484 ▼ -3	Northamptonshire Local Government Pension Scheme	UK	EU	PF	3.18	3%	1974
485 ▼ -3	Houston Municipal Employees Pension System	US	NA	PF	3.17	4%	1943
486 ▼ -3	Falkirk Pension Fund	UK	EU	PF	3.17	4%	1994
487 ▲ 18	Seattle City Employees' Retirement System	US	NA	PF	3.14	16%	1929
488 ▲ 50	Bank of Sudan	Sudan	AF	CB	3.13	39%	1960
489 ▼ -20	San Antonio Fire & Police Pension Fund	US	NA	PF	3.13	-5%	1919
490 ▲ 8	Kantonale Pensionskasse Schaffhausen	Switzerland	EU	PF	3.11	11%	2006
491 ▲ 1	Kantonale Pensionskasse Graubünden	Switzerland	EU	PF	3.10	7%	2008
492 ▼ -6	Banca Națională a Moldovei	Moldova	EU	CB	3.06	2%	1991
493 ▲ 15	National Social Security Fund	Uganda	AF	PF	3.06	14%	1985
494 ▼ -7	Gloucestershire Local Government Pension Fund	UK	EU	PF	3.04	2%	1974
495 ▼ -5	Lincolnshire County Council Local Government Pension Scheme	UK	EU	PF	3.02	3%	1974
496 ▼ -12	Wandsworth Pension Fund	UK	EU	PF	3.01	0%	1974
497 ▼ -55	National Bank of Ethiopia	Ethiopia	AF	CB	2.99	-25%	1906
498 ▼ -1	Oklahoma Firefighters Pension & Retirement System	US	NA	PF	2.98	5%	1908
499 ▼ -24	Detroit Policemen & Firemen Retirement System	US	NA	PF	2.97	-7%	1938
500 ▼ -9	Bedfordshire Pension Fund	UK	EU	PF	2.94	1%	1974
501 ▲ 9	Austin City Employees' Retirement System	US	NA	PF	2.91	11%	1941

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
502 ▼ -13	Manhattan & Bronx Surface Transit Operating Authority Pension Plan	US	NA	PF	2.86	-3%	1962
503 ▲ 36	Central Bank of Armenia	Armenia	EU	CB	2.85	27%	1993
504 ▼ -10	Baltimore County Employees' Retirement System	US	NA	PF	2.84	0%	1945
505 ▲ 17	Caisse des Dépôts et Consignations	Tunisia	AF	SF	2.80	15%	1816
506 ► 0	Phoenix City Employees' Retirement System	US	NA	PF	2.80	4%	1991
507 ▼ -8	Berkshire Pension Fund	UK	EU	PF	2.79	0%	1974
508 ▼ -5	Somerset County Council Pension Fund	UK	EU	PF	2.78	2%	1974
509 ▼ -7	Baltimore City Fire & Police Employees' Retirement	US	NA	PF	2.77	1%	1962
510 ▼ -6	Warwickshire Pension Fund	UK	EU	PF	2.77	2%	1974
511 ▼ -11	Cardiff and Vale of Glamorgan Pension Fund	UK	EU	PF	2.76	0%	1974
512 ▼ -17	Fort Worth City Employees' Retirement Fund	US	NA	PF	2.73	-4%	1945
513 ▲ 5	Utah SITFO	US	NA	SF	2.69	7%	1896
514 ▲ 49	Banco de Previsión Social	Uruguay	LA	PF	2.68	34%	1970
515 ▼ -3	Fairfax County Educational Employees' Supplementary Ret. System	US	NA	PF	2.67	3%	1973
516 ▼ -1	Marin County Employees' Retirement Association	US	NA	PF	2.66	4%	1937
517 ▼ -6	Gwynedd Pension Fund	UK	EU	PF	2.66	3%	1974
518 ▼ -9	Federal Holding and Investment Company	Belgium	EU	SF	2.64	0%	2006
519 ▼ -5	Iowa Municipal Fire & Police Retirement System	US	NA	PF	2.63	3%	1992
520 ▲ 85	Social Insurance Fund	Ireland	EU	PF	2.63	70%	2005
521 ▼ -28	Public Employees Contributory Retirement Scheme	UK	EU	PF	2.63	-9%	1967
522 ▼ -9	Oklahoma Police Pension & Retirement System	US	NA	PF	2.62	2%	1907
523 ▼ -7	Swansea Pension Fund	UK	EU	PF	2.61	2%	1974
524 ▲ 5	Personalvorsorgekasse der Stadt Bern	Switzerland	EU	PF	2.59	10%	1910
525 ▲ 2	Caisse de pensions du personnel communal	Switzerland	EU	PF	2.56	8%	1895
526 ▼ -9	Highland Council Pension Fund	UK	EU	PF	2.55	2%	1994
527 ▲ 18	State Capital Investment Corporation	Vietnam	AP	SF	2.47	13%	2005
528 ▼ -5	Cornwall Pension Fund	UK	EU	PF	2.46	3%	1974
529 ▲ 3	Missouri Dept. of Transport. and Highway Patrol Employees' Ret. Syst.	US	NA	PF	2.46	7%	1955
530 ▼ -10	Shropshire County Pension Fund	UK	EU	PF	2.45	0%	1974
531 ▲ 10	Employees Provident Fund	Nepal	AP	PF	2.44	9%	1959
532 ▼ -6	Lembaga Tabung Angkatan Tentera	Malaysia	AP	PF	2.43	2%	1984
533 ▲ 14	National Bank of the Kyrgyz Republic	Kyrgyzstan	AP	CB	2.42	12%	1991
534 ▼ -1	Arlington County Employees' Retirement System	US	NA	PF	2.42	5%	1981
535 ► 0	Banco Central de Nicaragua	Nicaragua	LA	CB	2.40	6%	1961
536 ▼ -11	Clwyd Pension Fund	UK	EU	PF	2.39	0%	1974
537 ▲ 5	Idaho Endowment Fund Investment Board	US	NA	SF	2.38	7%	1969
538 ▼ -1	Stanislaus County Employees' Retirement Association	US	NA	PF	2.37	5%	1948
539 ▼ -20	Pennsylvania Municipal Retirement System	US	NA	PF	2.35	-6%	1943
540 ▼ -12	Bank of Haiti	Haiti	LA	CB	2.35	-1%	1979
541 ▼ -11	National Insurance Fund	Barbados	LA	PF	2.32	-1%	1967
542 ▼ -18	Costa Rican Social Security Fund	Costa Rica	LA	PF	2.32	-3%	1941
543 ► 0	Bank of Papua New Guinea	Papua New Guinea	AP	CB	2.31	4%	1973
544 ▼ -13	Special Forces Pension Plan	Canada	NA	PF	2.28	-1%	2001
545 ▼ -24	Denver Employees Retirement Plan	US	NA	PF	2.26	-7%	1963
546 ▼ -39	Partnership Fund	Georgia	EU	SF	2.24	-17%	2011
547 ▼ -3	Louisiana Municipal Police Employees Retirement System	US	NA	PF	2.24	2%	1973

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
548 ▼ -14	Pensionskasse des Kantons Schwyz	Switzerland	EU	PF	2.23	-2%	2013
549 ▼ -13	Cincinnati Retirement System	US	NA	PF	2.20	-3%	1984
550 ▲ 17	National Social Security Fund	Kenya	AF	PF	2.19	12%	1965
551 ▲ 18	Employees' Old Age Benefits Institution	Pakistan	AP	PF	2.19	13%	1987
552 ▼ -74	Asabri	Indonesia	AP	PF	2.19	-30%	1971
553 ▼ -7	Tampa Police & Firefighters' Pension Fund	US	NA	PF	2.15	-1%	1948
554 ▼ -1	San Jose City Federated City Employees Retirement System	US	NA	PF	2.14	3%	1941
555 ▼ -5	Dallas Police & Fire Pension System	US	NA	PF	2.13	1%	1989
556 ▲ 4	Pensionskasse der Stadt Winterthur	Switzerland	EU	PF	2.13	6%	2014
557 ▼ -6	London Borough of Camden Pension Fund	UK	EU	PF	2.12	0%	1974
558 ▼ -3	Prince George's County Retirement System	US	NA	PF	2.10	2%	1993
559 ► 0	Southwark Council Pension Fund	UK	EU	PF	2.09	3%	1974
560 ▼ -8	Arkansas Local Police & Fire Retirement System	US	NA	PF	2.08	0%	1983
561 ▼ -13	Bank of Namibia	Namibia	AF	CB	2.06	-4%	1990
562 ▼ -8	Louisiana School Employees' Retirement System	US	NA	PF	2.05	-1%	1937
563 ▼ -2	Jacksonville Police & Fire Pension Fund	US	NA	PF	2.05	3%	1937
564 ▲ 23	Vermont State Teachers' Retirement System	US	NA	PF	2.05	18%	1947
565 ▲ 19	Nigeria Sovereign Investment Authority	Nigeria	AF	SF	2.01	16%	2011
566 ► 0	London Borough of Hackney Pension Fund	UK	EU	PF	2.00	2%	1966
567 ▼ -9	Government of Guam Retirement Fund	US	NA	PF	2.00	-1%	1951
568 ▲ 4	Vermont State Employees' Retirement System	US	NA	PF	1.99	6%	1944
569 ▼ -4	London Borough of Tower Hamlets Pension Fund	UK	EU	PF	1.99	1%	1974
570 ▼ -2	Caisse Nationale d'Assurance Pension	Luxembourg	EU	PF	1.97	0%	1951
571 ▼ -15	Centrale Bank van Curaçao en Sint Maarten	Curaçao	LA	CB	1.92	-6%	1828
572 ▼ -2	Baltimore City Employees' Retirement System	US	NA	PF	1.91	0%	1926
573 ▼ -16	Detroit General Retirement System	US	NA	PF	1.89	-7%	1938
574 ▼ -10	Anne Arundel County Retirement & Pension System	US	NA	PF	1.85	-7%	1996
575 ▲ 25	CPS Energy Employees' Pension Trust	US	NA	PF	1.84	14%	1986
576 ▲ 3	Newham Pension Fund	UK	EU	PF	1.84	4%	1972
577 ▼ -4	Lambeth Pension Fund	UK	EU	PF	1.84	0%	1974
578 ▲ 21	Japan Pension Service	Japan	AP	PF	1.84	13%	2010
579 ▲ 15	ProPublic Vorsorge Genossenschaft	Switzerland	EU	PF	1.83	10%	2012
580 ▼ -3	Social Security and National Insurance Trust 27	Ghana	AF	PF	1.82	2%	1972
581 ▼ -3	City of Westminster Superannuation Fund	UK	EU	PF	1.81	2%	1972
582 ▼ -20	Chicago Transit Authority Employees Retirement Plan	US	NA	PF	1.81	-10%	1949
583 ▲ 7	Orlando Employee Retirement Funds	US	NA	PF	1.79	6%	1998
584 ▼ -8	Northumberland Pension Fund	UK	EU	PF	1.79	0%	1974
585 ▲ 3	Louisiana Firefighters' Retirement System	US	NA	PF	1.78	4%	2008
586 ▲ 24	Pensionskasse Stadt St. Gallen	Switzerland	EU	PF	1.77	21%	1922
587 ▼ -4	London Borough of Lewisham Pension Fund	UK	EU	PF	1.77	2%	1974
588 ▼ -14	Haringey Council Pension Fund	UK	EU	PF	1.77	-2%	1965
589 ▲ 45	Central Bank of the Bahamas	Bahamas	LA	CB	1.76	37%	1974
590 ▼ -8	London Borough of Islington Pension Fund	UK	EU	PF	1.76	1%	1974
591 ► 0	Tulare County Employees' Retirement Association	US	NA	PF	1.75	3%	1945
592 ▼ -21	Superannuation Fund	Guernsey	EU	PF	1.73	-9%	1948
593 ▼ -7	Tallahassee Pension Plan	US	NA	PF	1.73	0%	2004

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594 ▼ -2	Miami City Fire & Police Retirement Trust	US	NA	PF	1.72	2%	1985
595 ▼ -6	Royal Borough of Greenwich Pension Fund	UK	EU	PF	1.70	0%	1974
596 ▼ -15	Eastern Caribbean Central Bank	E.Caribbean System	LA	CB	1.70	-3%	1983
597 ▼ -12	Banque Centrale de Madagascar	Madagascar	AF	CB	1.69	-3%	1973
598 ▼ -23	Tacoma Employees' Retirement System	US	NA	PF	1.67	-8%	1941
599 ▲ 5	El Paso Firemen & Policemen Pension Fund	US	NA	PF	1.66	7%	1920
600 ▼ -20	Caisse de Prévoyance des Fonctionnaires de Police et de la Prison	Switzerland	EU	PF	1.65	-6%	1930
601 ▲ 6	Pensionskasse Stadt Luzern	Switzerland	EU	PF	1.64	8%	2012
602 ▼ -5	Public Service Pensions Fund	Eswatini	AF	PF	1.62	-1%	1993
603 ▼ -2	London Borough of Ealing Pension Fund	UK	EU	PF	1.61	0%	1974
604 ▲ 4	Croydon Pension Scheme	UK	EU	PF	1.61	8%	1974
605 ▼ -3	Sistema de Retiro de los Empleados del Gobierno de Puerto Rico	US	NA	PF	1.57	0%	1964
606 ▲ 7	Southeastern Pennsylvania Transportation Authority	US	NA	PF	1.54	6%	2007
607 ▲ 31	Centralna Banka Crne Gore	Montenegro	EU	CB	1.53	21%	2001
608 ▲ 6	Royal Borough of Kensington and Chelsea Pension Fund	UK	EU	PF	1.52	5%	1998
609 ▼ -3	The National Board of the Commonwealth of the Bahamas	Bahamas	LA	PF	1.52	-1%	1972
610 ▲ 1	London Borough of Enfield Pension Fund	UK	EU	PF	1.51	3%	1974
611 ▲ 8	Louisiana Education Quality Trust Fund	US	NA	SF	1.50	6%	1986
612 ▲ 3	Louisiana Education Quality Trust Fund	US	NA	SF	1.50	4%	1986
613 ▼ -17	Banque Centrale du Luxembourg	Tajikistan	EU	CB	1.50	-9%	1998
614 ▲ 22	National Bank of Tajikistan	Luxembourg	AP	CB	1.50	17%	1991
615 ▲ 38	Central Bank of Barbados	Barbados	LA	CB	1.48	41%	1972
616 ► 0	Fresno City Retirement Systems	US	NA	PF	1.47	3%	1939
617 ▼ -5	Barnet Pension Fund	UK	EU	PF	1.47	0%	1974
618 ▼ -20	Memphis Light Gas & Water Division Pension Plan	US	NA	PF	1.47	-10%	1948
619 ▼ -26	Metropolitan Water Reclamation District Retirement Fund	US	NA	PF	1.46	-13%	1931
620 ▲ 1	Fondo de Ahorro de Panamá	Panama	LA	SF	1.46	5%	2012
621 ▼ -26	Massachusetts Bay Transportation Authority Retirement Fund	US	NA	PF	1.45	-13%	1948
622 ▼ -19	Bank of Zambia	Zambia	AF	CB	1.45	-8%	1964
623 ▲ 62	Eesti Pank	Estonia	EU	CB	1.43	90%	1919
624 ▲ 7	Caisse de pensions de la République et du Canton du Jura	Switzerland	EU	PF	1.42	9%	1979
625 ▼ -8	Prévoyance Santé Valais	Switzerland	EU	PF	1.41	-2%	1984
626 ▲ 14	Central Bank of the Republic of Guinea	Guinea	AF	CB	1.41	15%	1960
627 ▼ -2	Oklahoma Tobacco Settlement Endowment Trust	US	NA	SF	1.40	3%	2001
628 ▼ -8	Omaha School Employees' Retirement System	US	NA	PF	1.40	0%	2010
629 ▼ -20	Arkansas State Highway Employees' Retirement System	US	NA	PF	1.39	-6%	1949
630 ▲ 40	National Bank of Rwanda	Rwanda	AF	CB	1.36	50%	1964
631 ▼ -2	City of London Corporation Pension Fund	UK	EU	PF	1.36	3%	1974
632 ▼ -6	London Borough of Hammersmith and Fulham Pension Fund	UK	EU	PF	1.34	0%	1974
633 ▲ 4	Hounslow Pension Fund	UK	EU	PF	1.33	4%	1974
634 ▼ -1	Bromley Pension Fund	UK	EU	PF	1.33	3%	1974
635 ▲ 4	Bundespensionskasse	Austria	EU	PF	1.33	8%	2000
636 ▼ -8	Puerto Rico Electric Power Authority Employees	US	NA	PF	1.32	0%	1945
637 ▲ 5	Shelby County Retirement System	US	NA	PF	1.32	14%	1978
638 ▼ -14	San Luis Obispo County Pension Trust	US	NA	PF	1.31	-5%	1958
639 ▼ -7	Barking and Dagenham Pension Fund	UK	EU	PF	1.31	1%	1974

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
640 ▼ -10	Georgia Municipal Association Employees Benefit System Ret. Fund	US	NA	PF	1.30	0%	1933
641 ▼ -23	Hillingdon Pension Fund	UK	EU	PF	1.29	-9%	1974
642 ▼ -7	Atlanta General Employees' Pension Fund	US	NA	PF	1.28	0%	1962
643 ▲ 1	Chicago Laborers' Annuity & Benefit Fund	US	NA	PF	1.24	9%	1982
644 ▼ -22	Fulton County Employees' Pension Fund	US	NA	PF	1.23	-12%	1991
645 ▼ -18	Wichita Retirement Systems	US	NA	PF	1.21	-9%	1956
646 ▼ -5	Fondo para la Revolución Industrial Productiva	Bolivia	LA	SF	1.20	0%	2013
647 ▲ 3	Pensionskasse Appenzell Ausserrhoden	Switzerland	EU	PF	1.18	11%	2000
648 ▲ 3	Pensionskasse Uri	Switzerland	EU	PF	1.16	10%	1938
649 ▲ 5	Colorado Public School Fund Investment Board	US	NA	SF	1.15	11%	2016
650 ▼ -7	Dumfries and Galloway Council Pension Fund	UK	EU	PF	1.15	0%	1994
651 ▼ -5	London Borough of Bexley Pension Fund	UK	EU	PF	1.13	1%	1974
652 ▼ -3	Brent Pension Fund	UK	EU	PF	1.10	3%	1974
653 ▲ 15	Banque Centrale de Mauritanie	Mauritania	AF	CB	1.10	19%	1973
654 ▼ -6	Waltham Forest Pension Fund	UK	EU	PF	1.10	2%	1974
655 ▼ -8	London Borough of Harrow Pension Fund	UK	EU	PF	1.09	0%	1974
656 ► 0	Royal Monetary Authority of Bhutan	Bhutan	AP	CB	1.08	5%	1982
657 ▲ 7	Central Bank of Cyprus	Cyprus	EU	CB	1.08	12%	1963
658 ▲ 8	Bank of the Lao PDR	Laos	AP	CB	1.07	13%	1968
659 ▼ -2	Royal Borough of Kingston upon Thames Pension Fund	UK	EU	PF	1.07	4%	1974
660 ▲ 5	Reserve Bank of Fiji	Fiji	AP	CB	1.04	10%	1984
661 ► 0	Banka Slovenije	Slovenia	EU	CB	1.04	7%	1991
662 ▼ -17	Bank Ċentrali ta' Malta	Malta	EU	CB	1.04	-7%	1968
663 ▼ -8	London Borough of Redbridge Pension Fund	UK	EU	PF	1.03	0%	1974
664 ▼ -4	Palestine Investment Fund	Palestine	ME	SF	1.01	1%	2003
665 ▼ 50	Central Bank of Yemen	Yemen	ME	CB	1.00	150%	1971
666 ▼ -8	Fonds Gabonais d'Investissements Stratégiques	Gabon	AF	SF	1.00	0%	2011
667 ▼ -8	Centrale Bank van Aruba	Aruba	LA	CB	1.00	0%	1986
668 ▲ 6	Ghana Petroleum Funds	Ghana	AF	SF	0.98	13%	2011
669 ▼ -7	Western Australian Future Fund	Australia	AP	SF	0.98	1%	2006
670 ▲ 3	Banka Qendrore e Republikës së Kosovës	Kosovo	EU	CB	0.97	10%	2006
671 ▼ -48	Fundusz Gwarantowanych Świadczeń Pracowniczych	Poland	EU	PF	0.96	-30%	1994
672 ▼ -20	South African Local Authorities Pension Fund	South Africa	AF	PF	0.96	-8%	1985
673 ▲ 2	Pensionskasse des Kantons Nidwalden	Switzerland	EU	PF	0.95	11%	1946
674 ▼ -7	Havering Pension Fund	UK	EU	PF	0.94	-1%	1974
675 ▼ -6	Scottish Borders Council Pension Fund	UK	EU	PF	0.94	2%	1996
676 ▼ -13	Pensionskasse der Stadt Biel	Switzerland	EU	PF	0.91	-6%	1923
677 ▼ -5	London Borough of Merton Pension Fund	UK	EU	PF	0.90	3%	1974
678 ▲ 2	Wayne County Employees' Retirement System	US	NA	PF	0.88	10%	1944
679 ▼ -2	London Borough of Sutton Pension Fund	UK	EU	PF	0.86	2%	1974
680 ▼ -1	Powys Pension Fund	UK	EU	PF	0.83	1%	1974
681 ▲ 3	Reserve Bank of Malawi	Malawi	AF	CB	0.82	8%	1964
682 ▲ 5	Personalversicherungskasse Obwalden	Switzerland	EU	PF	0.82	12%	2011
683 ▼ -7	Pensionskasse des Kantons Glarus	Switzerland	EU	PF	0.81	-4%	2011
684 ▼ -13	Government Employees' Retirement System of the Virgin Islands	US	NA	PF	0.81	-10%	1959
685 ▼ -7	Cayman Islands Public Service Pensions Board	UK	EU	PF	0.81	-3%	1999

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
686 ▼ -5	National Savings Fund	Mauritius	AF	PF	0.80	2%	1995
687 ▼ -4	Isle of Wight Council Pension Fund	UK	EU	PF	0.77	2%	1974
688 ▲ 5	Banque Centrale du Congo	DR of the Congo	AF	CB	0.77	15%	1997
689 ▼ -7	Maldives Monetary Authority	Maldives	AP	CB	0.76	-1%	1981
690 ▲ 9	Banco de Cabo Verde	Cape Verde	AF	CB	0.74	22%	1975
691 ▲ 1	Vermont Municipal Employees' Retirement System	US	NA	PF	0.74	9%	1975
692 ▼ -4	Central Bank of Lesotho	Lesotho	AF	CB	0.71	-2%	1980
693 ▼ -4	National Insurance Corporation of St. Lucia	E. Caribbean System	LA	PF	0.71	0%	1970
694 ▲ 3	National Insurance Fund Jamaica	Jamaica	LA	PF	0.69	10%	1965
695 ▼ -9	Revenue Equalisation Reserve Fund	Kiribati	AP	SF	0.67	-10%	1956
696 ▼ -5	Instituto Nicaragüense de Seguridad Social	Nicaragua	LA	PF	0.66	-5%	1956
697 ▼ -7	Jersey Teachers Superannuation Fund	UK	EU	PF	0.66	-7%	2010
698 ▲ 6	Palestine Monetary Authority	Palestine	ME	CB	0.66	22%	1994
699 ▼ -5	Banco Central de Timor-Leste	Timor-Leste	AP	CB	0.66	0%	2011
700 ▲ 2	National Development and Social Fund	Malta	EU	SF	0.64	17%	2015
701 ▼ -6	National Social Security Fund	Tanzania	AF	PF	0.63	-1%	1997
702 ▼ -1	Central Bank of Seychelles	Seychelles	AF	CB	0.58	6%	1978
703 ▲ 2	Bank of Guyana	Guyana	LA	CB	0.58	9%	1965
704 ▼ -6	Central Bank of Solomon Islands	Solomon Islands	AP	CB	0.57	-7%	1985
705 ▼ -2	Saint Christopher and Nevis Social Security Board	E. Caribbean System	LA	PF	0.56	4%	1977
706 ▼ -6	Centrale Bank van Suriname	Suriname	LA	CB	0.55	-5%	1957
707 ▲ 1	Central Bank of Liberia	Liberia	AF	CB	0.53	10%	1999
708 ▼ -2	Bank of Sierra Leone	Sierra Leone	AF	CB	0.51	-1%	1964
709 ▲ 1	Central Bank of Djibouti	Djibouti	AF	CB	0.50	10%	1977
710 ▼ -3	Grant Schools Provident Fund	Hong Kong	AP	PF	0.49	1%	2000
711 ▲ 7	Banca Centrale della Repubblica di San Marino	San Marino	EU	CB	0.47	40%	2005
712 ▲ 2	Saskatchewan Pension Plan	Canada	NA	PF	0.46	12%	1986
713 ▼ -1	Reserve Bank of Vanuatu	Vanuatu	AP	CB	0.46	8%	1981
714 ▼ -3	Central Bank of Swaziland	Eswatini	AF	CB	0.44	0%	1974
715 ▼ -6	Punjab Pension Fund	Pakistan	AP	PF	0.44	-4%	2008
716 ▼ -3	Central Bank of Syria	Syria	ME	CB	0.41	0%	1953
717 ▼ -1	Algemeen Pensioenfonds Sint Maarten	Netherlands	EU	PF	0.38	1%	2010
718 ▲ 3	Hampshire County Retirement System	US	NA	PF	0.36	16%	1911
719 ► 0	National Insurance Scheme Grenada	E. Caribbean System	LA	PF	0.36	6%	1983
720 ▼ -3	Luzerner Gemeindepersonalkasse	Switzerland	EU	PF	0.35	-2%	1965
721 ▼ -1	Kantonale Versicherungskasse Appenzell Innerrhoden	Switzerland	EU	PF	0.30	-4%	1930
722 ▲ 6	Turks and Caicos Islands National Insurance Board	UK	EU	PF	0.30	17%	1991
723 ▼ -1	Pensionskasse des Personals der Einwohnergemeinde Köniz	Switzerland	EU	PF	0.29	-4%	1942
724 ► 0	Central Bank of Belize	Belize	LA	CB	0.28	-6%	1982
725 ▲ 4	Seamen's Provident Fund Organisation	India	AP	PF	0.27	8%	1964
726 ▲ 1	Social Security Board Belize	Belize	LA	PF	0.27	3%	1981
727 ▲ 3	Antigua-Barbuda Social Security Fund	E. Caribbean System	LA	PF	0.26	7%	1973
728 ▲ 3	Korea Workers' Compensation & Welfare Service	South Korea	AP	PF	0.26	8%	1976
729 ▲ 3	Pensionskasse der Gemeinde Küsnacht	Switzerland	EU	PF	0.26	8%	2010
730 ▲ 5	Seychelles Pension Fund	Seychelles	AF	PF	0.26	14%	1971
731 ▼ -6	Banko di Seguro Sosial	Curaçao	LA	PF	0.24	-16%	1960

Rank and change on 2019	Institution	Country	Region	Type	AUM \$bn	% change on 2019	Year est.
732 ▲ 9	Central Bank of Gambia	Gambia	AF	CB	0.23	21%	1971
733 ▲ 1	National Reserve Bank of Tonga	Tonga	AP	CB	0.23	1%	1972
734 ▲ 6	Colpensiones	Colombia	LA	PF	0.23	17%	2005
735 ▲ 4	Cayman Islands Monetary Authority	Cayman Islands	LA	CB	0.22	13%	1997
736 ► 0	Agaciro Development Fund	Rwanda	AF	SF	0.22	4%	2012
737 ▲ 1	Central Bank of Comoros	Comoros	AF	CB	0.20	1%	1981
738 ▼ -5	Central Bank of Eritrea	Eritrea	AF	CB	0.19	-19%	1914
739 ▲ 3	Bermuda Monetary Authority	Bermuda	LA	CB	0.19	0%	1969
740 ▼ -3	Universities Provident Fund	Sri Lanka	AP	PF	0.19	-9%	1978
741 ▲ 3	Faletupe Tutotonu o Samoa	Samoa	AP	CB	0.19	9%	1984
742 ▲ 12	Reserve Bank of Zimbabwe	Zimbabwe	AF	CB	0.15	74%	1956
743 ▲ 13	Bank of South Sudan	South Sudan	AF	CB	0.14	89%	2011
744 ▲ 12	Central Bank of Burundi	Burundi	AF	CB	0.11	63%	1964
745 ▲ 8	Intergenerational Trust Fund for the People of the Republic of Nauru	Nauru	AP	SF	0.08	19%	2015
746 ▼ -59	Excess Crude Account	Nigeria	AF	SF	0.07	-89%	2004
747 ▲ 8	Banco Nacional de São Tomé e Príncipe	Sao Tome and Principe	AF	CB	0.05	8%	1975
748 ▼ -36	Fiscal Stability Fund	Mongolia	AP	SF	0.05	-84%	2011
749 ▲ 10	Fonds Souverain d'Investissements Strategiques	Senegal	AF	SF	0.01	-19%	2012
750 ▲ 10	National Stabilisation Fund	Taiwan	AP	SF	0.00	15%	1973

NOTES ON DATA SOURCES AND TOP 750 ENTRIES

Data for assets under management are largely sourced from global public investors' official websites, usually based on annual reports and financial statements. When no such official data are available, OMFIF uses reliable sources from the financial industry and research community.

Most data are taken as of December 2019. In cases where this is not possible, the latest available data are taken. Where figures are not recorded in dollars, an average conversion rate between the reporting currency and dollars of the year in which the report was published is used.

Total assets are used where possible. However, in a small minority of cases, net assets, fair value or market value are used.

1. Includes reserves managed by China's State Administration of Foreign Exchange
2. Includes assets held by the Japanese Ministry of Finance
3. Manages the Government Pension Fund Global
4. Includes assets held by the Federal Reserve and US Treasury
5. Fund created through the merger of the International Petroleum Investment Company and Mubadala Development Company in 2017, and the inclusion of the Abu Dhabi Investment Council in 2018
6. Includes assets held by HM Treasury
7. Includes assets of the Labor Pension Fund, Labor Retirement Fund, Labor Insurance Fund, Employment Insurance Fund, Occupation Incidents Protection Fund, Arrear Wage Payment Fund, and the National Pension Insurance Fund
8. The PIC is also responsible for investing the assets of the Government Employees Pension Fund
9. Includes all pension funds under the North Carolina State Treasurer
10. Includes Alberta's Heritage Savings Trust Fund
11. Régime de retraite des employés du gouvernement et des organismes publics
12. Manages the Government Pension Fund Norway
13. Includes the National Investment Corporation of Kazakhstan and Unified State Pension Fund of Kazakhstan
14. Includes Land Grant and Severance Tax Permanent Funds
15. Includes Judges' School, State Patrol, State Cash and County Cash Plans
16. Includes ERS, TSB, MERS, SPRBT, JRBT, RIJRFT, and RI Defined Contribution Plan
17. Includes Employees System, Police System and Uniformed System

NOTE ON METHODOLOGY

The ranking table includes 750 global public investors.

All figures are in dollars. Throughout the publication 'dollar' refers to the US currency. Figures for the percentage change in assets are calculated using year-on-year figures where possible, generally between December 2018-December 2019.

OMFIF adopts a regional classification: Africa (AF), Asia Pacific (AP), Europe (EU), Latin America and the Caribbean (LA), Middle East (ME) and North America (NA).

Three broad fund classifications – central banks (CB), public pension funds (PF) and sovereign funds (SF) – integrate different categories of asset managers in an easy-to-assess manner.

OMFIF recognises that not all states are universally recognised as enjoying full political independence or sovereignty. Where data are available, central banks and monetary authorities in overseas territories, dependencies or other non self-governing territories are included. Several central banks from countries not recognised by at least one United Nations member, such as South Korea and Israel, are also included.

Institutions such as pension funds are deemed public if they fulfil at least one of the following characteristics: they are owned or financed by the state; they serve public employees; or they are constituted as public institutions under public law.

Sovereign funds are institutions owned or controlled by the government and are mandated to manage assets transferred by the government. These assets are derived from balance of payments surpluses, official foreign currency operations, the proceeds of privatisations, fiscal surpluses and receipts resulting from commodity exports. Sovereign funds, a smaller grouping within this category, are contained in the sovereign fund definition.

Sovereign funds generally operate without explicit short-term liabilities and a significant share of their investments are in international assets. They typically fulfil some combination of the following roles: stabilisation fund to insulate the budget and national economy from 'Dutch disease' and volatile commodity prices; savings fund to share wealth across generations; development fund to provide resources for socioeconomic projects; and reserve investment fund to invest excess reserves in assets with higher returns.

Some institutions are grouped to reduce double-counting and eliminate doubts about sectoral overlaps. The most notable examples are: the US, where the term US Monetary Authorities has been used; China, where the holdings of the People's Bank of China include those of the State Administration of Foreign Exchange and other associated institutions; Japan, where the foreign reserves are owned by both the Bank of Japan and the Ministry of Finance; and the UK, where the Treasury's Exchange Equalisation Account is managed by the Bank of England.

'US monetary authorities' represents a combination of US institutions. The Federal Reserve holds some foreign reserves, while the Exchange Stabilization Fund holds the rest along with US stocks of special drawing rights. The general account of the Treasury holds the US gold reserves and the International Monetary Fund position. The Federal Reserve Bank of New York operates for both the Treasury and the Federal Open Market Committee and holds the Federal Reserve System's foreign exchange.

Central bank reserves include foreign exchange, gold, International Monetary Fund position and special drawing right holdings. Gold valuations are given by the IMF. This does not always match central banks' own valuation of their gold holdings.

Important note

Figures for previous years may not correspond directly to those published in earlier editions of *Global Public Investor*. This reflects revisions to and comparisons between 2019 data and past years' figures, as well as changes to the composition of the 750 institutions from year to year because of fluctuations in asset values.

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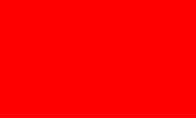
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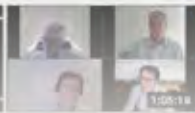
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