SOVEREIGN WEALTH FUNDS 2019

MANAGING CONTINUITY, EMBRACING **CHANGE**

CENTER FOR THE GOVERNANCE OF CHANGE

GOBIERNO DE ESPAÑA
MINISTERIO DE INDUSTRIA, COMERCIO Y TURISMO

ICEX

INVEST IN SPAIN

SOVEREIGN WEALTH FUNDS 2019

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Index

PREFACE

Preface

In 2019, the growth of the world economy slowed to 2.9%, the lowest annual rate recorded since the subprime crisis. This was a year in which the elements of uncertainty that had previously threatened the stability of the cycle began to have a more serious effect on economic expansion. Among these elements, there are essentially two – both of a political nature – that stand out from the rest. The first is the trade war between the world's leading economy, United States and its nearest contender, China, which led to a dangerous tariff escalation. The second was the confirmation of the United Kingdom's withdrawal from the European Union, whose long denouement plunged the economy and the companies of the old continent into uncertainty. However, the negative impact of both these factors is clearly waning, and, coupled with the continued favorable financial conditions, suggests a return to growth of the world economy of 3.3% for 2020 and 3.4% for 2021.

Advanced economies saw their growth rates fall from 2.2% to 1.7% last year, a situation experienced by all the major economies with the exception of Japan. Growth in the United States fell sixty basic points, tax support from the Trump administration is now tailing off, and we are unlikely to see an upturn in GDP growth in the present election year. The Eurozone grew only 1.2% due to the negative impact of the cooling of activity in the German powerhouse, which saw modest growth of only 0.5%. Europe is also facing the tough challenge of achieving higher growth rates in a scenario characterized by very little margin for stimulating the economy through the fiscal and monetary policy strategies. In any case, the developed world is undergoing its tenth consecutive year of expansion, and the risks of relapsing into a recessive cycle appear to have been allayed in view of the fact that, in spite of record low interest rates, inflation and debt remain at moderate levels.

While 2018 saw a recovery in growth in the group of emerging countries, their economic activity in 2019 once again slowed to 3.7% as a whole. China continues to astound the world with the speed of the transformation of its productive and business model, but is also an example of the difficulties of maintaining growth rates after achieving a certain level of development. Latin America's growth in its GDP was almost imperceptible, which is a matter of concern in a region that requires more growth and an adequate distributive policy to resolve its pressing social challenges. In any case it is worth noting the divergence in the behaviour of the two major regional economies, with Brazil emerging from a long period of stagnation in recent years while Mexico is struggling to shake off its sluggish growth.

In the increasingly complex choreography of the world economy, sovereign wealth funds (SWF) play an ever more important role due to their capacity to channel large volumes of savings toward investment and hence boost economic growth. This role is analyzed in depth in the study on sovereign funds, a joint project between ICEX-Invest in Spain and IE University, whose result is the report you now hold in your hands, and which has become a leading instrument of analysis for the institutional investment industry worldwide. The aim of this project is primarily to analyze the strategies, operations and trends that feature these public investment vehicles. The present edition also takes a broad look at how these institutional investors are becoming transformed into agents for change in the key areas of our time, such as technology and sustainability.

The 2019 Sovereign Wealth Funds report shows that these funds are defined by continuity and change. Continuity because they make it possible to maintain strong investment activity and are seen as a factor of stabilization in the investment cycle due to their relative immunity to the volatility of the economic situation. From January 2018 to September 2019 the total value of SWF transactions was 139 billion dollars. And change because they allow the rapid adaptation to the technology revolution thanks to increased investment in sectors such as biotechnology, software, fintech, data, mobility, e-commerce and health. SWFs are increasingly acting not only as financial investors seeking a return in the medium and long term, but also as instruments of public policy that drive the transformation of the productive sector of their economies. In this context, and in line with these objectives, SWF investments in Spain have multiplied in recent years, offering evidence of Spain's attractiveness to these investors.

This eighth edition takes a closer look at the greater participation of SWFs in the most disruptive technologies, and also analyzes one of the most promising and novel aspects of the activity of these funds: their role as responsible investors in the Sustainable Development Goals (SDGs). The achievement of the SDGs represents a business opportunity in areas such as the agroindustrial sector, smart cities, energy and health. SWFs, as they are market-oriented government-controlled funds, might play a key role in involving private investment in the development of the 2030 Agenda. In 2018 and 2019 alone, SWFs invested in sustainability-linked assets with a total value close to 16 billion dollars.

In short, as in previous years we hope you will find the present document of interest and that it will continue to serve as a useful tool for public policy decision-makers and professionals in the investment industry worldwide.

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EXECUTIVE SUMMARY

Executive Summary. Sovereign Wealth Funds 2019: Continuity and Change

1. MANAGING CONTINUITY AND EMBRACING CHANGE: SOVEREIGN WEALTH FUND DIRECT INVESTMENTS IN 2018-2019

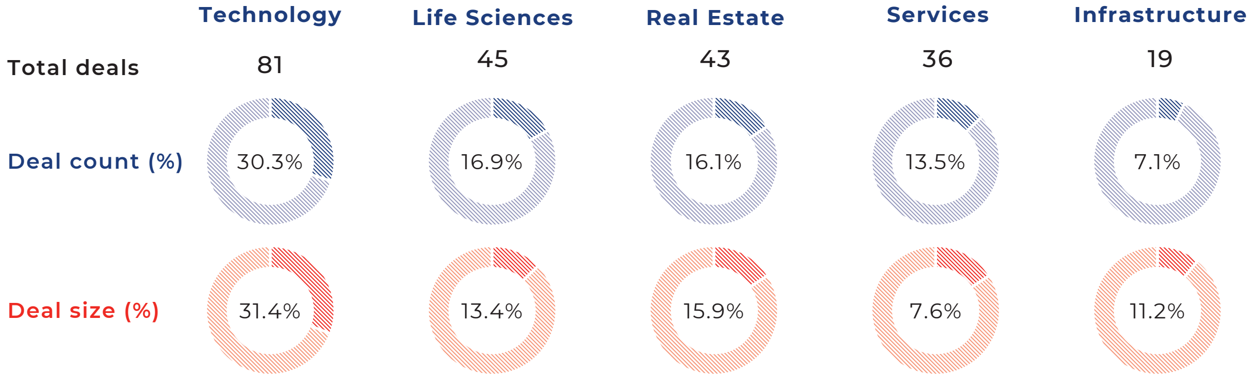
The 2018-2019 sample includes 267 transactions invested by SWFs. Of these, 251 represent independent transactions, i.e. invested by at least one sovereign fund. The total value of these transactions during the period from January 2018 through September 2019 was approximately $139 billion. Importantly, this sample includes only deals that had formally closed and that had received required regulatory approvals. By way of comparison, our of 2018 sample alone includes 178 deals, including 18 real estate transactions attributable to Norway's Government Pension Fund Global (GPFG), while our 2017 sample included 208 transactions. Through September 2019 we count 101 deals, including 12 pending transactions, amounting to approximately $17 billion in total value. Our research also identified a number of divestitures not incorporated into our overall deal count.

Direct SWF investment activity reveals both continuity and change. Change is characterized by the inversion in sector allocation. Sovereigns, led by Singaporean funds Temasek and GIC, embrace the dynamism of rapidly evolving technologies in sectors that allow them to exploit their extended investment horizons to enhance long-term risk-adjusted returns. Partnering with a wide array of institutional investors, SWFs have diversified direct investment programs away from traditional sectors and deployed capital in scale to technologies and companies capable of driving disruptive innovation in industries such as biotechnology, software, fintech, data, mobility, e-commerce, and healthcare. Doing so affords them the ability to hedge disruption risk, while enhancing their own capacity to understanding the forces driving macro- and micro-economic change.

This evolving inversion in sector allocation notwithstanding, prevailing fund-level activity, scale and geographic preference have remained consistent with earlier-established SWF practices. The dominant direct SWF investors in our 2018-19 sample include Temasek, GIC, UAE's Mubadala, Norway's GPFG, and Abu Dhabi Investment Authority in the top five, followed in deal count by Qatar Investment Authority, Australia Future Fund, the Ireland Strategic Investment Fund, the Russia Direct Investment Fund, the China Investment Corp (CIC), and Khazanah. Leadership in activity remains stable over the last 5 years, and of course, this should come as no surprise as it is the largest SWFs that have the capacity and scale – mandate permitting - to undertake direct investment programs.

Top 5 sectors 2018-2019

Deal count and deal size



Source: Sovereign Wealth Research (IE Center for the Governance of Change) and SovereigNET (Fletcher School, Tufts University). The 2019 data for the nine-month period Jan to Sep.

Moreover, constraints – whether imposed by scale, mandate, or even politics – necessitate that most funds in most deals invest both through and with other institutional investors. This includes sovereign development and strategic funds investing domestically. Rather than implying inertia then, continuity, along with stability, are key pillars on which to build and scale global capital markets. A third is partnership, as it is through such collaboration that risk – whether financial or political - is distributed and shared.

2. TECHNOLOGY, VENTURE CAPITAL AND SWFS: THE ROLE OF THE GOVERNMENT FORGING INNOVATION AND CHANGE

2018-2019 was a record period for SWFs investing in venture capital. Despite their size, SWFs can be considered today as key players of the VC industry, fostering change and framing innovation both internationally as well as at home.

Since 2010, SWFs have been active on venture capital, and since 2014, the bet consolidated with more SWFs and larger capital deployment. SWFs joined rounds valued at $30 billion in 2018 alone. This means that 9% of all world's VC dollar volume deployed in 2018 was participated by a SWF. This record year saw 16 different SWFs investing in 94 rounds.

The United States and China remain the preferred destinations, followed by India, United Kingdom, Indonesia, South Korea and Singapore. Yet, the geopolitics of innovation are to be manifested when these technologies mature and exert their influence globally. New innovation poles already backed by SWFs are flourishing in cities of Europe or Latin America.

Biotechnology investments outpace any other technology sub-sector by the number of deals. Three main reasons explain this huge interest: leapfrogging in human development by adopting innovative healthcare solutions and technologies for the wellbeing; the potential benefits of applying biotech solutions for long-run issues such as ageing populations, growing middle-classes and urbanization; the fact that biotech innovation requires long-term capital and SWFs are fitted for this kind of patient capital. All these explain why biotech and life sciences represented 15% of all technology deals.

SWFs participated in multi-billion VC rounds like Ant Financial, Go-Jek, Lufax or Lucid Motors. Yet, the bulk of the SWF activity focuses on late-stage rounds (above $100 million), instead, which totaled $16 billion, showing the relevance of SWFs in the global VC landscape at all stages.

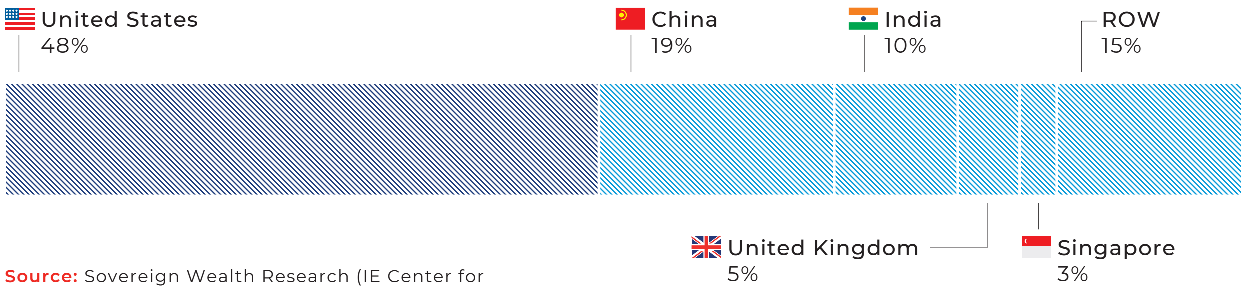
Temasek and GIC have led the group of "sovereign venture funds" over the years. Yet, their relative importance has declined to favour other SWFs like the Australia Future Fund or UAE's Mubadala.

The strategies used by SWFs to approach innovation include venture capital investment programs, funds of VC funds, support of national innovation ecosystems and the establishment of startup hubs.

The risks of VC investing were clear in the recent developments of SWF-backed startups. To enter the VC cycle at late stages makes SWFs get exposed to profitability issues and to the valuation pressures of public markets. Recent experiences taught that global VC investment decisions are to focus on operational performance rather than market share growth rates.

SWF-backed venture rounds by country

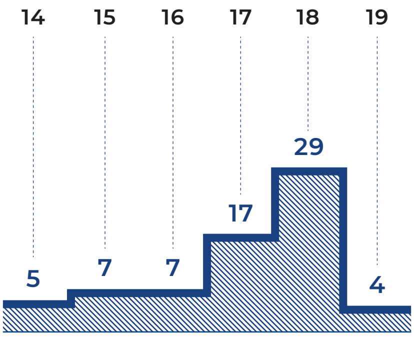
% of total deals



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase.

SWF investments in Bio&Healthtech

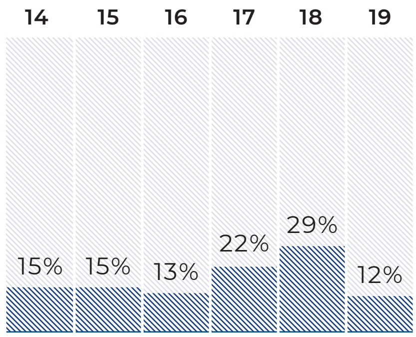
VC rounds joined by SWF



TOTAL 2014-2019*

69

% of VC rounds



TOTAL 2014-2019*

20%

Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on data from Crunchbase (2019).
*Up to september.

Sovereign funds returns in a bad year

Weight of the fund (AUM/ TOTAL AUM) | 2018 Return

Stabilization

6.0%	HKMA	0.3%
0.4%	SOFAZ	0.4%
0.3%	NMSIC	-1.3%
0.2%	ESSF	-0.4%
0.1%	T&T	3.8%

Savings

12.4%	NBIM	-6.1%
9.8%	CIC	-2.4%
9.5%	ADIA**	-10.0%
4.2%	GIC**	-1.0%
3.8%	NSSF	-2.3%
1.3%	KIC	-3.7%
1.2%	Future Fund	5.8%
0.7%	Alaska	-3.2%
0.3%	NZ Super	-2.2%
0.2%	PFTL	-2.6%
0.1%	PRF	-3.6%
0.0%	Panama	0.3%
0.3%	SGRF	N/A

* High-profile public pension funds whose investment profile and behavior aligns with those of SWFs.

**Author's estimations.

Source: IE Sovereign Wealth Research, except for pension funds.

3. SWFS IN A BAD YEAR: CHALLENGES, REPORTING, AND RESPONSES TO A LOW RETURN ENVIRONMENT

Sovereign wealth funds (SWFs) are long-term investors by nature. One of the most pressing challenges for long-term investors is precisely to endure the lower parts of the business or equity cycle. Year 2018 could have been perceived as a difficult year for those looking beyond short-term investment horizons.

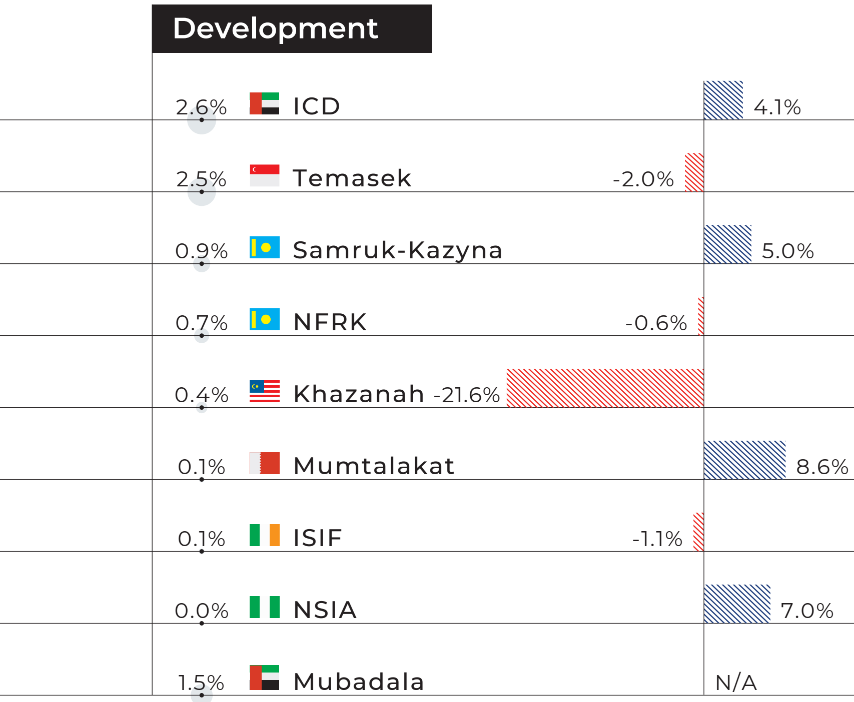
Indeed, 2018 was a difficult year for many. The SWFs' average return was flat in the fiscal year, while the SWFs' weighted average was negative to -1.6% when assets under management were considered.

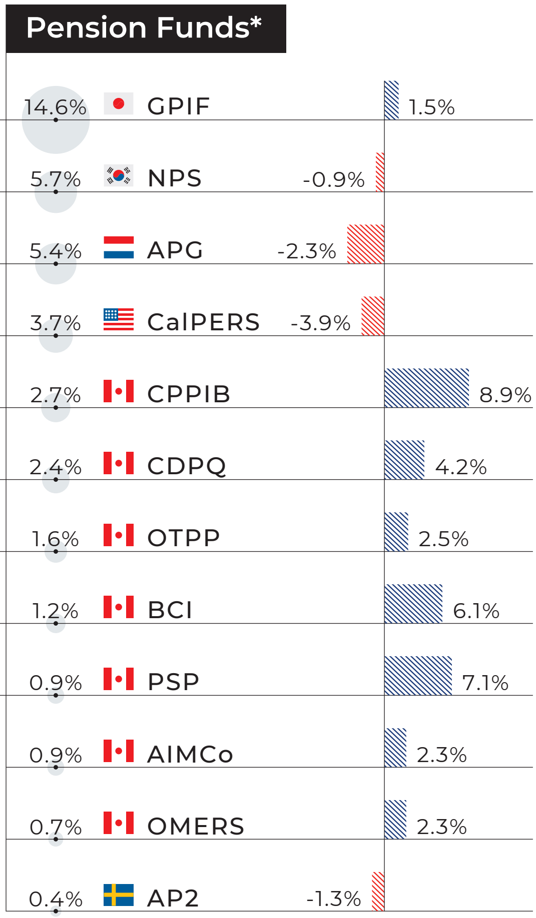
As we have learned, institutional investors are an extremely heterogeneous group with diverse purposes and asset allocation and generalizing can be deceptive and inaccurate. The chapter breaks SWFs down into four major groups: stabilization, savings, development, SWF-like pension funds; and shows how returns are aligned to each mission.

One of the distinguishing exercise SWFs do is to present information according to their long-term horizon realm. Rolling returns (10- or 20-year) are valuable ways to educate stakeholders about the long-term mission of SWFs; yet this kind of reporting may conflict with the short-term performance.

Indeed, some IFSWF members have found that certain types of information and the frequency with which it is released may create an overly short-term focus. Also, certain funds like the newly created India's National Investment and Infrastructure Fund (NIIF) have chosen not to disclose certain aspects to the public domain by design.

Along with the short-term measure of their choice, long-term investors should keep investing and reporting according to their long-run mission and goals, making sure to educate stakeholders including politicians, government officials, media or national financial institutions along the way. The road ahead is still very long.





4. THE SUSTAINABLE DEVELOPMENT GOALS AND THE MARKET FOR SUSTAINABLE SOVEREIGN INVESTMENTS

The United Nations Conference on Trade and Development (UNCTAD) says achieving the Sustainable Development Goals (SDGs) will take between US$5 to $7 trillion, with an investment gap in developing countries of about $2.5 trillion per year.

Achieving the SDGs could open up $12 trillion of market opportunities in food and agriculture, cities, energy and materials; health and well-being alone could create 380 million new jobs by 2030.

Lack of transparency and reporting standardization, inconsistent risk measurement tools, and fears of missing returns when investing with a responsible investment focus represent significant challenges for investors that want to combine social good with profit. While impact investing is gaining more and more popularity in OECD/DAC countries, investors are more cautious about putting their money in riskier developing markets.

One common characteristic of sovereign wealth funds is the maximization of long-term returns; and due to their mixture nature of government-owned entities with a market orientation, SWFs are well positioned to enter these opportunities. Their potential role in financing SDGs is undeniable yet scarcely explored.

SWFs are exposed to green assets by committing to green debt platforms, investing in renewable energy infrastructure companies and projects or by participating in green infrastructure funds. In total, SWFs have participated in equity deals directly linked to green assets amounting to $15.8 billion in the period from January 2018 to September 2019. Other funds have followed a “divestment” strategy instead of equity investing (i.e., exiting companies which use carbon as their main energy source or those companies emitting above certain defined thresholds).

Investments go beyond classical wind and hydro utility-scale projects. For example, with its investments rounds in Impossible Foods, Perfect Day and InnovaFeed, Temasek contributed $380m to the development of a more sustainable food system. On its part, Mubadala, through its fully owned subsidiary Masdar, has invested in solar and wind power projects with a combined value of $12.5 billion since 2006 displacing nearly 5.4 million metric tonnes of carbon dioxide per year.

Whether it is through investing in disruptive technology, clean energy production and sustainable food systems or divesting from polluting companies, SWFs are starting to successfully mobilize capital towards the Sustainable Development Agenda, re-shaping the way the world eats, moves, builds and grows.

5. SWFS IN-DEPTH. MUBADALA: THE 360-DEGREE SOVEREIGN WEALTH FUND

In the report, under the "In-Depth" section, we analyze a specific SWF. This year, we study in-depth the case of Mubadala. A SWF which has implemented an integrated and ambitious strategy to foster development based on three dimensions: innovation and change, sustainability and long-run partnerships.

Mubadala Investment Company, with $229 billion in assets, is today the result of the merge of three Abu Dhabi preexisting funds: International Petroleum Investment Company (IPIC), Mubadala, and Abu Dhabi Investment Company (ADIC). The aggregation of missions and legacy portfolios required Mubadala to make a thorough exercise to understand its role in the Emirati economy.

First, Mubadala's approach towards innovation and change is an effort to create value by betting on multiple elements of the ecosystem (founders, VC managers), leveraging on Mubadala's experience in technology sectors and business partnerships.

Mubadala has deployed a comprehensive strategy that includes a fund of funds investment strategy, the commitment of $15 billion to the SoftBank's Vision Fund, the opening of an office in San Francisco, and culminates with the commencement of a local innovation hub. This hub, known as Hub71 and located in Abu Dhabi, acts as the glue for the other previous initiatives. It attracts all the stakeholders of the process and fosters entrepreneurial spirit among foreign and ultimately national founders, while benefitting UAE's home market through economic diversification and high-quality jobs.

The second mission of Mubadala is to foster sustainable and responsible businesses. Responsible investing is a growing trend among institutional investors. According to IMF,[1] around 1,000 institutional investors and almost $9 trillion assets have been divested from fossil fuels since 2012.

[1] See López, D. (2019) "SWFs as grown up investors: Asset allocation, purpose and maturity", in Capapé, J. (Ed.) Sovereign Wealth Funds 2018, IE Sovereign Wealth Research. Accessed at https://docs.ie.edu/cgc/SWF-CGC-2018.pdf

Mubadala can be considered a precursor of the SWFs' involvement in sustainable finance. Certainly, Masdar, a wholly owned subsidiary at the core of Mubadala, is a regional champion in sustainable finance. With a presence in 25 countries, Masdar has invested $8.5 billion in global sustainable projects and has 4 GW capacity installed or under development. Launched in 2006, Masdar is mainly focused on solar and wind power projects. It is estimated that the clean energy capacity backed by Masdar displaces 5.4 million tons of CO_2 every year. Today, Masdar City, one of the key projects of Masdar, aims to be a greenprint on how cities can adjust to rapid urbanization while reducing their energy and water needs and waste production.

The efforts made by Mubadala in the areas of development, green transition or technology, cannot be understood without a key element: partnerships. In this sense, Mubadala is fully aligned with the critical Sustainable Development Goal 17 "Partnerships".

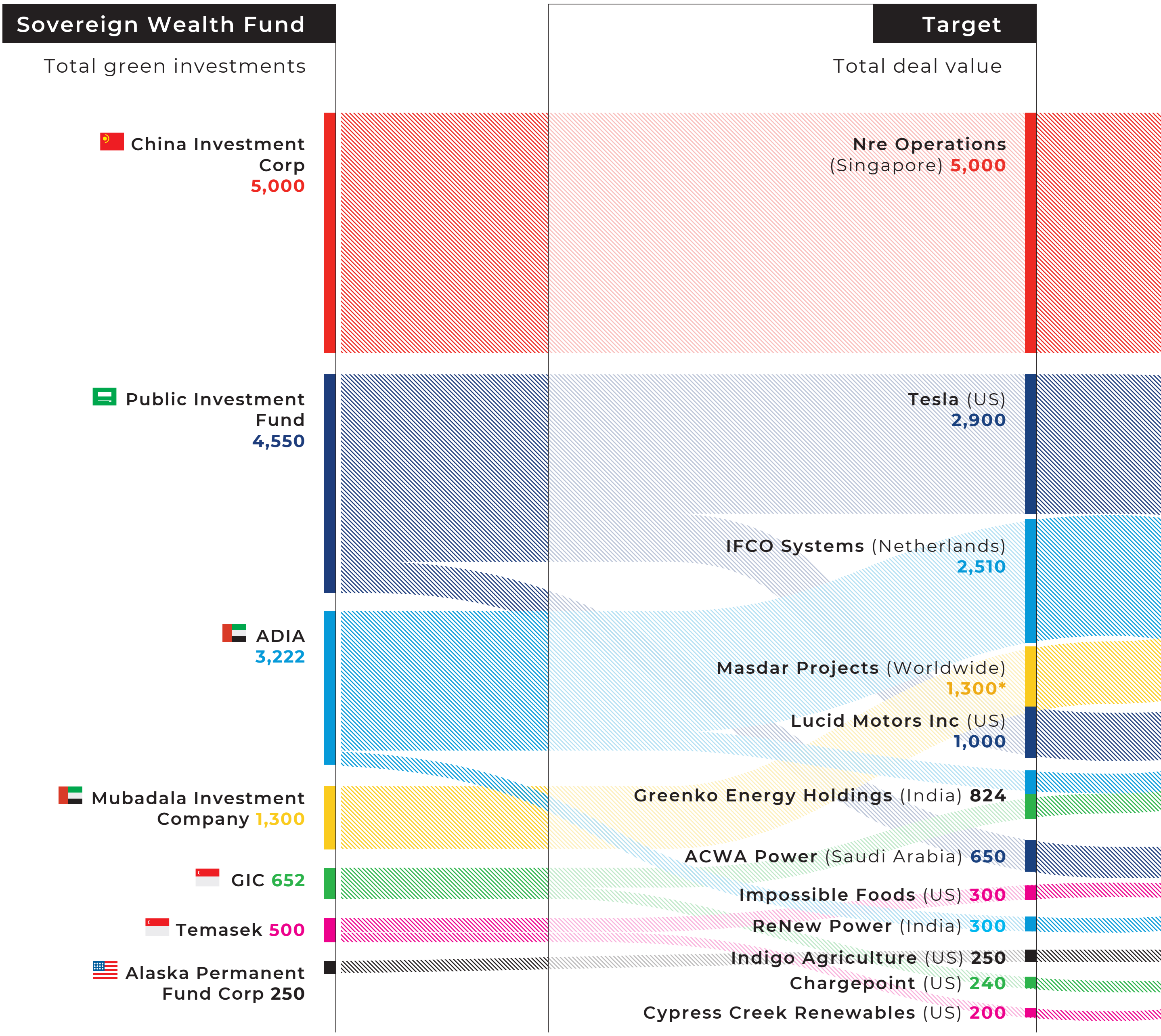
Mubadala's partnership program includes a business unit devoted to establishing commercially driven co-investment programs between the UAE and foreign counterparts including China, France, Greece, Kazakhstan and Russia. Beyond sovereigns, and due to the particular nature of Mubadala, as a hybrid between investment and an operating company, core partnerships are established directly between Mubadala's subsidiaries and global operating business leaders.

Apart from energy, a critical partnership arena for Mubadala was the aerospace industry. The comprehensive strategy to stimulate an aerospace sector from scratch in the country led to partnerships with aircraft makers Boeing or Airbus and GE, among others. A series of strategic long-term partnerships served the ultimate goal of diversifying the economy from oil and gas and generated hundreds of aerospace-related jobs for Emiratis.

The logic of a sovereign development fund is clear in this particular case study. The prudent usage of oil and gas-related wealth has propelled the creation of a complex and high value-added industry in the country, throughout long-term strategic partnerships and knowledge sharing with key global players.

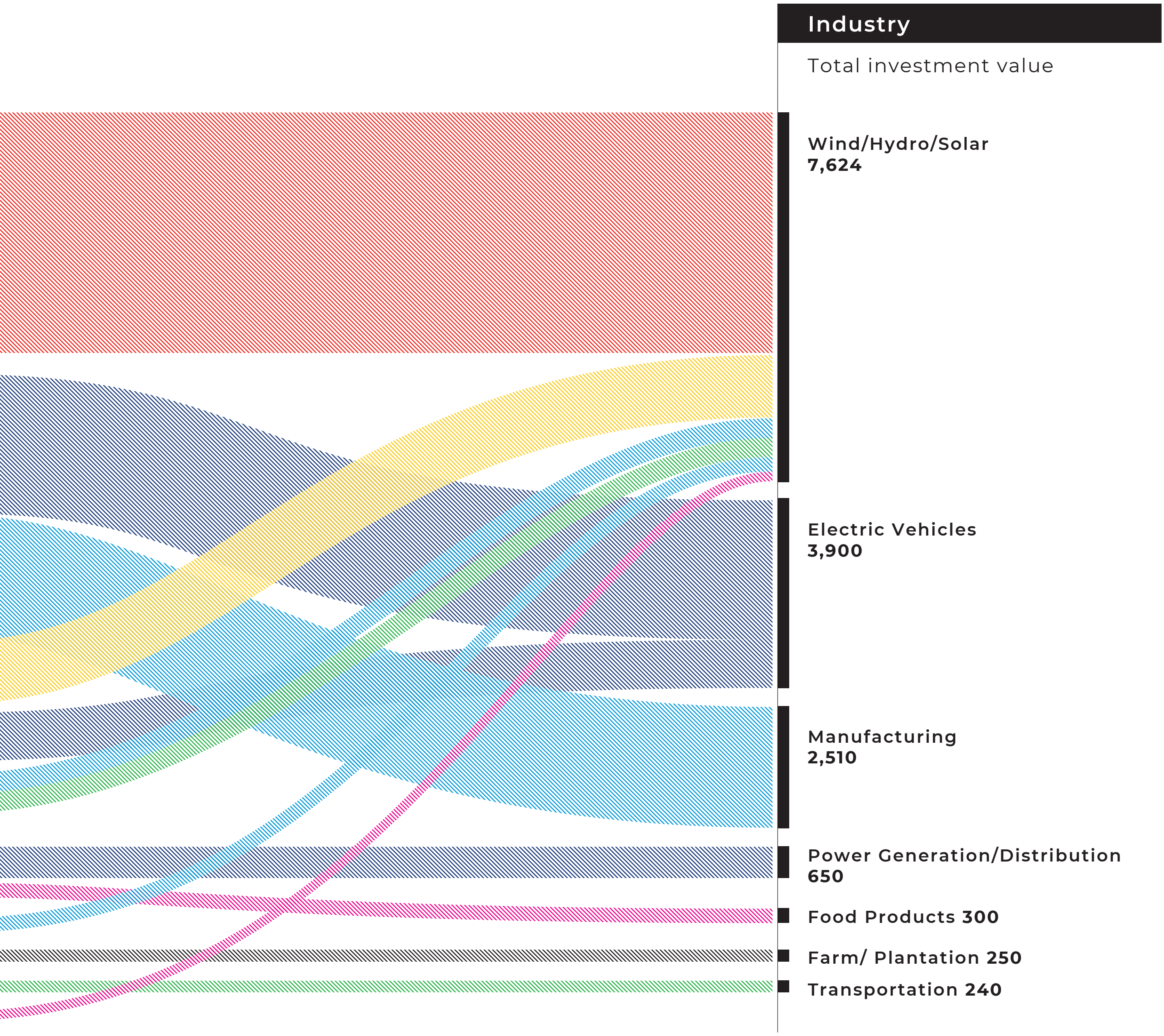
Sovereign Wealth Fund Sustainable Investments 2018-2019

Selected deals. The 2019 data for the nine-month period Jan to Sep.
In million US dollars.



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Refinitiv and Bloomberg.

*Estimated.


Industry
Total investment value
Wind/Hydro/Solar
7,624
Electric Vehicles
3,900
Manufacturing
2,510
Power Generation/Distribution
650
Food Products 300
Farm/ Plantation 250
Transportation 240

Mubadala's Business Platforms: How does Mubadala embrace innovation?

Mubadala Ventures has established three main channels to approach innovation:

.01 Mubadala's partnership with SoftBank Visionfund

$15 US billion dollars commitment
Opening of the San Francisco Office, May 2017.

.02 Direct and fund investing

$400M US dollars
Mubadala Ventures Fund 1
31 investments (Collective Health, InCountry, Platform9...).

$200M US dollars
Global Fund of Funds
It has invested in seven funds in its first year of operation (Aug 2018).

$400M US dollars
European Tech Fund
4 investments.
Opening London office, 2019.

$150M US dollars
MENA Fund of Funds
Data Collective Venture Capital, Middle East Ventures Partners and Global Ventures...

$100M US dollars
MENA Tech Fund
Data Collective Venture Capital, Middle East Ventures Partners and Global Ventures...

.03 Hub 71

Goals

A. Bring Softbank Vision Fund portfolio companies to establish regional offices in Hub71: WeWor, OYO, Gympass, Slack, Kabbage, Roivant...

B. Connect Hub71 startups with Mubadala global portfolio companies and bring opportunities to startups in Hub71.

Selected 2019 VC rounds
US$ Million

Source: Sovereign Wealth Research (IE Center for the Governance of Change).

1

MANAGING CONTINUITY... EMBRACING CHANGE: SOVEREIGN WEALTH FUND DIRECT INVESTMENTS IN 2018-2019

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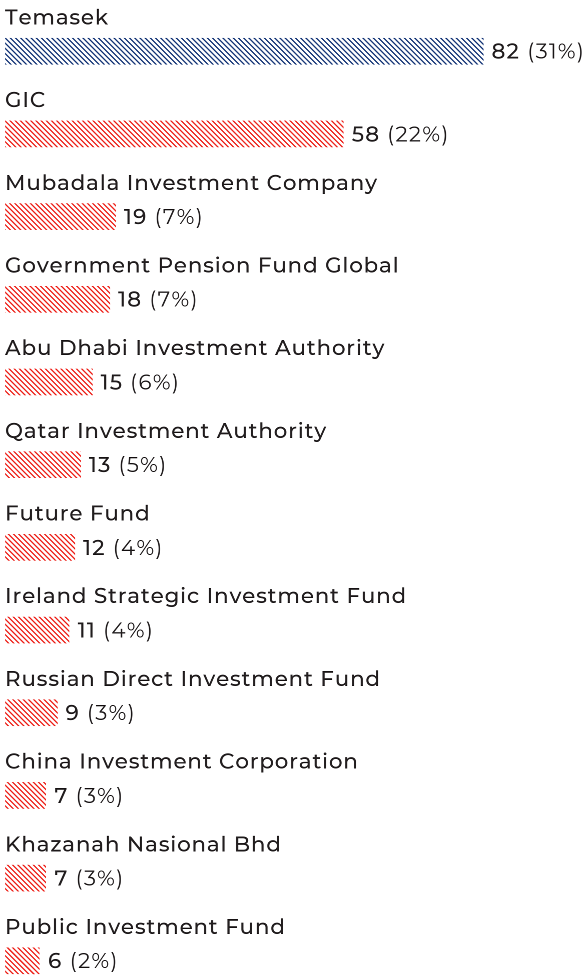
1. Managing Continuity…Embracing Change: Sovereign Wealth Fund Direct Investments in 2018-2019

"Plus ça change, plus c'est la même chose"[1], as Jean-Baptiste Alphonse Karr observed in 1848. Generally translated as "the more things change, the more they remain the same", this reflection might aptly apply to the sovereign wealth fund investment activity reflected in our 2018-19 sample of direct transactions. As we have now engaged in this enterprise for nearly ten years, we are continually struck by the degree of continuity in broad investment patterns among SWF investors and the sectors and geographies in which they invest, even while we search for evolving shifts in investor preferences and behavior. Direct investments by SWFs are driven largely by market conditions, scale considerations and mandate. Generally, prevailing fund, sector, and geography patterns persisted in 2018-19, as market conditions, SWF capacity, and the overall availability of investible deals, dictated pace and scale. This is readily apparent from our recent practice of analyzing transactions across years' end. The scale of deals involving SWFs, accentuated by complex deal structures involving a significant number of co-investors, necessitates relatively long gestation periods from deal announcement through any regulatory review phase and finally to close. At September end 2019, there were 94 SWFs in our universe (See Infographic 1) representing $8.34 trillion in assets under management (AUM). This compares to 91 funds in 2018 with assets of some $8.09 trillion. While implying an increase of 3.1% increase in AUM, this is by no means an indicator of performance[2], but rather obscures a variety of factors, including fund-level asset allocation, public market returns, private

FIGURE 1

The most active Sovereign Wealth Funds 2018-2019

Deal count and % of total deals



Source: Sovereign Wealth Research (IE Center for the Governance of Change) and SovereigNET (Fletcher School, Tufts University).

The 2019 data for the nine-month period Jan to Sep.

[1] The full quote – "plus ça change, plus c'est la même chose" – is generally translated as "the more things change, the more they remain the same" and is attributed to Jean-Baptiste Alphonse Karr. See https://www.merriam-webster.com/dictionary/plus%20ça%20change,%20plus%20c%27est%20la%20même%20chose.

[2] For more detail on recent SWF investment performance, see the article in the volume by Diego Lopez.

market returns, and - not least – the ebb and flow of SWF creation and fund flows. For example, in early 2018 the Russia Reserve Fund ceased operations[3], while in 2019, several new funds were established or are under consideration. These included funds in Guyana, Cyprus, Mongolia, and Georgia. Similarly distorting to changes in AUM estimates are discrete contributions to and/or withdrawals from funds.[4]

With respect then to direct investing, we identify twenty-one SWFs that completed at least one direct investment across our 2018-19 sample. This represents just 22% of our universe yet 58% of SWF assets, a cohort that has remained relatively stable year over year, accentuating our earlier point concerning the relationship between scale, mandate, and the propensity for SWF direct investment. Also consistent, but perhaps more interesting, is the concentration of direct investment activity. Across our horizon, the ten most active investors by deal count participated in over 90% of the total transactions in our sample; the top five – Temasek, GIC, Mubadala, Norway's Government Pension Fund Global (GPFG), and Abu Dhabi Investment Authority (ADIA) – accounted for approximately 73% of the total volume, with Temasek and GIC alone representing 55%.

EMERGENT THEMES FROM THE 2018-19 SAMPLE

Despite the continuity that we observe, there emerge from our data distinct indicators of SWFs as adaptable and opportunistic long-term investors with a capacity for innovation. SWFs continue to invest in the US in scale; they have further extended their domestic reach via strategic fund structures that serve as catalysts for inward direct investment; they demonstrate a high propensity for coinvestment, whether directly in individual transactions or through investment partnerships or platforms. Though ESG and sustainability as investment themes are not widely observable from the data, several funds nonetheless have expressed their commitment to invest responsibly and sustainably. It is, however, at the industry/sector level, that perhaps the most distinct evolution has occurred: Sector allocations are gradually inverting as sovereign capital is finding its way from traditional industries to disruptive sectors and companies. These trends are driven by shifting demographics, the continuous emergence of new technologies, particularly those that facilitate access to and analysis of large volumes of data, innovative healthcare solutions, led by biotechnology, and dynamic new business models that undermine traditional commercial foundations in, for example, retail, industry, energy, and transportation.

Pressures on the global trading system have extended to cross-border capital flows with the US squarely at the center. This is accentuated by a restructuring of the Committee on Foreign Investment in the United States (CFIUS) rules in 2018 that was designed specifically to tighten Congressional oversight over foreign investment activity in the US. Notwitstanding, with respect to destination, our sample includes 102 US investments, once again establishing the United States as the preeminent destination for SWF investment. Among the most active SWFs investing in the US in 2018-19 were Temasek, Mubadala, GPFG, Australia Future Fund, GIC and QIA, i.e. funds domiciled in countries – Singapore, UAE, Norway, Australia, and Qatar – that enjoy strong bilateral relations with the US based on mutally reinforcing strategic interests. Conversely, we note that neither Russian Direct Investment Fund (RDIF) nor China Investment Corporation (CIC) invested in the US in our horizon sample, but instead extended bilateral investment activities between themselves.[5]

Also apparent from our sample is the continued emergence of funds with strategic domestic mandates, generally organized as development or strategic funds. In addition to the RDIF, these include the Ireland Strategic Investment Fund, CDP-E, Mubadala, Mumtalakat, Samruk Kazyna, among several others. Joining this group is the National Infrastructure Investment Fund of India (NIIF), which

[3] See https://www.themoscowtimes.com/2018/01/11/russias-reserve-fund-ceases-to-exist-a60157

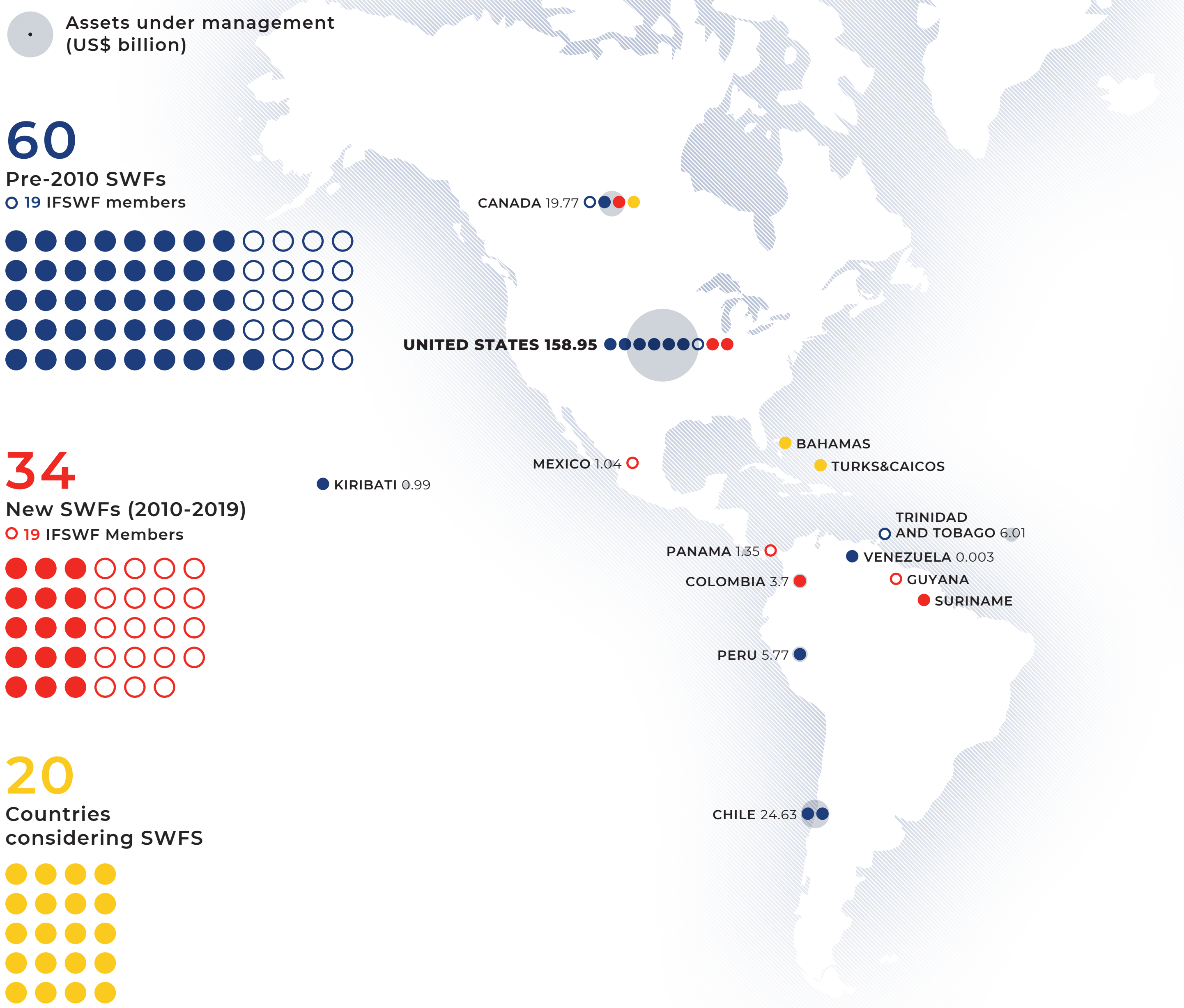
[4]Note for example, the sizeable inflow to GIC Singapore's foreign reserves; details available here - https://www.businesstimes.com.sg/government-economy/mas-s45b-transfer-to-gic-could-give-government-revenues-a-boost

[5] See https://www.ft.com/content/29e133dc-db73-11e9-8f9b-77216ebe1f17.

INFOGRAPHIC 1

IE Sovereign Wealth Research Map 2019

Currently, there are 94 active sovereign wealth funds, three more than in our 2018 Ranking. 65 countries have established at least one SWF, three more than a year ago. The Middle East, China, Southeast Asia and Norway are the four most active poles of SWFs. Assets under management totaled $8.3 trillion. SWFs have widely spread in recent years. Since 2010, 34 new funds have been established. Other 20 countries are actively considering establishing a SWF. Debates over new SWFs are growing in Sub-Saharan Africa and the Caribbean. Thus, in 2018, there are 114 operating or prospective-SWFs. 38 SWFs are full or associate members of the International Forum of Sovereign Wealth Funds.



Source: Sovereign Wealth Research (IE Center for the Governance of Change).


RUSSIA 134.14
NORWAY 1,047.05
UNITED KINGDOM
IRELAND 19.66
KAZAKHSTAN 127.48
FRANCE 4.67
ROMANIA
MONGOLIA 0.22
ITALY 4.23
GEORGIA 1.64
TURKMENISTAN
JAPAN
SPAIN 0.2
TURKEY 40
AZERBAIJAN 42.46
LEBANON
MALTA 0.53
CHINA 2,607.93
SOUTH KOREA 131.6
MOROCCO
1.80
CYPRUS
ISRAEL
IRAN 68
PALESTINE 1
KUWAIT 530.5
LIBYA 67
BAHRAIN 17.4
QATAR 304
EGYPT 0.28
UAE 1,259.37
BANGLADESH
MAURITANIA 0.15
SAUDI ARABIA 792.14
SENEGAL 0.02
OMAN 33.2
INDIA 3.0
VIETNAM 3.62
UGANDA 0.09
NIGERIA 1.69
SOUTH SUDAN
PHILIPPINES
GHANA 0.87
LIBERIA
MALAYSIA 32.72
BRUNEI 39.0
NAURU 0.06
EQ. GUINEA 0.08
GABON 0.02
KENYA
SINGAPORE 638
SÃO TOMÉ E
PRÍNCIPE
RWANDA 0.06
INDONESIA
TANZANIA
PAPUA NEW
GUINEA
TIMOR-LESTE 15.8
D.R. CONGO 0.002
ANGOLA 3.40
ZAMBIA
MOZAMBIQUE
BOTSWANA 4.9
ZIMBABWE
MAURITIUS
NEW CALEDONIA
NAMIBIA
AUSTRALIA 112.9
SOUTH AFRICA
NEW ZEALAND 28.09

has recently become a full member of the IFSWF. Strategic fund structures are designed to facilitate inward direct investment. Funds, such as RDIF and NIIF create bespoke investment "sleeves" through which to intermediate the flow of capital to distrete projects in their domestic economies. They also serve as domestic anchors for the types of bilateral investments programs noted above, often through special purpose vehicles, such as the Russia-China Investment Fund or the China-Ireland Growth Technology Fund.[6] Together development and strategic funds represent approximately 18 percent of the deals in our 2018-19 sample with total deal value of approximately $23 billion.

The theme of partnerships in fact resonates further through our sample as SWFs actively commit to investment platforms, consortia, and other closed investment structures. In our last report, we highlighted several such arrangements. The CIC, particularly, leverages partnering and co-investment to facilitate its access to deal flow. This was noted prominently in CIC's 2018 Annual Report.[7] Though we identified no direct CIC deals in the US during our sample period, CIC has been able to develop US exposure via its partnership with Goldman Sachs, the China-US Industrial Cooperation Fund, which announced its first investment in September 2019[8] CIC is also a member of the Quadgas consortium that acquired a 100% controlling interest in Cadent Gas in the United Kingdom. The consortium includes Macquarie Infrastructure and Real Assets and Allainz Capital Partners, among others.[9]

With respect to sectors, our sample is especially revealing of the steady inversion in sovereign flows from traditional industries, such as manufacturing, construction, telecom, retail, and power generation to critical sectors and industries that are expected to drive disruptive change in areas such as life sciences and technology, including big data and artificial intelligence. We attribute this to a combination of demand and supply factors. For example, the demand for capital in these sectors is growing rapidly as many innovative private companies move technology from research and development to production. On the supply side, sovereign and other institutional investors, with the capacity to invest in long duration assets, seek to diversify their direct holdings, while at the same time establish natural hedges against the disruptive forces that threaten returns across traditional industries. Direct investments in these advancing technologies offer not only the prospect of returns that are less (or even negatively) correlated with existing holdings, but also valuable insights into the forces driving broad macro and micro-economic transformations.

[6] The CIC has been an active partner in such arrangements. See for example references in its 2018 annual report available here http://www.china-inv.cn/chinainven/xhtml/Media/2018EN.pdf.

[7] China Investment Corporaiton 2018 Annual Report. Op cit.

[8] See https://www.wsj.com/articles/goldman-chinas-sovereign-wealth-fund-begin-investing-in-u-s-manufacturing-11568978734.

[9] See https://www.macquarie.com/us/about/newsroom/2018/quadgas-investments-aquire-interest-in-cadent-gas.

INVESTMENT ACTIVITY BY FUND

As noted above, the dominant direct SWF investors in our 2018-19 sample include Temasek, GIC, Mubadala, GPFG, and ADIA in the top five, followed in deal count by QIA, Australia Future Fund, the Ireland Strategic Investment Fund (ISIF), the Russia Direct Investment Fund (RDIF), the China Investment Corp (CIC), and Khazanah.

Across our sample of 267 investments, we identified 82 transactions attributable to Temasek, 35 of which were completed in the US, heavily targeting life sciences and technology. Temasek furthermore continued to invest actively in India and China. They also favored life sciences and technology sectors when investing domestically in Singapore. GIC's investments across our horizon were, by contrast, considerably less concerntrated in the US (10 deals), but rather more broadly diversified particularly across Asia, also including India and China, but, in addition, Vietnam, South Korea, Myanmar, and Indonesia. As noted above, GIC's investments as well reflects a continuing commitment to real estate.

NBIM, manager of Norway's Government Pension Fund-Global, a perrenial investor in global real estate with an original target of 5% of its assets, announced in 2019 a significant restructuring with direct impact to its real estate investment holdings. The fund's original intention was to invest up to 5% of the portfolio in direct real estate, but at present this allocation stands at 2.8%. In 2018, we identify 18 new GPFG transactions[10] in commercial office buildings focused on global gateway cities such as Paris, London and Boston and logistic assets in a range of geographies near central cities in Spain, Poland or the United States.

Of 13 deals in our sample attributable to the QIA, 10 transactions were completed in the US. These were primarily distributed across services, industry, technology, infrastructure and real estate. Mubadala's investments during the period were also notably concentrated in the US. This is consistent with Mubadala's expressed private market strategy targeting the US, particularly in technology-intensive industries such as data, fintech, software, and aerospace. ADIA's direct investment instead exhibits a noticeable India-bias (5 transactions or 30% of their sample total), including two transactions - ReNew Power and Greenko Energy - that reflect ADIA's increasing interest in renewable energy.

Ireland's ISIF is an active direct investor with the majority of its transactions concentrated domestically in the Republic of Ireland. In 2018, the Irish government reevaluated the ISIF's investment objectives in light of strong capital flows and solid economic growth. This resulted in changes to the ISIF mandate and resultant shifts in sector allocation centered on five key priorities: regional development; housing supply; indigenous industry; projects to address climate change; and sectors adversely affected by Brexit. Thus, across our sample, the ISIF, once again deployed the majority of its capital to domestic investments, in particular making active use of intermediated structures managed by Quadrant Real Estate Advisors and Beechbrook Capital. Similarly, the RDIF, as a development fund, also concentrated its investment activity domestically in Russia with six of its nine transactions domiciled domestically. These included, in particular, four transactions in life sciences covering biotechnology, pharmaceuticals and hospitals.

We identify seven transactions in our sample to the China Investment Corp. Among these most prominently is China's participation in the Quadgas investment consortium – noted above. With regard to CIC, it is also interesting to note that, starting in 2018, CIC began to report its domestic holdings along with its international portfolio. These assets consist of large state-owned financial institutions, managed through CIC subsidiary Central Huijin Investments. As of December 2018, CIC reported Central Huijin controlling stakes in 17 state-owned financial institutions amounting to $625 billion. This represents approximately 66% of CIC's total AUM.

[10] Our source for GPFG real estate transactions has not yet been updated.

INVESTMENT ACTIVITY BY GEOGRAPHY

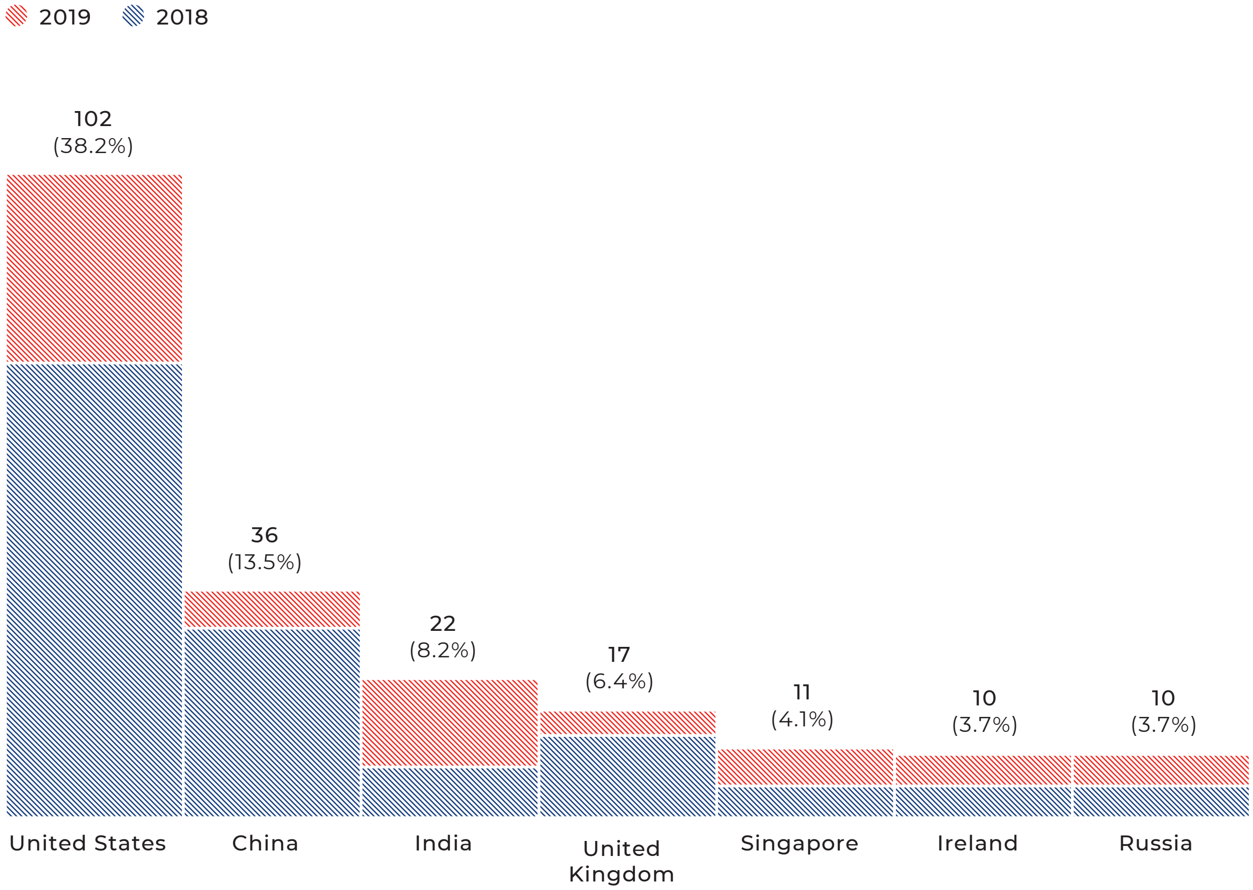
By geography based on deal count, the US (38%), China (13%), India (8%), the UK (6%), Singapore (4%), Ireland (4%), and Russia (4%) together account for 78% of the transactions in our sample (See Figure 2). This profile, however, masks considerable diversity in purpose and objectives. We earlier highlighted the profile and scale of SWF investment in the US. This was concentrated in several key industries including biotech, data, fintech, logistics and mobility services. Investments in China, heavily dominated by Temasek and GIC, were weighted in technology and life sciences with a focus generally on biotech and fintech. Investments in India, likewise dominated by Temasek and GIC, were also focused on technology, specifically fintech and e-commerce. Also noted above with respect to India, were investments by GIC and ADIA in infrastructure linked to renewable energy sources.

Despite the continuing uncertainty over Brexit, the UK likewise remained a preferred destination for sovereign investment. Across our sample 17 transactions were concluded in the UK. These were dominated by investments in technology and life sciences, but also included traditional sectors such as finance, insurance, real estate and utilities/ infrastructure. We note here for example, ADIA's

FIGURE 2

Top 5 destination countries 2018-2019

Deal count and % of total deals



Source: Sovereign Wealth Research (IE Center for the Governance of Change) and SovereigNET (Fletcher School, Tufts University). The 2019 data for the nine-month period Jan to Sep.

2018 investment in Anglian Water Group and reiterate the investment by a consortium of investors that included the CIC and QIA to acquire a 100% controlling interest in Cadent Gas.

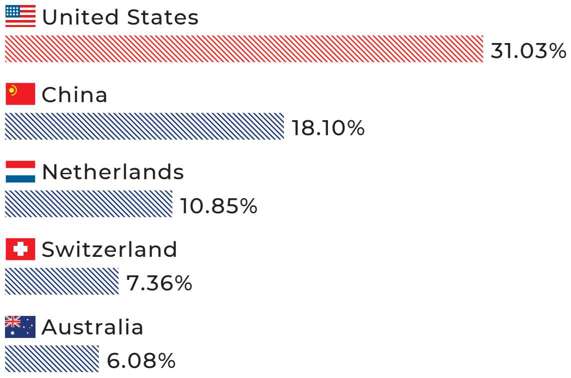
Important to note with respect to sovereign investments in Singapore, Russia and Ireland, that each benefited significantly from domestic investment activity by their respective SWFs. GIC, but particularly Temasek, invested extensively in Singapore most especially in the technology and life sciences sectors. In the case of Russia and Ireland, sovereign funds (RDIF and ISIF respectively) have a domestic strategic mandate and so dominated the deal count within their countries focusing on strategic sectors and, specifically in the case of Ireland, consistent with its revised mandate, regional development and small and medium enterprises.

In terms of deal size, we reiterate a frequent cautionary note that large transactions can dramatically skew sector and countries comparisons on a year-

FIGURE 3

Top 5 destination countries by deal volume 2018-2019

Percentage of total deal volume

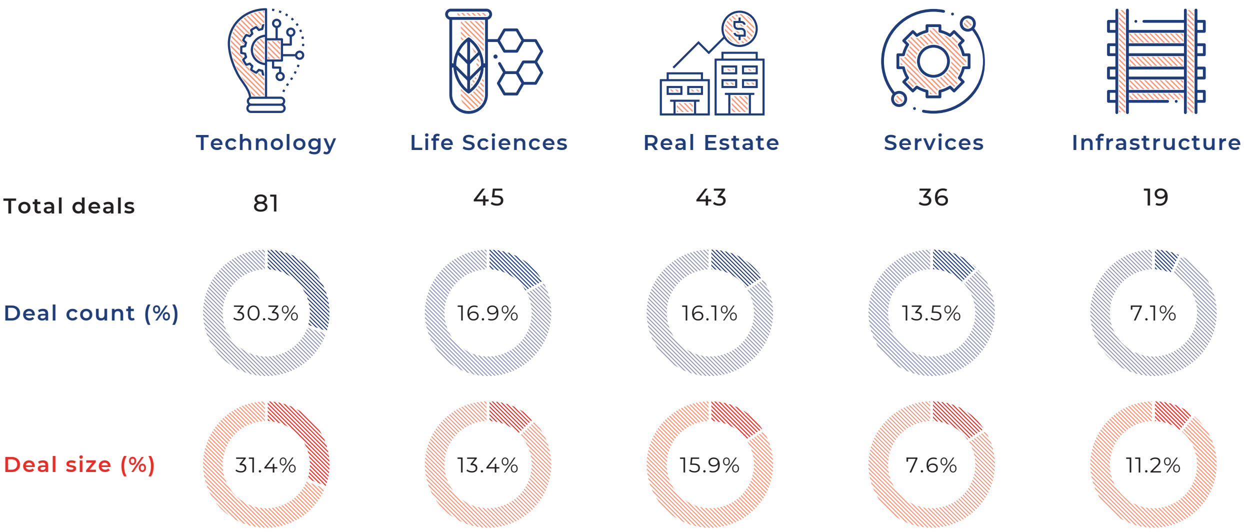


Source: Sovereign Wealth Research (IE Center for the Governance of Change) and SovereigNET (Fletcher School, Tufts University). *nine-month period Jan to Sep.

FIGURE 4

Top 5 sectors 2018-2019

Deal count and deal size



Source: Sovereign Wealth Research (IE Center for the Governance of Change) and SovereigNET (Fletcher School, Tufts University). The 2019 data for the nine-month period Jan to Sep.

on-year basis. In our current dataset, for example, several large deals placed the Netherlands, Switzerland and Australia among the top countries (See Figure 3). These included, in the Netherlands, GIC participation in Akzo Nobel, in Switzerland, ADIA's investment in Nestlé Skin, and, in Australia, ADIA's participation in WestConnex, an underground motorway currently under construction in Sydney.

INVESTMENT ACTIVITY BY INDUSTRY AND SECTOR

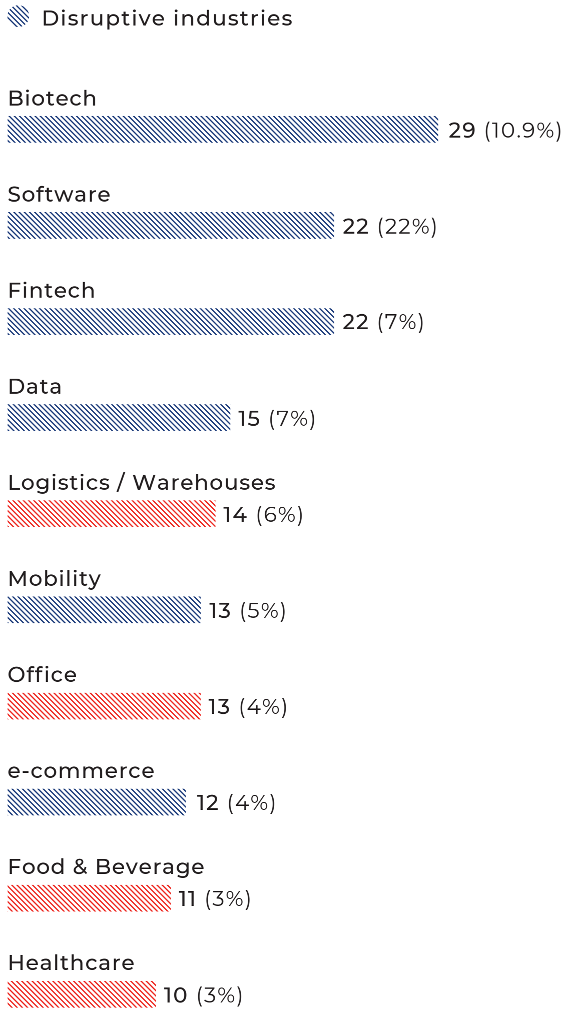
To develop a more focused view of sector allocations our taxonomy extends to 53 discrete industries across 11 sectors. We focus this analysis specifically on deal count in order to identify individual sectors and industries that garner a greater weight of sovereign investment. With regard to sector (Figure 4), sovereigns remain commited to technology, life sciences, real estate, services (including mobility solutions) and infrastructure (with an increasing preference for renewable energy projects). At the sector level by value, i.e. the aggregate amount of investment by all investors in deals in which sovereign wealth fund participated, technology also led at $43.6 billion, followed by real estate at $22.1 billion, industry as a sector at $20.9 billion, life-sciences at $18.5 billion and infrastructure at 15.6 billion.

At the industry-level, 60% of the deal count is concentrated in the top 10 industries led by biotech, software, fintech, data, logistics/warehouses, mobility, offices, e-commerce, food and beverage, and healthcare (See Figure 5). Nearly one third of the industry-level deal count consists of transactions in what we would describe as disruptive sectors, such as software, fintech, data, e-commerce, and mobility services. In addition, almost 17% of the total deal count is in life sciences, defined as biotech, healthcare, and pharmaceuticals.

In stark contrast, evidencing the inversion noted earlier, traditional industries - textiles, manufacturing, power generation, construction, telecommunications, port facilities, retail, and pipelines - attracted the least sovereign investment capital across our sample. Investments in natural resources, an earlier focus of sovereign investment, represented merely 1% of the transactions in our dataset by sector count.

At the fund level Temasek and GIC dominated across many industries but both were especially active in life sciences, a continuing focus that has persisted over several years. To date, Temasek has invested in a series of companies that target food, energy, waste and water challenges. These have included investments in meat-less foods such as Impossible Foods, Perfect Day, auto-immune diseases (Viela Bio), rare diseases (Orchard Therapeutics), genomic

FIGURE 5
Top 10 industries 2018-2019
Deal count and % of total deals



Source: Sovereign Wealth Research (IE Center for the Governance of Change) and SovereigNET (Fletcher School, Tufts University). The 2019 data for the nine-month period Jan to Sep.

informatics (WuXi NextCode), and pharma supply chain companies (Ascent Health and Wellness Solutions).

Real estate, as an asset class, has attracted considerable sovereign investment over the years. It has however been under increasing pressure. Nonetheless, it represents the third largest sector for sovereign investment in our sample by deal count. This ranking however belies an investor concentration that distorts more interesting and relevant trends. Among the 43 real estate transactions numbered in our sample the majority of them, approximately 18, were invested singularly by GPFG while GIC added with 16. GPFG has been a perennial contributor to the sector. Yet, a detailed analysis of Norway's 2018 and 2019 real estate transactions suggests that while continuing to add to their holdings, the fund has been a net seller of logistic and office assets. This is consistent overall with NBIM's decision in 2019 to restructure its real estate investment program and to consolidate its direct investing team with its public real estate program. Also, it appears to reflect a broader trend among large institutional investors to diversify away from the real estate sector as low interest rates and an abundance of liquidity drive valuations higher. Notwithstanding, GIC has sought out specific opportunities in property sub-classes, and continued to advance its interests in student housing, data centers, logistics and warehosues, as well as prime office buildings in a wide range of geographies including China, United States, South Korea, Australia, France or Mexico.

A 2019 LARGE DEAL SNAPSHOT

Across our sample we identify approximately 20 transactions over $1 billion, ten of which were completed in 2019 with five of these pending at 30 September 2019. These are dominated again by GIC and include two deals by GIC in oil and gas infrastructure - ADNOC Pipelines and Genesee and Wyoming – a third deal establishing a joint venture with Equinix to develop and operate hyperscale data centers in Europe, and a fourth deal with Carlyle, the private equity global group, to acquire a significant stake in the American Express' corporate travel business for an estimated $5 billion. Rounding out the top 5 pending deals in 2019 is GPFG's investment in an US logistics portfolio, acquired through the merger between Prologis with Industrial Property Trust (IPT). GPFG's investment includes no debt and values the portfolio at $1.99bn.[11]

A number of 2018 large deals received coverage in our 2018 report, including Ant Financial, and AccorInvest. We chose here to highlight selected 2019 transactions. Among these exceeding $1 billion in total value we highlight first an ADIA-led deal to acquire Nestle Skin Health, a unit of Nestle providing medical and consumer skin health solutions. Investors included Canada's Public Sector Pension Investment Board, one of Canada's largest pension investment managers.[12] The aforementioned Cadent Gas, at $2.5 billion, included sovereign participation by both CIC and QIA via the Quadgas consortium.

The QIA continued as an active investor in Manhattan real estate in 2019, joining Crown Acquisitions to invest $1.3 billion in a portfolio of properties controlled by Vornado Realty Trust[13] This follows 2018 Manhattan real estate investments that drew considerable global media scrutity due to reported links with the Kushner family.

[11] See https://realassets.ipe.com/norways-swf-invests-in-2bn-logistics-portfolio-from-prologis-ipt-merger/10034741.article

[12] See https://www.eqtgroup.com/news/Press-Releases/2019/consortium-led-by-eqt-and-adia-enters-exclusive-negotiations-to-acquire-skincare-company-nestle-skin-health/

[13] See https://www.reuters.com/article/us-usa-property-vornado-qatar/qatars-sovereign-fund-crown-acquisitions-named-as-investors-in-5-6-billion-new-york-deal-idUSKCN1RV120

Finally, we call out an interesting investment by Mubadala Capital, the private capital group of Mubadala Investment Company, who joined an investor group led by Sinclair Broadcast Group and included Amazon, RedBird Capital, and Blackstone's managed funds, to acquire 80% of Yes Network for a total value of $3.47bn. Yes Network is the most-watched regional sports network in the United States, home to televised games of the New York Yankees, the Brooklyn Nets, the New York Liberty, and New York City FC.[14] Mubadala has experience in the entertainment and media industry and was a major shareholder in EMI Music Publishing, sold to Sony in 2018.

CONCLUDING THOUGHTS

"Plus ça change..." Indeed, reviewing direct SWF investment activity in 2018-19, change is most evident in the sovereign embrace of the dynamism of rapidly evolving technologies in sectors that allow them to exploit their extended investment horizons to enhance long-term risk-adjusted returns. Partnering with a wide array of institutional investors, SWFs have diversified direct investment programs away from traditional sectors and deployed capital in scale to technologies and companies capable of driving disruptive innovation. Doing so affords them the ability to hedge disruption risk, while enhancing their own capacity to understanding the forces driving macro- and micro-economic change.

Yet, "...plus c'est la même chose", i.e. "the more they remain the same." This evolving inversion in sector allocation notwithstanding, prevailing fund-level activity, scale and geographic preference have remained consistent with earlier-established SWF practices. Of course, this should come as no surprise as it is the largest SWFs that have the capacity and scale – mandate permitting - to undertake direct investment programs. Moreover, constraints – whether imposed by scale, mandate, or even politics – necessitate that most funds in most deals invest both through and with other institutional investors. This includes sovereign development and strategic funds investing domestically. Rather than implying inertia then, continuity, along with stability, are key pillars on which to build and scale global capital markets. A third is partnership, as it is through such collaboration that risk – whether financial or political - is distributed and shared.

[14] See https://www.bloomberg.com/news/articles/2018-11-21/yankees-tv-deal-said-to-attract-ontario-fund-mubadala-amazon and also https://www.penews.com/articles/disney-sells-80-of-yes-network-to-new-investor-group-for-3-5bn-20190830.

2

TECHNOLOGY, VENTURE CAPITAL AND SWFS: THE ROLE OF THE GOVERNMENT FORGING INNOVATION AND CHANGE

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2. Technology, Venture Capital and SWFs: The Role of the Government Forging Innovation and Change

GLOBAL VENTURE CAPITAL: STYLIZED FACTS

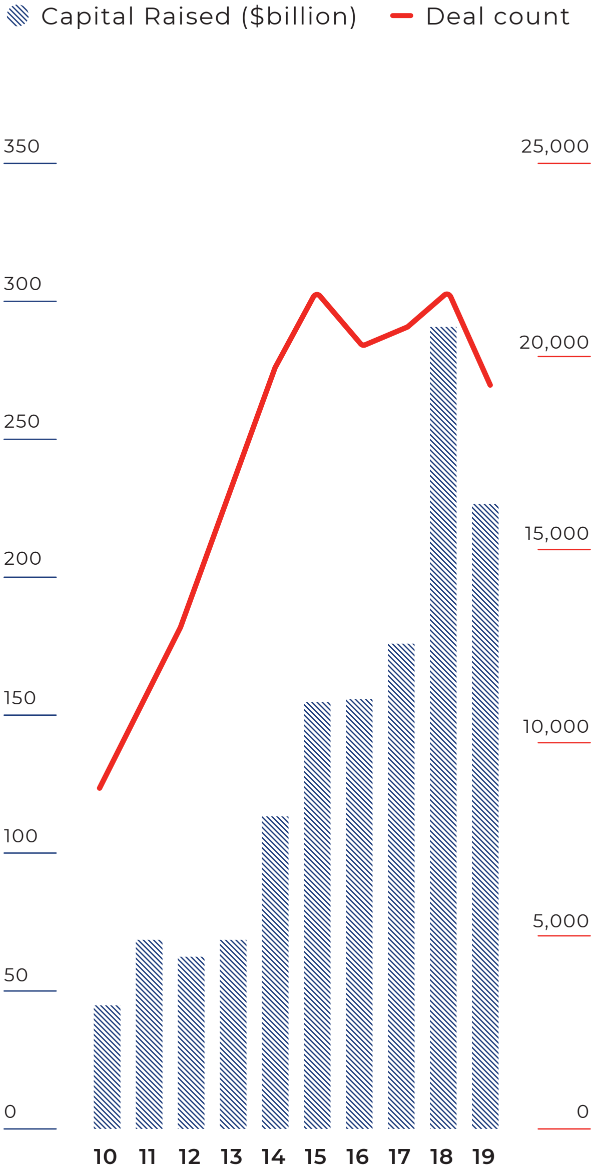
Technology firms lead the ranking of the world's largest companies in 2019. Microsoft, Apple, Amazon, Google/Alphabet or Facebook, along with Tencent and Alibaba, accumulate hundreds of billions in market capitalization, are well-known global brands and frame our societies and business models today. Technology-based companies are growing faster and larger as innovation ecosystems refine their processes, companies engage into digitalization and embrace new solutions. And as fears rise that industry incumbent leaders will be disrupted, more money flows into the game. Low interest rates paired with volatile and uncertain equities also attract nonconventional investors to the venture capital space in search of returns.

Most of the technology giants noted before (already known as FAAMG) were backed by angel investors and venture capitalists at their early stages. Today, the VC global industry tries to replicate the success of the past by finding and funding the future Google or Alibaba among the millions of companies established in innovation ecosystems in the United States, China, Europe and beyond.

The money has flown fluently. In fact, in yearly terms, 2018 represented a record year for global venture capital both in deal term and dollar volumes (Figure 1). Low interest rates and the scarcity of private equity opportunities partially explain this trend. In 2018, private companies raised around $300 billion in 20,744 deals, which is over three times as much capital as they raised just four years prior. Activity in 2019 is under a slight correction from the 2018 record year. According to CrunchBase, 2019 brought pause to a generalized uptrend in global venture dollar and deal volume, with an upswing in seed and early-stage deal counts in 2019 Q3 and a decrease in the number of mega rounds

FIGURE 1

Global venture capital deal flow



Source: Sovereign Wealth Research (IE Center for the Governance of Change) with data of PitchBook Data (2019).

(above $100 million). In the first nine months of 2019, 220 billion were invested globally across 26,000 venture deals.

Venture capital is one of the riskiest asset classes. Investing in early stage companies entails remarkable risks: 2 out of 3 startups which receive some initial seed capital stall at some point in the VC process and fail to exit or raise follow-on funding, which can be acceptable for startups themselves but is normally disastrous for investors. The odds of a company hitting a home run (10x return) is one in ten, and not surprisingly, the odds to become a unicorn (a privately-owned startup valued at one billion dollars or more) hovers around 1%.[1] So, yes, the Uber, Airbnb, Slack or Stripe, are the rare successful exceptions of an uncertain investment asset class filled with flawed promising bets.

Innovation ecosystems are growing worldwide, yet VC action has been highly concentrated in the US and China. By total dollar volume, 75 out of every 100 dollars invested globally since 2016 targeted US (50) or Chinese (25) companies. A recent decline (Q3 2019) in the number of mega rounds in China in favor of the US and Europe may drive more globalization of VC. In the second quarter of 2019, four of the ten largest late-stage rounds were raised by US-based companies, with just one Chinese company making the top ranks that quarter. Actually, the largest round was for a Colombian delivery company (Rappi) which received a $1 billion commitment by SoftBank's new Innovation Fund (a $5 billion fund focused exclusively in the Latin American market) in combination with its Vision Fund (backed by Mubadala and Saudi Arabia's Public Investment Fund (PIF)). The investment is the largest technology financing to date in a Latin America-based company and shows the globalization of startups and venture capital.

VENTURE CAPITAL, SOVEREIGN WEALTH FUNDS, AND INSTITUTIONAL INVESTING

Over the last five years, there has been a democratization of the VC practice and funding. As seen, innovation ecosystems are flourishing globally beyond Silicon Valley, and global investors are exploring this asset class with renewed interested by putting not only capital but knowledge and resources to work.

Technology is a necessary strategic driver for institutional investors today. And SWFs are not an exception. While growing their assets under management from nearly $3 trillion in 2008 to more than $8 trillion in 2018, SWFs increased positions in alternative asset classes and expanded their geographic scope. Also, SWFs have progressively added technology-based companies to their portfolios.

One may question the rationale behind this interest of SWFs on technology. Indeed, SWFs have pursued VC investments for a variety of reasons, that can be summarized in three main motivations:

- Strong returns from innovative technologies (disrupting incumbents)

- Asset class diversification

- Diversification of local economies and other positive economic spillovers

The focus on returns is perhaps most obvious, but also one of the more difficult to achieve. While VC has enjoyed historically high returns, a flood of investors into the space, often driven by a need to overcome low returns in debt assets, risks making the asset class a victim of its own success. While SWFs are eager to invest in venture capital, many SWFs are also recognizing that they must be careful in selecting when and how to invest. The search

[1] See "Venture Capital Funnel Shows Odds Of Becoming A Unicorn Are About 1%", Research Briefs, CB Insights, September 6, 2018. Accessed at https://www.cbinsights.com/research/venture-capital-funnel-2/

of stable and durable returns may include hedging against incumbent leaders. When they invest in a unicorn, they also aim to be part of the new economy that will lead the corporate world in the coming decades and back those companies that will amass the industry profits and market share. For example, it is reasonable for a SWF with a strong portfolio exposition to the banking industry to invest also in fintech companies that may disrupt the whole financial sector in the near future. The same logic applies to sectors such as retail, logistics, healthcare, hotel management, or transportation, that are being already disrupted by startups using new technologies, procedures and solutions.

SWFs' interest in VC is not drive solely by returns, however. Venture investing is also part of a broad strategy of diversification. SWFs want to diversify their portfolios to balance and smooth their exposure to different asset-classes. To include venture capital, as well as private equity or hedge funds, is part of the same logic of diversifying across all asset classes and a way to obtain balanced risk-adjusted long-term returns. Some SWFs do it directly establishing their own VC teams, while others prefer to do it giving specific mandates to funds managed by external asset managers.

While some funds are making a conscious shift to increased alternative investments, including venture capital, some of the shift is simply a result of the changing nature of capital markets. Because many companies are waiting longer (and growing bigger) before listing on a public exchange, increasing allocations to VC investments simply reflects the larger trend in the market towards companies remaining privately held for longer. Small or medium-sized companies that would have gone public 15-20 years ago are now deciding to remain privately traded. These trends in VC investment favor SWFs' longer-term investment strategies. SWFs are also some of the most deep-pocketed investors in the markets, and many SWFs have become very sophisticated and well-connected partners in the VC space, making them attractive as limited partners. Cultivating relationships with strong asset managers will be key for SWFs that want to be in line for the best deals.

There is a third reason for SWF interest in VC that is specific to government-owned funds such as SWFs: economic development and the logic of learning how to foster innovation ecosystems. When a pension fund invests in tech-based startups it pursues the first two objectives mentioned above: returns and diversification. Yet, in the case of SWFs, implementing a VC investment program may have a third motivation and benefit: the economic spillovers. SWFs can use these new technologies developed in their portfolio companies to foster economic development, enhance change, and diversify their economies beyond natural resources into stronger value-added economic sectors. In this way, getting access to the latest technologies would allow developing economies with established SWFs (recall that most of SWFs are located in developing economies) to leapfrog in terms of economic development. SWFs can help to transfer the most advanced technologies used by innovative startups in their portfolios to the rest of the economy, looking for efficiency gains in traditional and new sectors. At the end of this chapter, some specific cases are presented on how SWFs foster economic development through venture capital investments and strategies.

SWFS INVESTING IN VENTURE CAPITAL

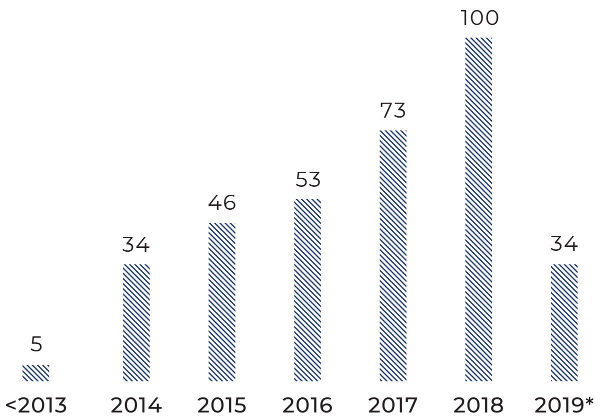
SWFs participated in venture capital rounds since late nineties. Yet, both the number of different SWFs investing in technology companies and the number of venture capital rounds in which SWFs have invested, has grown exponentially since 2014 (see Figure 2). Before then, only few SWFs invested in startups and showed an interest in VC.[2]

In fact, the linkage between SWFs and VC has a very clear driver: the Singaporean SWFs. Overall, both Temasek and GIC represent 62% of all VC round participations in our database. The Singaporean domination has been strong since 2014, representing more than 50% of deals yearly. Yet, this dominion has decreased over time since then, when SWFs like the Australia's Future Fund, Malaysia's Khazanah or the Ireland Sovereign Investment Fund (ISIF) decided to follow suit on this trend.

FIGURE 2

SWF investments in Venture Capital

Deal count



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase. *Up to September.

The database shows that SWFs have participated in 413 venture capital rounds since 1999.[3] As said, the SWFs interest in VC has two clearly differentiated periods. The first one finishes in 2013 and is characterized by a small number of deals and a small set of SWFs investing per year. During those years, the VC industry was still recovering from the burst of the internet bubble, and some massive SWFs like China Investment Corporation, Qatar Investment Authority or the Future Fund had not even been established yet. Thus, this first period, 1999-2013, averaged just 5 deals per year, and with a maximum of 5 SWFs per year joining VC investment rounds.

In contrast, the second, more "active" period, which started in January 2014 and for which we have data up to August 2019, averaged 57 deals and foresaw 11 SWFs joining VC rounds yearly, with a peak of 16 SWFs investing in 94 rounds in 2018. Well-known and global startups (i.e., Magic Leap, Luckin Coffee, GoGoVan) were invested in 2018 and 2019 by SWFs from Saudi Arabia, Russia, France, Ireland or Australia.

The total dollar volume of the SWF-backed VC rounds reflects a very similar trend (Figure 3). The first period, ending in December 2013, averaged $540 million per year. In contrast, the second period of expansion reached $15 billion per year with a record year in 2018, in line with global VC investment trends.[4]

To put this figure in context, in 2018, global venture dollar volume reached $334 billion,[5] while SWFs joined rounds valued at $30 billion ($41bn

[2] This chapter uses a proprietary database on venture capital rounds. The chapter uses this dataset to explain the relationship between SWFs to innovation and technology. Authors admit that other investments in larger tech companies may have similar spillover effects in terms of transferring knowledge and fostering innovation. The database core is obtained from Crunchbase and manually adapted to the SWF case by the Sovereign Wealth Research at the IE Center for the Governance of Change.

[3] In this chapter's statistics we do not include the investments made by Softbank's Vision Fund. It is not a SWF. It is the largest VC fund, managed by Softbank and backed by commitments of two SWFs: PIF ($45 billion of which only half is equity) and Mubadala ($15 billion, and only half is equity). All the conclusions of this chapter hold in terms of sectors of interest and investment approach, when we include Vision Fund investments. By August 2019, Vision Fund had 68 portfolio companies, with a clear bias toward transportation and logistics, which represent 28% of its total portfolio, and includes Uber, DiDi or Grab. Vision Fund's portfolio is also US-biased (44), followed from afar by Asia (18), and EMEA (6).

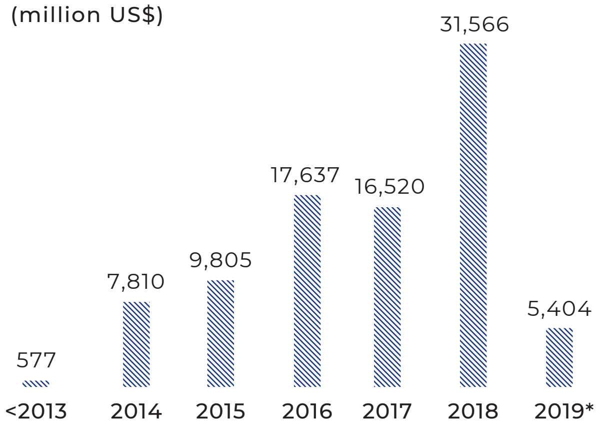
[4] It is important to notice that in most VC investment rounds, the information about the share of capital invested by each participant in the round is not disclosed. Thus, the figures showed represent the total dollar value of the VC rounds in which SWFs participate. Hence, it is unclear to obtain meaningful conclusions out of this dollar data, and the reason we rely more on deal count data to understand it.

[5] See "The Q2 2019 Global Venture Capital Report: A Market Gone Sideways", Crunchbase News, July 9, 2019. Accessed at https://news.crunchbase.com/news/the-q2-2019-global-venture-capital-report-a-market-gone-sideways/

FIGURE 3

SWF-backed Venture Capital rounds

Total VC round value (million US$)



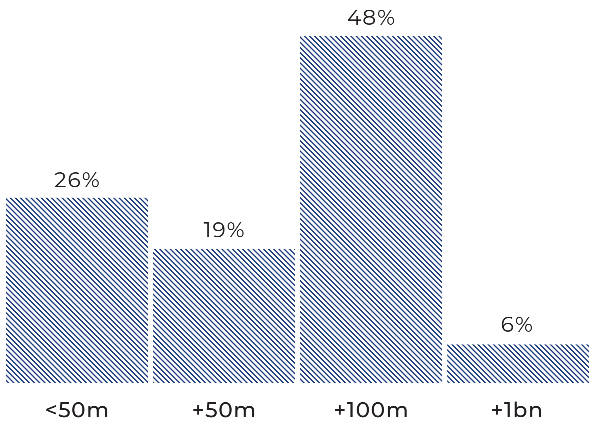
Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase. *Up to September.

Today, private companies grow bigger and get older while remaining private. The typical large VC-backed company founded before 2000 (Ebay, Salesforce or Google) took on average 6-8 years since inception to go public. In the case of Amazon, it was just 3 years private. When compared to companies founded since 2006, this average has been extended to 10-12 years (i.e., Uber, Airbnb, Lyft, Dropbox, Eventbrite) and more value is captured by private investors with larger and longer VC investment rounds. Startups reach higher valuations (billion or tens of billions) faster while still private due to larger rounds.

FIGURE 4

SWF investments in VC by round size (2014-2019)

Deal count (%)



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase.

if SoftBank Investment Advisors was included). This means that 9% of all world's VC dollar volume deployed in 2018 included SWF funding (12% if SBIA is considered). It is a quite remarkable figure given that SWFs participated in just 92 rounds that year, compared to a global total deal count of 34,100 rounds. The participation in the Ant Financial round ($14bn) represents almost half of the exposure, yet Go-Jek, Lufax or Lucid Motors, were billion-dollar investments too, amounting to a combined $3.8bn. However, as covered below, the bulk of the SWF activity focuses on a "smaller scale" of multi-million rounds ($100M+) which totaled another $16 billion, showing the relevance of SWFs in the global VC landscape at growth stages.

One of the reasons behind this growth of institutional investing in VC is the fact that VC-backed startups stay private for longer today than they did in the past. There are several reasons that explain why this is happening, including low interest rates and the search for returns; startups building maturity and global scale while avoiding public-markets pressure; and fundraising of even larger venture capital funds with the entrance of nonconventional sources of venture capital such as pension funds, university endowments and SWFs.

SWFs not only joined this wave of VC mega rounds, but as Figure 4 shows, SWFs have also joined smaller rounds below $50 million as well. However, data confirms the intuition that SWFs are joining more million dollar rounds today and less smaller rounds than they did in the past, in line with the market generally.

The billion-dollar rounds, which distort the average, are dominated by a handful of very large "unicorns". That is the case of the massive Ant Financial investment round of 2018 joined by Khazanah, GIC and Temasek (in which the total funding reached $14 billion), which remains the largest-ever venture capital transaction to date. Also, the investment made by PIF in Uber ($3.5bn), and several mega rounds in Alibaba or Meituan-Dianping (two of the largest e-commerce platforms in China and globally) were joined by SWFs too, showing their interest for massive rounds in privately-owned tech companies. China dominates this segment of the market with 12 of the 17 billion-dollar rounds, only contested by few startups based in the US, India, and Indonesia.

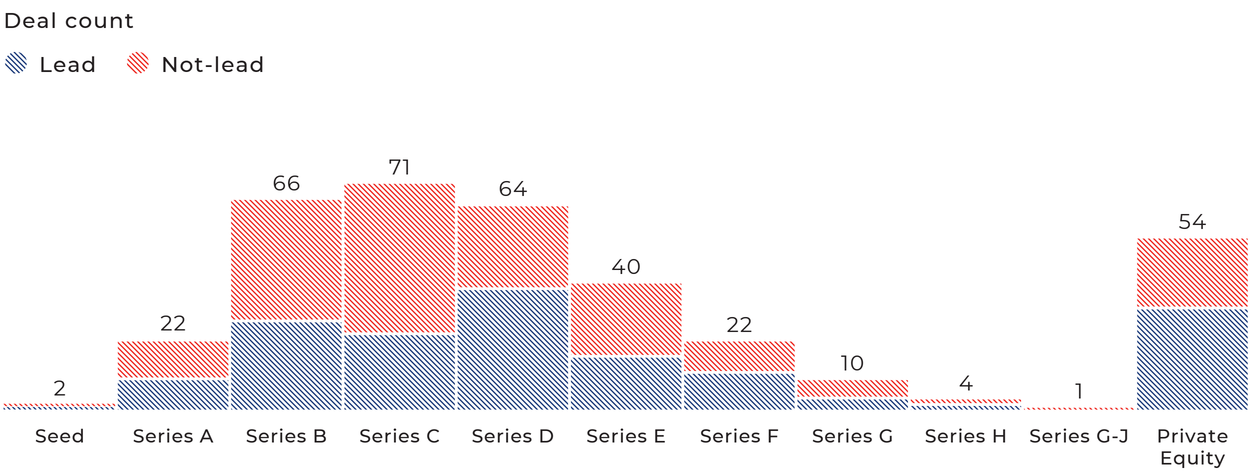
Globally, the number of VC investment rounds above $100 million has grown since 2014, both in absolute and relative terms. At the end of the third quarter of 2019 this figure reached 57% of total dollar volume. SWFs have followed this market trend and focused on these 100 million-dollar rounds, which represented 48% of all SWF-backed VC deals in the last five years.

Related to the size of rounds is the ability of large institutional investors managing billions of dollars of identifying entrepreneurs and innovative startups at earlier stages. Despite startups expanding faster globally, entrepreneurship still requires a strong local presence and understanding. This is why most SWFs investing in VC have established new offices around ecosystem areas such as San Francisco, Silicon Valley, New York, Shanghai or Bangalore. This has given them the opportunity to invest at earlier stages. According to the classical taxonomy for private-company funding cycle (pre-seed, seed, Series A, Series B, etc., until private equity and pre-IPO rounds), SWFs are getting access to very late rounds (SWFs have joined rounds G, H or J in companies such as DoorDash, Flipkart, or SoundCloud), but also have participated in early-stage series A rounds with local VC partners. The Infographic shows how SWFs invested in the last six years. The bulk of the SWF strategy is still dominated by early-stage Series B and late-stage Series C, and D.

Interestingly, Figure 5 shows that SWFs are not only joining VC rounds but also leading them. In total, SWFs have led or co-led investment rounds in 141 cases, almost one third of financing events. Again, it remains true that this segment is dominated by the Singaporean funds (51%), yet more SWFs are leading VC rounds such as the Future Fund of Australia, ISIF, Khazanah, or ADIA.

FIGURE 5

SWFs VC Rounds Lead vs Not-lead (2014-2019)



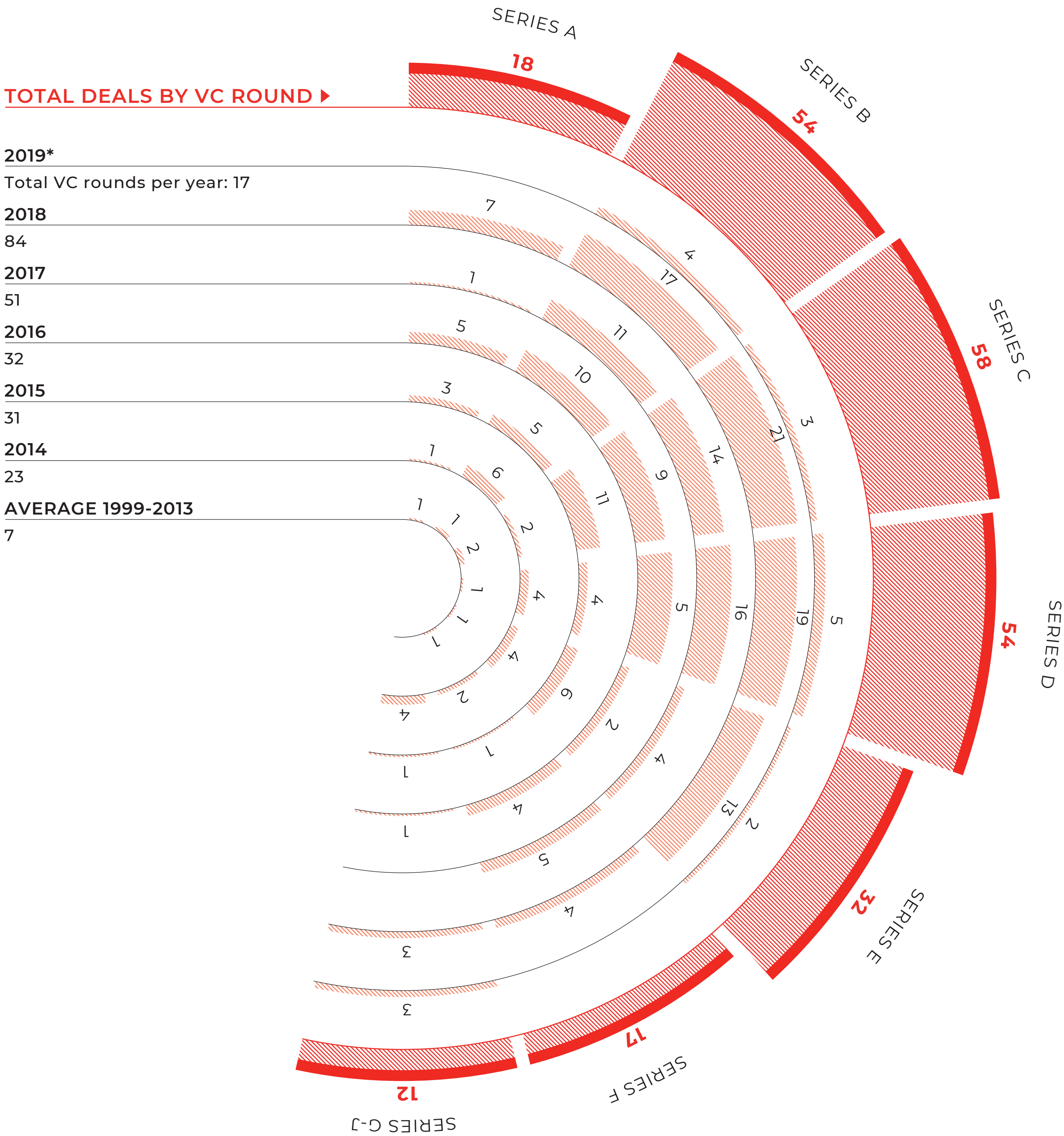
Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase.

INFOGRAPHIC 2

SWFs foster change via venture capital

SWF investments, by Series

Deal count of VC rounds



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on data from Crunchbase (2019).

*Up to september.

SWF investments in Bio&Healthtech

	14	15	16	17	18	19*	TOTAL 2014-2019*
Bio&Healthtech VC rounds joined by SWF	5	7	7	17	29	4	69
% of VC rounds	15%	15%	13%	22%	29%	12%	20%

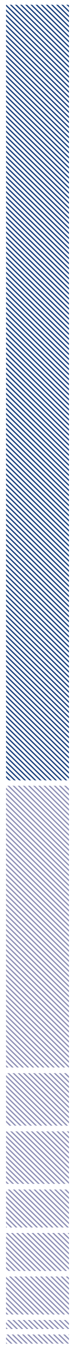
Other sectors

VC rounds joined by SWF

	14	15	16	17	18	19*	Total
E-Commerce	10	6	11	1	2	2	32
FinTech	2	1	5	8	8	4	28
Energy	2	3	3	4	4	5	21
Mobility	2	4	1	3	6	1	17
A.I.		3		2	7	2	14
Food & Beverage		2		2	4	3	11
Analytics		1	3	4	2	1	11
Enterprise Software	1	2		1	4	2	10
Software	1	4		4			9
Advertising	1	1	4	2	1		9
CyberSecurity			1	1	5	1	8
Cloud		1		5	1	1	8
Edtech	1	4	1		1	1	8
AgriTech			2	3	3		8

USA vs China in biotech

VC rounds joined by SWF (% total rounds)

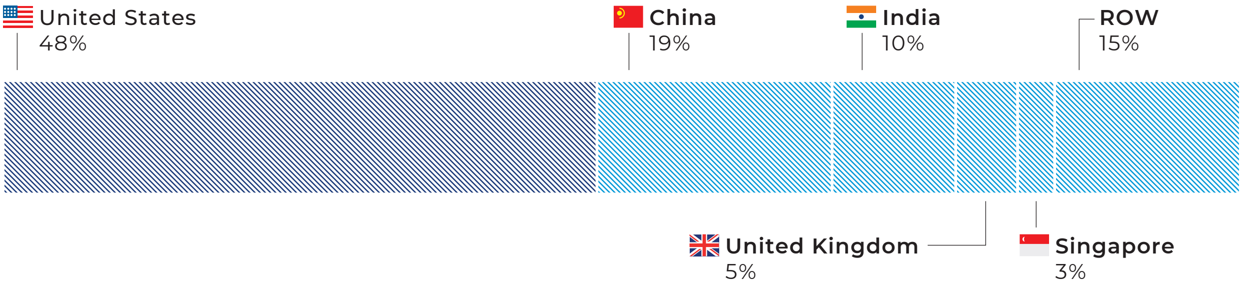


- United States **58%**
- China **22%**
- India **4%**
- United Kingdom **4%**
- Singapore **3%**
- France **3%**
- Ireland **3%**
- Russia **1%**
- Israel **1%**

FIGURE 6a

SWF-backed venture rounds by country

% of total deals



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase.

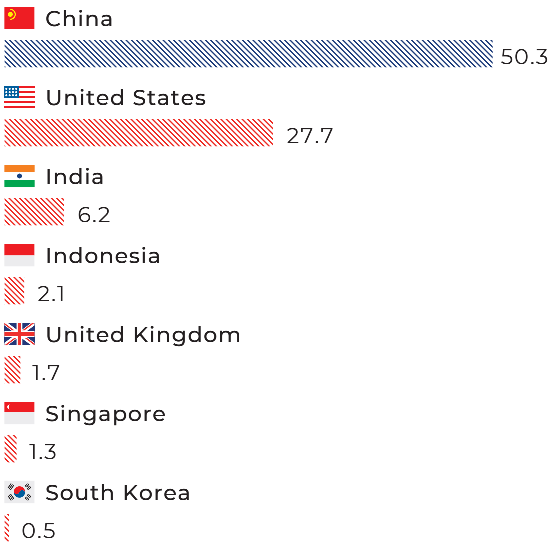
Geographic preference for technology startups remains quite concentrated in the US and China, overall. So far, the United States is the clear leader with 191 deals with SWFs participation, followed by China with 80, and India with 49 (Figure 6a). The United Kingdom and Singapore close the top-5 destinations by deal count with 23 and 14, respectively. Yet, the last period (2014-2019) reinforced the diversification process already explained and affected also the geography of technology, with startups established in 30 different countries being invested by SWFs. Today, more economies are able to attract institutional investment by building valuable innovation ecosystems from Ireland to Russia, France, Canada or Spain.

Similar results are obtained when considering the total dollar value of the investment rounds joined by SWFs. Yet, in this case, and due to the presence of the large billion-dollar rounds, China leads the ranking (Figure 6b) with a total investment in VC rounds joined by SWFs of close to $50 billion, followed by the United States ($28bn), India ($6.2bn), Indonesia ($2.1bn) and the United Kingdom ($1.7bn).[6] The geopolitical implications of such competition have been stressed of late, and the results of the winning race for technology dominance go beyond mere financial considerations. So far,

FIGURE 6b

SWF-backed venture rounds by country

Total venture round value (US$ billion)



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase.

[6] The inclusion of the Vision Fund has no effects in the geographical distribution of deals, yet it has a strong effect when total dollar value is considered. The Vision Fund has joined massive rounds of US-based companies worth $27 billion since 2017. When included, the US still makes the second rank globally but barely closes the gap with respect to China.

the United States is able to attract more deals, while China is able to attract more capital.

In terms of sectors, the preferences remain clear: SWFs are investing repeatedly in biotech, e-commerce, fintech, healthcare, mobility, artificial intelligence and energy startups (See Figure 7a and 7b). Dollar amounts give preference to fintech (again, Ant Financial's massive round distorts the averages) and mobility over e-commerce and biotech or healthcare.[7] Apart from these dominant sectors, SWFs are interested in technologies that can be applied to traditional sectors such as education and agriculture, or new solutions in the space of cybersecurity and the Internet of Things (IoT).

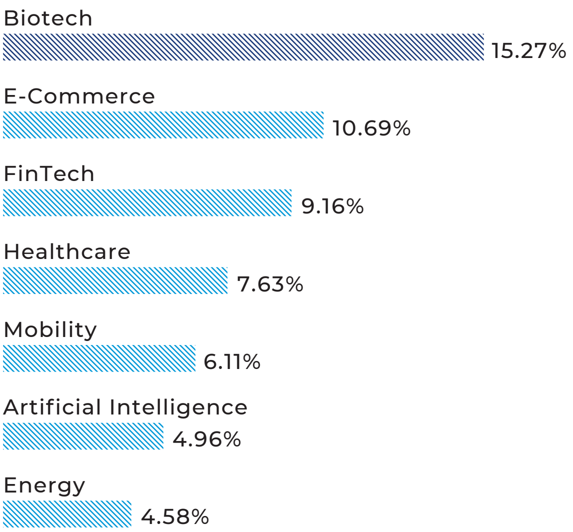
The current competition among countries to lead in areas such as artificial intelligence, cybersecurity, mobility or biotechnology will depend in high degree on how fast and large these startups grow. For instance, the Infographic details the competition between China and the United States to lead the development of biotechnology and healthcare startups. Combined, both countries already concentrate the majority of all SWF-backed VC deals, reaching 70% in 2018-2019. Yet, this figure grows even more up to 80% in the case of bio and health tech companies, showing a new battleground between the two countries to command the race of precision medicine, in the increasing convergence of genomics and artificial intelligence.

To understand the behavior of these investment giants, and the technologies SWFs prioritize, remains a critical task given the potential significant impact on the future of SWFs domestic economies, social development and international relations too. Change, in the end, will be affected globally by the investment decisions made by these government-owned financial institutions.

FIGURE 7a

SWF-backed venture rounds by sector (2014-2019)

% of total deals

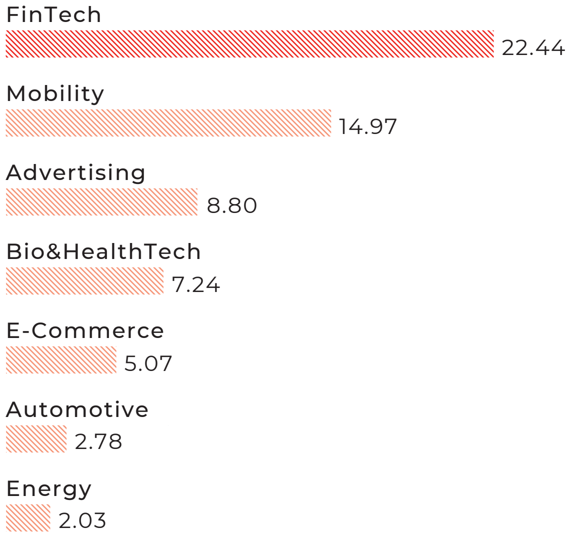


Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase.

FIGURE 7b

SWF-backed venture rounds by sector (2014-2019)

Total venture round value (US$ billion)



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Crunchbase.

[7] The inclusion of Softbank has no important repercussion in terms of sectors measured by both deal and dollar total volume, just an increase in mobility and e-commerce startups is observed. The same sectors remain on top of the ranking with or without the Vision Fund.

THE STRATEGIC LOGIC OF SWFS INVESTING IN VC: CASE STUDIES IN INNOVATION, DIVERSIFICATION, AND DOMESTIC DEVELOPMENT

As explained above, SWFs pursue VC because it can provide strong returns, diversity their portfolios, and provide positive spillovers through economic development. SWFs and strategic development funds are usually motivated by more than one of these reasons. The following case studies show how these motivations push investment strategies at three of the most successful funds operating in the VC space.

The SoftBank's Vision Fund

In an influential 2013 article, Gao, Ritter and Zhu examined reasons for the decline in US IPOs from an average of 310 IPOs per year in 1980-2000 to 99 IPOs per year from 2001-2012.[8] Not only have IPOs of all sizes dropped significantly, but small-company IPOs of less than $50 million have dropped more than 80%. What explains this precipitous change in the IPO markets? Many market participants have argued that the costs of being a public company have become too great, and that the market "ecosystem" of underwriters, brokers, and analysts has been eroded such that there is not sufficient analyst coverage for emerging companies.

While they recognize that regulatory changes have led to increased public company costs and an impoverished ecosystem for small companies in particular, they find stronger evidence for a different phenomenon shrinking the IPO market: in many sectors of the economy "the importance of bringing products to market quickly has increased." For many companies, then, the goal is to realize economies of scope as quickly as possible. To survive and thrive in modern markets, companies must grow large as quickly as possible, and can often do that more easily in private markets. This strategy has also been applied to other markets around the world.

[8] See Xiaohui Gao, Jay R. Ritter, and Zhongyan Zhu. (2013). Where Have All the IPOs Gone? Journal of Financial and Quantitative Analysis 48(6), 1663-1692.

SoftBank's Vision Fund has taken advantage of this "get big fast" market dynamic since its inception in 2017. As Vision Fund founder Masayoshi Son stated at a recent symposium, "in our industry, winner takes all. By probability, the No. 2 company's chance of succeeding is very low."[9] SoftBank tends to look for early-stage companies that are already leaders in their field and provides them funding that allows them to dominate their industry. This risky strategy has yielded some strong returns. The fund reported annualized returns of 29% since its inception in 2017 through the end of March 2019.

Funded mainly through limited partner contributions from SWFs (Saudi Arabia's Public Investment Fund and Mubadala Investment Company committed $45 and $15 billion, respectively), the fund has a particular and risky capital structure. A big part (40%) of the fundraising was in preferred shares, which pay a 7% coupon. This unusual model attracted large investors and helped to raise massive capital at a record short time, but increased risk in the fund given that coupon payments must be made whether or not the fund is making money.[10]

The $100 billion Vision Fund has primarily focused on investments in IoT, artificial intelligence (AI), robotics, mobile applications and computing, communications infrastructure and telecoms, computational biology and other data-driven business models, cloud technologies and software, consumer internet businesses and financial technology. [11]

[9] See "Masayoshi Son and his SoftBank Vision Fund place massive bets", Reinhardt Krause, Investor's Business Daily, September 23, 2019. Accesed at https://www.investors.com/news/technology/softbank-vision-fund-masayoshi-son-places-big-unicorn-company-bets/

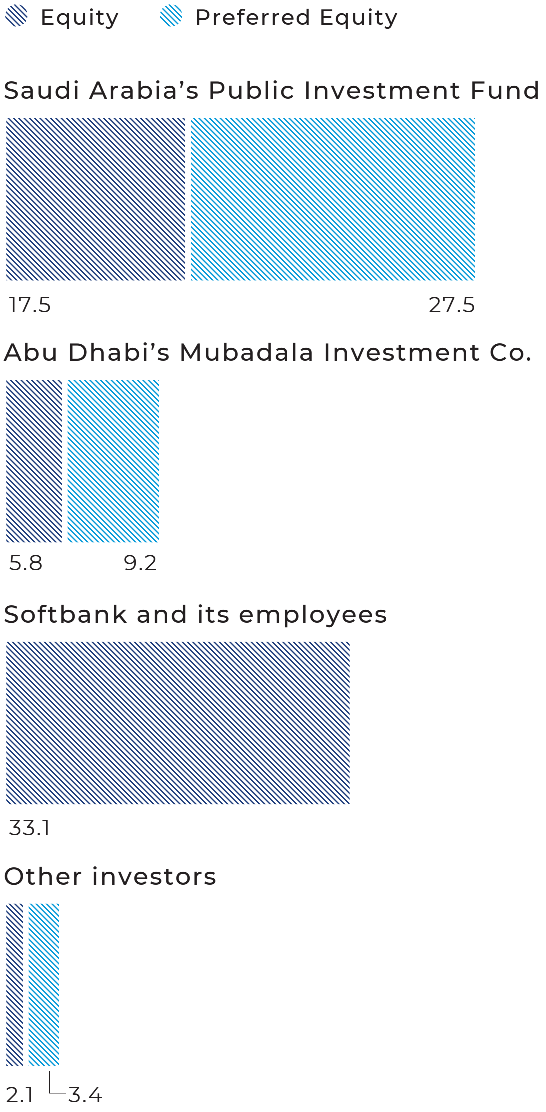
[10] See "What drove SoftBank's Vision Fund up is dragging it down", Mirima Gottfried and Phred Dvorak, The Wall Street Journal, September 23, 2019. Accessed at https://www.wsj.com/articles/what-drove-softbanks-vision-fund-up-is-dragging-it-down-11569243411

[11] See "SoftBank Vision Fund and Delta Fund segment", SoftBank Group. Accessed at https://group.softbank/en/corp/business/svf/

FIGURE 8

Vision Fund Limited Partners

Billion of US dollars



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on SoftBank Group and The Wall Street Journal.

Among the more well-known investments of the Vision Fund are the fund's big bets on Uber, WeWork, OYO and Slack. Yet, not all of these investments are faring as well as expected; some of the most important bets made by the SWF-backed Vision Fund are analyzed below. What made the fund soar in bull years may pull it down during a bear market.

Indeed, public markets are not validating the private valuations accounted for by large institutional investors who participated in late private venture rounds and the idea of "get big before you get profitable" is under full revision. For example, Uber's IPO disappointed in May 2019 after years of high expectations. Only months earlier, at the time of the IPO, investment bankers involved in the process expected a record initial public valuation of $120 billion. Uber raised $8 billion in fresh capital, yet the post-IPO stock sank 8% in the first day of trading to a valuation below $70 billion, a figure below the latest private round at $76 billion in August 2018. Since the IPO in May 2019, Uber stock has lost an additional 20% of its value.

Similarly, WeWork abandoned its IPO plans after weeks of turbulences. In September 2019, WeWork announced it was slashing its IPO valuation potentially as low as $15 billion, a long distance from the $47 billion figure it had reached in January 2019 when Vision Fund led the latest private VC round. Finally, WeWork shelved its IPO intentions and was bailed out by SoftBank with a rescue package of $9.5 billion, that would imply an astonishing valuation loss of $37.5 billion. For comparison, the worst historic drop in valuation was Square in 2015, the San Francisco company had had a final private valuation of $6 billion yet an initial market cap of $2.95 billion, a valuation loss of more than $3 billion (this is almost 13 times smaller than the WeWork's valuation collapse). Other companies which suffered in their transition to public markets in recent years were Pinterest ($2.2 billion valuation loss), Domo ($1.8bn) or Box ($0.8bn). The strong presence of SoftBank in The We Company (parent of WeWork), with more than $10 billion invested and controlling 30% of its shares, explained why the Japanese company urged managers at WeWork to abandon the IPO and focused on the foundations of the company to emerge from an extreme business situation.

Yet, the Vision Fund has a large number of companies still in the pipeline for future public offerings or acquisitions. On the positive side consider the case of Flipkart, the first known divestment of the Fund. The Vision Fund acquired a $2.5 billion stake in Flipkart in August 2017, which was sold to Wal-Mart for $4 billion, only nine months later.

Other companies which are yielding a positive investment income are Slack, DoorDash and OYO. Slack expanded its valuation through a direct listing, in spite of its shares having declined since then to a $13 billion valuation in September 2019. The Vision Fund put capital in the company at a valuation of $5 billion, which still implies a high markup. On its part, DoorDash was valued at a Series G round in May 2019 more than $12 billion, while the Vision Fund and Temasek led a Series D round in 2018 at a mere $1.8 valuation. Similarly, OYO, the India's second most valuable startup and a regional accommodation leader, has performed with the support of the Vision Fund, which has followed on investments since July 2015.[12]

Building off the experience of the Vision Fund, Softbank is set to continue pursuing its winner-take-all investment model with the launch of SoftBank Vision Fund 2. Limited partners expected to commit to the $108 billion fund include SoftBank Group, Apple, Microsoft, a group of Japanese banks, the National Investment Corporation of National Bank of Kazakhstan (a SWF), among others. If finally raised, the fund is expected to be more narrowly focused on artificial intelligence investments with an explicit determination for profit-making mature companies. As noted by the Wall Street Journal, the size of Vision Fund 2 is more than five times the size of the $20 billion total that was invested in privately-held artificial intelligence companies in 2018.[13] Yet, the doubts casted by the failed IPO of WeWork and the stock performance of Uber and Slack may delay or reduce the ambition of this second Vision Fund and probably reconsider a risky although unique investment strategy, backed by sovereign wealth funds.

[12] See "Here's What SoftBank's Earnings Tell Us About How The Vision Fund Is Performing", Alex Wilhaelm, Crunchbase News, August 7, 2019. Accessed at https://news.crunchbase.com/news/heres-what-softbanks-earnings-tell-us-about-how-the-vision-fund-is-performing/

[13] See "AI Is Hot and SoftBank's New Tech Megafund Offers Cash to Burn", Heather Somerville, The Wall Street Journal, August 8, 2019. Accessed at https://www.wsj.com/articles/ai-is-hot-and-softbanks-new-tech-megafund-will-add-money-to-burn-11565184767

TABLE 1

ISIF Priority Themes

Priority	Regional Development	Housing
Goal	€500m - €750m of commercial investment into the Regions	25,000 homes by 2025
Investment Case	Dublin has an overconcentration of population, homes and jobs. Cities like Cork, Limerick, Galway and Waterford are growing but not at the pace or scale required to function as realistic alternatives to Dublin.	Despite increased activity levels, significant capital gaps persist in the housing market. ISIF to focus on parts of the capital structure where there are funding gaps.

Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Ireland Strategic Investment Fund (Investment Strategy 2.0).

Ireland Strategic Investment Fund

Some sovereign investment activity is primarily domestic in nature. Indeed, a rapidly expanding group of sovereign funds, often identified as "strategic investment funds" (SIF) or "sovereign development funds," have been created in the last few years (this SIF tradition started with Singapore's Temasek and Khazanah from Malaysia, recently followed by Russia, Senegal, Turkey or Malta). These funds typically add to the sovereign fund focus of profit-maximizing foreign investment a "double bottom-line" of financial goals and economic development through their domestic investments. A primary example of a successful SIF is the Ireland Strategic Investment Fund (ISIF). ISIF was founded in December 2014, with a mandate to invest "on a commercial basis in a manner designed to support economic activity and employment in the state." ISIF's investment priorities are aligned with the Project Ireland 2040 program, and focus on 5 priority themes: regional development to encourage balanced economic growth, housing, indigenous businesses, climate change and sectors adversely affected by Brexit.

As with most SIF's, ISIF seeks to leverage private capital, and has, to date, achieved a co-investment ratio of 2.8x. Whereas the Vision Fund makes direct investments in growing market leaders (without a double-bottom-line focus), ISIF tends to invest both directly and through a fund-of-funds model. In 2019, for example, ISIF made a variety of investments in its priority programs through venture funds, as shown in Table 2.

Venture investments were an important focus of ISIF's investment activities under the ISIF 1.0 Investment Program (totaling about 15% of €4.1 billion committed) and look to take an equally significant role as ISIF embarks on its ISIF 2.0 Program.

Indigenous Businesses	Climate Change	Brexit
Support and scale >100 businesses over 5 years	Investments to deliver substantial carbon reduction	Commercial investment to enable long term product and market diversification
There has been a lack of scaling of indigenous businesses over the last 10 years. ISIF can assist in developing the next wave of large-scale businesses in Ireland that compete internationally.	Significant progress required in this arena in order for Ireland to meet future 2030 EU renewable energy targets.	Enhance the long term resilience of businesses in Ireland principally through market and product diversification as they prepare for a post-Brexit era.

TABLE 2

ISIF 2019 Investments (through July)

Issuer	Target	Type of investment
July 2019	Beechbrook Capital	Ireland SME Fund
June 2019	Vectra	Follow on investment in an artificial intelligence cybersecurity company
June 2019	Gore Street Energy Storage	Financing the build out of energy storage infrastructure in Ireland to support the growth in renewables
May 2019	Atlantic Bridge Fund IV	Venture Fund focused on investing primarily at the expansion capital and growth equity stages in companies that have started to scale
May 2019	Fountain Healthcare Partners III	Venture fund providing risk capital and expertise to entrepreneurs developing life sciences companies
May 2019	Ata Group	Commitment to help ATA, a precision engineering group, to scale and expand domestic and international operations through the acquisition of Karnasch Professional Tools
April 2019	ILIM	€140 million commitment in Irish Life's Residential Property Fund to create new homes for the private rental market
April 2019	Quadrant	€35m investment in Quadrant managed fund that will provide financing of up to €120m for the development of high-quality office space in Cork City
March 2019	Green Isle Foods & Donegal Catch	Funding for the acquisition of Green Isle Foods and Donegal Catch enabling plans to grow revenues and diversify its customer base
February 2019	Frontline EMEA Expansion Fund	Expansion stage venture capital fund that will invest in highly rated North American software companies that are at the point of entering the EMEA

Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Ireland Strategic Investment Fund (2019).

Mubadala Investment Company

Abu Dhabi's Mubadala Investment Company has a sophisticated venture program too. As noted above, Mubadala has partnered with Softbank with a $15 billion commitment in the Vision Fund. Along with its Vision Fund investment, Mubadala Capital's venture team also has a U.S. Ventures program, a Europe Ventures Program, and invests through a fund-of-funds program. As noted in Table 3, Mubadala has identified key areas in which it has garnered expertise and has concentrated its investments.

The newest of these programs is the $400 million EU venture program, which Mubadala announced in June of 2018. This EU strategy will focus on "founder-led, high growth technology companies with global scale and impact."[14] Mubadala Ventures, which manages Mubadala's VC programs, will also expand its fund of funds program. Through direct

[14] See "Mubadala to launch $400 million European tech fund", Mubadala, June 13, 2018. Accessed at https://www.mubadala.com/en/news/mubadala-launch-400-million-european-tech-fund

TABLE 3

Mubadala's "Typical Investment Parameters"

Sector

Broad enterprise and consumer technology investments.

Developing deep theses and relationships in the following core areas:

· Life sciences and digital health.
· Frontier technologies including cyber, airspace security, satellites and space.
· Transformation and digitization of the enterprise.
· Fintech including blockchain, financial services, and insurance tech.
· Transformation of cities and transportation.

Open to founders applying technology in novel ways and building defensible business models.

Geographic Focus

Global with a focus on North America and Europe.

Transaction Type

Minority positions in common equity, preferred equity or convertible notes in series A and beyond in early stage, founder-led companies based in the U.S. and Europe.

LP commitments to established venture capital managers with strong track records as well as to new venture capital managers with unique and differentiated points of view and strategy.

Ownership / Governance Model

Active portfolio management approach with a preference for board seats at portfolio companies where the investment team can support management to create value over time.

Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Mubadala Capital.

and fund-of-funds investment, Mubadala Ventures hopes to target European tech companies, and particularly companies that look to establish operations in Abu Dhabi as a means to access Gulf States and Middle Eastern markets.

The drive to establish Abu Dhabi as a tech hub has taken shape through the HUB71 initiative, formed as a collaborative tech incubator system co-founded by Mubadala, Microsoft, and SoftBank's Vision Fund, operating out of the Abu Dhabi Global Market. The ecosystem seeks to bring together and support start-ups, VCs, accelerators, established tech companies, other large business entities, universities, and governments. Among other things, Hub71 offers subsidized housing, office space, and health insurance. And, crucially, Hub71 also supports the venture ecosystem by arranging co-investment with venture capitalists in Abu Dhabi-based start-ups and with Abu Dhabi-based "first-time" fund managers. The Abu Dhabi Investment Office manages the Hub71 platform.

Mubadala's venture programs highlight the importance of developing and leveraging relationships among investors. Mubadala committed $15 billion in the Vision Fund, and SoftBank is in turn providing $200 million of the $400 million Mubadala EU venture program. SoftBank is also supporting Hub71 financially and by encouraging portfolio companies, including Uber, Didi, and OYO, to be part of the Hub71 ecosystem.[15]

[15] See "Abu Dhabi offers startups Dh535 million through new hub", Triska Hamid, Wamda, March 24, 2019. Accessed at https://www.wamda.com/2019/03/abu-dhabi-offers-startups-dh535-million-new-hub`

3

SWFS IN A BAD YEAR: CHALLENGES, REPORTING, AND RESPONSES TO A LOW RETURN ENVIRONMENT

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3. SWFs in a Bad Year: Challenges, Reporting, and Responses to a Low Return Environment

Sovereign wealth funds (SWFs) are long-term investors by nature. One of the most pressing challenges for long-term investors is precisely to endure the lower parts of the business or equity cycle. Year 2018 could have been perceived as a difficult year for those looking beyond short-term investment horizons. This chapter captures how the long-term investment community behaved during a low performance year and what lessons can be learned.

Indeed, 2018 was a difficult year for many. The geopolitical and macroeconomic uncertainty that had started some years prior got only worse, and the topics of the US-China trade tensions and of Brexit took over most of the agendas at board meetings of SWFs and other investors around the world.

The major issue was not political but very much financial though: 2018 was the worst for stocks in 10 years. In the United States, the Dow Jones Industrial Average fell 5.6%; the S&P 500, 6.2%; and the Nasdaq Composite, a 3.9%. Major equity markets outside of the United States were even worse: the Stoxx 600 fell a 13.2% in Europe, the FTSE All-World and the Nikkei 225 plummeted a 12% and the Shanghai Composite, a 25%.

Just to make it worse, the fall in equities was not coupled with a rise in bonds, as it normally is the case. The iShares Core U.S. Aggregate Bond ETF fell 2.6%, its biggest decline since 2013, and the Morningstar Corporate Bond and Emerging Market Composite Indexes registered a loss of 2.3% and 2.8%, respectively. In a world where fixed income and public equities continue to be the largest portion of SWFs portfolios, it translated into a very bad year to navigate, especially when the worst performances occurred during the last quarter.

HOW BAD WAS IT?

As we have learned, institutional investors are an extremely heterogeneous group with diverse purposes and asset allocation[1] and generalizing can be deceptive and inaccurate. Let us break them down into four major groups, according to their central mission in order to analyze specific fund performances during 2018.

Stabilization Funds (average allocation: 70% bonds, 25% stocks, 5% illiquid). This is the smallest group, of quasi-central banks, highly liquid funds. Given their tiny allocation to alternative assets, this was the group more prone to having bad results, although the overweight of bonds over stocks made it less bad. New Mexico's SIC lost a 1.3% and Chile's ESSF a 0.4%, while Hong Kong's HKMA and Azerbaijan's SOFAZ barely made positive returns. Trinidad and Tobago's HSF saved the year given they closed accounts on September 30, 2018 and avoided the last quarter; while Libya's LIA did not report for obvious reasons (LIA's assets have been under United Nations sanctions since 2011 and the $67 billion SWF remain frozen) while the returns of Saudi's SAMA remain unknown.

Savings Funds (average allocation: 40% bonds, 43% stocks, 17% illiquid). This is the largest, most diverse and highest-profile universe, with the funds making front pages often, and the strong weight most placed in equities, especially US equities, took its toll on performances. According to our estimates, Abu Dhabi's ADIA had a tough year with losses at about -10%, followed by Norway's NBIM with -6.1%, Korea's KIC with -3.7%, and Alaska's Permanent Fund, -3.2%. Timor-Leste's PF, China's CIC and NSSF, New Zealand's Superannuation Fund and Sin-

[1] See López, D. (2019) "SWFs as grown up investors: Asset allocation, purpose and maturity", in Capapé, J. (Ed.) Sovereign Wealth Funds 2018, IE Sovereign Wealth Research. Accessed at https://docs.ie.edu/cgc/SWF-CGC-2018.pdf

gapore's GIC also ended up with negative returns, with Panama just saving the year. Australia's Future Fund was the exception to the rule with a positive 5.8% return, thanks to its position of less risk and volatility to perform better during downturns.[2] The indicators of Middle East's KIA, PIF, QIA and SGRF, and of China's SAFE remain unknown.

Development Funds (average allocation: 24% bonds, 30% stocks, 46% illiquid). Given their heavy allocation into private markets, as well as their domestic focus, SDFs were the best positioned to shy away from negative returns. Yet, the worst performance of the year, -22%, corresponds to Malaysia's Khazanah (see box below), Singapore's Temasek lost a 2% despite closing the year in March 2019, and Ireland's ISIF also had negative results, with -1.1%. Most of the other funds proved our thesis right: Dubai's ICD earned a 4.1%; Kazakhstan's Samruk-Kazyna, a 5%; Nigeria's NSIA, a 7%; and Bahrain's Mumtalakat, an 8.6%. However, as we will see later, Sovereign Development Funds, or SDFs, are special in the sense that rates of return may not have the same importance or meaning. The returns of high-profile strategic funds, such as Abu Dhabi's Mubadala, Russia's RDIF, Iran's NDFI, Italy's CDP and Angola's FSDEA remain unknown.

"SWF-like" Pension Funds[4] (average allocation: 28% bonds, 45% stocks, 27% illiquid). A number of pension and retirement funds also struggled, given the reliance into global stocks too. California's CalPERS lost a -3.9%, Netherlands' APG, a -2.3%, and Sweden's AP2 and South Korea's NPS, a -1%. However, the gargantuan Japanese fund GPIF saved the year (1.5%), and so did all the Canadian pension funds, who performed extremely well, all things considered. Those funds closing the year on December 31, 2018, including AIMCo, CDPQ, OMERS and OTPP, returned between 2.3% and 4.1%, while those reporting on March 31, 2019, including BCI, CPP

Khazanah Nasional: A year of changes

Khazanah was born in 1994 with the sole objective of managing the government's commercial assets and investing in strategic and high-technology sectors. Ten years later though, the fund had grown significantly, and it was decided that it would also invest in other sectors and geographies. To do so, it opened offices in Beijing and Mumbai (2008), Istanbul and San Francisco (2013), London (2016) and Shanghai (2018), and it became a powerhouse in the SWF world. The ownership of domestic champions including UEM, Malaysia Airports and Tenaga (Infrastructure), Malaysia Airlines and CIMB (Services) and Telekom Malaysia and Axiata (Telecommunications, Media and Technology) mixed with investments in Turkish healthcare, Chinese digital companies and US' venture capital, and business was good.

However, 2018 was a challenging year for Malaysia Inc. As the house of cards of 1MDB unfolded, national flagship fund Khazanah Nasional announced its first pre-tax loss in a decade. This has caused a similar reaction to what we have observed with Ireland's ISIF or Saudi Arabia's PIF, as Khazanah changes its investment strategy. The changes also included the resignation of the Fund's managing director, chairman and entire board.

Khazanah is going back to its origins as a domestic development fund: it shut down Istanbul's and London's operations, it divided its portfolio into a Commercial Fund and a Strategic Fund, and most importantly, it changed its financial reporting standards to MFRS / IFRS[3], assuming the significant latent impairment loss of certain portfolio companies, including Telekom Malaysia and national carrier Malaysia Airlines.

[2] See "Future Fund's thumping year as it delivers 58pc return in 2018", Financial Review, February 2019. Accessed at https://www.afr.com/companies/financial-services/future-funds-thumping-year-as-it-delivers-58pc-return-in-2018-20190211-h1b35t

[3] See Audited Financial Statements, Khazanah Nasional Berhad, December 31, 2018. Accessed at https://www.khazanah.com.my/khazanah/files/2e/2e43ecca-1134-41c0-9bc1-437951d1c0c8.pdf

[4] We define "SWF-like" as those high-profile Pension Funds whose investment profile and behavior aligns with those of SWFs, including the seven big Canadian Funds, the two Dutch Funds, Korea's NPS, Japan's GPIF, Sweden's AP2 and US' CalPERS.

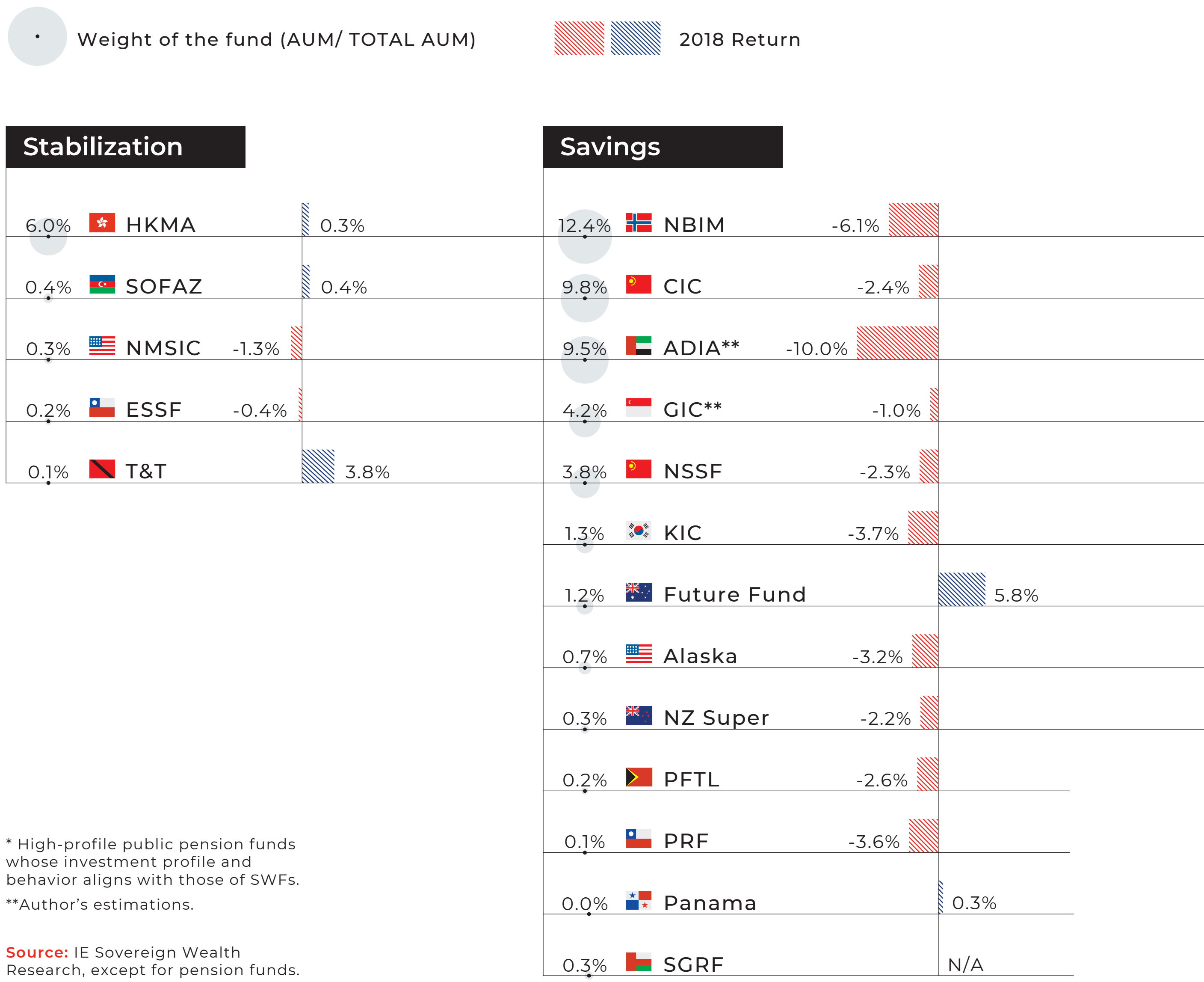
and PSP waved the negative impact even more, and reported performances between 6.1% and 8.9%.

Now, one needs to take a close look to the kind of metrics reported. For example, there may be a significant difference between returns in local currency and those in USD (e.g. ESSF earned a 12.6% in Chilean pesos while it lost a 0.4% in USD) and there is no rule in terms of the specific financial indicator that must be used. For example, while Temasek choses to report the Total Shareholder Return ("TSR"), which takes into account the dividends paid and any potential capital injection from the Government of Singapore, GIC uses the rolling 20-year real rate of return, as its objective is beating global inflation over the long term.

In fact, reporting rolling returns has become common practice among sovereigns and can be misleading. The reason behind this way of reporting performance relates to their long-run horizon identity. Rolling returns (10- or 20-year) are valuable ways to educate stakeholders about the long-term mission of SWFs; yet this kind of reporting may conflict with the short-term performance. For example, NBIM reported a 6.1% loss for 2018,

FIGURE 1

Sovereign funds returns in a bad year



* High-profile public pension funds whose investment profile and behavior aligns with those of SWFs.

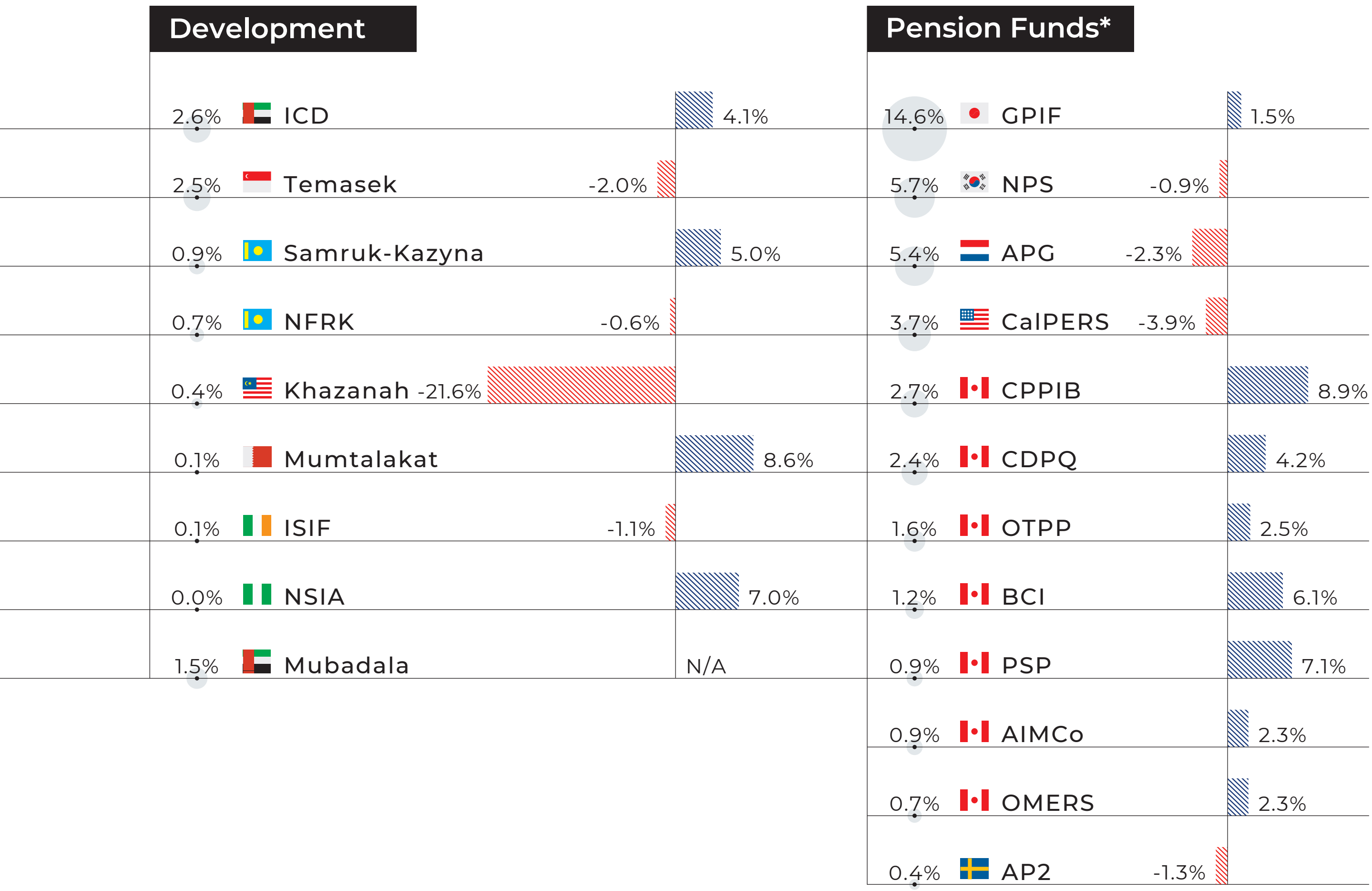
**Author's estimations.

Source: IE Sovereign Wealth Research, except for pension funds.

which was driven by a -9.5% return of the Fund's equity investments and compensated with a 7.5% positive return of its unlisted real estate. However, the annualized return over the last 20 years remained positive at 5.5% nominal and 3.6% real return p.a., after deducting inflation and management costs. This goes to show how a bad annual performance should be considered in the context of a longer horizon period. In fact, NBIM has been able to accumulate wealth up to 1.1 trillion in 20 years. The same "grain of salt" should be used when talking about abnormally positive returns above the long-run rolling returns.

Increasingly sophisticated and have communications professionals and public relations consultants that think very well what and how to report financial performances. To the risk of not mixing apples with apples, we have analyzed the announced results ("press release") and what is behind them ("2018 return") of selected funds, as per Figure 1.

But these are not all the major funds there are. There is a large number of SWFs missing on Table 1, including China's SAFE, Kuwait's KIA, Qatar's QIA and Russia's RDIF. These investors choose not to make financial statements public, and to not report financial performance. In some cases, there was certain information published by the press, but in any case, incomplete and inaccurate.



In fact, with its latest six additions in September 2019,[5] the International Forum of Sovereign Wealth Funds comprises today 37 full and associate members. The members of the IFSWF, which defines itself as a voluntary organization of global SWFs committed to working together and strengthening the community through dialogue, research and self-assessment and promoting a deeper understanding of SWF activity, subscribe the Santiago Principles for transparency and best practices (including public disclosure of certain relevant financial information). At the time of this article, we could not access such information for 60% of the total members, who are lagging behind.

PORTFOLIO VALUATIONS

SDFs are "double bottom-line" investors, seeking both financial gains and economic returns for their domestic economy. This translates into hybrid, more illiquid portfolios, with a number of control positions that make them "operators" rather than pure "financiers". In this case, it is important to look not only at balance sheet figures (AuM, returns), but also at income statement performance (revenues, net income). For example, Mubadala Investment Company reports a 21% increase in comprehensive income, although it remains unclear whether this was caused by the change in perimeter, after it absorbed Abu Dhabi Investment Council.[6]

At the same time, illiquid portfolios can present challenges at the time of being valued, and this is true not only for SDFs. For example, when Masayoshi Son claims[7] that Softbank's Vision Fund (SVF) return rates are up 45%, he is referring to unrealized gains, and purely subjective discounted cash flow exercises, probably carried in-house. The valuation of loss-making companies in particular, and venture capital in general, is a tricky exercise that deserves separate attention. Even for more established asset classes, any fair value exercise has a component of subjectivity and judgement. For example, if we look closely at Canada's CPP Investment Board's returns, we see that the main drivers for such good performance are foreign private equities (up 18%) and infrastructure assets (up 14%).[8] These results rely heavily on the valuations variables, and one would have to dig deeper into any potential change in assumptions over time.

[5] See "Mongolia joins International Forum of Sovereign Wealth Funds as associate member", Montsame, September 13, 2019. Accessed at https://montsame.mn/en/read/200614

[6] See Mubadala Annual Review 2018, Mubadala Investment Company, 2018. Accessed at https://www.mubadala.com/annual-review-2018/assets/pdf/MUB_Annual_Report_2018_English.pdf

[7] See "Masayoshi Son claims Vision Fund LPs are already up 45% - but that's mostly paper gains", May 9, 2019. Accessed at https://techcrunch.com/2019/05/09/softbank-vision-fund-paper-gains-and-paper-dreams/

[8] See Annual Report 2019, CPP Investment Board, 2019. Accessed at http://www.cppib.com/documents/2048/F2019-annual-report_-june-6-2019-EN.pdf

SHORT-TERM VS LONG-TERM GOALS

In the context of a continuous quest for beating the capital markets (i.e. "creating alpha"), and of the constant scrutiny of sovereign wealth funds, we tend to forget these are long-term investors and that short-term performances should be less of a concern. For example, some IFSWF members have found that certain types of information and the frequency with which it is released may create an overly short-term focus.[9]

SWFs that are pushed for regular reporting may prioritize short-term performance over long-term goals. Just like daily returns are not a valid predictor of annual returns, stakeholders and co-investors should not rely on quarterly and annual reporting to assess the skills of an inter-generational investor. In fact, the asset allocation of a long-term investor is likely not optimal if the aim is to experience short-term gains.

Some funds may even choose not to disclose certain aspects to the public domain by design. One of IFSWF's newest members, India's National Investment and Infrastructure Fund (NIIF), has the objective of attracting foreign investors to co-invest into domestic infrastructure assets. In order to minimize external noise about track record that can harm their fundraising efforts, NIIF states that it "may delay the disclosure of certain information that it would otherwise make publicly available".[10] In other words, a lack of transparency to avoid short-termism pressures and debates.

When NBIM disclosed that it had lost 6.1% in 2018, very few remembered that it had gained 13.6% in 2017, or that it is a long-term investor with a very liquid portfolio, highly tied to the global markets. In order to avoid this, sometimes it is necessary to remind of any target return, or the performance of any benchmark portfolio the fund may have, and how have these compared over the long-term.

Now, we have to also be conscious of the challenges of long-term investors to beat very efficient and integrated markets consistently. Take Singapore's GIC, for instance, which is one of the world's most sophisticated and recognized SWFs. The 38-year-old fund operates with over 1,500 highly skilled employees out of 10 offices and uses a large number of external managers in fixed income, equities and marketable alternatives. Yet, GIC shows in its last 2018 Annual Report a comparison between GIC's nominal USD return and its reference portfolio (which refers to a portfolio of 65% global equities and 35% global bonds). Over the last 10 years, the reference portfolio returned 9.3% exceeding the GIC's nominal portfolio (8.6%); yet when compared over a longer period of 20 years, GIC's returns (5.5%) are able to beat that of this typical basket (5.2%). In all cases, GIC uses its reference portfolio not as a benchmarking for performance but as a tool for risk management and as a tool to gauge the risk tolerance of the fund's owner (the government of Singapore, and ultimately the people of Singapore) to obtain long-term returns. Indeed, in all these horizons, GIC is able to obtain similar returns with a much lower volatility.[11] This example of one of the most renowned SWFs goes to show the challenges of beating the financial markets in the long term, while preserving and enhancing the international purchasing power of the assets.

[9] See IFSWF Member's Experiences in the Application of the Santiago Principles, International Forum of Sovereign Wealth Funds, July 7, 2011. Accessed at https://www.ifswf.org/sites/default/files/Publications/stp070711_0.pdf

[10] See NIIF Environment & Social Management Policy, National Investment and Infrastructure Fund, 2018. Accessed at http://niifindia.in/wp-content/uploads/2018/06/NIIFL_ES-Policy.pdf

[11] See Investment report, GIC, 2019. Accessed at https://report.gic.com.sg/investment-report.html

WHAT'S NEXT?

As the uncertainty at the macro and geopolitical level continues, it is difficult to ascertain how the next few years will be for the stocks and bonds markets. Some institutional investors may choose to ignore the external noise, assume the short-term losses, and continue with their long-term mandate and asset allocation, in terms of geographies and asset classes.

Some others, however, may choose to be more aggressive or place more weight into private markets, including real estate, infrastructure, private equity and venture capital. This is harder than it sounds though, given the abundance of capital, and the current valuation multiples. The number of gargantuan funds (GPIF, NBIM, PIF), "chasing elephants" around the world has become too common, and there are not too many opportunities to deploy over $1 billion stakes for a non-controlling, equity check. And those that do meet the criteria, may do so for the wrong reasons. The recent example of WeWork's failed IPO and its consequences on SVF may serve as a lesson for other elephant chasers.

At the same time, there is a significant pressure on asset managers, and the way they are remunerated. The "2/20 model", where the manager charges the owner a 2% annually for the management, and a 20% for the carry or net return of holding it, is long gone, and the average management fee is now 1.2%. In June 2018, Japan's GPIF issued a working paper[12] complaining that "asset managers are paid considerable sums regardless of their investment performance" and introducing a new performance-based fee structure.

This is a major concern for other investors, too. GPIF barely outsources 20% of their portfolio, but the figure is much more significant for others like Abu Dhabi's ADIA, who has reduced its dependency to external managers from 75% to 45% over the past 10 years. In general terms, SWFs now seek co-investments as a means of reducing fees and sourcing their own deals. Similarly, hedge-funds and private equity funds are becoming more investor-friendly, with a number of protections such as higher water marks (which ensures that the manager does not get paid for poor performances) or clawback clauses (which allow investors to recover fees paid in profitable years if returns turn negative). Managers now have a much larger array of tools and are able to create closer alignment with investors, which explains why the latter have remained loyal to hedge funds in recent years.[13]

In sum, 2018 was clearly a bad year for most SWFs; however, they need to continue to be faithful to its founding principles and mandate. Along with the short-term measure of their choice, long-term investors should keep investing and reporting according to their long-run mission and goals, making sure to educate stakeholders including politicians, government officials, media or national financial institutions along the way. The road ahead is still very long.

[12] See GPIF's New Performance-Based Fee Structure, GPIF, June 11, 2018. Accessed at https://www.gpif.go.jp/en/investment/pdf/20180611_new_performance_based_fee_structure_en.pdf

[13] See In Concert - Exploring the alignment of interests between hedge fund managers and investors, AIMA. Accessed at https://www.aima.org/uploads/assets/uploaded/df23fb37-78ff-4d57-88859a7d70167d02.pdf

4

THE SUSTAINABLE DEVELOPMENT GOALS AND THE MARKET FOR SUSTAINABLE SOVEREIGN INVESTMENTS

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4. The Sustainable Development Goals and the Market for Sustainable Sovereign Investments

INTRODUCTION

In 2015, the 193 countries of the General Assembly of the United Nations adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). A year later, in 2016, the Paris Agreement on climate change entered into force, with the goal of limiting the rise of global temperatures in the 21st century. That same year, the 17 SDGs of the UN's 2030 Agenda officially came into force as well. Over the next fifteen years, through the pursuit of the SGDs, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, and ensure that no one is left behind.

The SDGs build on the success of the Millennium Development Goals (MDGs, established in 2000 and ended in 2015). The new SDGs are a call for action by all countries—poor, rich and middle-income—to promote prosperity while protecting the planet. The SDGs recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs, including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.[1]

Climate change is a primary focus of the SDGs, as 8 of the 17 goals have a direct relationship with climate change mitigation and adaptation. Goals 6 and 7 aim for clean water and the expansion of clean energy sources, Goals 9 and 11 are linked to sustainable infrastructure and urbanization, and Goal 12 refers to responsible production and consumption. Goal 13 directly addresses climate action, while Goals 14 and 15 pretend to manage and conserve life on land and below water.

Of course, all the goals are interwoven. For example, a proper management of urban infrastructure (Goal 9) may entail better water use (Goal 6), which can help alleviate poverty (Goal 1) and combat hunger (Goal 2) in a given community. Attaining these goals will require massive investment. This chapter focuses on the investments made by SWFs that are directly linked to green assets and opportunities.

The challenge represented by the SDGs is daunting, and will necessitate significant changes in, among other things, energy use and energy production. Over the last 150 years, burning coal and fossil fuels have been the main source of energy. And these trends are quite difficult to reverse, despite recent coordinated efforts. Indeed, in 1970, more than 75% of the world's energy came from fossil fuels. In 2018, the number was similar.[2] The use of fossil fuels releases carbon dioxide which in turn has increased in atmospheric concentration by more than a third since the Industrial Revolution. That is why, for some, the debate and investment efforts should focus on cleaning (carbon capture and storage technologies) rather than substituting fossil fuels. Enhanced carbon capture technologies can remove carbon dioxide from the atmosphere if applied on a worldwide scale in combination with bioenergy facilities.[3] Yet, others suggest that this capturing technologies may serve to protect the fossil fuel industry and delay the transition toward cleaner forms of energy. It is an open, wide, and critical debate, not addressed in this chapter.

[1] See https://www.un.org/sustainabledevelopment/ for a detailed description of the 17 goals, 169 targets, and 232 indicators to measure their compliance.

[2] See "The future of oil", Quartz, 2019.

[3] See "Special Report Global Warming of 1.5 °C", IPCC. 2019. Accessed at https://www.ipcc.ch/sr15/

Another critical debate on the strategy toward transition is the fight between exclusion (negative screening) and engagement (shareholder/stakeholder action). Those proposing excluding or banning contaminating companies argue that this strategy helps to signal polluting companies and represents the fastest way to reduce emissions. On the other hand, those proposing engagement and change, propose transition plans to contaminating companies (especially energy and natural resources companies) that will reduce emissions progressively. This debate is neither tackled in this chapter.

Regardless of how the debates unfold, the challenge of keeping the rise of global temperature below 1.5°C pre-industrial levels can only be achieved by deploying vast amounts of capital towards both mitigation (reducing the number of forcing greenhouse gases such as carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons, which trap heat on Earth) and adaptation to climate change already taking place.

One way to solve this conundrum is to make a more extensive and intensive use of renewable energy sources. And this solution requires investments from private sources of capital, well beyond current government expenditures. According to the International Energy Agency, investments in low-carbon energy sources, such as wind or solar (and nuclear), must more than double by 2030 if the world is to meet the Paris Agreement. Yet, in 2018, one dollar out of every 10 invested around the world into energy goes towards financing oil and gas in North America. Sustainable forms of energy, on the other hand, remain underdeveloped and represents a significant opportunity.

According to the International Monetary Fund, sustainable finance is defined as the incorporation of environmental, social, and governance (ESG) principles into business decisions, economic development, and investment strategies. There is an economic reason for sustainable finance. Firms engage in “good” corporate behavior that comes with operational and disclosure costs but provides benefits to society for several reasons.

Firms may choose to invest in ESG projects in response to evolving investor or consumer preferences, a choice that could lower costs of capital or improve profit margins. Business investment in ESG may lead to a more motivated workforce, greater trust between firms and stakeholders, or less firm-level tail risk from carbon emissions. And firms may choose to become more ESG-friendly because of policy-driven actions, such as the cost of meeting forthcoming regulatory requirements that would make delayed compliance expensive.

ESG application to private markets is aided by a longer time horizon and greater scope for investor activism. Figure 1 shows the number and assets of ESG funds, they still represent 2 percent of the total investment fund universe but are growing fast. Yet, the lack of consistent definitions makes it difficult to identify the global asset size related to ESG, with estimates ranging from $3 trillion to $31 trillion. Initially, sustainable investing was primarily about negative screening strategies that excluded firms or entire sectors from investment portfolios. Over time, concerns about risk management, benchmark underperformance, and a need to demonstrate material ultimate impact have given rise to strategies based on positive screening for companies with good ESG performance (best-in-class, improvement), companies that fulfill certain minimum standards or norms (norm-based screening), or sectors that are considered sustainable (sustainability-themed investments).

Yet, there is a lack of conclusive evidence of the performance of ESG-oriented investment strategies. This absence of definitive conclusions in academic research is due to a combination of factors, including changing definitions of material ESG factors and ESG investment approaches (so that studies are not comparable), data inconsistencies and short time series, and the long-term nature of some ESG issues.[4]

Sustainable finance represents a tremendous occasion for institutional investors globally, especially in lower-middle to low-income countries. For instance, in these country groups the share of global energy investment was 14% for a population representing a share of 42% of the total. SWFs are well positioned to join these opportunities given their hybrid nature, as government-owned entities with a market orientation, and due to the inherent long-term nature of ESG goals.[5] Their characteristics allow SWFs to efficiently mobilize resources to obtain both financial returns and a positive environmental impact.

[4] Most of these ideas on sustainable finance can be found at "Sustainable Finance: Looking Farther", Global Financial Stability Report, International Monetary Fund, Oct 2019. The first dedicated chapter on sustainable finance of the IMF within the GFSR series ever. Accessed at https://www.imf.org/en/Publications/GFSR/IsGsues/2019/10/01/global-financial-stability-report-october-2019#Chapter6

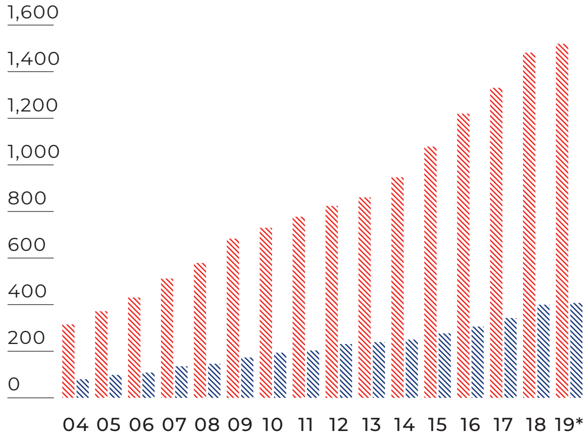
[5] See the "World Energy Outlook 2019", International Energy Agency, Nov 2019. Accessed at https://www.iea.org/weo2019/

FIGURE 1

Funds with an ESG Mandate by Asset Class

Number of funds

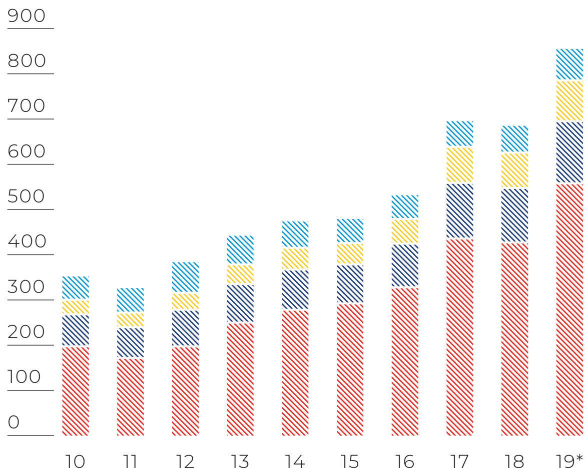
Equity Fixed Income



Assets of ESG-Listed Funds

Billion of US dollars

Equity Fixed Income
Mixed allocation Others



Source: IE Sovereign Wealth Research based on International Monetary Fund (2019). *Up to September.

THE SDG OPPORTUNITY. The Case of Green Bonds

The market for green investments is vast in terms of available need, and capital is already increasingly flowing into green projects around the world. Green bonds are regularly included into the more ample space of "sustainability-linked bonds", which includes social and overall sustainability-aligned bonds. This chapter focuses on "green bonds" which still represent the bulk of the SDG-related bonds (as seen in Figure 2). The green bond market has grown rapidly over the past decade, with 2018 totaling $167.6 billion in proceeds and estimated $230 billion for 2019 and $350 billion in 2020[6] with Europe leading regionally. Government-linked investors are experienced and frequent participants in the green bond market, with development banks, government-affiliated entities (such as Fannie Mae in the US), sovereigns, and local government issuances constituting about 26.5% of the global green bond market.

For local governments, green finance is a way for the government to fund a local, identified project. For example, a city may require a new water treatment facility, or may be interested in developing green power generation capabilities. They thus approach climate and green finance markets as issuers, not as investors (See Table 1 for a list of green bond issuances in 2019). Sovereigns may also bring issuances to market, using national and international capital markets to help fund projects designed specifically to fund projects designed to attain SDGs. This is the case, for example, with Ireland's National Treasury Management Agency, which in 2018 issued $3.5 billion in climate bonds to help finance green projects in Ireland. 2019 has also been a strong year for sovereign issuances in the green bond market.

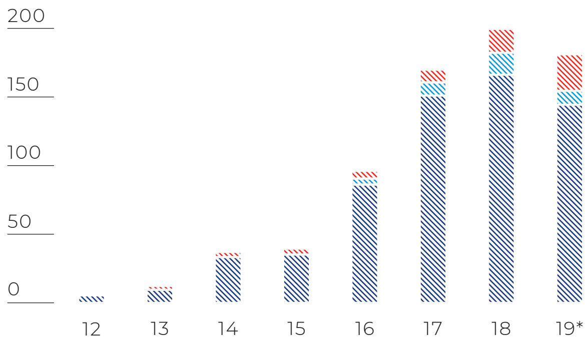
[6] See "Climate Bonds Initiative", 2019. Accessed at https://www.climate-bonds.net/

FIGURE 2

Sustainability-Linked Bond Issuance

Number of funds

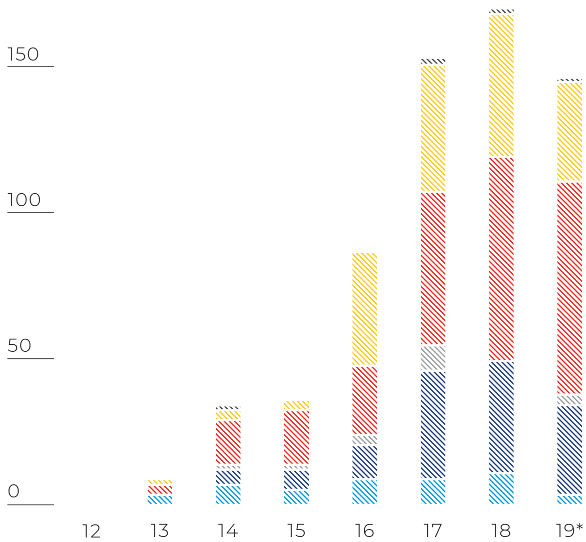
Green bonds
Social bonds
Sustainability Bonds



Assets of ESG-Listed Funds

Billion of US dollars

Africa and Middle East
Latin America
Asia Pacific
North America
Europe
Supranational



Source: IE Sovereign Wealth Research based on International Monetary Fund (2019). *Up to September.

Sovereign wealth funds, on the other hand, may approach green markets as investors; green bonds, for example, might make up a part of an overall green investment strategy for a sovereign fund, as well as green infrastructure or decarbonization strategies. But SWFs also have an important—and often more direct—role to play as equity investors in SDG investment markets. SWFs may not only be investors in sustainable projects or companies, but they can also help to facilitate transactions in which other investors participate. In other words, sovereign funds may be part of a country's green investment sourcing strategy. This is particularly true of sovereign development funds (or, as they are also called, strategic investment funds), which may be designed specifically to help fund local and national development projects or to help catalyze such projects by acting as anchor investors, which can encourage investment by other domestic or foreign sophisticated institutions. As described in the case studies below, SWFs may use some or all of these strategies as part of an overall SDG investment strategy.

A Lack of Deals, Not a Lack of Capital

The achievement of the SDGs will require tremendous investment from both the public and private sectors. Given the number of potential projects and the vast scale and ambition of the SDGs, linking deals and investors will be crucial. The United Nations Conference on Trade and Development (UNCTAD) estimates an annual investment gap of $2.5 trillion in key sustainable development sectors in developing countries alone.[7] With trillions in assets under management by SWFs and other sovereign investors, government investment vehicles will play a key role in funding a large number of these projects. But connecting SWF capital with the projects have proven to be a challenge, not because projects are lacking or capital is lacking, but because of a lack of profitable, viable projects. There are two primary reasons why investment in SDGs is less than it could be.

[7] See "Investing in SDGs: An Action Plan", World Investment Report 2014, UNCTAD, 2014. Accessed at https://unctad.org/en/PublicationsLibrary/wir2014_en.pdf

TABLE 1

Sovereign Green Bond Issuances 2019

Issuer	Amount issued	Currency	Amount $US million	Issue date	Maturity	External Verifier
Republic of France	2,471,000,000	EUR	2,750	May-19	Jun-39	Vigeo Eiris
Republic of Poland	2,000,000,000	EUR	2,246	Mar-19	Mar-49	Sustainalytics
Republic of Indonesia	2,000,000,000	USD	2,000	Feb-19	Feb-29	CICERO
Republic of France	1,737,000	EUR	1,976	Feb-19	Jun-39	Vigeo Eiris
Republic of Chile	1,418,000,000	USD	1,418	Jun-19	Jan-50	Vigeo Eiris
Republic of Chile	861,000,000	EUR	960.6	Jul-19	Jul-31	Vigeo Eiris
Federal Government of Nigeria	15,000,000,000	NGN	41.4	Jun-19	Jun-26	Moody's
Export-Import Bank of Korea	33,800,000	USD	33.8	Feb-19	Feb-24	CICERO

Source: Sovereign Wealth Research (IE Center for the Governance of Change) with data from Climate Bond Initiative (2019)

First, projects may have very long-term investment timeframes that do not align with those of the investors. This is often the case with infrastructure projects, which may take years to complete and decades to produce a break-even return. For SWFs and other sovereign investors, however, the time frames associated with such investments do not pose a deterrent, as SWFs typically do not have express liabilities that would limit their ability to invest in long-term, illiquid assets like infrastructure projects.

Second, and more importantly, many potential projects simply do not have a positive "return on investment". Some may not present a favorable risk-reward profile because some of the risks associated with the project may be difficult to evaluate, and some of the returns may be difficult to calculate because of unknowns with respect to regulation. Others may be almost certain to lose money, based on reasonable assumptions about current market conditions. As a result, it is not the case that there is a lack of potential projects, but rather that there is a lack of investible projects.

Filling the gap between investors and investible SDG deals will require new strategies on the part of development financial institutions (DFIs, including national, regional, and international development banks), sovereigns, and subnational governments. DFIs will be key in helping to source deals and connect investors like sovereigns with the private investment capital and expertise that will be essential for many SDG projects. As noted above, sovereigns—and in particular, sovereign development funds—can also play a role in sourcing deals. But all governments, including those without SWFs or SDFs, also have a crucial role to play in helping to define the SDG market and create trustworthy standards. The roles of DFIs and governments are complementary, and by working together the two groups can build reliable and robust SDG deal pipelines.

Sourcing and Connecting Deals

Development financial institutions are key to mobilizing the trillions in private assets needed to advance the SDGs, yet they continue to struggle to catalyze private investment. In 2017, for example, the World Bank reports that for infrastructure projects in emerging markets and developing economies, state-owned enterprises and other government entities accounted for 83 percent of the $500 billion of infrastructure project investment, and private investors only 17 percent.[8] The problem is two-fold: first, private investors lack visibility into potential scalable projects, and second, many projects require creative structuring, such as first-loss capital from development institutions, in order to attract private investors. DFIs can help to solve this problem by evaluating existing project pipelines and determining which projects could be scaled to have the greatest development impact if private investors added capital and expertise. Development institutions will also need to develop and expand relationships with potential investors, to help understand their risk appetites and what expertise and resources these investors can bring to projects. In some cases, these investors may provide important contributions on the front end, in origination, project design, structuring, and brokering. A Boston Consulting Group report[9] argues that DFIs should consider "shifts in the degree to which they provide high-risk capital to increase the attractiveness of deals, the financial instruments they use, and the length of their investment horizon." Catalyzing private investment requires a shift from merely serving as a funder to acting as a broker. This includes adopting a promoter's mindset, and promoting deals using tools employed by investment banks, such as "full-fledged roadshows."

This advice can also be applied to sovereign funds, which are not only acting as limited partners in green deals but are increasingly operating as general partners as well. Making a transition from LP to GP may require new personnel and incentive structures, as well as (at least initially) specialization in particular regions, development areas, and projects types.

[8] See "Who sponsors infrastructure projects? Disentangling public and private contributions", World Bank, 2017. Accessed at https://ppi.worldbank.org/content/dam/PPI/documents/SPIReport_2017_small_interactive.pdf

[9] See "Narrowing the SDG Investment Gap: The Imperative for Development Finance Institutions" Douglas Beal, Julia Dhar, and David Young, Boston Consulting Group, February 12, 2018. Accessed at https://www.bcg.com/publications/2018/narrowing-sdg-investment-gap-imperative-development-finance-institutions.aspx.

Defining sustainable investment and setting standards

The governmental role in defining sustainable investment markets and setting standards for those markets will be key to achieving the SDGs. Strong investment markets have two essential characteristics: First, investors must be able to obtain adequate and accurate information about the value of the investment, and second, they must have confidence that the managers and any controlling investors will not "tunnel" or otherwise cheat them out of some or all of the value of their investment. [10] There are, unfortunately, no shortcuts to strong investment markets. They must be built up through careful attention to the creation of a strong institutional foundation, including regulators, courts, and intermediaries such as lawyers and accountants.[11] On this base may be built strong investor protection mechanisms, such as disclosure rules and mandated adherence to accounting standards. For example, the Task Force on Climate-Related Financial Disclosures backed by the Financial Stability Board, is refining "voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders."[12]

Governments are also playing a role by helping to define what constitutes a "green" investment. The EU has taken a leadership role by promulgating a green bond standard that should serve to catalyze efforts to produce workable green bond regulations in Europe and around the world. The EU attempts to simplify and add certainty to the issuance process in an effort to reduce transactional frictions associated with green bond issuance. The recommendations include, among other things, the adoption of a green bond standard that helps issuers align their offerings with the EU green project taxonomy. The EU recommendations also include a green verification process that will be crucial to the development of a robust green bond market. Such intermediaries have always played a key role in debt markets; consider, for example, the role of credit ratings agencies in typically bond issuances. The regulation of green bond verifiers has, to this stage, been primarily through self-regulatory organizations such as the Climate Bonds Initiative and its Climate Bonds Standard Board. Under the proposed EU standard, a governmental authority such as the European Securities and Market Authority (ESMA) would "design and operate . . . an accreditation regime."

DFIs and governments have key roles to play in developing and supporting SDG investment markets. Some SWFs, the investment arms of governments, are already taking leadership roles in SDG investment beyond bond markets. The following section provides data on SWF activity in sustainable investments, and also provides case studies on some of the most successful efforts.

[10] Black, B.S. (2001)The legal and institutional preconditions for strong securities markets, 48 UCLA LAW REVIEW 781.

[11] As Black notes, such institutions "must be homegrown and can precede market development. That effort can begin with honest courts, regulators, and prosecutors, which are critical whatever form a country's capital markets take. And government honesty is important for more than just capital markets development." Id.

[12] See, for example, Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017), TCFD. Accessed at https://www.fsb-tcfd.org/publications/final-recommendations-report/

SWF DEAL DATA AND CASE STUDIES

SWFs are well equipped to deal with sustainable finance. First, most green utility-scale projects require long-term investing, which fits well with long-term investment horizons of many SWFs. Second, SWFs are aligned with government policy plans and thus, can help to develop strong national green markets and take a leadership role as first movers. Third, as leading financial entities in many countries, SWFs can have a catalytic role in attracting domestic and foreign investments to domestic green projects. Lastly, nascent regulations on green data and reporting can be adapted by SWFs and generate an imitative process.

In this section, data on SWFs green investments and strategies (2018-up to September 2019) are studied. SWFs data tends to be dispersed, undefined and lastly not abundant. This is the case of SWFs green investments too. Yet, five SWFs stand out in terms of green deals and strategies. This section reviews them all:

- Temasek, the active Singaporean SWF, has a strong exposure to technologies aspiring to build a new sustainable model for production and consumption;

- Abu Dhabi Investment Authority and Singapore's GIC Private Limited (GIC), with their continued support to Greenko, an Indian-based company building integrated renewable energy assets, have shown a leading successful story that can be told to other SWFs.

- Also, Saudi Arabia's Public Investment Fund (PIF), with its increased interest in renewable energy operators (ACWA) and electric car manufacturing (Lucid and Tesla), presents an interesting case of a SWF with a mission of greening the economy.

- Mubadala Investment Company, through its fully owned subsidiary Masdar, is an active investor in renewable energy infrastructure and deserves a special attention given the leadership and influence in the Gulf region and globally, with projects ranging from multibillion utility-scale projects to micro power facilities in least developed economies.

Other SWFs, including the China Investment Corporation (CIC) or Norway's Government Pension Fund-Global (GPFG) have also been active in green investment. According to IE Sovereign Wealth Research data, SWFs have participated in equity deals directly linked to green assets amounting to $15.8 billion in the period January 2018 to September 2019 (See the Infographic for an overview). To give some sort of dimension, climate bonds issued in the same period amounted to $292 billion, twenty times larger.[13] Another perspective, SWFs green investments represent approximately 11% of the total size of deals with SWF participation from January 2018 to September 2019. Yet, relative to total assets under management, SWFs participation in green equity deals represent a mere 0.2%. The room for further involvement looks clear. Other funds have followed a "divestment" strategy instead of equity investing. This type of exclusionary strategy, started in the SWF community by the Norway's GPFG, and followed by New Zealand Superannuation Fund, has now been adopted by the Ireland Strategic Investment Fund (ISIF). The Irish fund, through the Fossil Fuel Divestment Act 2018, approved in December 2018, decided to exclude companies "that derive more than 20pc of their revenues from the exploration, extraction and/or refinement of fossil fuels".[14] The total value of the divestment of ISIF was $78 million.

As noted earlier, what constitutes "green" or "sustainable" it is still under debate. This lack of consensus makes the estimation of the SWFs participation in sustainable industries volatile. In fact, this total investment figure can be easily modified if sustainable-linked deals such as the IFCO Systems acquisition—led by Triton, the European-focused investment firm, and joined by ADIA—were to be excluded. The two investment companies acquired IFCO for an enterprise value of $2.51 billion.

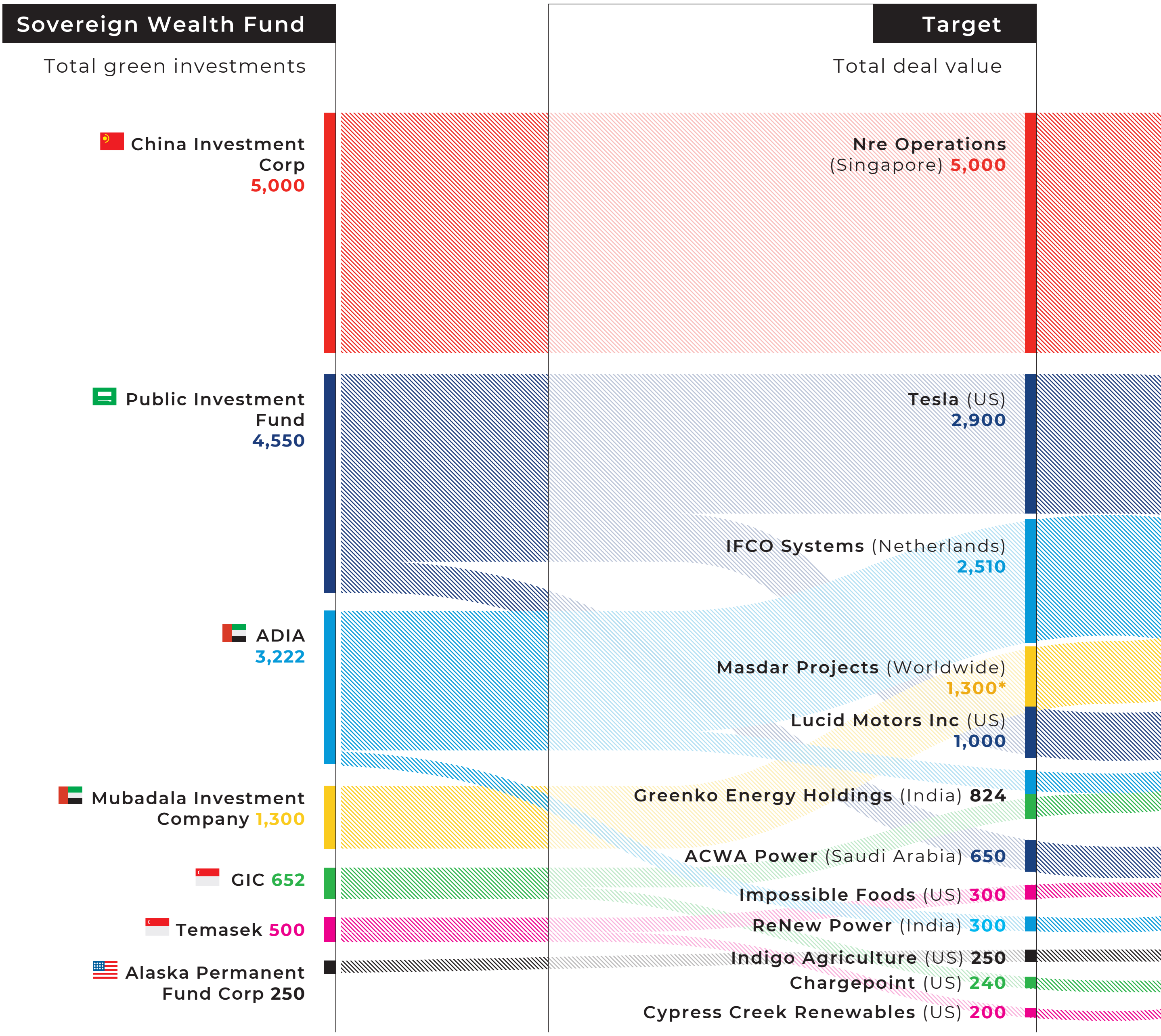
[13] See Climate Bonds Initiative for data on the Green Bonds Market. Available at https://www.climatebonds.net/

[14] See "Ireland Strategic Investment Fund's sale of interests in global fossil fuel companies leads the way in green thinking – Donohoe & D'Arcy", Jan 4, 2019. Available at https://isif.ie/news/press-releases/ireland-strategic-investment-funds-sale-of-interests-in-global-fossil-fuel-companies-leads-the-way-in-green-thinking-donohoe-darcy

INFOGRAPHIC 3

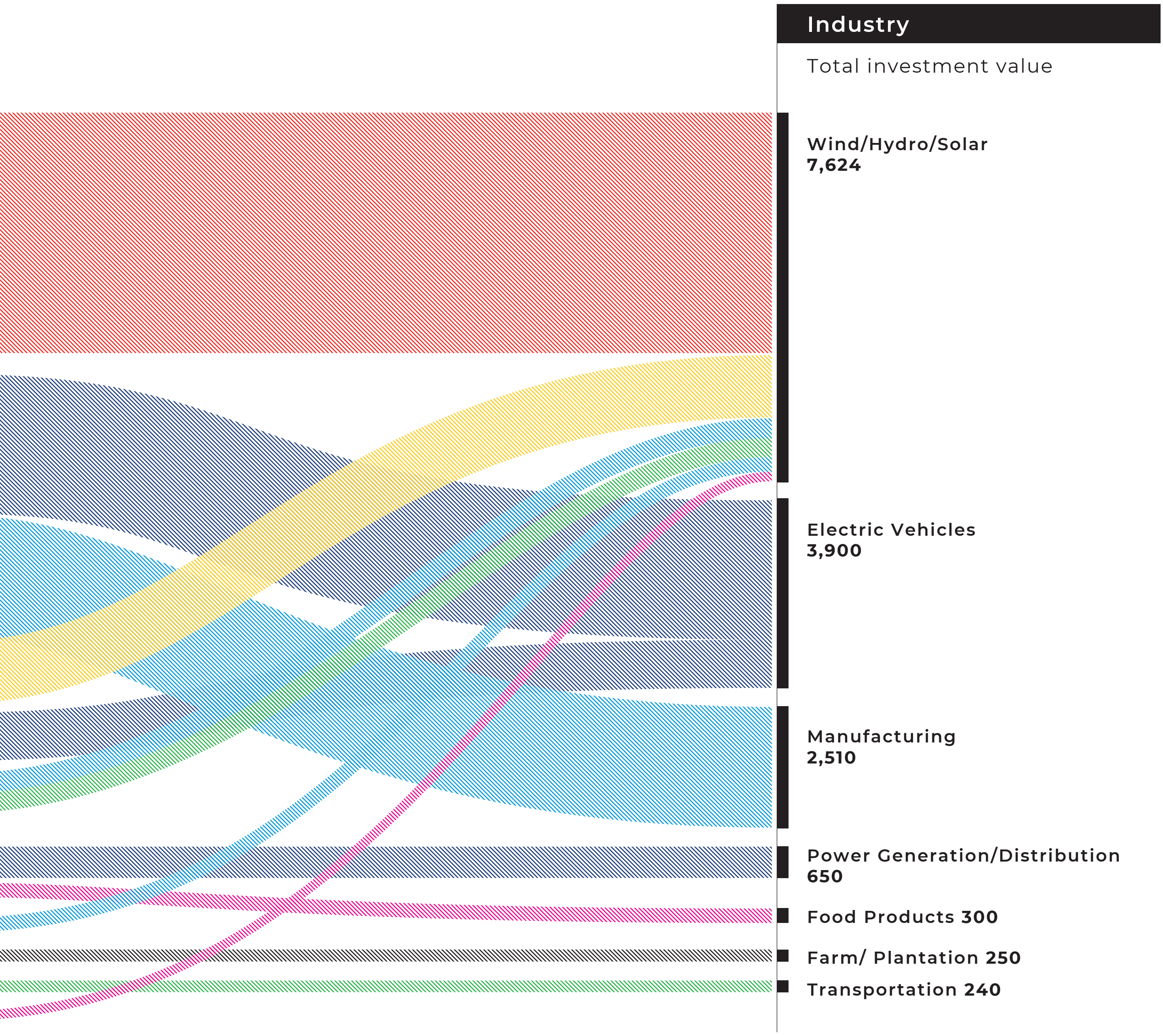
Sovereign Wealth Fund Sustainable Investments 2018-2019

Selected deals. The 2019 data for the nine-month period Jan to Sep.
In million US dollars.



Source: Sovereign Wealth Research (IE Center for the Governance of Change) based on Refinitiv and Bloomberg.

*Estimated.


Industry
Total investment value
Wind/Hydro/Solar
7,624
Electric Vehicles
3,900
Manufacturing
2,510
Power Generation/Distribution
650
Food Products 300
Farm/ Plantation 250
Transportation 240

IFCO is the global leading provider of reusable plastic containers for fresh foods, producing up to 60% less CO2 emissions, using less energy and water, and cutting solid waste by 86%, than single-use packaging. Thus, the classification of investments of this type, which some consider sustainable solutions and others do not (given the use of plastic in the process), may have a substantial effect on total figures.

Temasek: technologies reducing resources use and achievement of the SDGs

Temasek has made a remarkable effort on sustainability, as has its fellow Singaporean SWF, GIC. They both acknowledge the importance of being a long-term investor and steward. Temasek's last Annual Review details that "there is an urgent need for solutions that support sustainable, longer and more fulfilling lives, while protecting the natural environment". That includes investments into Neoen, a French international solar, wind and energy storage company; Pivot Bio, a synthetic biology company producing nitrogen-fixing microbes that reduce the need for chemical fertilisers; and indoor farm operators like Sustenir Agriculture and Bowery Farming, operating in Singapore and the US respectively, that grow and deliver high quality fresh clean produce in urban spaces using less resources.[15]

Indeed, energy efficiency remains a high priority to reach the SDGs (mainly Goals 7, 11, and 12) all over the developed and developing world. In this regard, Temasek is supporting technologies to help transitioning toward more efficient energy systems. Temasek joined a $110 million round in Stem Inc., a US-based company which uses data, analytics, and advanced energy storage to enable businesses a more efficient energy usage. The company systems obtain sustainable benefits by enabling distributed energy, reducing the need for peak power plants, and increasing renewable energy use by smoothing the volatile output of solar plants. The company has been backed by other energy giants such as GE, Total, Iberdrola or RWE. This investment shows how certain SWFs are able to track and identify the technologies that will disrupt sectors and leaders where SWFs are already invested such as, in this case, traditional energy industries.

Temasek's concern about resource use is also reflected in the investment rounds it joined in the food sector: Impossible Foods ($300m), Perfect Day ($35m), and InnovaFeed ($45m). The first two relate to human food while the latter produces for animals and, particularly, fish. Impossible Foods, the worldwide-known plant-based meat company founded in 2011, has had Temasek as a shareholder since 2017. In May 2019, it invested for the third time in the company when it led a populated series E round that valued the meat-free burger company at $2 billion. Interestingly, the company has recently announced its intention of creating plant-based dairy products. Precisely, another Temasek portfolio company is Perfect Day, which is creating milk proteins that are nutritionally identical to cow's milk, but without the use of animal products. This allows Perfect Day to produce sustainably flora-based dairy by using less water, energy, greenhouse gas emissions and land. Similarly, InnovaFeed, which has also been invested by Temasek at an early series B round, is a French biotech company which produces a new source of protein from insect rearing for use in animal feed and for aquaculture.

In the context of a fast-growing world population, these companies' activity responds competitively to an increase in protein demand while contributing to the development of a more sustainable food system.

[15] See 2019 Temasek Review for more details on its sustainable strategy. Available at https://www.temasekreview.com.sg/

Green infrastructure investments: the case of India

SWFs are investing in technology that will reshape the way the World eats, moves, builds and grows. SWFs are particularly well suited to engage in larger green infrastructure projects. The needs are enormous, and the willingness to invest and identify appropriate projects grows in time.

Indeed, SWFs typically have a long-term patient capital view. These attributes, along with the internal capabilities developed in time by some of the largest funds on real assets, make SWFs ideal investors in green infrastructure. SWFs follow different strategies; for some, green investment exposure is achieved directly by owning, developing or managing green assets (Mubadala being a clear example), indirectly by acquiring existing green infrastructure companies (CIC); lastly, some sort of a mixed model (private equity alike) is executed by PIF, GIC and ADIA as they invest at early stages and grow private green companies.

The most salient case of the “acquisition” strategy is exemplified by CIC. In January 2018, along with GIP and other co-investors, CIC joined the largest renewable energy generation acquisition in history. The group of global investors bought Equis Energy, the Asia’s largest independent renewable energy firm, for $5 billion, including liabilities. Equis’ assets have installed capacity beyond 11GW. With over 180 assets comprising solar, wind and hydro generation, Equis spread across countries including Australia, Japan, India and the Philippines.

A typical example of this green “private equity” approach is the support given by ADIA and GIC to Greenko Energy Holdings. Greenko is an India-based renewable energy firm with wind, solar, and hydro projects. Together, these two large SWFs have backed Greenko since its establishment in 2006, as they have injected $2 billion in the company through several rounds. Today Greenko has an enterprise value of over $6 billion. The two sovereigns have partnered to control the company along with its founders, with GIC and ADIA holding 61% and 15%, respectively, while the two founders own the remaining 24%. Greenko has a total renewable energy operational capacity of 4.85GW across 15 Indian states, with 7GW under construction. Recently, GIC and ADIA agreed to invest fresh capital totaling $824 million in June and July 2019. The increased interest in serving growing populations and middle classes in developing countries like India and China has attracted SWFs, which now focus on the sustainable development of these countries by strengthening their green infrastructure capacities.

India is ranked fourth and fifth, globally, in installed capacities for wind and solar power, respectively. India has become one of the top renewable producers globally with ambitious capacity expansion plans, and SWFs are not willing to miss the opportunity to participate in those plans. With almost every jurisdiction in the western world raising the bars for entry for foreign investors, India is going the other way around. This is reflected in the NIIF (National Investment and Infrastructure Fund), which aims to contribute to this sustainable development push by bringing international investors in. An excellent example of how a sovereign fund can serve as part of a country’s green deal sourcing strategy, NIIF self-defines as a “professional fund manager, anchored by the Government of India along with participation from institutional investors such as ADIA”.

The exposure gained by ADIA over years investing in equities and fixed income in India is having positive spillover effects. Regulatory reforms (such as the simplification of rule on foreign portfolio investments in 2014) are helping attract foreign direct investments. ADIA is helping this regulatory push by supporting the growth of the fund management industry (ADIA provided $500 million in funding to a distressed debt manager) and helping to develop debt markets (Greenko issued the Asia's largest 2019 green bond in July, after the financing round noted above).

ADIA has also supported ReNew Power, India's largest renewable energy independent power producer. In May 2019, it joined Goldman Sachs and the Canada Pension Plan Investment Board in a $300 million rights issue. ADIA had invested another $200 million in 2015. Again, a continued interest in a renewable energy company is the model followed by ADIA to acquire exposure to green assets.

Undoubtedly, long-term and scale opportunities are available in India. Moreover, given the scale of the country, a successful achievement of SDGs in India is crucial for the overall success of the SDGs. Sovereigns are helping the SGDs become a success story.

Public Investment Fund: achieving Saudi Arabia's vision of sustainability

The PIF is the investment engine behind the 2030 Vision, Saudi Arabia's master plan to diversify its economy and foster sustainable growth. In line with this mandate, the PIF has made a number of investments in renewable energy and electric vehicles. These acquisitions are intended to increase the share of renewable energy in the national energy mix, as part of the country's economic diversification plans.[16] In fact, PIF secured the mandate from the Saudi state to develop 70 percent of all renewable energy projects in the Kingdom.

In 2019, PIF acquired a 15% equity interest in ACWA, a privately-owned renewable energy leader in Saudi Arabia, for an estimated $650 million. As a result, PIF will directly and indirectly own 24% of the most dynamic renewable energy company in the GCC.[17] ACWA has a clear domestic and regional leadership as a developer, owner, and operator of power generation and water desalination plants. Similarly, PIF invested in Global Environmental Management Services (GEMS), for an estimated amount of $300 million. GEMS is the largest industrial waste management company in the GCC.

PIF has also invested heavily in electric vehicles in recent months. One of its portfolio companies, Lucid, a California-based automotive company, specializes in luxury electric vehicles. PIF's investment of over $1 billion, made in September 2018, helps PIF to simultaneously achieve three goals: get exposure to long-term opportunities with a strong sustainability angle, support innovation and technological development, and drive new revenue streams and economic sectoral diversification for the country.[18] Indeed, according to the Lucid Chief Technology Officer, PIF "are not just a financial partner, they are a strategic partner".

The Saudi sovereign fund also bet on electric carmaker Tesla in 2018. The PIF built up a stake of $2.9 billion in the electric carmaker to become the fifth largest investor in August of that year (though months later, PIF hedged this investment to secure profits and avoid stock fluctuations).

In addition to these four SWFs, other sovereign funds also play key roles in their sponsor governments' efforts to achieve the SDG. These include Abu Dhabi's Mubadala as well as the signatories to the One Planet SWF Working Group (Kuwait Investment Authority, Norges Bank Investment Management, the Qatar Investment Authority, and the NZ Super Fund, in addition to ADIA and PIF).

[16] See Vision 2030 website for further details: https://vision2030.gov.sa/en/vision/roadmap

[17] It is said that this interest has grown to 40% in the last months. See The National's "Saudi Arabia appoint PIF chief as chairman of Aramco" for more details, Sep 2, 2019, https://www.thenational.ae/business/energy/saudi-arabia-appoints-pif-chief-as-chairman-of-aramco-report-1.905622

[18] See the Chapter on SWFs investing in technology in this Report for further details on the comprehensive development strategies followed by SWFs using technology investments. The news was unveiled by Reuters in the article available at https://www.reuters.com/article/us-saudi-investment-auto/saudis-pif-invests-more-than-1-billion-in-lucid-motors-idUSKCN1LX1IG.

The One Planet Initiative Grows

In the 2018 edition of this report, Mr. Adrian Orr, formerly chief executive officer of the New Zealand Superannuation Fund and chair of the International Forum of Sovereign Wealth Funds (IFSWF), talked about the paradox of fossil fuel based sovereign funds promoting green investments, noting that "whilst it seems kind of ironic that it's the oil-producing funds that have signed up, they have the most to lose and the most to gain if they get it wrong or right. So, they are highly incentivized." This paradox is crystalized in the One Planet SWF (OPSWF) Framework.

Launched in December 2017, the initiative aims to integrate climate change risks and promote investing in the smooth transition to a low emission economy; it plans to do so by diffusing a new framework composed of 3 principles—alignment, ownership, and integration—among large, long-term asset pools. This framework can be understood as a "natural extension of the Santiago Principles".

The OPSWF venture has grown over the last year with regular meetings and engagement with investment chain participants to understand the barriers in using the proposed framework. More importantly, the SWF initiative was endorsed by the investment community in 2019 when eight global asset managers, with a combined $15 trillion of assets under management, founded a parallel "One Planet Asset Managers Initiative" to support the OPSWF Framework. These money managers represent one fifth of global assets under management and include the asset management divisions of Amundi, BlackRock, BNP Paribas, Goldman Sachs, HSBC, Natixis, Northern Trust, and State Street.

The six founding members met in September 2019 during the UN Climate Summit, hosted by the French President Emmanuel Macron, who pushed the initiative from its inception. The OPSWF members have exchanged practices and experiences on applying the Framework. A new document released by OPSWF details actions taken by its members on alignment, ownership and integration. The document cites the ADIA's implementation of an eight internal asset-class specific task forces to understand the potential ramifications of climate change. On its part, KIA mentions the introduction of the Framework in the investment management agreements with third-party managers. Moreover, KIA's is asking asset managers "to provide an implementation status on a periodic basis." Qatar Investment Authority, another OPSWF member, shared their new revision of QIA's real estate portfolio, "and found that advancing sustainability standards in both new and old construction is more profitable, attracts more tenants and aligns with their investment mandate. Energy efficiency retrofits of the Empire State financed by QIA have cut energy use by 38%, leading to $4.4 million of annual energy cost savings."[19]

[19] See the "Framework Companion Document 2019", One Planet SWF Working Group, September 22, 2019. Accessed at https://oneplanetswfs.org/wp-content/pdfjs/web/viewer.html?file=https://oneplanetswfs.org/download/23/online-publication/827/opswf_09_22_final-spreads-low.pdf

Norway: From exclusions and divestments to a new green investment mandate

Norway, one of the One Planet founders, has long been a leader in sustainable investing. Norges Bank Investment Management, which manages the $1 trillion Government Pension Fund Global, seeks to improve performance and reduce risks by considering governance and sustainability issues that could have an impact on the fund's performance over time. Although the fund has invested broadly according to these principles, it has not invested in private markets (with the exception of real estate), and so has not invested in renewable energy infrastructure projects directly.

Yet, responsible investment is quintessential to NBIM. The fund operates under stringent ethical guidelines. In order to ensure these guidelines were followed by the managers of the fund, Norway's Ministry of Finance established in 2004 the independent Council on Ethics. Moreover, beyond adherence to these ethical principles, responsible investing at NBIM is developed through active ownership and sustainable investments.

The ethical guidelines have been adjusted over the years to reflect the will of Norway's parliament. Among other developments, tobacco, nuclear weapons, or coal-dependent companies have been banned from the investment universe of the fund. Since 2005, 69 companies have been excluded using the coal-based criterion (only 4 in the period of this report) and 19 because of severe environmental damage (only 2 since January 2018). Indeed, as reflected in the 2017 Report, decarbonization strategies executed via divestments from companies using coal in the period 2016-2017 had an estimated total value of $2.1 billion.

More recently, in June 2019, the Parliament endorsed the conclusions of a report for "omitting exploration and production companies in the energy sector from the GPFG to reduce overall oil price risk in the Norwegian economy".[20] The agreement in June 2019 disappointed those who thought the transition away from oil and gas would be bolder. Only months earlier, in September 2017, the Norges Bank advocated selling out oil and gas entirely. This implied an impact of $37 billion at that time. The final decision (allowing the fund to maintain investments in diversified energy companies with renewable energy divisions) reduces the impact, given that the exposure to this particular group of oil exploration and production is five times smaller, representing $7.5 billion.

So far, the world's largest SWF has been focused on divestment strategies, yet this is about to change in the near future. The Parliament in Norway decided to allow NBIM to invest in unlisted renewable energy infrastructure projects. NBIM has insisted that these decisions respond to a financial motivation, and not to support climate policy measures. With this measure, the Ministry of Finance "is not stipulating that the fund shall be invested in unlisted renewable energy infrastructure but are enabling Norges Bank to make such investments if deemed profitable."[21] In a movement that reflects the importance of this new investment strategy, Mr. Yngve Slyngstad, CEO of NBIM since 2007, who decided to resign from his position in October 2019, will continue in the fund, and contribute to the further development of this new investment area focused on building up an unlisted renewable energy infrastructure portfolio.

These investments will focus first on developed markets, relying on experienced partners, in order to minimize operational and market risks. In total, these new investments, which are considered part of the existing special environment-related mandate, will reach, if realized, about $12 billion, with an upper cap on unlisted renewable energy infrastructure investments at 2 percent of the fund value (thus with a limit of $19 billion as of September 2019).[22]This means that NBIM will join the group of SWFs investing directly in sustainable-linked projects and companies.

[20] See the press release of the Norway's Ministry of Finance for details. Available at https://www.regjeringen.no/en/aktuelt/phaseout-of-exploration-and-production-companies-from-the-gpfg/id2662141/

[21] Id.

[22] See the press release of the Norway's Ministry of Finance for details. Available at https://www.regjeringen.no/en/aktuelt/allowing-for-unlisted-renewable-energy-infrastructure/id2640386/

Masdar: Mubadala Investment Company's renewable energy investment vehicle

Any discussion of SWFs and green investments must include the work of Masdar, a fully-owned subsidiary of Mubadala Investment Company. Masdar, established in 2006, is an experienced global developer and investor of renewable energy. The company works in partnership with some of the world's largest energy companies and is active in more than 25 countries.[23]

Interestingly, Masdar is able to develop and operate both utility-scale and smaller off-grid renewable energy projects, showing an extraordinary capacity to generate impact at all levels. The development of these off-grid projects are helping to expand clean energy access in least developed countries. For example, Masdar develops and operates solar and wind farms in south Pacific islands such as Tonga, Tuvalu, Nauru, or Vanuatu, with generation capacities below 1 MW. Simultaneously, Masdar is a large-scale investor in projects such as the London Array, the second largest operational offshore wind farm with 630 MW capacity.

Since 2006, Masdar has invested in solar and wind power projects with a combined value of $12.5 billion. The electricity generating capacity of its projects is nearly 4 GW. Altogether, they displace nearly 5.4 million metric tonnes of carbon dioxide per year.

Beyond green infrastructure projects, Masdar works as a key player for the clean-tech ecosystem in the UAE, and the wider GCC region. The ability of Masdar to incubate technologies, implement them at scale and test their commercial viability, contributes to the ecosystem. The experience, capabilities developed by Masdar over the years have spillover effects in the clean technology industry, from air-conditioning to waste management technologies.

CONCLUSION

Attaining the SDGs will require a worldwide mobilization of capital. Creating a strong SDF deal pipeline will require significant work in sourcing the deals and in creating regulatory conditions that provide clear assurances to investors.

SWFs are well-placed to play a key role in helping countries achieve the SDGs. Not all (or even most) of the necessary investment capital will come from SWFs and SDFs, but SWFs and SDFs will often take the lead in making SDF investments, and they will also often be able to lead and catalyze investment by the private sector.

As shown in the case studies above, SWFs are working on the SDG challenge from a number of different angles, including investments in technology, clean energy production, and sustainable food production, among other disruptive initiatives. Such creativity and imagination will be necessary as SWFs seek to find deals that will be able to simultaneously provide strong returns while also drive towards the achievement of the SDGs.

[23] See the Chapter on "Mubadala In Depth" in this Report for further information on Masdar and the Mubadala's comprehensive strategy on sustainability.

5

SWFS IN-DEPTH

Mubadala: the 360-degree Sovereign Wealth Fund

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5. *SWFs In-Depth.* Mubadala: The 360-degree Sovereign Wealth Fund

What is Mubadala Investment Company? Mubadala defines itself as "a global investment company with a mandate to create sustainable financial returns, furthering its shareholder's strategic objective of a globally integrated and diversified economy."

Mubadala is a truly global investment entity with presence in 50 countries. Legally classified as a state-owned enterprise, this particular SWF has a strong mandate for the UAE's economic diversification and global integration. In turn, Mubadala is a good representative of the group of sovereign development funds.[1] SDFs can be defined as a "government-sponsored investment vehicle that has dual objectives; it seeks to realize developmental objectives, while delivering competitive financial performance".[2]

Yet who owns Mubadala? The only shareholder is the government of Abu Dhabi. Abu Dhabi is one of the Emirates that compose the federation of the United Arab Emirates (UAE), established in December 1971. Abu Dhabi, with a population of 2.9 million, holds 9% of the world's oil reserves and 5% of the world's gas reserves. The city of Abu Dhabi is the capital of the federation and of the Emirate.

More than a decade ago, the Abu Dhabi government identified a set of priority areas to drive the diversification of the economy and reduce the country's reliance on hydrocarbons. Today, 50.3% of Abu Dhabi's total GDP is not related to hydrocarbon revenues.

The history of Mubadala is the history of the efforts of a nation to diversify the economy from oil and gas wealth, and the development of critical infrastructure, including hospitals and universities, for UAE's present and future generations.

MUBADALA INVESTMENT COMPANY: THE MERGE OF THREE SWFS AND THEIR MISSIONS

In fact, Mubadala Investment Company, is today the result of the merge of three Abu Dhabi preexisting funds:International Petroleum Investment Company (IPIC), Mubadala, and Abu Dhabi Investment Company (ADIC). To understand the group is important to understand its components.

IPIC was the first of these three funds. Established in 1984, IPIC aimed to increase the oil wealth potential of the country. Discovered in 1958, oil has led the transformation of the country. The first tanker of Abu Dhabi crude departed the Jebel Dhanna port on December 1963. After eight years of oil exploration, production and exporting, the late Sheikh Zayed bin Sultan Al Nahyan established the Abu Dhabi National Oil Company (ADNOC), in 1971. A decade later, IPIC started its investment path with a clear mission: build a global diversified portfolio of oil companies. Its first investment was Cepsa in 1988. Today, Cepsa is the Europe's largest privately-owned integrated oil & gas company, and is majority owned by Mubadala Investment Company while The Carlyle Group controls a remaining stake between 30-40%. After Cepsa, IPIC continued with investments at all the stages of the oil and gas value chain: from refining companies, to petrochemical producers, pipeline operators, oil investment companies, or electricity companies. With investments in 10 different countries including Pakistan, Japan, Austria or Spain, IPIC was merged with Mubadala in 2017, following a Royal Decree. Its petroleum-related assets form the bulk of one of the four

[1] See Santiso, J. "Sovereign Development Funds: Key financial actors of the shifting wealth of nations," 2008, OECD Emerging Markets Network Working Paper, Accessed at https://www.oecd.org/dev/41944381.pdf

[2] See Bruce-Clark, P. and Monk, A.H.B. (2017). Sovereign Development Funds: The Governance and Management of Strategic Investment Institutions. In The Oxford Handbook of Sovereign Wealth Funds, D. J. Cumming, G. Wood, I. Filatotchev, and J. Reinecke (Eds.). Oxford (UK): Oxford University Press. Another major read is Schena, P.J., Braunstein, J., and Ali A. (2018). The Case for Economic Development Through Sovereign Investment: A Paradox of Scarcity? Global Policy 9, 365-376.

global business platforms of Mubadala Investment Company, the Petroleum & Petrochemicals.

Mubadala, on its part, was established in 2002, with the mission of further diversifying the UAE's economy out of oil. With both an international and domestic goal, Mubadala grew focused on relevant sectors including aerospace, semiconductors, healthcare and renewable energy. Each of these sectors has evolved successfully and represent some of the best case-studies of sovereign development funds worldwide. In fact, a series of coordinated investments in the aerospace value chain has allowed the Emirate to grow as an international aerospace powerhouse. Today, Strata, a Mubadala's fully owned subsidiary established a decade ago in 2009, supplies highly complex parts to Airbus or Boeing. Today, more than 50% of Strata's workforce is Emirati, of which 86% are women. It represents a clear case for development SWFs, using the wealth obtained from underground riches to diversify the economy by developing new sectors from the scratch, helping to generate non-oil new revenue streams, making an impact while securing jobs and national talent development.

Lastly, Abu Dhabi Investment Council (ADIC), which started operations in 2007, was merged with Mubadala Investment Company in March 2018. ADIC, which today operates as a fully owned subsidiary of Mubadala Investment Company, keeps its leadership management yet reports to the Mubadala Group CEO and the Mubadala's board of directors. Nevertheless, ADIC's activities remain elusive. It is the least transparent of the three components of the new Mubadala: and only few investments are traceable using publicly available sources. It is known the prestige of ADIC as a globally diversified investor and it is considered a major investor in the Abu Dhabi's financial services investor, holding significant positions in key financial institutions. ADIC has an extensive network of global and regional partners.

Of the three current entities which merged to form Mubadala Investment Company, ADIC is the most typical financial SWF, pursuing long-term returns by investing both in foreign private and public markets; on its part, Mubadala aims for a direct development goal and IPIC has an industry-specific investment focus. In that sense, ADIC, resembles the other large SWF in the Emirate, Abu Dhabi Investment Authority (ADIA), yet smaller.

The integration of the three investment vehicles, fully owned by the government under the umbrella of Mubadala Investment Company represents a clear case to understand the different missions of SWFs and how countries design SWFs according to the needs of their time. (See Infographic)

Today, Mubadala Investment Company (MIC) reunites three goals in one fund. Yet, all of them serve to the ultimate goal of the Emirate of diversifying its economy and prepare Abu Dhabi (and the UAE) to the post-oil era. The second goal of MIC, according to the initial statement which opened this chapter, is to integrate Abu Dhabi in the global economy. Here, the pooling of the three portfolios should allow for large savings from economies of scale and synergies. The integration of MIC is at least four times larger today than Mubadala was before 2017. MIC manages $229 billion in assets.

HOW TO MEASURE PROGRESS: INNOVATION AND CHANGE, SUSTAINABILITY AND LONG-RUN PARTNERSHIPS

It is interesting to focus first on how Mubadala measures progress. It is not an evident answer for state-sponsored funds which aim to obtain high financial returns and simultaneously support government long-term economic policies. How to measure the former seems easy and an ample array of measurements and approaches are used by SWFs all over the World (see the Chapter on Returns of SWFs in this report to explore this issue in detail). Yet, to understand the latter, "economic impact", is not an easy endeavor. A given state can focus on job creation, other in the support of declining industries, other in attracting investments, other in building up national champions or preparing state-owned companies for public markets, etc. There are multiple goals for sovereign development goals. Ultimately, a fund should be measured against its mission. In the case of MIC, it has made a thorough exercise to understand its role in the Emirati economy. To measure the progress of Mubadala we should focus on five areas as defined by MIC:

- Embrace innovation.
- Foster sustainable and responsible businesses.
- Build long-run partnerships to create value.

INFOGRAPHIC 4

Mubadala: A 360-Degree Fund

Mubadala is today the result of the merge of three Abu Dhabi preexisting funds.

1984

International Petroleum Investment Company (IPIC)

Goal: to advance the vision of using Abu Dhabi's natural petroleum wealth to build a modern, diversified economy. IPIC has an industry-specific investment focus in the petroleum industry: energy, plastics, polyolefin, refining, integrated...

2002

Mubadala

Goal: to advance the emirate's economic diversification. An active investor across multiple sectors in more than 20 countries.

2007

Abu Dhabi Investment Company (ADIC)

A $100bn fund investing globally with a strong exposure to domestic financial institutions.

2017

Mubadala Inestment Company

The merge IPIC+Mubadala creates Mubadala Investment Company.

A $125 billion state-owned fund.

2018

ADIC joins the Mubadala Investment Company group

Another step in Abu Dhabi's efforts to accelerate the diversification of the UAE's economy. With an investment vehicle of $229 billion, world-class talent and wide geographical reach, UAE enhances its country's competitive position.

Mubadala's Global Business Platforms

Alternative Investments & Infrastructure

- Capital
- Healthcare
- Real Estate & Infrastructure

Petroleum & Petrochemicals

- Refining & Petrochemicals

Technology, Manufacturing & Mining

- Metals & Mining
- Semiconductors

Aerospace, Renewables and Information & Communications Technology

- Aerospace
- Information & Communications Technology
- Renewables
- Utilities

Source: Sovereign Wealth Research (IE Center for the Governance of Change).

- Explore opportunities in emerging markets.
- Make a positive impact in local communities.

For brevity, this chapter explores the first three areas: innovation, sustainability and partnerships. The opportunities in the emerging markets will appear in all the previous sections and the positive impact on local communities will be exemplified through some of the investments detailed in the sustainability section. The overall mission of MIC of creating sustainable financial returns, while fulfilling its shareholder's strategic objective of a globally integrated and diversified economy, resonates in all the sections studied below.

EMBRACE INNOVATION AND CHANGE

Mubadala wants to embrace innovation. But how? Mubadala has established three main channels to approach innovation: Mubadala Ventures, Hub71 and the partnership with SoftBank's Vision Fund.

In 2017, during the reorganization process coinciding with the integration of IPIC, MIC established Mubadala Ventures. A dedicated team based in Abu Dhabi and San Francisco that will support and expand the exposure of Mubadala to global innovation. Built on their previous experience with advanced technologies in aerospace, semiconductors, or energy efficiency, Mubadala Ventures focuses on US- and Europe-based startups. This unit plans a three-way access to innovation: to invest directly, manage a fund of funds, and oversight the Mubadala's partnership with SoftBank, enrooted in its $15 billion limited partnership commitment to the SoftBank Vision Fund.

Mubadala Ventures is part of Mubadala Capital, the investment arm of Mubadala, which comprises other strategies including private equities, credit or sovereign investment partners. On this regard, Mubadala Ventures can rely on established relationships and a network of experienced professionals working in private equities or credit, based in Hong Kong, New York, and Rio de Janeiro, to continue exploring opportunities in the venture capital space.

Mubadala launched Hub71 -named after the United Arab Emirates' formation year- in March 2019. It is part of a $13 billion stimulus plan called Ghadan ("tomorrow" in Arabic) and located in a newly established international financial center in Abu Dhabi's Al Maryah island. Hub71 is the vault key of the Mubadala's innovation strategy. This collaborative tech incubator system supported by Microsoft and SoftBank aims to build an innovation ecosystem in Abu Dhabi. As it has happened with other ecosystems in Paris, Santiago de Chile or Barcelona, an international incubator has a dual consequence. First, it attracts global talent by providing capital, and a favorable business environment, along with easiness on office space, affordable housing and healthcare. The incubating program focuses on international VC-backed companies at seed and early stages. Second, it generates a (desired) imitative process to attract national talent to innovation and entrepreneurship. Nationals get to know and interact with foreign founders, ideas, and projects and may end up leading their own projects. These kind of spillover effects are perfectly in line with a sovereign development fund targeting economic diversification.

In the case of Mubadala Hub71, it adds another layer: it is the glue for the other previous initiatives. Not coincidentally, companies invested by the Mubadala's backed Vision Fund are aligned with the initiative. Accordingly, OYO will provide the housing services offered by the hub; WeWork will establish its first location in the UAE in Hub71 in early 2020. Given the closeness of Mubadala to Vision Fund's portfolio companies, Hub71 can be easily presented as a suitable spot to open up regional offices not only to WeWork, OYO but beyond: Gympass, Slack, Kabbage, or Roivant, may be candidates to bring their teams, open regional offices or open innovation and research and development units in the Al Maryah island. Indeed, Hub71 would help to foster the long-term partnerships between portfolio companies at the Vision Fund and Abu Dhabi.

Also, Hub71 is in line with the Mubadala's direct and fund investment strategies already running for Europe and the United States. Actually, in October 2019, Mubadala Capital announced the establishment of two new vehicles: a $150 million fund of funds which will "invest in funds that are committed to supporting the Abu Dhabi-based Hub71 ecosystem, including through investing in companies that leverage Hub71 for regional expansion and growth"; and a $100 million fund "dedicated for direct investments in early stage technology companies led by founders that are committed to be part of the Hub71 ecosystem".[3]

Moreover, Mubadala Ventures closes the circle by connecting Mubadala's businesses around the world with international talent. Indeed, one of the main claims for attracting founders is on the promise that Hub71 will help entrepreneurs to access global markets through MIC's network of more than 60 global assets in 15 sectors. This strategy reinforces the interactions among all Mubadala's business platforms and assets and allows to create opportunities and synergies all along its diversified portfolio, and to generate potential innovation and efficiency gains.

INFOGRAPHIC 5a

Mubadala: Innovation and Change

Chronology:

Mubadala's experience in advance technology

2007
AMD
The Nasdaq-listed multinational developing computer processors.
Yahsat
A UAE-based company which has already launched two satellites into space with a third scheduled for launch this year.

2008
Masdar City

2009
GlobalFoundries
The second largest semiconductor foundry company in the world.

2015
Cognit
A joint venture with IBM, to provide IBM's computing system Watson to organizations in the MENA region.

Experience as direct private capital investor

2011
Mubadala Capital
Access to deal flow and knowledge via local offices in Abu Dhabi, New York, San Francisco, Rio de Janeiro and Moscow
Examples: Experienced teams investing in private equities, credit, or establishing alliances with other sovereign funds.

2017
Mubadala Ventures is established
During the reorganization process coinciding with the integration of IPIC, MIC established Mubadala Ventures to support and expand the exposure of Mubadala to global innovation.

Source: Sovereign Wealth Research (IE Center for the Governance of Change).

[3] According to Ibrahim Ajami, head of Mubadala Ventures, as quoted in Gulf Business, "Abu Dhabi's Mubadala launches new fund for startups," 22 October 2019. Accessed at https://gulfbusiness.com/abu-dhabis-mubadala-launch-new-funds-start-ups/

INFOGRAPHIC 5b

Mubadala's Business Platforms: How does Mubadala embrace innovation?

Mubadala Ventures has established three main channels to approach innovation:

.01

Mubadala's partnership with SoftBank Visionfund

$15 US billion dollars commitment
Opening of the San Francisco Office, May 2017.

.02

Direct and fund investing

$400M US dollars
Mubadala Ventures Fund 1
31 investments (Collective Health, InCountry, Platform9...).

$200M US dollars
Global Fund of Funds
It has invested in seven funds in its first year of operation (Aug 2018).

$400M US dollars
European Tech Fund
4 investments.
Opening London office, 2019.

$150M US dollars
MENA Fund of Funds
Data Collective Venture Capital, Middle East Ventures Partners and Global Ventures...

$100M US dollars
MENA Tech Fund
Data Collective Venture Capital, Middle East Ventures Partners and Global Ventures...

.03

Hub 71

Goals

A. Bring Softbank Vision Fund portfolio companies to establish regional offices in Hub71: WeWor, OYO, Gympass, Slack, Kabbage, Roivant...

B. Connect Hub71 startups with Mubadala global portfolio companies and bring opportunities to startups in Hub71.

Selected 2019 VC rounds
US$ Million

Source: Sovereign Wealth Research (IE Center for the Governance of Change).

In sum, the Mubadala's approach towards innovation and change is an effort to create value by betting on founders, VC managers, by leveraging on Mubadala's experience in technology sectors and business partnerships. Indeed, Mubadala has envisioned the access to technology as a coordination of several elements. Sequentially, it all started with the acquired experience over the years investing in Mubadala's advanced- technology assets in areas such as aerospace, semiconductors, or renewable energy. Then the opening of the San Francisco office helped Mubadala to stay close to disruptor founders and the largest tech companies; it was followed by a series of direct investments in global startups and the design of a fund of funds strategy that helped to engage with leading and regional venture capital firms, with the critical role of Mubadala's commitment to the SoftBank Vision Fund; this in turn helped to form strategic alliances between Mubadala's assets and VC-backed companies, fostering innovation; the process culminates with the commencement of a local innovation hub to attract all the stakeholders of the process and to foster entrepreneurial spirit among foreign and ultimately national founders, while benefitting UAE's home market through economic diversification and high-quality jobs.

As an epilogue to this holistic effort, the first investment from the Mubadala's Capital MENA direct fund was in Bayzat. It is a Dubai-based startup which offers enterprise software enabling SMEs to automate HR administration and health insurance. The participation of Mubadala Capital in this Series B along with Point72 Ventures (the venture capital firm founded in 2016 by a US hedge fund manager billionaire), rounds this story. The three co-founders, educated first in the American School of Dubai and then graduated in top engineering universities in California and Montreal, came back home and establish their company in Dubai, and now represent the hopes of a region that wants to change oil for technology as soon as possible.

FOSTER SUSTAINABLE AND RESPONSIBLE BUSINESSES

The second mission of Mubadala is to foster sustainable and responsible business. The fund, and all the UAE's financial architecture and economy, has relied greatly on oil and gas revenues. In fact, the different vehicles and funds were design to manage and preserve this underground finite wealth and to transform it into financial, potentially infinite, wealth.

Responsible investing is a growing trend among institutional investors. According to IMF,[4] around 1,000 institutional investors and almost $9 trillion assets have been divested from fossil fuels since 2012. SWFs are not unconnected to this trend. Two anecdotal events in 2019 further illustrate it. In a recent meeting in New York, the head of the Kuwait Investment Authority focused his speech on the need to reduce the global carbon footprint and the importance of integrating climate risk considerations into investment portfolios. The ex-CEO of the Norway's SWF will continue at the $1.1 trillion fund, now focused on building up an unlisted renewable energy infrastructure portfolio, which aims to invest $13 billion.[5] This is the first time Norway's fund is allowed to invest in unlisted markets beyond real estate or pre-IPO companies. On its part, The One Planet Working Group of SWFs, established by 6 SWFs, including ADIA and representing close to $3 trillion collectively, received further endorsement from the international community when eight global fund managers representing $15 trillion in combined assets signed up to the working group's framework in July 2019.[6] The One Planet framework targets to accelerate the integration of financial risks and investment opportunities related to climate change among large and long-term investors.

[4] See International Monetary Fund, Global Financial Stability Report, Chapter 6, October 2019. Accessed at https://www.imf.org/en/Publications/GFSR/Issues/2019/10/01/global-financial-stability-report-october-2019#Chapter6

[5] See NBIM, September 2019. Accessed at https://www.nbim.no/en/the-fund/news-list/2019/comments-on-the-mandate-for-investments-in-bonds-and-unlisted-renewable-energy-infrastructure/

[6] See "One Planet Sovereign Wealth Fund Group." Accessed at https://oneplanetswfs.org/#

Mubadala can be considered a precursor of the SWFs' involvement in sustainable finance. Indeed, Masdar, a wholly owned subsidiary at the core of Mubadala, is a regional champion in sustainable finance.

Masdar leads the way of the green and sustainable finance strategy at Mubadala. With presence in 25 countries, Masdar have invested $8.5 billion in global sustainable projects and has 4 GW capacity installed or under development. Launched in 2006, Masdar is mainly focused on solar and wind power projects. It is estimated that the clean energy capacity backed by Masdar displaces 5.4 million tons of CO2 every year. Interestingly, Masdar is able to deploy a dual strategy: on the one hand, to join some of the world's largest renewable energy infrastructure projects and, on the other hand, develop and finance off-grid renewable energy projects, which help to expand energy access in emerging markets and least developed countries, reducing their reliance on fossil fuels for electricity generation.

So far, the best example of a Mubadala's utility-scale project is the London Array. This 175-turbine 630 MW offshore wind farm is located 20 km off the Kent coast in the outer Thames Estuary in the United Kingdom. It is the second largest offshore wind farm on Earth. London Array prevents the release of 925,000 tons of CO2 per year and provides clean energy to 600,000 homes in the greater London area. Masdar owns 20% of the project, jointly with E.ON (30%), the energy company, La Caisse de dépôt et placement du Québec (25%), a public pension fund, and Orsted (25%), the market leader in offshore wind energy (previously known as DONG Energy). Other large-scale clean energy projects include concentrated solar power plants in Spain and UAE, the first floating wind farm in Scotland, or a waste-to-energy facility in the UAE.

As said, Masdar's strategy goes beyond large-scale infrastructures in solar and wind energy. Masdar has joined other UAE government institutions to reduce fossil fuel dependence in least developed countries. These include micro-scale wind and solar projects in countries in the Pacific islands or the Caribbean, photovoltaic projects in remote communities in Mauritania, or solar home systems in dozens of villages in southern Afghanistan. They exemplify how Masdar is able to meet the needs of smaller communities and populations around the World with a tangible impact. These projects help to offset emissions, save money to local governments by providing cheaper energy sources and displace diesel and oil consumption.

Masdar City: The sustainable city of the future

Masdar City is a unique answer to the world's growing urbanization question and the climate change threats it encompasses. Today, 55% of world total population lives in cities.[7] By 2050, it is expected that this figure increases to 68%, according to the United Nations Population Division,[8] meaning more than 6.7 billion people living in cities, compared to the current 4.2 billion. In order to manage this population growth while keeping emissions low, cities need to adapt to a more sustainable way of living and organizing. Precisely, Masdar City

[7] See World Bank Data. Accessed at https://data.worldbank.org/indicator/SP.URB.TOTL.in.zs

[8] See UN Population Division Data. Accessed at https://population.un.org/wup/

was launched in 2008 to serve as a model and sustainable city laboratory. The goal was to design and implement the world's most sustainable low-carbon city. Today, Masdar City "is pioneering a greenprint for how cities can accommodate rapid urbanization while dramatically reducing their energy and water needs and waste production."[9]

Masdar City is a sustainable ecosystem focused on sustainable solutions. It integrates knowledge, research and development, a technology hub, as well as a business and investment free zone. Sustainable solutions are investigated by global industrial corporations in the City including GE, Siemens or Mitsubishi. Research projects done at Masdar City deal with photovoltaic test centers, seawater energy systems, smart homes or energy storage solutions.

The sustainable technology hub has received a recent push in line with that of Hub71. Indeed, Masdar City recently launched Tech Park, an eco-friendly cluster of offices, hot desks made from recycled shipping containers. The Tech Park, backed by The Catalyst, the Middle East's first start-up accelerator specializing in clean technology and sustainability supported by a joint venture of Masdar and BP, will be one of the first destinations of its type focused on innovation in the digital economy and sustainability. The Catalyst plans to attract and incubate 12 new homegrown and international startup ventures per year in the coming 3 years until 2021.

Overall, the working population at Masdar City today exceeds 4,000 with around 600 companies now operating out of the city, from global corporations to local enterprises and freelance entrepreneurs. The City receives on average 10,000 visitors per month, converting Masdar City in an attractive destination and a modern cultural icon of global sustainability. The ability of the City to keep attracting talent, ideas, and capital on sustainable development is today more urgent than ever. Only the future will tell us if Mubadala is able to provide the much-needed solutions the world is awaiting to help achieving the SDGs, out of this innovative and brave project.

[9] See Masdar City Facts. Accessed at https://masdar.ae/en/masdar-city/the-city

Plastic waste and Mubadala's sustainability

Mubadala's petrochemical assets (composed mostly of IPIC's legacy portfolio) are at the forefront of global efforts on reducing plastic waste, combat marine pollution and enhance recycling. Mubadala's sustainable approach goes beyond renewable energy infrastructure or Masdar City. Mubadala's portfolio companies are developing, partnering or acquiring technologies to solve plastic waste. Three cases can be highlighted.

First, Borealis, some of the world's largest petrochemical company, majority owned by Mubadala since 1998, plays a pivotal role. In 2016, Borealis acquired two German recycling plastic companies, leaders in technology for post-consumer plastic waste and Europe's largest producers of post-consumer recyclates. Secondly, OMV, another Mubadala´s subsidiary controlled jointly with an Austrian state-owned enterprise, has developed proprietary technology to liquefy and process plastic waste into naphtha-equivalent feedstock. Thirdly, NOVA Chemicals, among the largest plastic producers in the US acquired by IPIC in 2009, is a founding member of the "Alliance to End Plastic Waste, a non-profit made up of 30 cross-industry companies committing $1 billion over five years to recycling infrastructure, research and waste clean-up through company directed spending and funding of the non-profit."[10] In addition, NOVA is using single polymers to ease recycling without compromising functionalities.

As seen, there is a will throughout Mubadala's petrochemical assets to reduce environmental impact, increase awareness, investigate technologies to expand recycling and engage into circular economy patterns. Yet, there is an obvious paradox, common to all the oil- and gas-based SWFs. Their source of wealth remains the major contaminating driver in the planet when used for industry, electricity and heat production, as well as transportation. Fossil fuel combustion and industrial processes contributed about 78% of the total greenhouse gas emissions increase from 1970 to 2011.[11]

[10] See Mubadala's website. Accessed at https://www.mubadala.com/en/our-impact/advancing-global-sustainability

[11] See United States Environmental Protection Agency, Global Greenhouse Emissions Data. Accessed at https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data

There is a growing global pressure stemming from citizens, governments, regulators, political parties, investors, corporates, media and the third sector, to foster the transition towards a low-carbon economic model. Sovereign wealth funds are ideally positioned to play a pivotal role in this transition given their size, the influence they generate as investors on other peers, and because of their sovereign-nature which should facilitate the alignment with governments and citizens.

One of the main responses of SWFs to the call on action ignited by the SDGs, and the Paris Agreement in 2015, was the establishment of the One Planet SWF Working Group (OPSWF) in 2017. This group co-founded by six SWFs including ADIA, "committed to develop an environmental, social and governance framework to address financial risks due to climate change, and to develop methods and indicators that can inform investors' priorities as shareholders and participants in financial markets. In July 2018, the OPSWF Framework was published, consisting of a set of principles to guide efforts to further integrate climate change analysis into large, long-term and diversified asset pools."[12]

BUILD LONG-RUN PARTNERSHIPS TO CREATE VALUE TOGETHER

The efforts made by Mubadala in the areas of development, green transition or technology, cannot be understood without a key element: partnerships. In fact, one of the main differences between the United Nations' Millennium Development Goals, which ended in 2015, and the current Sustainable Development Goals, is that the latter is totally reliant on partnerships. In this sense, Mubadala is quite experienced to aligning with the critical Sustainable Development Goal 17 "Partnerships".

Sovereign Investment Partnerships

Back in 2013, Mubadala Capital started a "Sovereign Investment Partnership" strategy. This business unit has managed commercially driven co-investment programs between the UAE and foreign counterparts including China, France, Greece, Kazakhstan and Russia. In the case of China, France, and Russia, the counterpart is a SWF (SAFE, Bpifrance, and RDIF, respectively). These SWF-SWF co-investment programs are in line with a growing trend in the SWF investment practice on co-investments. The strengthening of relationships between SWFs has crystalized in more frequent co-investments. In the case of Mubadala, the establishment of these bilateral agreements relies on three guiding principles:

- An investment portfolio managed by a dedicated in-house team who works with the corresponding sovereign partner through a well-defined operating model.

- An active presence maintained in the target country with a commitment to expand resources on the ground once scale is achieved.

- A disciplined investment program whereby capital and resources are deployed deliberately in accordance with experience and opportunity in the host country.

The investment philosophy is in accordance with global private equity investment principles. On a country-case, targets are defined considering the sectors of interest, asset classes targeted, investment size ($50-250 million), capital structure (covering equity, debt, and mezzanine), transaction type (control or minority positions, and a clear preference to investing alongside sponsors and strategic investors in various forms: lead, co-lead, syndicated co-investments or limited partnership commitments to private equity funds), and ownership model (with preference for board seats to ensure active involvement to ensure the "investment team has the ability to contribute distinctive expertise and create value over time").[13]

[12] See "Framework Companion Document 2019." One Planet SWFs. Accessed at https://oneplanetswfs.org/wp-content/pdfjs/web/viewer.html?file=https://oneplanetswfs.org/download/23/online-publication/827/opswf_09_22_final-spreads-low.pdf

[13] See Mubadala's Sovereign Investment Partnerships for further information. Accessed at https://www.mubadala.com/en/what-we-do/capital/sovereign-investment-partnerships

So far, the Mubadala's most fertile relationship within the Sovereign Investment Partnership program is with the Russian Direct Investment Fund. The $7 billion agreement launched in 2013 has generated at least 45 joint investments with an aggregate value in excess of $2 billion. It includes the $2 billion RDIF-Mubadala Investment Fund and a $5 billion commitment from Abu Dhabi Department of Finance to invest in Russian infrastructure projects. These partnerships included high-profile investments such as the joint venture to develop oil fields in the Tomsk and Omsk regions of Western Siberia; logistic platforms in Moscow and Novosibirsk areas, which would support the Auchan's group expansion in Russia; a controlling stake in Russian Fitness Group, Russia's biggest fitness group; and the recent signature of six memoranda of understanding covering advanced technology, artificial intelligence, healthcare or transportation.

This particularly active multidimensional relationship continued in 2019 with a $2.8 billion proposed project for a new pulp mill plant in northwest Russia, the investment into NefteTransService, one of the Russia's largest operators of railway rolling stock, and the agreement to invest in NtechLab, the Russia's leader developer in face recognition technologies.[14]

Partnerships beyond sovereigns: The case of Total

Yet, Mubadala's efforts on partnerships expand beyond Sovereign Partnerships. In fact, the particular nature of Mubadala, as a hybrid between an investment and an operating company, explains why core partnerships are made directly between Mubadala's subsidiaries and global operating business leaders. These including GE, Boeing, Airbus, or Total.

The Total agreement and array of initiatives explains the Mubadala's vision of having dynamic and diverse collaborations. Total has a 75-year history in the UAE, and Mubadala partners with Total in initiatives spanning the whole energy spectrum from hydrocarbons to renewable energy. In the gas area, Dolphin Energy is the central example: an initiative of Total, Mubadala Petroleum and Occidental Petroleum, Dolphin is today a multinational gas development and transportation company producing 2 billion cubic feet of gas per day in Qatar, which is then transported for use in the UAE and Oman. Dolphin is among the largest investment initiatives in the region. Mubadala collaborates with Total in Indonesia too, where natural gas is extracted by Mubadala Petroleum and processed at Total's onshore terminal.

On renewable energy, Mubadala partnered with Total to build up Shams 1, a 100MW concentrated solar power plant in Abu Dhabi. The initiative counts with the participation of a global industry leader, the Spanish Abengoa Solar, and delivers clean energy to power 20,000 homes in the UAE. Moreover, SunPower, Total's solar energy subsidiary, reinforced the longstanding relationship with the opening of new offices at Masdar City, with a focus on research, in January 2015.

[14] See "Mubadala and RDIF consider joint investment in $2.8bn project in Russia", The National, 26 October 2019. Accessed at https://www.thenational.ae/business/mubadala-and-rdif-consider-joint-investment-in-2-8bn-project-in-russia-1.924522

A successful case study: partnerships in the aerospace industry

Beyond energy, one critical partnership arena for Mubadala was the aerospace industry. The comprehensive strategy to stimulate an aerospace sector from scratch in the country, led to partnerships with aircraft makers Boeing or Airbus and GE, among others.

In 2008 and 2009, Mubadala engaged into global agreements with GE, Airbus, and Boeing. In the case of GE, Mubadala signed an ambitious multi-billion-dollar global business agreement with the US industrial leader.[15] The agreement focused on several aspects: commercial finance, renewable energy and water (which led to the establishment of an R&D unit of GE in Masdar City), aviation and corporate learning. With respect to aviation, the partnerships commenced with the expansion of the MRO (maintenance, repair and overhaul) capabilities of Abu Dhabi Aircraft Technologies (ADAT), the Mubadala's leading Middle Eastern MRO company. The aim was to better serve the growing number of GE aircraft engines in service in the region. The collaboration between the two entities was close. By December 2011, a $150 million facility was built in Abu Dhabi. GE supported ADAT in "the design and construction of this facility to meet the industry's global regulations, through providing the necessary expertise during the development phase".[16] Mubadala and its partner GE, continued with their plans to position Abu Dhabi as a world class engine maintenance hub. The relationship received a further push in 2013, when GE Aviation signed an extended agreement to help Mubadala develop engine component manufacturing capabilities within the Emirate, with the aim of positioning Mubadala to become a Tier 1 engine supplier in the next decade.

In 2013, stronger and critical agreements between Mubadala and both Airbus and Boeing were signed. That year implied a big push to the partnerships and initiated a series of collaborations that extended Airbus' and Boeing's footprint in the region. These growing interactions ensured commitments to award composite work packages to Strata, the Mubadala's fully owned advanced composite aerostructures manufacturing facility. And it turned well. By 2018, Strata is a key supplier to both Boeing and Airbus. Moreover, after years of building trustful relationships by manufacturing high-quality products, Strata became a leading Tier 1, or direct, supplier, as well as a sole supplier to Airbus on particular parts. "In a telling example of the global reach that Abu Dhabi's aerospace industry has achieved, every A330/340 which joined operation after February 2011 and every A380 after 2012 has components which were manufactured by Emirati technicians in Strata."[17] Similarly, the partnership with Boeing solidified over the years with the supply of Boeing's 777 and 787 aero structures. Today, Strata is the Boeing's first direct composites supplier in the Middle East region.

The knowledge exchange and training programs, shared between UAE-engineers and their global partners, has cemented the growth of an important industry in the country. This series of strategic long-term partnerships served the ultimate goal of diversifying the economy from oil and gas, and generated hundreds of aerospace-related jobs for Emiratis. The logic of a sovereign development fund is clear in this successful case study. The prudent usage of oil and gas related wealth has propelled the creation of a complex and high value-added industry in the country, throughout long-term strategic partnerships with key global players.

[15] The main purpose of this agreement was the establishment of a new financial entity focused on commercial lending (Mubadala GE Capital, MGEC) and funded with $8 billion in equity. The assets (loans) generated over the years were sold in different phases to Blackstone and finally Apollo, the global private equity managers.

[16] See Mubadala press release for more details. Accessed at https://www.mubadala.com/en/news/abu-dhabi-aircraft-technologies-establish-world%E2%80%99s-first-ge-and-engine-alliance-network-partn

[17] See Mubadala & Airbus partnership description at Mubadala's website. Accessed at https://www.mubadala.com/en/who-we-are/partnerships/mubadala-airbus

ANNEX 1

IE Sovereign Wealth Research Ranking 2019

TABLE 1

IE Sovereign Wealth Research Ranking 2019

● Pre-2010 SWFs
○ IFSWF members

● New SWFs (2010-2016)
○ IFSWF members

● Countries Considering SWFs

	Sovereign Wealth Fund*	Assets under Management ($bn, US dollars)	Country	Established	
1.	**Government Pension Fund Global**	**1,047.05**	NORWAY	1990	●
2.	**China Investment Corporation**	**940.60**	CHINA	2007	○
3.	**Abu Dhabi Investment Authority**	**745.00**	UAE	1976	○
4.	**State Administration of Foreign Exchange**	**690.00**	CHINA	1997	●
5.	**Hong Kong Monetary Authority - Exchange Fund**	**529.43**	HONG KONG SAR (CHINA)	1993	●
6.	**Kuwait Investment Authority**	**527.00**	KUWAIT	1953	○
7.	**Saudi Arabian Monetary Authority - Reserve Assets**	**512.14**	SAUDI ARABIA	1952	●
8.	**National Social Security Fund**	**437.90**	CHINA	2000	●
9.	**GIC**	**407.00**	SINGAPORE	1981	○
10.	**Qatar Investment Authority**	**304.00**	QATAR	2005	○
11.	Public Investment Fund	280.00	SAUDI ARABIA	1971	●
12.	Investment Corporation of Dubai	239.39	UAE	2006	●
13.	Temasek Holdings	231.00	SINGAPORE	1974	●
14.	Mubadala Investment Company	229.98	UAE	2002	●
15.	Korea Investment Corporation	131.60	SOUTH KOREA	2005	○
16.	National Wealth Fund	124.14	RUSSIA	2008	○
17.	Future Fund	112.00	AUSTRALIA	2004	●
18.	National Development Fund	68.00	IRAN	2011	○
19.	Samruk-Kazyna	67.43	KAZAKHSTAN	2008	○
20.	Libyan Investment Authority	67.00	LIBYA	2006	○
21.	Alaska Permanent Fund	66.30	USA - ALASKA	1976	○
22.	National Oil Fund of Republic of Kazakhstan	59.94	KAZAKHSTAN	2000	●
23.	Texas Permanent School Fund	46.52	USA - TEXAS	1854	●
24.	Emirates Investment Authority	45.00	UAE	2007	●
25.	State Oil Fund of the Republic of Azerbaijan	42.46	AZERBAIJAN	1999	○
26.	Turkey Wealth Fund	40.00	TURKEY	2016	○
27.	Brunei Investment Agency	39.00	BRUNEI	1983	●
28.	Khazanah Nasional	32.72	MALAYSIA	1993	○
29.	New Zealand Superannuation Fund	28.09	NEW ZEALAND	2001	○
30.	State General Reserve Fund	25.00	OMAN	1980	○
31.	New Mexico State Investment Council	24.63	USA - NEW MEXICO	1958	●
32.	Ireland Strategic Investment Fund	19.66	IRELAND	2001	○
33.	Bahrain Mumtalakat Holding Company	16.67	BAHRAIN	2006	●

	Sovereign Wealth Fund*	Assets under Management ($bn, US dollars)	Country	Established	
34.	Timor-Leste Petroleum Fund	15.80	TIMOR-LESTE	2005	○
35.	Fondo de Estabilidad Económica y Social	14.19	CHILE	2007	●
36.	Alberta Heritage Savings Trust Fund	13.82	CANADA	1976	●
37.	Fondo de Reserva de Pensiones	10.44	CHILE	2006	●
38.	Russian Direct Investment Fund	10.00	RUSSIA	2011	○
39.	China-Africa Development Fund	10.00	CHINA	2007	●
40.	Oman Investment Fund	8.20	OMAN	2006	●
41.	Permanent Wyoming Mineral Trust Fund	8.07	USA - WYOMING	1974	●
42.	North Dakota Legacy Fund	6.28	USA – NORTH DAKOTA	2011	●
43.	Heritage and Stabilization Fund	6.01	TRINIDAD AND TOBAGO	2000	○
44.	Quebec's Generations Fund	5.93	CANADA	2006	●
45.	Fondo de Estabilización Fiscal	5.77	PERU	1999	●
46.	Pula Fund	4.90	BOTSWANA	1994	○
47.	Bpifrance	4.67	FRANCE	2014	○
48.	CDP Equity	4.23	ITALY	2011	○
49.	Fondo de Ahorro y Estabilización	3.70	COLOMBIA	2011	●
50.	State Capital Investment Corporation	3.62	VIETNAM	2006	●
51.	Gulf Investment Corporation	3.50	KUWAIT	1982	●
52.	Fundo Soberano de Angola	3.40	ANGOLA	2012	○
53.	Alabama Trust Fund	3.24	USA - ALABAMA	1985	●
54.	National Investment and Infrastructure Fund	3.00	INDIA	2015	○
55.	Idaho Endowment Fund	2.47	USA - IDAHO	1969	●
56.	Ithmar Capital	1.80	MOROCCO	2011	○
57.	Nigeria Sovereign Investment Authority	1.69	NIGERIA	2011	○
58.	Partnership Fund	1.64	GEORGIA	2011	●
59.	Louisiana Education Quality Trust Fund	1.44	USA - LOUISIANA	1986	●
60.	Fondo de Ahorro de Panamá	1.35	PANAMA	2011	○
61.	Fondo Mexicano del Petróleo - Reserva Largo Plazo	1.04	MEXICO	2015	○
62.	Palestine Investment Fund	1.00	PALESTINE	2003	○
63.	Revenue Equalization Reserve Fund	0.99	KIRIBATI	1956	●
64.	Western Australia Future Fund	0.90	AUSTRALIA	2012	●
65.	Future Generations Fund	0.73	BAHRAIN	2006	●
66.	National Development and Social Fund	0.53	MALTA	2015	●
67.	Ghana Stabilization Fund	0.49	GHANA	2011	●
68.	Ghana Heritage Fund	0.38	GHANA	2011	●
69.	Egypt Fund	0.28	EGYPT	2018	●
70.	Future Heritage Fund	0.22	MONGOLIA	2019	○
71.	COFIDES	0.20	SPAIN	2018	○
72.	National Fund for Hydrocarbon Reserves	0.15	MAURITANIA	2006	●
73.	National Investment Corporation	0.11	KAZAKHSTAN	2012	○
74.	Petroleum Revenue Investment Reserve	0.09	UGANDA	2015	●
75.	Fund for Future Generations	0.08	EQUATORIAL GUINEA	2002	●
76.	Intergenerational Trust Fund	0.06	NAURU	2015	○
77.	Agaciro Development Fund	0.06	RWANDA	2012	○
78.	Fonds Gabonais d'Investissements Stratégiques	0.02	GABON	1998	●
79.	FONSIS	0.02	SENEGAL	2012	○
80.	Northwest Territories Heritage Fund	0.02	CANADA	2012	●
81.	Fondo para la Estabilización Macroeconómica	0.003	VENEZUELA	1998	●
82.	Fonds de Stabilisation des Recettes Budgétaires et Réserves pour Générations Futures	0.002	REPUBLIC OF THE CONGO	2005	●
83.	Permanent Fund for Future Generation	N/A	SÃO TOMÉ E PRÍNCIPE	2004	●
84.	West Virginia Future Fund	N/A	USA - WEST VIRGINIA	2014	●
85.	National Investment Fund	N/A	CYPRUS	2019	○

	Sovereign Wealth Fund*	Assets under Management ($bn, US dollars)	Country	Established
86.	Natural Resources Fund	N/A	GUYANA	2018
87.	Dubai World	N/A	UAE	2006
88.	Dubai Holding	N/A	UAE	1997
89.	Oil Revenue Stabilization Fund	N/A	SOUTH SUDAN	2008
90.	Turkmenistan Stabilization Fund	N/A	TURKMENISTAN	2008
91.	Zimbabwe Sovereign Wealth Fund	N/A	ZIMBABWE	2014
92.	Papua New Guinea SWF	N/A	PAPUA NEW GUINEA	2011
93.	Savings and Stabilization Fund	N/A	SURINAME	2017
94.	Fund for Israel Citizens	N/A	ISRAEL	2014

Total Assets under Management	$8.34 trillion

*This list includes sovereign wealth funds established as at September 2019. The IE Sovereign Wealth Research Ranking uses the most updated information available, some figures may differ from data shown in other parts of the Report. IFSWF members includes both full and associate members.

Potential new funds

	Sovereign Wealth Fund**	Assets under Management ($bn, US dollars)	Country	Established
95.	Japan	N/A	JAPAN	N/A
96.	Indonesia	N/A	INDONESIA	N/A
97.	National Wealth Fund	N/A	TURKS & CAICOS	N/A
98.	Mauritius Sovereign Wealth Fund	N/A	MAURITIUS	N/A
99.	South Africa	N/A	SOUTH AFRICA	N/A
100.	Lebanon	N/A	LEBANON	N/A
101.	Kenya	N/A	KENYA	N/A
102.	Zambia	N/A	ZAMBIA	N/A
103.	Mozambique	N/A	MOZAMBIQUE	N/A
104.	Namibia	N/A	NAMIBIA	N/A
105.	Tanzania	N/A	TANZANIA	N/A
106.	Liberia	N/A	LIBERIA	N/A
107.	Saskatchewan	N/A	CANADA	N/A
108.	Bangladesh	N/A	BANGLADESH	N/A
109.	New Caledonia	N/A	NEW CALEDONIA	N/A
110.	United Kingdom SWF	N/A	UNITED KINGDOM	N/A
111.	Investment and Development Fund	N/A	MACAU SAR (CHINA)	N/A
112.	Philippines	N/A	PHILIPPINES	N/A
113.	Bahamas	N/A	BAHAMAS	N/A
114.	Romania	N/A	ROMANIA	N/A

**These 20 funds were not established when this edition went to press. Establishment is currently discussed.

Source: IE Sovereign Wealth Research (2019) with information obtained from funds' annual reports and websites. In their absence we relied inter alia on the estimates of the Sovereign Wealth Center, Natural Resource Governance Institute, and Preqin.

ANNEX 2

Sovereign Wealth Funds in Spain: 2018-2019

ANNEX 2
SOVEREIGN WEALTH FUNDS IN SPAIN: 2018-2019

In 2018 Spain has been more than ever on the radar of foreign investors, who have shown confidence in the evolution of the Spanish economy and in their business opportunities. Thus, foreign direct investment in Spain reached €55.6 billion in 2018, 37% more than in the previous year. And in net terms, the investment was more than €45 billion, an increase of 62.7% compared to 2017. This figure represents a maximum for foreign investment in Spain since the beginning of the data series (1993). Though we do not count on data for the entire year, we expect a slight slowing down for 2019.

Much of this investment volume has gone to the financial industry, and more specifically to private capital (private equity, mid-market and venture capital). This is not surprising, since private capital in Spain has been showing great strength in recent years. In Spain, the private capital total investment figure relative to GDP in 2018 registered an increase of 7 percentage points compared to 2017. In 2019 it reached an historical maximum for the third consecutive year hovering at €8.5 billion (exceeding Europe's average for the second year in a row).

The participation of international investors in Spanish private capital is dominated by investment funds. In 2018, investment funds invested €4.5 billion in Spain, and 76% of the investment total came from international funds. In 2019, the trend continued, and international funds represented 81% of the total. In addition, the domestic market continued focused on attracting international limited partners (LPs). In 2018, 68% of the funds raised (€2,2 billion) were invested by international LPs, and expectations for 2019 are equally positive.

Regarding investments from foreign SWFs, Spain continued its long-standing relationship with SWFs in the period January 2018-September 2019. In these 21 months, six different SWFs get exposed to Spanish companies with a total investment value surpassing €1.5 billion.

Few of these investments were already analyzed in the 2018 Report, including deals of GIC and ADIA in Cellnex. Both funds are reference shareholders in the company's capital via its controlling company ConnecT (29.9%). As of September 2019, the Benetton family owned 55% of ConnecT while the remaining 45% was in hands of two SWFs: GIC and ADIA, on equal terms. Following a continuation investment made in July 2019, the two SWFs indirectly control 13.5% of the company (6.75% each), ahead of Blackrock (5.6%), and Criteria (5%), right after the Benetton family which controls 16.5% of the company and remains the largest shareholder. Cellnex is the main infrastructure operator for wireless telecommunication in Europe. It owns and operates a network which comprises more than 46,000 sites in Italy, Netherlands, United Kingdom, France, Switzerland, Ireland and Spain. Infrastructure telecommunications companies remain a key target for long-term investors, including SWFs. The strong demand and the growing market for voice, data and audiovisual contents explain why these companies will play a larger role in the near future, and why SWFs want to position into it.

Aligned with this long-run strategy, Mumtalakat, the SWF of the Kingdom of Bahrain, closed its second investment in Spain in 2019. Back in March 2016, Mumtalakat took a significant minority shareholding of Aleastur business capital. Aleastur is a Spanish company located in Avilés (Asturias) which manufactures specialty alloys for the aluminium and steel industries since 1985. Today, is one of the top aluminium grain refiners in the world. On its part, Bahrain is a large producer of aluminium. Its flagship company, Alba (Aluminium Bahrain) is one of the largest industrial companies in the Middle East and the largest aluminum smelter in the world except China. Industrial and development logics explain the investment in Aleastur through a partial vertical integration. Alba is 69% owned by Mumtalakat.

In July 2019, Mumtalakat acquired a significant minority equity stake in Premo Group. This Málaga-based company established in 1962 is a leading manufacturer of electromagnetic components for applications in automotive, telecommunications and electronics industries. Premo has specialized in the key enabling technologies of the 4th industrial revolution: internet of things, machine to machine communication, virtual reality, connected and electric vehicles (EV). Precisely, Mumtalakat was attracted by the capabilities of Premo in the EV industry. Again, a growing demand forecast for EVs worldwide explains why a SWF would be interested in a company like Premo. Indeed, the EV sales are expected to shift from 2 million units in 2018, to 4 million in 2020, 12 million in 2025, before rising to 21 million in 2030 as the cost of manufacturing batteries falls significantly. By 2030, 20% of all sales of passenger car and light duty vehicles will be electric globally.[1]

[1] See Deloitte report, "New Market. New Entrants. New Challenges", 2019. Accessed at https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/manufacturing/deloitte-uk-battery-electric-vehicles.pdf

With patient capital, Mumtalakat expects to reap a share of the future profits of the growing EV industry worldwide by acquiring a significant stake of a key global supplier. This transaction is another example of a SWF anticipating the societal and economic changes through investments in technology.

In 2019, another key investment in Spain by SWFs involved Temasek. The Singaporean active sovereign fund acquired through Pavilion Energy, a fully owned subsidiary, a portfolio of liquefied natural gas contracts from Iberdrola, valued at €115 million. The deal signifies the entry of Temasek in the LNG operations in Spain and its expansion to European networks. The deal also includes contracts for long-term regasification in the United Kingdom and access to a pipeline between Spain and France. Pavilion Energy will also supply natural gas to Iberdrola Generación España. The need of diversifying LNG sources to Europe´s need of diversifying LNG sources and the current advantage of LNG versus other more contaminating fossil fuels, may explain why Temasek wants to a play a role in this important industry.

A significant share of the SWFs presence in Spain is attributed to Norges Bank Investment Management (the asset manager of the Norway's sovereign fund). NBIM overall exposure to Spain remained flat, with a decrease in the value of its Spanish equity portfolio (a year when IBEX35, the reference stock index, fell by 18%, the equity value of NBIM resisted by decreasing 11%), compensated by an enlarged relevance of fixed income. In fact, companies and sub-national regions debt witnessed an increase of 29% by the end of 2018 to €1.5 billion. On its part, the strength of the Spanish Government bonds remains at historical record levels. NBIM held €5.2 billion in Spanish sovereign bond holdings as of September 2019, an increase of 17% year on year. Spanish sovereign debt keeps ranked sixth largest NBIM's bond holding, ahead of bonds from larger economies by GDP such as South Korea, Mexico and Italy.

Beyond capital intensive transactions in sectors such as utilities, communication infrastructure or electronic components, another strategic deal took place in the last days of 2019. In December 2019, Mubadala led a €150 Series E round in Glovo, an on-demand delivery app company. Glovo, based in Barcelona and with global presence (Latin America, Southeast Europe, East Europe and Africa) became the second privately held business in Spain with a valuation past 1$ billion, following Cabify, a ride-hailing company. The investment was made through a $400 million European tech fund, that Mubadala launched in 2018. The tech fund is backed by SoftBank as strategic investor. The growth of the Spanish tech ecosystem with flourishing global startups explains the attractiveness for global investors. Previously, Temasek invested in Flywire, a Valencia-based fintech company in 2018 while KIA led a round in Madrid-based Tyba in 2015. SWFs continue betting on global long-run shifts in consumer behavior and innovative urban mobility models.

NBIM was authorized in late 2019 to start investments in unlisted renewable energy infrastructure. The leadership role of Spanish companies in this sector, may provide new opportunities for increasing the already significant relationship between SWFs and Spain.

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Institutions

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