IOPS Working Papers on Effective Pensions Supervision, No.36

SUPERVISION OF INFRASTRUCTURE INVESTMENTS BY PENSION FUNDS

Nina Paklina
Dariusz Stańko
April 2021

IOPS WORKING PAPERS ON EFFECTIVE PENSIONS SUPERVISION

As the proportion of retirement income provided by private pensions becomes increasingly important, the quality and effectiveness of their supervision becomes more and more crucial. The IOPS Working Paper Series, launched in August 2007, highlights a range of challenges to be met in the development of national pension supervisory systems. The papers review the nature and effectiveness of new and established pensions supervisory systems, providing examples, experiences and lessons learnt for the benefit of IOPS members and the broader pensions community.

IOPS Working Papers are not formal publications. They present preliminary results and analysis and are circulated to encourage discussion and comment. Any usage or citation should take into account this provisional character. The findings and conclusions of the papers reflect the views of the authors and may not represent the opinions of the IOPS membership as a whole.

IOPS WORKING PAPERS
ON EFFECTIVE PENSIONS SUPERVISION
are published on www.iopsweb.org

SUPERVISION OF INFRASTRUCTURE INVESTMENTS BY PENSION FUNDS

Nina Paklina, Dariusz Stańko*

ABSTRACT

The primarily goal of the report is to collect available data on the investment by pension funds in infrastructure, and to review recent regulatory changes aiming to facilitate long-term investments by pension funds, including in infrastructure, as well to observe market dynamics, practices and the main risks that pension funds are facing when investing in infrastructure.

The report reviews the supervisory practices of 33 IOPS jurisdictions in relation to infrastructure investments that are generally regarded as complex, illiquid, opaque and demanding high-skills, with the objective to understand what role supervisors are playing to address risks that investors are taking and what supervisory approaches have been developed to overcome these issues.

In most of the surveyed jurisdictions infrastructure investments by pension funds are subject to general investment limits (such as by asset classes, concentration ratios, or credit ratings). Only five jurisdictions have explicit infrastructure-specific investment limits, whereas another four allow pension funds to invest in infrastructure without any limits, as long as they meet prudent investment requirements.

The report provides good practices and lessons learned from Members' experiences in supervising pension funds investment in infrastructure.

Keywords: infrastructure investments, pension supervision, private pensions, long-term investments

JEL codes: G-23, G-28, G-32, H-54.

* International Organisation of Pension Supervisors (IOPS).

Contents

Tables

Boxes

Supervision of infrastructure investments by pension funds

Executive summary

This paper surveys 33 supervisory authorities, IOPS Members, on their approaches to and challenges perceived in relation to supervision of infrastructure investments by pension funds. The main findings are outlined as below.

Regulatory framework:

- Most jurisdictions do not have a specific definition of infrastructure in their legislation or supervisory practice.
- Debt securities and equity of concessionaires are the most common instruments used by pension funds; many jurisdictions also allow use of infrastructure investment funds or private equity funds.
- A majority of jurisdictions allow both direct and indirect investments; infrastructure investments by pension funds are usually subject to general investment limits or to prudent person rules.
- Several jurisdictions provide legal structures to facilitate infrastructure investments, such as PPPs and SPVs; only a few apply credit enhancements to promote such investments.
- Many governments have introduced changes to make the investment framework more flexible, and to broaden and/or facilitate investment opportunities in infrastructure for pension funds domestically and in some cases also abroad.
- Some jurisdictions created new structured instruments and/or special categories of domestic private equity funds focused on infrastructure projects to allow pension funds to participate in infrastructure investments.

Market practice:

- Even though pension funds are searching for higher yields, better asset-liability matching, and diversification their infrastructure investments remain quite low, well below 1-5% of total assets in most jurisdictions.
- Pension funds predominately invest indirectly in domestic infrastructure.
- Main risks that supervisors perceive pension funds are exposed in such investments are market, valuation, liquidity and counterparty risks.

Supervision:

- Most responding supervisors reported difficulties in providing statistical data with respect to infrastructure investments; this hampers their ability to support industry efforts on a significant scale. Lack of data also impacts ability of pension funds to undertake investment analysis and reduces their willingness to invest in this asset class.
- Managing operational risk (including legal risk, counterparty risk, and political risk) is crucial and calls for proper design of the contract between the pension fund and managers of the infrastructure funds.

- Respondent authorities do not have any special approach for the supervision of infrastructure investments. This finding is in line with previous IOPS research (IOPS, 2017) on supervision of non-traditional investments by pension funds.
- Supervisory oversight is conducted at the level of global portfolio management. The supervisory monitoring and surveillance activity focuses on compliance with legislative and regulatory requirements (e.g. due diligence, eligibility of investments, investment strategies, process of investment decision making, asset allocation models and risk analysis, outsourcing of investment and risk management).
- Nevertheless, pension supervisors are paying increasingly more and more attention to alternative investments, including infrastructure.

Key takeaways:

- Both investment analysis and supervision of infrastructure investments by pension funds could be improved if jurisdictions arrived at a common, internationally recognised definition and classification of infrastructure (or relevant financial instruments) and developed a common methodology that would enable collection of more granular investment data.
- An individual supervisory approach dedicated to infrastructure seems to be neither feasible nor desirable, based upon the observations from the survey.
- Good practices identified:
  a) strengthening governance of pension funds in order to promote effective investment risk management, with a focus on fund-level supervision rather than on the sector-wide monitoring, including an exhaustive due diligence of infrastructure investments and related contracts.
  b) issuing supervisory guidelines on supervisory expectations or requirements that relate to crucial issues in investment (e.g., valuation, due diligence, and contractual risks)
  c) requiring, where relevant, risk buffers to give proper incentives to managers and, if deemed by necessary by a supervisor, to smooth investment returns
  d) using market participants for creating checks and balance mechanisms (e.g., dual reporting by pension fund and custodians)
  e) applying a look-through approach (subject to development of an appropriately granular database).
- Supervisory guidance could be further supported by encouragement of adoption of self-regulation mechanisms by the private pension industry.
- With a growing need to close the infrastructure gap observed, supervisors should make sure that the decisions of pension funds to invest in infrastructure are taken purely on an economic basis, i.e., without sacrificing risk-adjusted returns in order to achieve the ultimate goal of securing the best interest of their members and beneficiaries.

Background

Over the past five years, Members of the International Organisation of Pension Supervisors (IOPS) have been developing a work stream on the role of pension supervisory authorities in the supervision of investment management, regarding non-traditional investments and infrastructure and other long-term investments. The work was initiated as part of the IOPS Programme of Work (POW) for 2015-2016.

In September 2017, the IOPS published its first output from this work stream, IOPS Working Paper No. 29, entitled "Supervision of pension investment management including non-traditional investment"[1], which looked at the approaches adopted by supervisors and the challenges experienced in supervising traditional and non-traditional investment management of pension funds.

The current project aims to analyse in more detail the supervision of infrastructure investments by pension funds. A key early step in the process entailed collecting available data from pension supervisory authorities, Members of IOPS[2] (hereafter Members), on the investment by pension funds in infrastructure. Additional information was obtained through a review of recent regulatory changes intended to facilitate long-term investments by pension funds, including in infrastructure. A third component of the work was based on observations of market dynamics, practices, and the main risks that pension funds face when investing in infrastructure.

In addition to the insights to be gained through the analytical work just outlined, the project aims to review more generally the supervisory practices used in relation to investments that are generally regarded as complex, illiquid, opaque and consequently require high skills to manage effectively. This review should facilitate better understanding of the steps supervisors are taking to address risks that investors are bearing and identify successful approaches that have been developed to overcome these issues. In this context, the research discussed in this report seeks to identify good practices and lessons learnt from Members' experiences in supervising pension funds' investments in infrastructure.

The report is structured in three parts. Part I describes regulatory frameworks and recent changes in investment regulations related to infrastructure and other non-traditional investments in different Members' jurisdictions. Part II provides a snapshot of market trends, practices and main risks associated with pension funds' investments in infrastructure, based on the available data collected by Members. Part III offers supervisory perspectives on the main risks and challenges faced by pension funds in IOPS jurisdictions and the ways in which supervisory authorities support and facilitate investments in infrastructure by pension funds, and identifies good practices and lessons learned. Brief conclusions follow.

Scope and coverage

As with other IOPS projects, responses to the questionnaire by Members constitute the main information source for this report, along with desk research and work developed in the area by the

[1] See http://www.iopsweb.org/WP_29_Supervision-Pension-Investment-Management.pdf

[2] http://www.iopsweb.org, the Organisation currently has 91 Members and Observers representing supervisory bodies from 80 countries and territories worldwide.

OECD[3] and other international organisations. The questionnaire was sent to the Members in 2018, followed up by a number of calls to the Members in 2019.

Responses were provided by 33 jurisdictions: Australia; Austria; Bulgaria; Canada[4]; Chile; China; Colombia; Croatia; the Czech Republic; Egypt; Ghana; Hong Kong, China; Hungary; Iceland; Israel; Jamaica; Kazakhstan; Kenya; Liechtenstein; Republic of North Macedonia; Mauritius; Mexico; Morocco; Namibia; the Netherlands; Nigeria; Peru; Romania; Russia; Switzerland; Turkey, Uganda, Zimbabwe. Some feedback was also provided by Armenia, France, Poland, and Rwanda.

I. Regulatory framework for investment in infrastructure by pension funds

1. Definition of infrastructure

The majority of surveyed jurisdictions **do not have a definition** of infrastructure in their legislation or supervisory practice[5].

Such definitions exist in only seven jurisdictions and are developed by supervisors or defined in the law therein. Supervisory definitions exist in Australia (see APRA's Prudential and reporting standards for Superannuation, Reporting standard SRS 801.0 Investments and Investment flows[6]) and in some provinces in Canada. In Canada, at the federal level, the term was defined by the Office of the Superintendent of Financial Institutions in its supplementary guideline[7]. Legal acts define infrastructure in three jurisdictions (Bulgaria, the Netherlands, and Turkey). The definitions are the same or similar to the OECD definition used in the survey: "The system of public works in a country, state or region, including roads, utility lines and public buildings." (OECD Glossary of Statistical Terms).

In Croatia, the law on mandatory pension funds does not define infrastructure projects *per* se but stipulates conditions and requirements necessary for a project to be an eligible investment for pension funds. In Mexico, the legislation also does not provide a specific definition; however, the Fiscal Miscellaneous Resolution for 2017 does indicate the types of investment projects that can be held within infrastructure trusts.

---

[3] OECD (2018, 2019) Annual Survey of Investment Regulation of Pension Funds, OECD (2020) Annual Survey of Investment Regulation of Pension Funds and Other Pension Providers; OECD Long-Term Investment project.

[4] Responses provided by the Canadian Association of Pension Supervisory Authorities (CAPSA) from the following provinces: Alberta (AB), New Brunswick (NB), Ontario (ON), as well as from the Office of the Superintendent of Financial Institutions (OSFI), Federal Government.

[5] Two jurisdictions (Israel, and Kazakhstan) did not respond to this question.

[6] APRA Prudential and Reporting Standards for Superannuation: https://www.apra.gov.au/industries/33/standards; Investments and Investment flows (SRS 801.0); Financial sector (collection of data) (reporting standard) determination N° 25 of 2015, Reporting standard SRS 801.0 Investments and Investment flows: https://www.legislation.gov.au/Details/F2015L01011. Definition of infrastructure is included in Glossary of additional terms: **Infrastructure**: Represents the basic physical systems of a country, state or region including transportation, communication, utilities, and public institutions.

[7] Certified Financial Statements (OSFI 60) (osfi-bsif.gc.ca) (Line 046 Infrastructure under section "Diversified and Other Investments (Canadian and Foreign)"

On the basis of this information, one can conclude that **infrastructure is not specified as a distinct asset class in most of the responding IOPS jurisdictions.** In Switzerland, infrastructure is qualified as a component of "alternative assets", given its long-term horizon and low liquidity in the event of a crisis. In some jurisdictions, (e.g., Egypt, Israel, and Jamaica) infrastructure investments fall under the category "other investments".

Although the majority of jurisdictions do not treat infrastructure as a separate asset class, there are exceptions. In Colombia, for example, the government enacted a special decree in April 2014, which aimed to facilitate infrastructure investment by banks and institutional investors, including private pension funds. To promote pension fund investment in infrastructure, a special category of domestic private equity funds focused on infrastructure projects was created as a permitted asset class, distinct from other non-traditional investments[8]. In Romania, more recently, the governance ordinance (2019) specified infrastructure as an asset class and allowed (from February 2020) mandatory pension funds to invest up to 15% of their total assets in infrastructure investment funds or in equities and debt instruments issued by companies organized as Public Private Partnerships (PPPs).

The absence of a specific definition for infrastructure can be attributed to the fact that, in most of the surveyed jurisdictions, investments in infrastructure are minor, non-existent, or are not subject to data reporting.

2. Types of infrastructure investments allowed for pension funds

Most jurisdictions allow pension funds to invest in some type of infrastructure assets[9]. The survey responses indicate that *debt securities* are the most common infrastructure instruments allowed for investment by pension funds (Australia, Bulgaria, Chile, Colombia, Croatia, Egypt, Ghana, Hong Kong (China), Iceland, Israel, Jamaica, Kazakhstan, Liechtenstein, Macedonia, Mexico, Morocco, Namibia, Nigeria, the Netherlands, Peru, Romania, Russia, Rwanda, Switzerland, Uganda[10], and Zimbabwe), followed by *equity of concessionaires* (Australia, Chile, Colombia, Croatia, Ghana, Hong Kong (China), Iceland, Israel, Jamaica, Liechtenstein, Macedonia, Mexico, Morocco, Namibia, Peru, Romania, Russia, Switzerland, and Turkey). In Bulgaria, pension funds can invest in bonds that are traded on regulated markets and issued by banks with a majority of state ownership and have been approved for banking activities in line with legislation of either Bulgaria or an EU Member State. In Nigeria, funds are allowed to use infrastructure bonds and *sukuk* bonds offered by the government. In Zimbabwe, funds can invest directly in infrastructure projects by getting involved in the development of infrastructure for leasing, either as individual entities or in joint ventures with other pension funds[11].

Investment funds are the next most popular vehicle used by pension funds to obtain exposure to infrastructure. For example, small *Pensionskassen* in Austria invest over 95% of their infrastructure holdings indirectly via investment funds. Such funds are also allowed in Chile, Croatia (classified as real estate, private equity, infrastructure funds, ETFs, etc.), Ghana (real estate investment trusts REITs), Mexico, Namibia (e.g. Nimbus fund specialising in pursuing investments in the Information Communication and Technology Sector in sub-Saharan Africa), Morocco and Nigeria

[8] OECD, *Colombia: Review of the Financial System*, April 2016.

[9] For detailed taxonomy of instruments and vehicles for infrastructure financing see OECD (2015).

Modes Infrastructure Finance Instruments Mark

[10] Only through government bonds, however no specific infrastructure bonds have been issued.

[11] For example, healthcare facilities such as Bains Intercare and ZESA Specialised Services Hospital.

(infrastructure funds), Peru (including participation certificates of infrastructure funds and investment trusts specialised in infrastructure), and Romania (including exchange-traded-funds (ETFs) and specialised investment funds in infrastructure). In Colombia, related instruments that are allowed include debt funds issuing non-listed project debt. In Peru, pension funds can also invest in debt of concessionaires, such as certificates of recognition of annual pay for infrastructure projects (CRPAO) or debt of companies related to or involved in infrastructure projects.

Another instrument that enables funds to invest in infrastructure is *private equity*. For example, pension funds in Ghana and Zimbabwe can invest directly in private equity, whereas infrastructure investment via private equity funds is allowed in Colombia (most of such funds represent direct investments in the infrastructure project). China, Nigeria, Romania (voluntary pension funds and most recently mandatory pension funds with a limit of 10%), Rwanda and Turkey (venture capital investment funds) allow investment in infrastructure via investment funds.

Other instruments that enable pension funds to invest in infrastructure include: special purpose vehicles (SPVs) in Croatia and Namibia; infrastructure equity investment plans and infrastructure debt investment plans in China; build-operate-transfer (BOT) funds[12] in Israel; and alternative assets in Chile (through co-investment, private equity or private debt[13]). In Mexico, a wide range of instruments for infrastructure investment is available to pension funds. Aside from traditional instruments, Mexican pension funds can also invest in infrastructure indirectly via ETFs, trust certificates, capital development certificates (CKDs), investment project certificates (CERPIs), real estate investment trusts (FIBRAs), energy and infrastructure investment trusts (FIBRA-Es)[14], and local listed companies with exposure to foreign infrastructure[15]. However, investment in infrastructure via private placement is not allowed in Mexico.

[12] Build operate transfer project: typically used to develop a discrete asset rather than an entire network; generally entirely new or greenfield in nature (although refurbishment may be involved). "In a BOT Project, the project company or operator generally obtains its revenues through a fee charged to the utility/ government rather [than] from tariffs charged to consumers", World Bank, https://ppp.worldbank.org/public-private-partnership/agreements/concessions-bots-dbos.

[13] For alternative investments, the secondary regulation defines a range limit between 5% and 10% of total investment for each fund. Moreover, the Central Bank of Chile establishes the exact limit for alternative investments for each fund. These limits are currently set at 10%, 8%, 6%, 5% and 5% of total investment for funds A, B, C D and E, respectively. They apply to the overall category of alternative investment, whether national or foreign.

[14] FIBRA-E is an equivalent of the US Master Limited Partnership (MLP) agreement. It is "a trust created in accordance with the laws of Mexico with a Mexican banking institution acting as trustee, qualified as a FIBRA E for tax purposes, that issues publicly traded securities in the form of trust bonds or *certificados bursátiles fiduciarios de inversion en energía e infraestructura* ("CBFEs"), registered with the National Securities Registry (Registro Nacional de Valores – the "RNV") and listed in the Mexican Stock Exchange (*Bolsa Mexicana de Valores, S.A.B. de C.V.* – the "BMV"), in accordance with Securities Market Law (*Ley del Mercado de Valores* – the "Securities Law") and its regulations (*Disposiciones de carácter general aplicables a las emisoras de valores y otros participantes del Mercado de valores* – the "Regulations"). As provided in the Securities Law, the CBFEs shall grant its holders a pro rata property right with respect to trust assets." Source: https://www.ey.com/Publication/vwLUAssets/ey-fibra-e-legal-framework/$FILE/ey-fibra-e-legal-framework.pdf.

[15] Currently, there is one company listed in Mexico and structured as SPAC (Special Purpose Acquisition Company) whose purpose is investment in energy projects abroad.

3. Investment limits relating to infrastructure

As noted above, all responding jurisdictions allow investment in infrastructure by pension funds. The investments can be made **directly and indirectly** in 22 jurisdictions (Australia, Austria, Canada, Chile, Colombia, Croatia, Egypt, Hungary, Iceland, Israel, Jamaica, Liechtenstein, Mauritius, Morocco, Namibia, the Netherlands, Peru, Romania, Russia, Rwanda, Switzerland, and Zimbabwe), whereas 12 jurisdictions (Bulgaria, China, Czech Republic, Ghana, Hong Kong (China), Kazakhstan, Kenya, Republic of North Macedonia, Mexico, Nigeria, Turkey, and Uganda) allow **only indirect** investments. Two countries that did not formally participate in the survey, Armenia and France, mentioned that infrastructure investment is neither prohibited in their jurisdictions nor specifically regulated and can be undertaken through allowed asset classes.

In most jurisdictions (Austria, Bulgaria, Canada (Alberta province), Chile, China, Colombia, Croatia, Czech Republic, Egypt, Ghana, Hong Kong (China). Hungary, Iceland, Jamaica, Liechtenstein, Mauritius, North Macedonia, Namibia, Peru, Russia, Rwanda, Switzerland, Turkey, Uganda, and Zimbabwe), infrastructure investments by pension funds are subject to *general investment limits* (such as by asset classes, concentration ratios, or credit ratings). In Namibia, pension funds are ***obliged*** to invest at least 1.75% up to a maximum of 3.5% of their assets in private investment funds (unlisted debt or equity), which may offer exposure to various asset classes, including infrastructure. Similarly, in Zimbabwe, funds are obliged to invest 20% of total assets in so-called prescribed assets, such as government and municipal debt instruments as well as, since recently, commercial bonds with prescribed asset status accorded by the government, which are aimed at financing projects of economic and social impact. In Switzerland, infrastructure investments fall under category of “alternative investments”, which is currently capped at 15%.

Only five jurisdictions (Croatia, Kenya, Mexico, Nigeria, and Romania) have *explicit infrastructure-specific investment limits*.

In contrast, another four jurisdictions allow pension funds to invest in infrastructure *without any limits*, as long as they meet *prudent investment requirements*: Australia (prudent person rule), Israel, and the Netherlands (prudent person rule), Kazakhstan and in some Canadian provinces (Table 1).

In Mexico, infrastructure limits vary according to the type of pension fund (known as SIEFORES) and their asset allocation policy. The SIEFORES investment model, based since 2008 on a multi-funds scheme whereby workers migrated among funds depending on their age, but evolved to a Target Date Funds (TDF) model by the end of 2019, in which affiliates remain in one fund according to their date of birth for most of their accumulation phase. The previous five funds were able to invest from 10% to 45% in this asset class, from the most conservative (those for older workers) to the most aggressive (for the youngest). Now, the new TDF family comprises a seed fund for employees aged 25 years or younger and, therefore, the most aggressive (Seed Fund); 8 Generational SIEFORES[16] for five-year age groups from 25 to 65, with increasing risk aversion (SB90-94, SB 85-89 and so on until SB60-64); and a last SIEFORE for employees aged 65 years or older (Income Fund, the most conservative). Flexibility for equity investments was increased, widening the limit from 45% to a range which goes from 60% down to 15% along the long-term glide paths, which incorporate decreasing limits for risky assets, allowing a gradual disinvestment towards retirement age. As of the end of 2019, funds could invest in listed equity up to 50% (from Seed Fund to SB80-84), 40% (SB75-79), 35% (SB70-74), 30% (SB65-69 and SB60-64), 10% (SB55-59) and 0% (Income Fund). Unlisted equity investments or loans are not allowed; investment is facilitated via direct exposure through Initial Public Offerings (IPOs) and the

[16] SB = Basic Generational SIEFORE, in the Mexican Pension Savings System.

secondary market for listed individual stocks, as well as indirect exposure through authorised derivatives, authorised active mutual funds, structured notes linked to equity, equity ETFs or mutual funds that replicate authorised equity indices, or through Special Purpose Acquisition Companies (SPACs). Pension funds can invest in infrastructure via corporate bonds up to 100%. However, investments in corporate bonds are subject to issuer limits that depend on the credit rating. For a Mexican issuer, the limits are 5% for AAA ratings, 3% for AA, 2% for A, and 1% for BBB (local credit rating), but those pension fund administrators (AFOREs) that implement internal credit models (according to the regulation) are allowed to define their own issuer limits within a maximum of 5% of their assets under management (AUMs) (instruments rated BBB or more). For state-owned companies (Pemex and CFE), the limit is 10%. For an international issuer, the limit is 5% if the global credit rating is not lower than BBB- or higher.

Mexican pension funds can also invest in infrastructure bonds known as "Trust Certificates" that are linked to real projects and are classified as securitizations in the pension funds' investment regime, within limits from 20% to 40%. Another permitted category includes structured instruments such as capital development certificates (CKDs) and investment project certificates (CERPIs), the limits for which range from 10% to 20%. Pension funds can invest in Mexican real estate investment trusts (FIBRAs) and energy and infrastructure investment trusts (FIBRA-Es), subject to limits from 5% to 10%. That said, since the transition from Basic Funds to TDFs, SB55-59 and the Income Fund are no longer allowed to acquire new instruments of this type.

In Nigeria, pension funds can invest in infrastructure funds raised to finance infrastructure projects. A minimum of 60% of such funds must be invested in projects within Nigeria in order for the fund to qualify for pension fund investment. All pension funds[17] (from type Fund I to Fund VI) are eligible to make infrastructure investments, given their exposure to FGN/State/Local Government and Corporate Debt Instruments, which could be used to finance infrastructure projects through infrastructure bonds. Each of these six funds have different limits for infrastructure investments through exposures to infrastructure bonds and unlisted infrastructure funds.

Table 1 Explicit infrastructure investment limits by pension funds in selected IOPS jurisdictions

Jurisdiction	Description
Australia	No restrictions. Prudent person rule applies[18].
Canada (Alberta, New Brunswick, Ontario)	In Alberta, general investment limits and a concentration limit 10% apply. In some Canadian jurisdictions, there are no quantitative limits. However, investments of the pension plan must be prudent, and must be

[17] The Nigerian pension fund administrators maintain a multi-fund structure that comprises Funds I, II, III, IV. Funds differ depending on asset allocation: e.g., Fund I – for members aged below 50 who actively chose the fund; Fund II – default fund for members aged below 50, Fund III – default fund for members aged 50 or above, Fund IV – default fund for retirees only. There are two additional Funds, namely: Fund V (Micro pension Fund) and Fund VI (Non-Interest Fund).

[18] APRA's Prudential Standard SPS 530 Investment Governance provides principles that range from diversification to trustees, which are relevant to consideration of the benefits of infrastructure (and other) investments.

	made in accordance with the Plan's Statement of Investment Policies and Goals. At the Federal level, the general investment limits apply (prudent person rule, 10% concentration limit and 30% votes limit if applicable).
China	30% (infrastructure investments are currently classified as "real estate assets").
Croatia	Transferable securities issued for the financing of infrastructure projects: 55%, 35% and 10%, respectively, for mandatory pension funds categories A, B, and C. An additional limit for funds A and B of investing up to 25% in a single investment project. Funds C can invest only in debt transferable securities issued for the financing of infrastructure projects.
Israel	No restrictions.
Kazakhstan	No restrictions.
Kenya (explicit infrastructure limits)	Infrastructure bonds issued by the government and public bodies: 90%.
Mexico (explicit infrastructure limits)	Listed equity: 50% (from Seed Fund to SB80-84, the most aggressive), 40% (SB75-79), 35% (SB70-74), 30% (SB65-69 and SB60-64), 10% (SB55-59) and 0% (Income Fund, the most conservative). Unlisted equity investments or loans are not allowed. Corporate bonds: 100%, with issuer limits depending on credit rating: for a Mexican issuer 5% (AAA), 3% (AA), 2% (A), and 1% for BBB (local credit rating). For state-owned companies (Pemex and CFE) 10%. For an international issuer 5% (global credit rating BBB- or higher). Infrastructure bonds ("Trust Certificates"): from 20% to 40%, depending on the fund. Structured instruments (capital development certificates, CKDs and investment project certificates, CERPIs): from 10% to 20%. Mexican real estate investment trusts (FIBRAs) and energy and infrastructure investment trusts (FIBRA-Es): from 5% to 10% .
Nigeria (explicit infrastructure limits)	Unlisted infrastructure funds (bond and equity): 10% (Fund I), 5% (Fund II), not allowed (Fund III), not allowed (Fund IV), 5% issuer concentration limit, 20% issue limit. Infrastructure bonds (private listed): 25 % (Fund I), 20% (Funds II and Fund III), 10% (Fund IV), issue concentration limit: 7.5% (Funds I and II), 5% (Funds III and IV), issue limit (based on credit rating): BBB – 25%, A - 30%, AA and above – 35%.
The Netherlands	No restrictions. Prudent person rule applies.
Romania	15% (*infrastructure project companies*, established according to the Government Emergency Ordinance no. 39/2018 regarding the public-

	private partnership or *specialized investment funds in infrastructure* only).
Switzerland	10%.

Note: if not stated otherwise, "limits" relate to maximum value of pension fund assets/investment.

Source: IOPS.

4. Investment limits on foreign infrastructure investment

Pension funds can invest in foreign infrastructure *without any limits* in five surveyed jurisdictions: Australia (prudent person rule), Canada (three provinces and at the federal level), Israel, and the Netherlands (prudent person rule). Even though allowed, pension funds in China do not currently invest in foreign infrastructure.

Foreign infrastructure investment is allowed, although subject to *some restrictions* (e.g., geographical restrictions, investment category limit, concentration limit or foreign currency limit), in Austria, Bulgaria, Chile, China, Colombia, Czech Republic, Ghana, Hong Kong (China), Hungary, Iceland, Jamaica, Kazakhstan, Liechtenstein, Mauritius, Mexico, Morocco, Namibia, Nigeria, North Macedonia, Peru, Romania[19], Russia (voluntary funds), Switzerland, and Uganda.

Pension funds are *not allowed* to invest in foreign infrastructure in Croatia, Egypt, Kenya, Russia (mandatory funds), Turkey and Zimbabwe[20].

Table 2 Investment in foreign infrastructure by pension funds in selected IOPS jurisdictions

Jurisdiction	Is infrastructure investment abroad allowed?
Australia	Yes, no restrictions. Prudent person rule applies[21].
Austria	Yes, via direct debt and equity investments and through investment funds. 30% limit applies for investment in foreign currencies. If hedged, transactions can be attributed as euro denominated.
Bulgaria	Yes, but only in bonds issued by banks from the EU that have at least 50% state ownership and meet licence requirements. Investment limits 10% for mandatory pension funds. No quantitative limit for voluntary pension funds.
Canada (Alberta, New Brunswick, Ontario)	Yes, no restrictions in addition to prudent person rule and the general investment restrictions.

[19] The project-companies will be organized in Romania only and, therefore, the projects they will develop will most probably be domestic ones. As the law is silent on the way the specialized investment funds in infrastructure will be organised, exposure to foreign infrastructure will be, at least theoretically, possible.

[20] In Zimbabwe, only so-called external funds can invest in foreign infrastructure. These are a few small funds that have less than 13 Zimbabwean members, i.e. whose members are largely foreigners working for a foreign employer operating in Zimbabwe.

[21] APRA's Prudential Standard SPS 530 Investment Governance provides principles that range from diversification trustees, which are relevant to consideration of the benefits of infrastructure (and other) investments.

Chile	Yes, via equity or debt instruments, investment or mutual funds and alternative investments (through co-investment, private equity or private debt). No infrastructure-specific limits exist but for each fund there are structural limits per type of investment, restrictions per group of investments and specific limits per investor.
China	Yes, with upper limit to foreign investments of funds in tax deferred pension insurance common account.
Colombia	Yes, via private equity funds (PEF) but with restrictions – administrator headquarter must be domiciled in an investment grade jurisdiction, has AUM above 1bn USD, its manager must have at least 5 years of experience of managing the fund's underlying assets, fund's prospect must specify its investment objectives, policies, and risk administration procedures. Via concessionaires' debt or equity – similar requirements as above, bonds with investment grade from an international credit rating agency.
Croatia	No.
Czech Republic	Yes, but max. 5%, in securities traded on a regulated market.
Egypt	No.
Ghana	Yes, but subject to prior approval by the President of the Republic through the Ministry of Finance.
Hong Kong (China)	Yes, but max 70% (min. 30% of total funds must be held in HK dollars).
Hungary	Yes, but with general asset class and concentration limits.
Iceland	Yes, via equity and debt, but only if issued in OECD or EU/EEA and meeting 10% concentration limits.
Israel	Yes, no restrictions.
Jamaica	Yes, but max 20% and only via instruments issued in a recognised jurisdiction (Canada, US, and the UK). Excess over 20% needs to get approval from the Bank of Jamaica.
Kazakhstan	Yes, via infrastructure bonds, no specific limits for foreign infrastructure investment, but issuer credit rating requirements (for A- and above: up to 3% of total pension assets, for BBB+/- up to 2%, for BB+/- up to 1.5%.)
Kenya	No.
Liechtenstein	Yes, but 30% general foreign currency investment limit.
Mauritius	Yes, but 70% general foreign investments limit.

Mexico	Yes, via stocks, bonds, Investment Project Certificates (CERPIs), or Special Purposes Acquisition Company (SPAC) but with 20% general limits for foreign assets and 30% general limits for foreign currency.
Morocco	Yes, but 5% general foreign investment limit plus general asset class limits.
Namibia	Yes, via listed instruments but max. 55% in total due to general asset class limits or sub-limits. General limits are: 55% for listed foreign equity (taking into consideration the 45% domestic asset requirement), 50% for foreign bonds, 2.5% for unlisted equities and infrastructure loans (the limit for “other assets”).
Nigeria	Yes, via infrastructure funds 5% if direct investment (min. 60% of the infrastructure fund must be invested in projects within Nigeria for it to qualify for pension fund investment).
North Macedonia	Yes, via allowed publicly traded instruments but geographical restrictions and general investment limits apply. Mandatory and voluntary pension funds can invest in bonds and other securities issued by foreign governments and central banks from EU or OECD countries; and securities issued by non-state foreign companies, banks or investment funds from EU or OECD countries. Voluntary pension funds can also invest in other debt securities issued by the European Central Bank, European Investment Bank, the World Bank; as well as debt securities issued by non-state foreign companies or banks, shares issued by foreign companies or banks or participation units, shares and other securities issued by investment funds from EU or OECD countries.
The Netherlands	Yes, no restrictions. Prudent person rule applies.
Peru	Yes, mainly via debt instruments and foreign infrastructure funds. Foreign general limits by the Central Reserve Bank (operational limit 50%) and the Congress (legal limit 50%). Operational limit is the one in force and cannot exceed legal limit. Limits in alternative assets are 15% and 20% for funds type 2 and type 3, respectively. Funds type 0 and type 1 are not allowed to invest in alternative assets.
Romania	Yes, but only two categories allowed (see Table 1) and general 15% investment limits apply, no specific limits on foreign investment or foreign currency.
Russia	No for mandatory funds. Yes, for voluntary funds, via listed equities, bonds and investment fund units. General foreign investment limit 30%.
Switzerland	Yes, but max. 10%. General foreign exchange limit on unhedged foreign currencies 30%.
Turkey	No.

Uganda	Yes, but max. 80% via Treasury Bonds of the East African Community (Burundi, Kenya, Rwanda, South Sudan, Tanzania, Uganda) only. Any other foreign investment is not allowed.
Zimbabwe	No (except a few external funds).

Note: “general” limits relate to any type of investment, not specifically infrastructure.

Source: IOPS.

5. Legal structures and rules facilitating infrastructure investments by pension funds

In 14 jurisdictions (Australia, Canada – Alberta province, China, Colombia, Hong Kong (China), Mexico, Morocco, the Netherlands, Nigeria, Peru, Romania, Russia, Switzerland, and Zimbabwe), pension funds can invest in infrastructure including through *Public Private Partnerships (PPPs)*.

In Australia, PPPs are available not only to pension funds but to all other institutional investors. In the Alberta province of Canada, such platforms may exist for public pension funds. In Colombia, pension funds use infrastructure debt funds. In Hong Kong (China), partnerships between the public and private sectors have been established for investments in infrastructure projects, such as tunnels. Indirect investments in infrastructure are permissible, for example, through shares and debt securities. In Mexico, PPPs are used as legal platforms to establish long-term commitments between the private and public sector in reference to construction and infrastructure operations. Currently governments in Mexico, either at the local or federal level, use PPPs for the main purpose of covering infrastructure needs, defining the required type of project and hiring (through a public bidding process) private enterprises to be the ones that realize the required activities. In Nigeria, the platform for infrastructure investments by pension funds in PPP arrangements have been established and is regulated; however, the participation of pension funds in PPP infrastructure has not yet commenced. In Peru, PPPs coexist with the classic concessional model as a platform for infrastructure investments in which private pension funds are able to invest. The PPPs help to narrow the infrastructure gap significantly. Some examples of PPPs in infrastructure projects in Peru include: *Consorcio Trasvase Olmos*, *IIRSA Sur* and *IIRSA Norte*. In Russia, PPPs can issue bonds that pension funds can acquire in their portfolios. In Switzerland, PPPs are usually established for infrastructure projects (such as airports, highways, etc.). Zimbabwe has a general PPP framework in the form of a Joint Ventures Act, but it is not restricted to Pension Funds. Under this framework, funds are allowed to enter into infrastructure financing PPP arrangements such as Build Operate Transfer and Build Own Operate Transfer basis.

There are no PPPs for infrastructure investment in 17 jurisdictions (Austria, Bulgaria, Chile, Croatia, Egypt, Hungary, Ghana, Iceland, Israel, Kenya, Jamaica, Liechtenstein, Macedonia, Mauritius, Namibia, Turkey, and Uganda). Pension funds in Israel can invest in PPPs but not in infrastructure projects.

No answer was received from Kazakhstan and no data was available for other Canadian provinces.

Special Purposes Vehicles for infrastructure investment exist in 13 jurisdictions (Australia, Canada – Ontario province, China, Colombia, Croatia (no SPV established yet), Iceland, Mexico, Namibia, Nigeria, the Netherlands, Peru – see Box 1, Russia, and Zimbabwe). The use of SPVs is a commonly observed structure in Australia for investments in infrastructure and other unlisted assets. SPVs are also present in some Canadian jurisdictions, although this information is not collected by CAPSA. In the province of Ontario, SPVs are used at the plan sponsor’s discretion. In China, two regulations were established to allow insurance companies offering retirement products to invest in SPVs. After a law was passed in 2012, most infrastructure projects in

Colombia and PPPs have been created under a project finance approach, which includes SPVs. In Croatia, SPVs can issue transferable securities in which mandatory pension funds are allowed to invest for the purpose of financing or securitisation of infrastructure projects in the country. Iceland noted one case related to a hydro power plant, with some SPVs established mainly in cases of private equity and real estate investments. Some of them might have exposure to infrastructure investments. In the case of Mexico, there is a specialized manager, General Partner (GP), who is in charge of seeking attractive investment projects for each SPV's profile, conducting its respective due diligence according to best practices. In Namibia, SPVs have been explicitly established to facilitate infrastructure investments by pension funds pursuant to Regulation 13(5). Pension funds in Nigeria have also taken advantage of infrastructure projects funded through SPVs. In Zimbabwe, there are government agencies dedicated to mobilising resources towards infrastructure financing, including the Infrastructural Development Bank of Zimbabwe, which mobilises resources towards infrastructure development. However, the Bank mobilises resources from various institutional investors apart from pension funds and insurers. There are also private sector-driven initiatives by pension funds aimed at pooling resources for economies of scale to support infrastructure development, including, for example, the Insurance and Pensions Housing Fund.

Box 1 Special Purpose Vehicles (SPV) for infrastructure investments by pension funds in Peru

In Peru, the SPV structure is considered to be appealing for pension funds, on account of its ability to protect the investors against any legal problems with the company.

Although, SPVs can be created through a variety of entities, the most important entities, mainly owing to their size, are the "*Fideicomisos en Infraestructura*", which are trusts managed for the sole purpose of investing in infrastructure projects.

Peruvian funds participate in this kind of investment vehicle through cash transfers to the trust when projects are established and then each one receives equity participation. The trust can acquire a great variety of investment instruments (e.g., structured debt or equity), after approval of the investment committee set up by each of the pension funds. The committee decides in which projects to invest. The trust is managed independently and needs to be authorised by the regulator (SBS).

The first trust of this kind was created by the Ministry of Economy and Finance as a way to finance large investment projects in the context of the 2009 financial crisis, with a target of investments around $500 million. In 2015, another trust was created to foster the infrastructure sector with a broader set of investment instruments, including equity.

Source: Superintendence of Banking, Insurance and Pension Funds Administrators (SBS), Peru.

No SPVs are present in 15 jurisdictions (Austria, Bulgaria, Chile, Egypt, Ghana, Hungary, Israel, Jamaica, Kenya, Liechtenstein, Mauritius, North Macedonia, Romania, Turkey, and Uganda). The possibility to invest in alternative assets in Chile, including infrastructure, was introduced in the legislation in 2017. Secondary legislation has been in force since November 2017. That said, till now, there have not been any SPVs/SPEs established for infrastructure investments in Chile.

No answer was received from Kazakhstan and no data was available for other provinces of Canada, Hong Kong (China), and Switzerland.

Other legal rules relating to infrastructure investments.

Only one of the surveyed jurisdictions, China, has *infrastructure-specific rating requirements*. The Interim Provisions on the Management of Infrastructure Creditor Investment Plans (CIRC [2012]

No. 92) and the Notice on Investment in Financial Products Related to Insurance Funds (CIRC [2012] No. 91) stipulate specific rating requirements related to infrastructure investments.

A group of surveyed jurisdictions (Australia, Egypt, Canada, Croatia, Hungary, Israel, Jamaica, Kenya, Namibia, Liechtenstein, Morocco, the Netherlands, Switzerland, Turkey, and Uganda) do not impose any rating requirements on any type of investments by pension funds. Instead, some of them explicitly stipulate prudent behaviour requirement.

The surveyed jurisdictions use standard *valuation methods*, mostly market value or, if direct pricing is not available, fair value that computes valuations based on expected cash flows.

Only a couple of countries mentioned *other legal rules relating to infrastructure*. In Colombia, the manager of a private equity fund that is structured under PPPs must be independent from the Pension Fund Manager. In addition, resources invested by the Pension Fund Manager in such an investment must be less than 50% of the PEF value. Investments larger than 30% of the PEF value must be approved by the board of directors of the Pension Fund Manager.

In general, jurisdictions emphasised that infrastructure investment requires, as any investment, the need for **sound risk management and a sound investment governance framework**, including due diligence for selection of investments, monitoring of investment performance, and developing a liquidity management plan (e.g. Australian Prudential Standard SPS 530 Investment Governance, Austrian FMA Minimum Standards for Pension Funds for conducting Due Diligence). Some jurisdictions pointed also to proper concentration and ownership limits as tools for risk management (e.g., Canada). In Croatia, the potential for pension funds to invest in securities issued to finance or securitise an infrastructure project is dependent on the Government classifying the issuer of such securities as a special purpose issuer for an infrastructure project. The classification may be granted at the request of a pension management company. In Kazakhstan, for local infrastructure investment, only bonds with a government guarantee are accepted. Nigeria specifies qualitative requirements to be met for investing in infrastructure funds (Box 2).

Box 2 Nigeria: qualitative requirements for pension fund investments via infrastructure funds

The major requirements for pension fund investments where infrastructure projects are financed through Infrastructure Fund:

a) The **value** of the Infrastructure Fund must not be less than N5billion ($14 million).

b) All annual financial statements of the Fund shall be **audited** by independent firm(s) of chartered accountants registered by the Financial Reporting Council (FRC).

c) The Infrastructure Fund shall have satisfactory predefined **liquidity/exit routes** such as Initial Public Offering (IPO), sale to other Infrastructure Funds, Trade sale, sale to a strategic investor etc.

d) A minimum of 60% of the Infrastructure Fund shall be invested in projects **within Nigeria**.

e) The key Principals, namely the Chief Executive Officer (CEO) and Chief Investment Officer (CIO), of the Fund Manager shall each have at least ten (10) years relevant and continuous **experience** in infrastructure financing or investment management.

f) The key Principals shall not exit the Fund without prior notice to the PFAs, which shall not be less than 90days from the exit date. This **'exit clause'** shall be expressly.

g) The Fund shall have an Advisory Board with **independent representatives** of Limited Partners, being in majority. Prior to investment as well as during the tenor of investment in any Infrastructure Fund, the Advisory Board shall have responsibility over **audit functions** regarding transactions with parties related to the Fund Manager and **compliance** with the Fund's investment guidelines and policies.

h) Where the infrastructure project is financed through Public Private Partnership (PPP) arrangement, the project shall be awarded to a concessionaire with **good track record** through an **open and transparent bidding process** in accordance with the due process requirements set out in the Infrastructure Concession and Regulatory Commission Act (ICRC Act) and any regulation made pursuant thereto and certified by the Infrastructure Concession and Regulatory Commission (ICRC) and approved by the Federal Executive Council (FEC).

Source: National Pension Commission (PENCOM), Nigeria.

None of the surveyed jurisdictions mentioned the use of *tax incentives* to promote domestic/foreign investment by pension funds in infrastructure. Some indirect incentives, such as tax benefits, may be available for pension funds when investing in special economic zones (e.g., in Zimbabwe).

In only six jurisdictions (Canada, China, Kazakhstan, Mexico, Nigeria and Zimbabwe) are there *credit enhancement instruments* available from a government or its controlled agencies to promote investment by pension funds in infrastructure. The Canadian Federal Government recently implemented the Canada Infrastructure Bank (CIB). The CIB will use federal support to attract private sector and institutional investment to infrastructure projects that are in the public interest. The legislation is drafted in such way that the CIB may be used as a source of credit enhancement for infrastructure projects in the future[22].

In China, there are three categories of credit enhancements for infrastructure investment:

- Category A: State special funds, policy banks, state-owned commercial banks with credit ratings above AA (including AA) in the previous year, or joint-stock commercial banks provide unconditional and irrevocable guarantees of full amount of principal and interest
- Category B: Enterprises registered and established in China provide unconditional and irrevocable guarantees of joint and several liability in full principal and interest, and satisfy a series of conditions
- Category C: Pledge guarantees can be provided by unlimited sale of circulating shares of listed companies

In Kazakhstan, the government provides guarantees for local infrastructure investments. In Nigeria, infrastructure investments by pension funds can be backed by Irrevocable Standing Payment Orders and other guarantees. In Mexico, there are credit enhancements provided by development banks such as the state-owned BANOBRAS (*Banco Nacional de Obras y Servicios Públicos*) to securities investment in infrastructure. In Zimbabwe, credit instruments are available from institutions such as the Infrastructure Development Bank and the Reserve Bank of Zimbabwe to promote investment in infrastructure, but these instruments are not limited to pension funds alone.

In the majority of respondents (Australia, Austria, Bulgaria, Chile, Colombia, Croatia, Egypt, Ghana, Hungary, Iceland, Israel, Jamaica, Kenya, Liechtenstein, Mauritius, Morocco, Namibia, the Netherlands, Romania, Russia, Switzerland and Turkey) credit enhancement by a government entity is not available. In jurisdictions where direct investment in infrastructure is not allowed (e.g., Hong Kong (China), North Macedonia) or where the only feasible channel is via government bonds (Uganda), credit enhancement is not applicable. One jurisdiction (Peru) did not provide answers to this question.

[22] https://www.infrastructure.gc.ca/CIB-BIC/index-eng.html

6. Regulatory changes to facilitate infrastructure investment by pension funds

In addition to the support measures discussed above, respondents also noted changes in the legal and regulatory framework aimed at supporting or in some cases encouraging infrastructure investments by pension funds (Table 3. The types of changes identified by the respondents focused on **broadening** (Canada, Chile, China, Croatia, Mexico, Peru, and Romania) **and facilitating** (Austria, Canada, Chile, China, Colombia Egypt, Israel, Mexico, Namibia, Nigeria, Peru, and Romania), infrastructure investment opportunities.

Under these broad headings, the actual measures adopted to achieve the objective of facilitating infrastructure investment varied somewhat across jurisdictions. In Canada, for example, the approach focused on changing the calculation of loan concentration limits. Specifically, the 10% concentration limit on loans to and investments in any associated persons or affiliated corporations was changed effective 1 July 2016. The limit is now based on the market value of a pension plan's assets rather than the book value. This allows pension plans more flexibility to make large investments, as the market value of the plan's assets is a better reflection of the actual value of the plan's holdings.

Table 3 Regulatory changes to facilitate infrastructure investments by pension funds

Jurisdiction	Regulatory changes
Canada	Concentration limits calculated at market value of a pension plan's assets instead of book value. Implementation of the Canada Infrastructure Bank (CIB) to promote infrastructure projects deemed to be in the public interest.
Chile	Law of 2017 allowing pension funds to invest in alternative assets, including infrastructure.
China	Supervisory regulation of 2016 facilitating infrastructure investments by pension funds and supervisory notices expanding the investment scope, including infrastructure products.
Colombia	Law of 2012 setting up the definition of PPPs and their main required features. Decree of 2014 setting up investment limits in private equity funds and Decree of 2015 setting up conditions for such investments via PPPs.
Croatia	Recent amendment of pension law broadening the possibility to invest in infrastructure projects. Infrastructure projects were segregated as a special asset class, and consequently, there is no longer an obligation for such securities to be listed on the regulated market.
Egypt	Project of a law on supervision to deal with investment management, including non-traditional investments.
Israel	Investment cost cap does not apply in case of infrastructure investments.
Mexico	Recent structural reforms in the energy sector and regulatory changes in the investment regime of pension funds facilitating and giving incentives for

	infrastructure investment. Recently added the possibility for funds to invest in foreign infrastructure via investment project certificates (CERPIs). 35% limit of investment on the total issuance amount by a single pension fund was removed, setting instead a limit of 50% of the value of the project and 80% of the value of the project for small capital development certificates (CKDs) and CERPIs. Nevertheless, since the transition from Basic Funds to TDFs, two funds (those for the eldest workers) out of 10 are no longer allowed to acquire new instruments of this type. Also, investments in a single issuance of structured instruments cannot exceed 3% of total AUMs of the SB[23].
Namibia	Requirement to invest in unlisted instruments by pension funds of at least 1.75% of assets.
Nigeria	The revised regulation on Investment of Pension Assets provided thresholds and conditions for investment of pension funds in infrastructure projects which were hitherto not available.
Peru	Supervisory regulations to include financial securities related to direct infrastructure (2012), allowing investment in plain vanilla instruments without obtaining prior authorisation from the supervisor (2014), and allowing investment in foreign alternative infrastructure funds (2018).
Romania	The Governance ordinance (2019) specified infrastructure as an asset class and allowed (from February 2020) mandatory pension funds to invest up to 15% of their total assets in equities and debt instruments issued by companies organized as PPPs or in infrastructure investment funds.
Russia	Pension funds allowed to acquire non-rated bonds of concessioner.
Switzerland	Dedicated infrastructure investment category (10% limit) was introduced in 2020; previously infrastructure belonged to alternative investment category (15%).
Turkey	Plans to require pension funds to invest part of their portfolios in non-traditional assets, including infrastructure projects.

Source: IOPS

In Chile, a law was passed in 2017 that allowed pension funds to invest in alternative assets, including direct and indirect investment. Secondary legislation has been in force since November 2017. As of December 2018, four out of the six AFPs (managing companies), outlined in their investment policies alternative investments (which, in the case of Chile, include infrastructure); thus far, two of the AFPs have reported direct investments in alternative assets.

In China, the Measures for the Administration of Indirect Investment Infrastructure Projects for Insurance Funds (CIRC [2016] No. 2) issued by the supervisor facilitate infrastructure investments by commercial pension schemes. In addition, according to the Notice on Expanding the Investment Range of Enterprise Annuity Funds and the Notice on Issues Related to Pension Products, the investment scope of Chinese occupational pension schemes (so-called enterprise annuity funds) can be expanded to include trust products, infrastructure creditor investment plans, and specific asset management plans.

[23] SB = Basic Generational SIEFORE, in the Mexican Pension Savings System.

In Colombia, the approach taken focused on Public Private Partnerships (PPPs). The Law 1509 of 2012 set up the definition of PPPs and specified the main features that these vehicles should have. The Decree 816 of 2014 modified the investment regime for pension funds, setting up the limits of investments in Private Equity Funds (PEFs) through PPPs for each type of fund, according to the Law 1508 of 2012. Finally, the Decree 1385 of 2015, set up the conditions for investments in PEFs through PPPs when these funds invest in assets, shares, or securities issued, guaranteed or owned by pension fund managers, their subsidiaries or parent companies, unless two thirds (2/3) of the investments made by the PEF are related to infrastructure projects through PPPs.

In Croatia, the amendments to the Law on mandatory pension funds that entered into force on 1 January 2019 broadened the possibility for pension funds to invest in infrastructure projects.

In Egypt, the financial regulatory authority is preparing a new project law on supervision of pension funds that will address all issues of investment management relating to traditional and non-traditional investment.

In Israel, institutional investors operate as fiduciaries for the benefits of pension savers and in case of alternative assets are subject to a cost investment cap equal to 0.25% of the value of assets under management. In order to encourage institutional investors to invest in infrastructure such investments are not subject to this cap.

In Mexico, a range of measures have been adopted to facilitate investment in infrastructure by pension funds. For instance, owing to the inclusion of structured instruments such as development capital certificates (CKDs), investment project certificates (CERPIs) and real estate funds (FIBRAs) in the investment regime, as well as the recent addition of CERPIs in foreign infrastructure, a wide range of publicly traded instruments is allowed for pension funds to participate in infrastructure investments. In addition, because of the structural reforms implemented in the energy sector and the recent regulatory changes in the pension funds' investment regime, pension funds can now more actively invest in infrastructure. Furthermore, the investment regime gives incentives for greater participation by pension funds that have appropriate risk management. Another development that is worth mentioning relates to the modification of the limit set in the past to prevent pension fund administrators (AFOREs) from controlling the investment decision process in structured infrastructure investment entities (see Table 3). The limit is no longer calculated on the basis of total issuance amount by a single pension fund but rather on the value of the projects. In fact, each SB[24] may acquire up to 100% of a single issuance, as long as the investment in a single issuance does not exceed 3% of total AUM of the SB. There is a threshold level established by the investment regime: if the issuance amount is higher than this level, SBs can invest up to 50% of the value of the project only if its promoter, administrator, or qualified investors finance at least 50% of the project. If the issuance amount is below the threshold level, as happens in the case of small CKDs or CERPIs, funds can even invest up to 80% of each project, on condition that the participation of its promoter, administrator, or qualified investors is above 20% of the value of the project. In this way, investment objectives are aligned among several participants and potential control of pension funds over large projects is reduced, while increased offers of structured instruments are promoted by making small infrastructure projects attractive to pension funds for investment. This is the consequence of observing some obstacles for diligent issuance of structured instruments owing to difficulties in reaching an agreement among institutional investors of diverse risk profiles. The change makes it easier to meet the requirement of having a co-investor.

[24] SB = Basic Generational SIEFORE in the Mexican Pension Savings System.

In Namibia, the approach taken focused more on direct encouragement of infrastructure investment by pension funds by the introduction of a requirement for funds to invest at least 1.75% of assets in unlisted investments[25].

In Nigeria, revisions to the law introduced thresholds and conditions for investment of pension funds in infrastructure projects. The regulation was reviewed to utilise at least 60% of the infrastructure investment within Nigeria against 75% under the old regulation. However, the project types are limited to *sukuk* Bonds offered by the Government and private equity investments.

In Peru, the supervisory authority (SBS), being the regulator of private pension funds, has been issuing rules to make the legal investment framework more flexible. In 2012, the SBS broadened the investment opportunities for pension funds to include financial securities related to direct infrastructure (both operational and non-operational projects) and non-listed shares (private equity). In 2014, the authority created a more flexible investment process in which plain vanilla instruments (relating to direct investments in infrastructure) could be undertaken without prior authorisation from the regulator. The new authorisation process for complex instruments considers two types of authorisation: 1) authorisation for each instrument, and ii) general authorisation. For the latter, a series of requirements identified in an investment's legal framework must be accredited. In 2018, the SBS included Infrastructure Funds as a new strategy of foreign alternative funds in which pension funds can invest, but it requires one of the two types of authorisation described above from the SBS.

Switzerland introduced a major change in the legislation regarding infrastructure investments on 1 October 2020. A new dedicated category for infrastructure investments was introduced in the 2nd ordinance to the law on occupational benefits (BVV 2). Pursuant to the change, infrastructure investments no longer account as alternative investments. The new category has a limit of max. 10% (of total assets). The category limit for the remaining alternative investments was left unchanged at 15% (of total assets). The Office of Social Affairs clarified that the new category of infrastructure investments must not contain strategic leverage. Short-term "bridge financing" for liquidity reasons is not considered as strategic debt. Not allowing leverage can be considered controversial, as one of the characteristics of infrastructure investments is the use of debt for strategic leverage. Consequently, if an infrastructure investment uses strategic debt, the whole investment is still considered to be an alternative investment (as under the previous legal framework) and does not fall under the new category of infrastructure investments.

In Romania, at the end of 2018, the government issued an ordinance that modified the financial instruments in which mandatory pension funds are allowed to invest. Mandatory pension funds have been allowed to invest in equities and debt instruments issued by companies organized as PPPs or in infrastructure investment funds, up to 15% of their total assets. This regulatory change was implemented in the secondary legislation in September 2019 and became effective as of February 2020. Investment in infrastructure will be listed in the primary legislation as a specific asset class in which Romanian mandatory pension funds can invest. Previously, Romanian pension funds (mandatory or voluntary) could invest indirectly in financial instruments related to infrastructure as long as these instruments respected the private pension legislation.

[25] It can be noted that in line with the OECD Core Principle 4 on Investments and Risk Management, setting up minimum levels of investment in certain assets is not consistent with prudential principles, as such limits may prevent or impede managers from disinvestment in cases of inappropriate investments (c.f. OECD, 2016). Also, the IORP II Directive, prohibits EU Member States from requiring that the IORPs registered or authorised in their territory invest in particular categories of assets (c.f. EU (2016), art.19 point 4, Investments).

In Russia, investment in infrastructure has been facilitated by allowing pension funds to acquire bonds of concessioners that do not have credit rating.

In Turkey, measures under consideration would also take a more proactive approach in encouraging pension funds to invest in infrastructure asset. In particular, some changes to investment limits are considered that would require pension funds to invest at least 10% of their assets in non-traditional assets, including infrastructure projects.

Zimbabwe, by contrast, focuses on broadening the range of eligible investments. It is considering an amendment to the pension legislation that will allow foreign investments by pension funds, subject to approval by the supervisor based on the terms and conditions to be set and exchange control approval.

7. Supervisors' views on impediments to infrastructure investments by pension funds

Ten respondents identified issues that may inhibit investment in infrastructure by pension funds. The main problem (mentioned by Bulgaria, Israel, Peru, Romania, and Russia) was **the lack of or scarcity of quality infrastructure projects** that are suitable investments for pension funds.

Some authorities also mentioned **investment regulations,** such as: the ownership limitation level of 30% that may be impeding the ability of larger pension funds to invest in infrastructure (Canada), the current law and regulations not being in line with changes and developments in the financial markets (Egypt), strict investment rules preventing direct investment (Hungary), and the low investment limit for infrastructure bonds (Kazakhstan tbc). Romania and Russia also pointed to the **lack of expertise** on the part of pension funds to invest in or assess infrastructure projects.

One jurisdiction mentioned uncertainty relating to policy making as a factor impeding investment in infrastructure by pension funds. In Nigeria, infrastructure investment is not a priority investment for pension fund administrators owing to fears of a lack of political commitment in the long term and clarity on investment opportunities.

In Turkey, in order for pension funds to invest directly in infrastructure, a legal entity similar to a real estate investment fund must be established; however, under current rules, participants can leave a pension fund at any time, which creates implied constraints on illiquid investment allocations and may adversely impact funds' appetite for infrastructure investment. For Zimbabwe, hyperinflation constitutes a major impediment to pension funds investing in public sector investment projects (via government bonds) and there is no possibility to invest offshore.

In Chile, the main impediment to infrastructure investment in the past was the fact that direct instruments for investing in infrastructure, such as private debt and co-investment instruments, were not allowed. However, since November 2017, the new legislation has made it possible.

II. Market practice: pension funds' investments in infrastructure

1. Actual asset allocations in infrastructure by type of instrument

In most jurisdictions surveyed, **pension funds' investments in infrastructure remain quite low, well below 1-5% of total assets**[26]. Only a limited number of authorities[27] reported exposures exceeding 5%.

In some jurisdictions, pension funds, although allowed, actually do not invest directly in infrastructure (e.g., Egypt, Liechtenstein, Switzerland) or do not invest in these types of assets at all (Bulgaria, Croatia, Liechtenstein, Romania, Republic of North Macedonia, and Uganda). In the Czech Republic, investment in infrastructure by pension funds is negligible. In Bulgaria, pension funds are allowed to invest in infrastructure projects only in EU Member States; however, they have not invested in such bonds over the past three years.

While institutional investors, including private pension funds, could gain exposure to infrastructure assets through a mixture of direct investments and through dedicated investment funds, the survey found that **the pension funds in respondent jurisdictions predominately invest in infrastructure indirectly**[28].

Pension funds can **invest indirectly** in infrastructure using a variety of instruments, including equity, debt, loans or through specialised investment funds, infrastructure funds and structured investments.

A number of respondent authorities reported that **domestic debt instruments** such as corporate bonds or bonds issued by government and public bodies (state-owned enterprises) that develop and maintain infrastructure represent **the most common financial instruments** for investing in infrastructure (Bulgaria, Chile, Egypt, Iceland, Jamaica, Kenya, Kazakhstan, Mexico, Nigeria, Peru, and Russia). In Israel – the highest exposures of pension funds to infrastructure assets are through loans. In Jamaica, the main category of infrastructure investments observed are via PPP bonds.

Indirect infrastructure investments are mainly obtained through specialised investment funds (Liechtenstein) or via collective investment schemes (CIS), as in the case of in Austria, Iceland and Jamaica; private equity funds (Colombia, Iceland, and Kenya); closed-end funds (Chile) and infrastructure funds (Canada - Ontario, Chile, China, Ghana, Mexico, and the Netherlands). In Croatia, infrastructure investments can be made indirectly through transferable securities (equity or debt) or units or shares of different types of alternative investment funds (AFFs) – private equity funds, real estate funds, infrastructure funds, etc. In some jurisdictions, indirect investments in infrastructure are made through special purpose vehicles (SPVs). Examples include unlisted

---

[26] For the market practice of large pension funds in this area see OECD Annual Surveys of Large Pension Funds and Public Pension Reserve Funds (https://www.oecd.org/daf/fin/private-pensions/survey-large-pension-funds.htm).

[27] Israel, Mexico, Namibia, Peru, and Russia; relatively high infrastructure investment in Australia and Canada – about 10-12% and 16%, respectively (as informed from other OECD reports). Australian supervisor observes exposures of individual funds in the range of 0-12% for listed and 0-22% for unlisted infrastructure equity, but does not have data on infrastructure investments undertaken via debt instruments. The Namibian Financial Institutions Supervisory Authority (NAMFISA) reported data of pension fund investments in unlisted instruments through SVP amounting to 25.19% of total portfolio.

[28] Austria, Australia (95% of the total infrastructure investments, as of 31 Dec. 2017); Bulgaria, CAPSA, China, Columbia, Croatia, Ghana, Hong Kong (China), Republic of North Macedonia, Morocco, Liechtenstein, Mexico, Namibia, Russia, and Turkey.

investments (Australia, Namibia), bonds issued by SPVs (Peru), or transferable securities issued through SPV established for the purpose of financing or securitisation of infrastructure projects (Croatia). The use of SPVs is also a commonly observed structure in Australia for investment in infrastructure and other unlisted assets. Real estate investment trusts (REITS) and real estate investment/venture capital investment funds are common respectively in Kenya, Nigeria, and Turkey. Some investment is also made through public private partnerships (PPPs) (e.g., China and Colombia – PPPs private equity funds and PEFs). In Namibia, four new exchange traded funds (ETFs) expressly for infrastructure investments were listed on the local stock exchange.

In some countries (i.e., Hungary, Mexico and Russia) unlisted instruments are not allowed for infrastructure investments (such as. In Iceland, a general limit of 20% in single-entity exposure applies (does not refer specifically to infrastructure investments).

Direct infrastructure investment is made through the purchase of debt instruments or shares issued by concessionaires of infrastructure projects in Peru. Direct infrastructure investments are also quite common in the Netherlands and opportunities for such investments exist as well in a large number of other respondent jurisdictions (Austria, Australia, Canada [29], Chile, Colombia, Croatia, Czech Republic, Egypt, Hungary, Israel, Namibia, Mexico, Peru, Romania, Russia, Switzerland, Turkey). In some jurisdictions, direct investments in infrastructure are not allowed (e.g., Bulgaria, Hong Kong (China), and Mexico). There is also a group of countries where infrastructure investments are not separately mentioned by law (i.e., there are no specific provisions in relation to infrastructure investments), implying that they are an intrinsic part of prudential investment restrictions (e.g., Liechtenstein, Republic of North Macedonia, and Mauritius).

A large number of respondent authorities reported **difficulty in providing statistical data with respect to infrastructure investments**. For example, statistics on infrastructure investments by superannuation funds are currently not separately collected by the Australian pension supervisor (APRA); however, an industry consultation is underway on expanding APRA's prudential data collection, which may result in future inclusion of such statistics. In some jurisdictions, infrastructure investments fall under the categories 'other assets' or 'alternative investments'. For those authorities that already collect these statistical data, information is summarised in the table below.

Table 4 Infrastructure investment by pension funds in selected IOPS jurisdictions (as % of assets under management), 2018 or most recent years available

Jurisdiction	**Listed equity (total)**	range of asset allocation observed	**Unlisted equity (total)**	range of asset allocation observed	**Infra debt (total)**	range of asset allocation observed
Australia	1%	0-12%	4%	0-22%		
Austria	<5%	0-5%			<1%	0.1-2.6%
Chile			0.09%		0.4%	
Iceland			0.4%		2.3%	

[29] In some Canadian jurisdictions, pension funds can invest in infrastructure directly or indirectly through a variety of available instruments.

Israel*	0.2/0.0%				2.4/0.6%	
Kazakhstan					0.14%	
Mexico[30]	0.01%				7.5%	
Morocco	2.7%		1.5%			
Nigeria	0.33%		0.36%		1.55%	
Peru	1.89%		1.34%		4.90%	
Russia**	0.9%/2%				10.1%, 6.2%	

Note: (*) Old and new pension funds, figures are provided in total for both types of pension funds, domestic/foreign investments, (**) Data for mandatory and voluntary pension arrangements, respectively.

Source: IOPS.

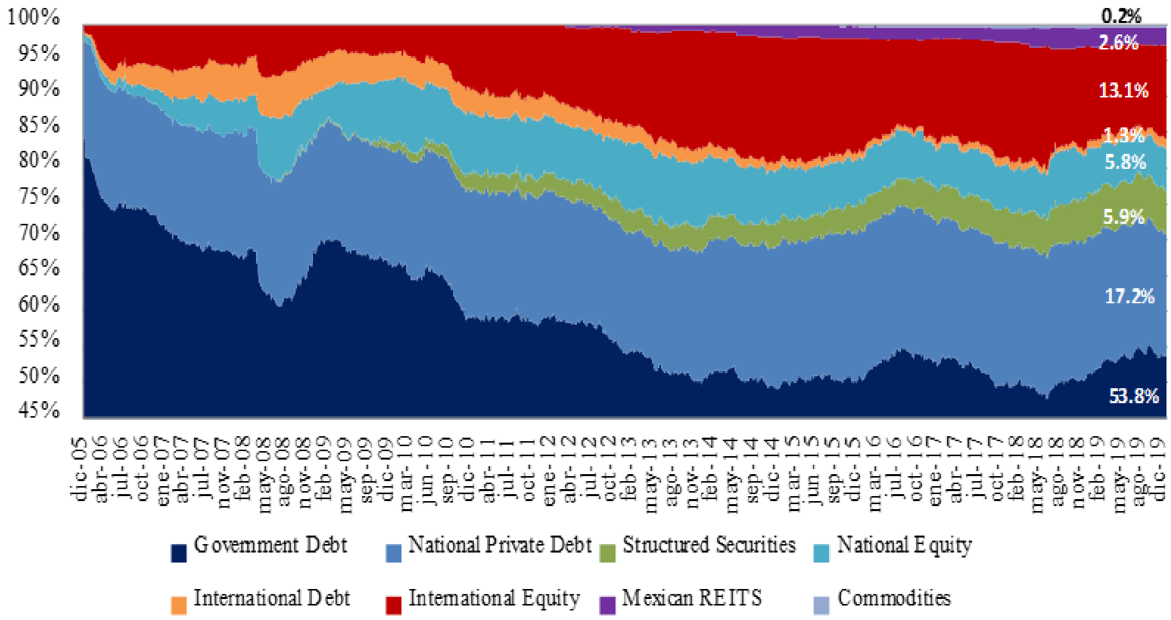
In the Czech Republic, investments in infrastructure are very limited, as pension funds can only invest in securities traded on a regulated market and their allocations need to meet strict criteria in terms of credit risk, liquidity risk and risk-return characteristics. In addition, some category of Czech pension funds, i.e., so-called transformed funds, need to provide a no-loss guarantee. In Chile, as of December 2018, four out of the six AFPs in the market outlined their investment policies regarding alternative investments. Thus far, only two AFPs have reported direct investments in alternative assets. As of June 2018, 2.7% of funds (approximately USD 5,512 million) were invested in alternative assets.[31] In Egypt, infrastructure investments relate basically to governmental securities, whereas in the Netherlands such investments are mostly allocated to equities. Swiss pension funds rarely invest in infrastructure directly, as such investments are subject to public disclosure accompanied by a sound rationale.

In Mexico, the Investment Regime (General provisions that establish pension funds' investment regime) for pension funds (SIEFOREs) has been loosened gradually. Prior to 2008, investment in infrastructure could only be channelled through debt (corporate bonds of enterprises related to infrastructure, including state-owned enterprises: Pemex and CFE) or via the acquisition of listed stocks from companies dedicated to infrastructure investments. In 2008, CKDs were created (i.e., SPVs destined for direct infrastructure investment) and afterwards FIBRAs and CERPIs. Figure 1 shows the investment dynamics of SIEFOREs (funds) in which infrastructure is considered. Investments in infrastructure can be made via structured instruments, bonds, and equity of companies that are dedicated to this sector. All told, debt instruments account for over two-thirds of total holdings.

[30] Figures as of December 2019.

[31] FIAP (2018), Pension Notes, No.32, December 2018.

Figure 1 Historical development of investments by Mexican pension funds, SIEFORE (2005-2019) as % of AUM



Source: National Commission of the Retirement Savings System (CONSAR), Mexico.

A few other jurisdictions also provided information on the observed exposures to infrastructure by pension funds. In Australia, for example, the maximum exposure of an individual pension fund to listed instruments was 12% of assets (1% direct, 12% indirect) and 22% for unlisted (6% direct, 22% indirect) instruments. From a geographical perspective, the highest infrastructure exposure observed in 2018 amongst Australian funds was 22% (3% direct, 22% indirect) for domestic infrastructure assets, compared with foreign infrastructure investments at a high of 11% (6% direct, 11% indirect).

In some jurisdictions, a breakdown by specific instruments was not available. Switzerland, for instance, reported that the total share of infrastructure investments was 0.9% (of total assets in 2017). In Israel, infrastructure investments totalled 5.8% (of which 2.7% was domestic and 3.1% foreign). The total investment by pension funds in the Netherlands was reported at EUR 22.3 billion in Q4 2017.

Only a few of respondent authorities could provide information on **investments of pension funds in infrastructure by sector** and also indicate the **geographical location** for such investments (e.g. jurisdictions or region/continent). **In the majority of respondent authorities, information on investments is not collected at this level of granularity.** Of those authorities that reported the data, infrastructure investments by pension funds are mainly concentrated in the energy sector (energy generation and energy transmission and distribution), followed by social infrastructure (schools and hospitals), and the transportation and telecommunication sectors (Box 3).

Box 3 Infrastructure investments by pension funds by sector
(% of total portfolio), latest available data as for 2018

Iceland: renewable energy generation: 0.4%; energy transmission/distribution –2,3%

Kazakhstan: transportation: 0.14%

Mexico: energy generation and transmission/distribution: 3.66%; social infrastructure – 3.89%; other (structured instruments and trust certificates linked to real projects) – 1.20%

Morocco: renewable energy generation: 1.4%; telecommunication – 2,0%; transportation – 0.6%; social infrastructure – 0.1%

Namibia: renewable energy generation – 11.10%; energy transmission/distribution – 6.45%; telecommunication – 1.28%; transportation – 0.81%; social infrastructure (schools and hospitals) – 5.55%

Nigeria: social infrastructure: 1.55%

Peru: energy generation: 3.11%; energy transmission/distribution – 1.44%; transportation – 2.1%; telecommunication – 0.46%; water – 0.33%; other projects: hydro-energy projects – 0.11%; hydrocarbons – 0.45%; infrastructure for health – 0.13%

Russian Federation: energy generation and transmission/distribution – 3.0% (mandatory pension arrangements) and 4.3% (voluntary pension arrangements); transportation – 5.9% (mandatory) and 2.9% (voluntary); telecommunication – 0.8% (mandatory) and 0.8% (voluntary); water – 0.3% (mandatory) and 0.1% (voluntary); social infrastructure 0.1% (mandatory) and <0.1% (voluntary); utilities – 0.6% (mandatory) and 0.1% (voluntary); other (Russian Post) – 0.4%.

Source: IOPS.

In China, the main investments by pension funds were in five domestic sectors, namely transportation, communication, energy, municipal administration, and environmental protection. Mexican funds, by contrast, invested mainly in roads, highways and in the energy sector. The highest exposures observed in Namibia relate to renewable energy, healthcare facilities (hospitals), utilities (sewage), and communication (transmission and towers). The Netherlands supervisor (DNB) does not require information on infrastructure investment by sectors to be reported. Looking into the largest pension funds it is observed, though, portfolios appear to be well diversified across sectors with utilities, energy (transmission, distribution and storage) and roads/railway receiving the highest allocations. In Zimbabwe, the supervisor observed that pension funds have shown interest in renewable energy investments via infrastructure bonds.

With regard to the **geographical distribution of infrastructure investments**, in the jurisdictions where investment is authorised both domestically and abroad, the supervisory authorities[32] that collect the data reported that these **investments are mainly domestic**; i.e., pension funds invest in domestic infrastructure projects or securities.

The recently adopted **changes in investment regulations of pension funds are deemed to encourage geographical diversification**. This is certainly the case for Mexico, where the recent regulatory changes allow since January 2018 investments in foreign infrastructure through investment project certificates (CEPRI). As for now, there is only one company listed in the Mexican market that was structured as a special purpose acquisition company, with the purpose of investment in energy projects abroad. Elsewhere, the Central Bank of the Russian Federation reported that pension funds can invest in bonds issued by the Russian special purpose vehicle (SPV)

[32] Austria, Iceland, Jamaica, Kazakhstan, Mexico, Morocco, Nigeria, and Russia.

that participates in construction of a railroad in Kazakhstan. In the case of Peru, although infrastructure investments are basically domestic, pension funds began to invest in foreign alternative infrastructure funds after the regulatory changes of 2018.

The Netherlands supervisor (DNB) estimates that around 85% of infrastructure investments by the Netherlands pension funds are made in Europe and North America, with Europe accounting for approximately 60% of those investments. The emerging markets represent about 8% of infrastructure investments by pension funds in the Netherlands.

2. Reasons for investing in infrastructure

Infrastructure investment has for some time been considered a good match for the long-term nature of pension savings in a general sense, but that is not the only potential benefit. A large majority of respondent supervisory authorities[33] noted, in fact, the following **key reasons for infrastructure investment by pension funds**:

- to improve diversification of the portfolio, allowing for new opportunities to invest in different sectors and asset classes, owing to a low correlation with traditional asset classes such as equity and bonds (which allow them to improve risk-return profile)
- to achieve better asset-liability matching; owing to long-term stable and predictable cash flows (over a long horizon) with low volatility and lower sensitivity to the economy cycle (as linked to essential services as energy, water supply, etc.)
- to reach higher returns in particular given the current very low interest rate environment (at a marginally higher risk).

Other reasons identified included:

- contribution to the national development goals (development of social and economic infrastructure)
- inflation hedging
- government guarantee (Kazakhstan).

3. Diversification of risks

As part of the survey, Members were asked about the types of financial instruments available for pension funds to diversify the country-specific and foreign exchange risks in relation to infrastructure investments. No infrastructure specific instruments were mentioned.

In most cases, pension funds must abide by the general principles of prudent management, security, and risk diversification when investing in infrastructure, including for investments in foreign securities and foreign infrastructure projects. To hedge foreign exchange risk relating to investments in infrastructure, pension funds can enter into **derivative contracts**. Of these derivatives, the most commonly used instruments are on exchange rates (Austria, Australia, Bulgaria, Chile, China, Colombia, Mexico, Morocco, Namibia, the Netherlands, Peru, Switzerland). Swaps, options, futures contracts, and other derivatives are also being used to hedge currency risk exposure. In Iceland, pension funds usually rely on currency overlay strategies to manage and minimise risks inherent in foreign exchange exposure. In Mexico, pension fund administrators (AFOREs) must have a certificate to utilise derivatives.

[33] According to the reply of the Netherlands Central Bank, infrastructure offers "return, diversification, low volatility and stable cash flow, link with inflation, and an ESG element".

In several cases, some general qualitative requirements or limits were mentioned, including general limits depending on the type of fund (as in Colombia), investments in currencies from eligible jurisdictions (Mexico), or other types of restrictions for investments in foreign currency.

In Colombia, pension fund investments in infrastructure abroad can be undertaken by investing in foreign private equity funds that invest in infrastructure, subject to compliance with a number of restrictions (see Table 2). Investments in securities issued overseas and deposits in foreign banks are subject to general limits that apply depending on the type of fund – moderate fund (60%), conservative fund (40%), programmed retirement fund (40%), and great risk fund (70%).

Additional limits apply regarding non-hedge instruments (depending on the type of fund – moderate fund (35%), conservative fund (15%), programmed retirement fund (15%) and great risk fund (50%)) and trading of US dollars on the spot market or through derivatives during the last five working dates (2.5% for all types of funds).

In Hong Kong (China), there are no restrictions on investments denominated in foreign currency (Table 2).

In Kazakhstan, certain limitations apply to investments in USD and/or EUR, which should not exceed 50% of total pension assets, and in other foreign currencies – investments should not exceed overall 10% of total pension assets.

In Russia, pension funds can use derivatives on the underlying permitted assets.

Regarding the instruments used for country risk[34] diversification, the respondent authorities generally referred to the principle of portfolio diversification. In certain cases, limits on investment in a foreign country may vary depending on issuer credit rating (as the case in Kazakhstan) or general limits to foreign securities apply (Table 2).

In Austria, given the small portion of assets and predominately indirect exposure to infrastructure assets, emerging market investments are typically conducted via investment funds that diversify geographically. Also, in Australia, indirect exposure to infrastructure would be through a managed fund or instrument that provides exposure to an infrastructure index that can provide country diversification, depending on the composition of the underlying portfolio.

In Nigeria, there currently are no instruments for pension funds to diversify country risks, whereas pension funds in Zimbabwe can invest in dual listed bonds for this purpose.

4. Performance and its drivers

Owing to limitations in the respondents' data collection process (performance statistics), a large majority reported that **infrastructure investment-specific data on performance is not available or not collected.** Only a few supervisory authorities provided general observations suggesting that infrastructure investments performed well (Canada – Province of Ontario, CAPSA response, Iceland, Nigeria – sovereign Federal Government of Nigeria sukuk bond). The response from the SBS, Peru, offered the following insights:

[34] "Country risk is the risk of non-payment on an export contract or project owing to actions taken by the importer's host government. Such actions may include intervention to prevent transfer of payments, cancellation of a license, or events such as war, civil strife, revolution, and other disturbances that prevent the exporter from performing under the supply contract or the buyer from making payment. Sometimes physical disasters such as cyclones, floods, and earthquakes come under this heading." (Source: OECD Glossary of Statistical Terms).

- all the bonds have paid their coupons and amortizations regularly. Although bond prices are subject to market fluctuations, they show low volatility, characteristic of fixed income securities
- listed equity have registered greater volatility than bonds; however, equity investments maintained their growth trend over the long term
- private funds/alternative investments have generated a negative performance in the first years of their existence, but usually recovered in their disinvestment stage, which is the characteristic behaviour of such instruments.

The Central Bank of the Russian Federation noted that no infrastructure investments by pension funds have defaulted yet and all of them have continued to be stable. The differences in performance have depended on the specificities of concession agreements rather than on the area or type of infrastructure projects. For example, bond issues with coupons based on a "key rate+" condition performed better than bonds with coupons based on an "inflation rate+" condition.

The Mexican supervisory authority (CONSAR) highlighted the early stage of structured investments (the "J curve" expected to be followed by significant gains). Debt infrastructure instruments are issued with a fixed rate, which generally pays above the inflation rate at the moment of issuance.

III. Supervision of infrastructure investment by pension funds

1. Supervisors' perceptions of infrastructure investment risks

More than half of the respondents (19) provided views on the main risks pension funds in their jurisdictions face when investing in infrastructure. As noted by one supervisor (Nigeria), pension funds must contend with all the risks associated with dealing with third parties, which include shareholders, financial institutions, regulators, and SPVs. Market risk, the potential loss of value of long-term assets and unsecured yield challenges, was cited by eight jurisdictions (China, Colombia, Hong Kong (China), Iceland, Jamaica, Liechtenstein, Mexico, Namibia, Nigeria, and Zimbabwe). This type of risk is generally associated with listed shares and debt securities used by pension funds to gain exposure to infrastructure. Among respondents, Namibian supervisors emphasized that the main risk is that the cash flows are not guaranteed, which can have a ripple effect on investment yields, especially when considering the duration of major infrastructure projects.

Other commonly cited risks were valuation risk (Australia, Canada – Alberta and Ontario, Chile, Colombia, Iceland, and Peru), liquidity risk and early exit mechanisms (Austria, Chile, China, Colombia, Mexico, the Netherlands, and Zimbabwe) and credit risk related to the counterparty (China, Hong Kong (China), Jamaica, Mexico, Nigeria, the Netherlands, and Russia). One supervisor remarked that once infrastructure opportunities are limited, valuations are likely to be elevated (expensive) in many cases. Another noted the need to consider the liquidity aspects of infrastructure investments, both directly and because of the impact on portfolio construction and management.

Other risks mentioned (with the number of respondents in parentheses) included: operational risk (5), legal (contract) risk (4), interest rate risk (related to long duration) (4), political/country risk (5) and transparency risk (owing to a possible lack of alignment of management fees with the interest of the pension fund) (4). In addition, limited specialist supervisory knowledge and experience was identified as a barrier to robust challenge/monitoring of funds' processes (3), including inadequate understanding of the risk and return drivers. Finally, supervisors also mentioned insufficient skills and resources available for risk management (2), inflation risk (2), currency reforms (1), regulatory risk (1) and policy risk (1).

2. Methods pension funds use to respond to risks related to infrastructure investment

Sixteen jurisdictions provided insights into how pension funds respond to risks related to infrastructure investment. The methods most often cited are the same as those applicable to "traditional" investment asset classes: due diligence (China, Colombia, Peru, and Switzerland), proper documentation of investment and risk management process (Jamaica, Mexico[35], and Switzerland), diversification (Kenya, Mauritius, Namibia, Peru, and Zimbabwe) and following proper legislation, regulation or guidelines (Australia[36] and the Netherlands). In Namibia, pension funds typically invest in projects with minimal capital injections costs and shorter investment periods. Some other solutions that were reported by single respondents included: using specialised fund managers, applying internal risk limits, supervisory monitoring and surveillance, seeking

[35] For information about Mexico's requirements for the risk and investment management process by pension funds, see Box 1 and page 31 in IOPS (2017).

[36] APRA's requirements on the part of Trustees in this area are set out in the prudential practice guides: SPG 530 Investment Governance (https://www.apra.gov.au/investment-governance) and SPG 531 Valuation (https://www.apra.gov.au/valuation). These guides relate to investments in general.

authorisation from the supervisor prior to investment in alternative instruments (including infrastructure funds), investing in projects of affiliated entities, submitting periodic reports, and ensuring an independent review of investments is undertaken by the risk management department. Because of hyperinflation in Zimbabwe, pension funds there have made calls for enabling an adequate supply of inflation-indexed instruments and equity-based instruments as opposed to traditional debt instruments.

In the context of infrastructure, in Colombia, due diligence requires pension fund managing companies to understand the main drivers of the private equity funds (PEF) organised under PPPs. These drivers include the underlying asset, the risks pertinent to the investment, and the control procedures regarding the PEF manager.

3. Supervisory approaches to infrastructure investment

All respondent authorities indicated that they **do not have any special approach for the supervision of infrastructure investments**. Among the quoted reasons for this approach, supervisors mentioned the use of the prudent person approach (universal to any types of assets), the small scale of infrastructure investments, and the fact that such investments are not separately mentioned in the law, which implies no special approach is needed for such investments.

In general, infrastructure investments by pension funds fall within the established legal and regulatory frameworks covering investment governance and investment management and the supervisory oversight is carried out at the level of the global portfolio management. The supervisory monitoring and surveillance focus on compliance with legislative and regulatory requirements, which includes among others, reviews of eligibility of investments, investment strategies, process of investment decision making, asset allocation models and risk analysis, outsourcing of investment and risk management. Regular investment reports submitted by pension funds to supervisors[37], supervisory analysis of these reports, organisation of meetings with pension funds' management, on-site visits focusing on investment management, and reporting were listed among the usual supervisory approaches to oversee investment risks, which include those arising from infrastructure investment.

Risk-based supervision present in certain jurisdictions implies that pension funds need to follow the approach applicable to any asset class or instrument when investing in infrastructure. For example, in Rwanda, where the supervisory framework for pension schemes is largely risk-based, the pension schemes/funds make investments based on their respective investment policies. Each pension scheme/fund, in consideration of its risk appetite, formulates its investment policy which is then approved by the regulator.

Whilst there is currently no specific supervisory approach to pension funds' infrastructure investment in most jurisdictions, some supervisory authorities recognised that **monitoring of investments in non-traditional instruments implies greater supervisory effort, and more scrutiny and analysis**.

In several jurisdictions (e.g., Chile, Mexico and the Netherlands) **regulatory guidelines or secondary regulation <u>indirectly</u> relating to infrastructure investment were put in place,** by way of covering investments in innovative or alternative assets. In Nigeria, general investment regulation includes specific requirements for investment, risk management, ratings, and valuation of infrastructure investment (see Box 2 in Section I).

[37] This could be done even on daily basis (e.g., Bulgaria, Chile, and Nigeria).

Box 4 Supervisory guidance on non-traditional investments, including infrastructure

Chile: In October 2017, the Superintendence of Pensions issued secondary regulation that allowed APFs to invest in alternatives assets. After adoption of the secondary legislation, *supervisory guidelines* were established covering the following areas:

- Investment and risk management process with a requirement of a solid due diligence process.
- Outsourcing of investment and risk management services.
- Valuation, with requirements relating to the issuance of financial statements, which must be certified by at least two independent valuation agents, etc.
- Solvency requirements. In the case of syndicated loans, pension funds may invest if there is at least one bank holding a minimum of 5%.
- Ratings.
- Management of conflicts of interest with the requirements relating to issuers, valuation agent, etc.
- General partners in the case of foreign investment should be approved by the Risk Rating Commission.

Mexico: Mexican regulation has authorised pension funds to invest in domestic alternative assets since 2007 and outside Mexico as of 2018. Secondary regulations were issued by the National Commission for Banking and Securities (CNBV) and the National Commission of Retirement Savings System (CONSAR)[38].

The CNBV regulation covered the vehicles' legal structure (CKD, CERPI, FIBRA, FIBRA-E), governance, and investors' rights. In the same way, minimum information disclosure requirements were issued for investors.

The CONSAR issued regulation related to the investment regime of pension funds: e.g., general provisions establish pension funds' investment regime and prudential regulation included requirements when investing in infrastructure.

The Netherlands: In 2012, the Central Bank of the Netherlands published "Focus areas and good practices for innovative investments" (among them are infrastructure, private equity and hedge funds).

Source: IOPS.

In China there are infrastructure-specific regulations; however, their requirements do not seem to differ from the typical requirements for investment and risk management. Chapter IX of the "Administrative Measures for Indirect Investment in Infrastructure Funds for Insurance Funds" stipulates several requirements, such as proper assessment of the investment risks (due diligence), effective risk control, investment accountability, and reporting. It also stipulates that a risk reserve fund (financed by at least 10% of asset management fee) be established to compensate the trustees for losses caused by violation of laws or misconduct. Chapter VI of the "Interim Provisions on the Administration of Infrastructure Creditor Investment Plans" stipulates requirements for effective risk control of such investments, including the requirement for an internal credit rating.

[38] https://www.gob.mx/consar/documentos/normativa-normatividad-emitida-por-la-consar-circulares-consar-23509

In Colombia, given the growth in infrastructure investments through private equity funds, owing also to the government's important role in facilitating institutional infrastructure investments[39], the pension supervisor is currently working on a set of good practices and recommendations on due diligence that investors will have to observe when investing in these vehicles. There are also plans for issuing a secondary regulation that will include requirements that pension funds will need to meet when investing in infrastructure.

In some jurisdictions (i.e., Chile, Peru, and Switzerland) in order to invest in non-traditional assets including infrastructure, **pension funds need to establish an investment policy** that needs to be approved by the pension fund management/board or the supervisory authority (e.g., Chile and Peru)**.**

In Chile, the Investment Regime updated in November 2017, established the requirement that prior to investing, pension funds have to issue a special Investment Policy for Alternative Assets, covering the main risks and the risk management. This investment policy must be approved by the Superintendence of Pensions. In the event a pension managing company fails to comply with regulatory provisions, the supervisor may forbid further investing in this category of assets.

In Peru, the regulation has set up a requirement for a pension fund managing company to approve its investment policies. These policies must describe the means and purposes of traditional and non-traditional investments for each type of fund under management, as well as the requirements that managers of non-traditional investments must meet. Investment policies cannot go beyond requirements imposed by regulation, but the management company itself can set even tighter requirements within the scope of regulation. Investments by pension funds in non-traditional assets are subject to pre-investment authorisation by the supervisor (SBS). This authorisation may necessitate an assessment of corporate governance; policies and procedures related to investment process; systems; methodologies and models of risk management; fit and proper requirements; information systems; and internal system of disclosure of investments. Based on the assessment, the SBS may grant a general or partial authorisation to invest 100% or 50% of the regulatory limit set for the particular type of fund. Pension funds may not outsource investment management.

In Switzerland, in order to invest in infrastructure, a pension fund's investment guidelines must allow infrastructure investments and these guidelines must be approved by the board.

Predominantly, responding jurisdictions do not apply any infrastructure-specific risk management tools, with the exception of two jurisdictions. In China, for example, the issuer of an infrastructure investment plan must be authorised by the regulator (CTIRC) to ensure that the issuer has the capability to identify the risks of the infrastructure investment, whereas the plan has to be registered by the Insurance Asset Management Association of China, which follows the guidelines issued and is subject to supervision of the CBIRC. In Ghana, private equity funds that focus on infrastructure need a prior approval from the regulator, which adds a layer of assurance into the system.

Some supervisors (Australia, Canada – Ontario, Chile, and Colombia) emphasized that **self-regulation by pension funds** is the most effective approach for infrastructure supervision. High governance and due diligence standards by pension funds make trustees more cognisant of the investment governance requirements for investing in infrastructure and other unlisted asset classes (Australia), motivate supervised entities to employ professionals to perform regular investment monitoring, and drive expectations for pension fund managers and administrators to adhere to high standards (Colombia). In China, the introduction of regulations related to infrastructure investment

[39] OECD, Colombia: Review of the Financial System, April 2016.

has helped in defining requirements related to the source of funding, capital application, manager, product specification, risk management, and information disclosure.

4. Main challenges in supervision of pension funds' infrastructure investment

Twelve supervisory authorities shared their views on the main challenges encountered in supervising infrastructure investment by pension funds. The most common challenges related to capacity and communication, data, corporate governance, and due diligence issues.

Supervisors mentioned a need for establishing and strengthening teams skilled in infrastructure investments and risk management systems in pension funds (Mexico, Nigeria, and Peru), as well as in the authorities (Chile) so that they can take/review complex decision-making processes with regard to less transparent investment structures. Related challenges include making sure that asset managers have a proper understanding of investment products (Switzerland) communicating to pension trustees the importance of having access to sufficient expertise to monitor infrastructure investments (Australia). One supervisor (Peru) cited reputational risk as another factor that can have a relevant impact on the investment portfolios. According to the supervisor, this risk, in turn, calls for having information on portfolios on a daily basis (through an electronic platform) that would enable a supervisor to perform the timely analysis needed for effective supervisory actions.

Another challenge mentioned by supervisory authorities relates to the scarcity of adequate current and historical data on infrastructure exposures across pension funds (Australia, Nigeria, Russia, and Zimbabwe). Another supervisor (Kenya) pointed out the difficulty in trying to segregate utilization and placement of the funds raised by government through infrastructure bonds. The supervisory authority from Nigeria emphasized that the lack of historical data impedes efforts to evaluate the potential impact of the risks associated with infrastructure investments, which hinders proactive regulation.

Challenges also relate to efforts to strengthen corporate governance (Mexico), including the establishment of good due diligence procedures that involve the assessment of the risks faced by pension funds when they invest in infrastructure-related vehicles (Colombia). According to another supervisor (Peru), the challenges in supervision are found in all non-traditional investment instruments, which may include structures that are less transparent so that fund managers are required to perform adequate due diligence, verify that the valuation policies are governed by best practices, perform an adequate ongoing due diligence (evaluation of investments in underlying assets, and develop metrics that enable the performance of the alternative fund to be properly evaluated).

A few supervisors also identified challenges related to monitoring of investment processes (Colombia and Liechtenstein), including the post-investment phase (China).

The wide variety of types of infrastructure projects, including investments in so-called "green" assets used for infrastructure investments was cited as another challenge (Nigeria). Such a wide divergence of infrastructure projects complicates the task for regulators to develop all-encompassing laws on these investments.

Another authority (Russia) considered the supervision of fiduciary responsibilities of investment managers to be challenging. This relates to executing the transactions with fixed income securities issued by participants of concession agreements. Owing to the lack of transparency, absence of credit ratings, and lack of comparable projects, unconventional cash-flow patterns and embedded options, it can be difficult to determine the value of investments in concession projects and assess whether the reward is appropriate for the given level of risks.

5. Good practices and lessons learnt in the supervision of pension funds' infrastructure investments

Eight supervisory authorities proposed measures that may provide avenues towards efficient supervision of infrastructure investments.

In the view of the Australian supervisor (APRA), implementing **a broad principles-based supervisory framework**, backed up with effective knowledge-based supervision, is the preferred approach for supervising infrastructure investments. This approach requires understanding of investment governance and investment management principles, as well as understanding of investment risks related to infrastructure and how these can be managed. Furthermore, each entity needs to be supervised according to its particular risk profile. In a similar vein, other supervisors (i.e., Austria, Colombia, Mexico, Russia, and the Netherlands) stressed the importance of setting up an appropriate **governance framework for pension funds** (credit policies, valuation methodology, investment analysis, due diligence, approval, and investment process documentation, including creating early exit mechanisms if possible). If deemed necessary, this framework could be supported by issuance of supervisory guidance on due diligence, investment requirements, valuation methodology, etc., as well as maintenance of regular communication with dedicated company analysts and organising, if required, thematic on-site inspections. Many supervisors opined that special attention should be devoted to the analysis of competencies of investment managers (e.g., by establishing suitability requirements) and verification of project valuations made by pension funds. According to the Mexican supervisor, given the characteristics of this asset category, infrastructure investments must be proposed and discussed in the core of the governance bodies of pension funds. Such bodies should be composed of technical personnel, as well as independent advisors who are in charge of representing the best interests of pension fund members. For this reason, pension funds should be required to establish independent investment and risk committees and follow-up due diligence when selecting investments. In the view of the supervisory authority of the Netherlands, the more complex the investment type, the higher should be the governance and control standards. For infrastructure investment, the level of complexity, required knowledge, and investment cost are high. That explains why these investments are concentrated in a few (of the larger) pension funds and why infrastructure investment is limited in size (both in terms of the share of total investments and in terms of the share of the fund population investing in it). These characteristics make **supervision of infrastructure investment more an item captured by fund-level supervision than by sector-wide analyses** (and concomitant good practices).

The supervisory authority from China suggests that the risk control mechanism can be further improved by establishing a **risk reserve fund** to finance potential losses stemming from misconduct on the part of project managers.

The Nigerian supervisor cited the need for a **dual reporting process on pension funds' investment portfolios,** whereby both the fund management company and its custodian are required to provide data to the regulator for daily review. This process, which actually can relate to any type of investment, enables the regulator to verify the data and take necessary action on any infraction by the management company.

The Peruvian authority mentioned the merits in requiring authorisation prior to investment in alternative assets (including infrastructure). Such **prior authorization**[40], done on the basis of a

[40] It is worth to note that that in accordance with Art. 19 para 5 of the IORP II directive 2016/2341/EC (EU, 2016) implemented into national law, EU Member States are not allowed to subject the investment decisions

scoring rule, enables the performance of analysis as to whether a pension fund and its governing bodies and investment plans are suitable. In this context, the Peruvian supervisor requests periodic information from the pension funds regarding the details of costs and expenses, as well as the underlying investments behind the vehicles. This allows analysis of the geographical concentration or concentration by sector, the performance of the fund, and the ratio of the invested capital versus committed capital (infrastructure funds). is the authority also deems it useful **to hold regular meetings between the supervisor and the pension fund managers,** as regards the management of the investments and risks of the global portfolio.

Five jurisdictions (Colombia, China, Mexico, Peru, and Zimbabwe) shared their experiences in regard to the lessons learnt in supervision of infrastructure investments.

In Colombia, for instance, a supervisor observed that **good practices on due diligence** in alternative investments will contribute to better investment decisions by pension funds. However, pension funds still need to understand whether the underlying asset is compliant with their investment policies.

In China, the supervisor resolved the problem of multi-layered investment products by adopting **a look-through approach,** which has contributed to better supervision of such investments.

In Mexico, managing pension fund administrators (AFOREs) have improved their investment and risk management processes, including those related to infrastructure. This improvement is linked to the growth and development of the Mexican financial market and the wider offer of infrastructure instruments. Nonetheless, there continues to exist a disparity between funds' investment and management teams in terms of their levels of expertise. This disparity has even led the least developed AFOREs to be influenced by the investment decisions made by more experienced pension funds[41]. Consequently, one of the main lessons learnt is that the improvement of regulation and supervision results from a continuous effort with **a focus on corporate governance as well as the professionalisation** of the investment and risk management teams, so that the decision-making process and prudential policies become more sophisticated and have higher performance.

The Peruvian experience shows that the political and economic environments are of crucial importance in a sector such as infrastructure. These environments may generate a scarcity of viable investment opportunities or make the existing investments unprofitable for the assumed level of risk. In this sense, in the case of non-traditional investments in infrastructure, **pension funds need to verify the pipeline of projects prior to the investment and monitor their performance,** which in cases of lower-than-agreed returns enables pension funds to negotiate the suspension or reduction of the management fees charged by the manager of alternative funds (including infrastructure funds). In this context, the supervisor has been working to develop a standard project that will align interests of the pension fund and the fund manager of the alternative assets. Likewise, it is important to conduct an exhaustive due diligence of infrastructure funds, which includes an adequate review of the underlying contracts in order to have negotiation tools in the event the infrastructure fund experiences adverse scenarios. Subsequently, the ongoing due diligence plays a relevant role in following up the details of the investment, performance indicators, cost analysis,

of an institution located in their territory or its investment manager to any kind of prior approval or systematic notification requirements.

[41] Such conjecture can be incurred from the development of the market. For example, the group of AFOREs which were investing mainly in bonds, now have diversified their portfolios with more risky strategies, alike the more experienced AFOREs.

expenses and fees, and staff turnover (including the key personnel). For these purposes, the supervisor requests information and reports regarding its monitoring actions.

The supervisor from Zimbabwe stressed the importance of establishing detailed record-keeping of infrastructure investments by sector so as to understand the extent to which the pension industry is invested in them. At present, most pension funds in Zimbabwe are heavily invested in real estate infrastructure (mostly industrial, commercial and residential properties), which is outside of the scope of this report.

IV. Conclusions

This paper summarises the surveyed responses from 33 supervisory authorities, IOPS Members, on their approaches to and challenges perceived in relation to supervision of infrastructure investments by pension funds. The responses indicate that most jurisdictions do not have a specific definition of infrastructure in their legislation or supervisory practice. Accordingly, infrastructure is not specified as a separate asset class in most jurisdictions. There are various reasons for this outcome, including the simple observation that such investments by pension funds are non-existent or very minor in most of the surveyed jurisdictions and consequently are not subject to (sufficient) supervisory data reporting.

Survey responses indicate that the most common infrastructure instruments allowed for investment by pension funds are debt securities and equity of concessionaires. In many jurisdictions, pension funds can also allocate a portion of their assets to infrastructure investment funds or private equity funds.

In all responding jurisdictions, investment in infrastructure by pension funds is allowed in some form. In some cases (11 jurisdictions), investment can only be made indirectly, while a majority (23 jurisdictions) allow both direct and indirect investments. In most jurisdictions, infrastructure investments by pension funds are subject to general investment limits (such as asset classes, concentration limits, or credit ratings) or to prudent person rules. Only five jurisdictions have legislation that prescribes explicit infrastructure-specific quantitative investment limits. In another four respondent jurisdictions, pension funds can invest in infrastructure without any limits, as long as they meet prudent investment requirements. Four surveyed jurisdictions allow foreign infrastructure investment without any limits, subject to prudent person rules, while some quantitative restrictions apply in 24 jurisdictions.

Several jurisdictions provide legal structures to facilitate infrastructure investments, such as Public-Private Partnerships (14 jurisdictions) and Special Purposes Vehicles (13), whereas five jurisdictions apply credit enhancements to promote such investments. In addition, the survey identified measures in some jurisdictions aimed at creating new structured instruments (CKDs, CERPIs, FIBRAs in Mexico) and/or special categories of domestic private equity funds (Colombia) focused on infrastructure projects to allow pension funds to participate in infrastructure investments.

The report found that many governments have introduced changes to make the investment framework more flexible, and to broaden and/or facilitate investment opportunities in infrastructure for pension funds domestically and in some cases also abroad. In a few jurisdictions, infrastructure was established as a separate asset class. Still, some impediments exist, such as the lack or scarcity of quality infrastructure projects that may qualify as suitable investments for pension funds, obstacles created by some aspects of existing investment regulations, and a lack of expertise on the part of pension funds to invest in or assess infrastructure projects.

Some general trends towards alternative assets, including infrastructure, are being observed. In the current context of low economic growth and low interest rates, pension funds are searching for higher yields, better asset-liability matching, and diversification, factors that should favour infrastructure investments. However, in most jurisdictions surveyed, pension funds' investments in infrastructure remain quite low, well below 1-5% of total assets. Only in a limited number of jurisdictions do exposures exceed 5%. Pension funds in the respondent jurisdictions predominately invest indirectly in domestic infrastructure. Market risk (e.g., potential loss of long-term asset value, unsecure yield challenges, and infrastructure cash flow volatility, among others), valuation questions for projects, liquidity constraints, and counterparty risks are perceived by supervisors as the main risks faced by pension funds when investing in infrastructure.

A large number of respondent supervisory authorities reported difficulties in providing statistical data with respect to infrastructure investments, both in terms of asset allocation and performance, and investment by sector and geographical areas. This lack of data may have an adverse impact on supervision[42]. Lack of available data is also a challenge for pension funds, impacting their ability to undertake investment analysis and reducing their willingness to invest in this asset class. It also hampers the ability of supervisors to support industry efforts on a significant scale.

Investment in infrastructure tends to be complex, requires skills and resources, and also interaction with numerous stakeholders. Therefore, managing operational risk (including legal risk, counterparty risk, and political risk) is crucial and calls for proper design of the contract between the pension fund and managers of the infrastructure funds.

All respondent authorities indicated that they do not have any special approach for the supervision of infrastructure investments. Possible reasons for this include: the fact that the large majority of respondent supervisors are using the prudent person or risk-based supervisory approach (universal to any types of assets), the small scale of such infrastructure investments, and the fact that infrastructure is not separately mentioned in the law. This finding is in line with previous IOPS research (IOPS, 2017) on supervision of non-traditional investments by pension funds.

In general, infrastructure investments by pension funds fall within the established legal and regulatory frameworks covering investment governance and investment management; hence, supervisory oversight is conducted at the level of global portfolio management. The supervisory monitoring and surveillance activity focuses on compliance with legislative and regulatory requirements, which includes among others a review of due diligence, eligibility of investments, investment strategies, process of investment decision making, asset allocation models and risk analysis, outsourcing of investment and risk management. Regular investment reporting submitted by pension funds to supervisors, supervisory analysis of these reports, organisation of meetings with pension funds' management, and on-site visits focusing on investment management and reporting were listed among the main supervisory approaches to oversee investment risks, including those arising from infrastructure investment. Risk-based supervision present in certain jurisdictions implies that pension funds investing in infrastructure need to follow the approach applicable to any asset class or instrument. The most common challenges encountered in supervising infrastructure investment by pension funds relate to skills and communication, data, corporate governance and due diligence issues.

Notwithstanding this general supervisory approach in relation to investment, the survey finds that pension supervisors are paying increasingly more and more attention to alternative investments, including infrastructure. Based upon the facts and views expressed above, the following conclusions can be provided:

[42] Interestingly enough, only three jurisdictions explicitly mentioned data scarcity as a supervisory challenge.

Both investment analysis and supervision of infrastructure investments by pension funds could be improved if jurisdictions arrived at a common, internationally recognised definition and classification of infrastructure (or financial instruments for such long-term investment) and developed a common methodology that would enable collection of more granular investment data (allocations, performance). Availability of such data would also facilitate investments in infrastructure and other alternative assets by pension funds.

An individual supervisory approach dedicated to infrastructure seems to be neither feasible nor desirable, based upon the observations from the survey. That said, supervisors should be mindful of the better practices identified in this report that could contribute to better supervision of infrastructure investments by pension funds. These good practices include:

a) strengthening governance of pension funds in order to promote effective investment risk management, with a focus on fund-level supervision rather than on the sector-wide monitoring, including an exhaustive due diligence of infrastructure investments and related contracts.

   As the ultimate responsibility for any type of investment rests with the board (or trustees) of a pension fund, it is extremely important to have the relevant knowledge for this relatively new type of infrastructure investments among the skillset of the board (or the trustees): This can be achieved either by an ongoing education of board members or by hiring dedicated specialists. New products require obtaining new knowledge.

b) issuing supervisory guidelines on supervisory expectations or requirements that relate to crucial issues in investment (e.g., valuation, due diligence, and contractual risks)

c) requiring, where relevant, risk buffers to give proper incentives to managers and, if deemed by necessary by a supervisor, to smooth investment returns

d) using market participants for creating checks and balance mechanisms (e.g., dual reporting by pension fund and custodians)

e) applying a look-through approach (subject to development of an appropriately granular database); such an approach would enable pension supervisors to better understand the risks resulting from the investment (multi-layered products) and outsourcing at the entity level as well as the exposure to infrastructure-related risks at the level of the pension sector.

Supervisory guidance could be further supported by encouragement of adoption of self-regulation mechanisms by the private pension industry. These could include adoption of high governance and due diligence standards by managers and trustees for infrastructure and other unlisted asset classes, use of professionals to perform regular investment monitoring functions, thereby exerting pressure for PEFs managers and administrators to adhere to high standards.

Finally, bearing in mind the growing need to close the infrastructure gap, supervisors should make sure that the decisions of pension funds to invest in infrastructure are taken purely on an economic basis, i.e., without sacrificing risk-adjusted returns in order to achieve the ultimate goal of securing the best interest of their members and beneficiaries.

Related bibliography

Javier Alonson, Alfonso Arellano, David Tuesta (2015), Pension Fund Investment in Infrastructure and Global Financial Regulation, Pension Research Council Working Paper No. 2015-22, August 2015, https://pensionresearchcouncil.wharton.upenn.edu/wp-content/uploads/2017/01/WP2015-22-Alonso-et-al..pdf

Alexander Andonov, Roman Kräussl, Joshua Rauh (2018), The subsidy to infrastructure as an asset class, NBER Working Paper No. 25045, September, https://www.nber.org/papers/w25045

Deutsche Bank Asset Management (2017), Why Invest in Infrastructure?, https://institutional.dws.com/content/_media/Deutsche_AM_Why_Invest_in_Infrastructure_May_2017.pdf

EU (2016), Directive (EU) 2016/2341 of the European Parliament and of the Council of 14 December 2016 on the activities and supervision of institutions for occupational retirement provision (IORPs), European Union, http://data.europa.eu/eli/dir/2016/2341/oj

FIAP, Pension Notes, No. 32, Pension fund investment in alternative assets: Chile and Mexico, December 2018, https://www.fiapinternacional.org/wp-content/uploads/2016/01/Pension-Note-No-32_Pension-Fund-Investment-in-alternative-assets_Dec.-2018-1.pdf

Georg Inderst (2009), Pension Fund Investment in Infrastructure, OECD Working Papers on Insurance and Private Pensions, No. 32 OECD, http://www.oecd.org/pensions/private-pensions/42052208.pdf

IOPS (2017), Supervision of Pension Investment Management Including Non-traditional Investment, IOPS Working Papers on Effective Pensions Supervision, No.29, IOPS, http://www.iopsweb.org/WP_29_Supervision-Pension-Investment-Management.pdf

ISSA (2019), Infrastructure investment: Challenges and opportunities for social security reserve funds, https://ww1.issa.int/infrastructure

PWC, Global Pension Funds, Best practices in the pension funds investment process, www.pwc.lu

OECD (2020) OECD Annual Survey of Investment Regulation of Pension Funds and Other Pension Providers, https://www.oecd.org/daf/fin/private-pensions/2020-Survey-Investment-Regulation-Pension-Funds-and-Other-Pension-Providers.pdf

OECD (2019) OECD Annual Survey of Investment Regulation of Pension Funds, https://www.oecd.org/daf/fin/private-pensions/2019-Survey-Investment-Regulation-Pension-Funds.pdf

OECD (2018), OECD Survey of Investment Regulation of Pension Funds, OECD, http://www.oecd.org/daf/fin/private-pensions/2018-Survey-Investment-Regulation-Pension-Funds.pdf

OECD (2016), OECD Core Principles of Private Pension Regulation, OECD, https://www.oecd.org/daf/fin/private-pensions/Core-Principles-Private-Pension-Regulation.pdf

OECD (2015). Infrastructure Financing Instruments and Incentives, https://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf

OECD/IOPS (2011). OECD/IOPS Good Practices on Pension Funds' Use of Alternative Instruments and Derivatives, http://www.iopsweb.org/Good_Practices_Alternative_Investments.pdf

OECD/IOPS (2011). OECD/IOPS Good Practices for Pension Funds' Risk Management Systems, http://www.iopsweb.org/principlesguidelines/46864307.pdf

OECD Annual Surveys of Large Pension Funds and Public Pension Reserve Funds (various dates), https://www.oecd.org/daf/fin/private-pensions/survey-large-pension-funds.htm