

Infrastructure Financing Instruments and Incentives

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Foreword

This taxonomy of instruments and incentives for infrastructure financing maps out the investment options available to private investors, and which instruments and incentives are available to attract private sector investment in infrastructure. The coverage of instruments is comprehensive in nature, spanning all forms of debt and equity and risk mitigation tools deployed by governments and agents. While the taxonomy is meant to capture all forms of private infrastructure finance techniques, a focus of this work is to identify new and innovative financing instruments and risk mitigation techniques used to finance infrastructure assets.

Part I of this report provides the foundation for the identification of effective financing approaches, instruments, and vehicles that could broaden the financing options available for infrastructure projects and increase as well as diversify the investor base, potentially lowering the cost of funding and increasing the availability of financing in infrastructure sectors or regions where investment gaps might exist.

Part II identifies the range of incentives and risk mitigation tools, both public and private, that can foster the mobilisation of financing for infrastructure, particularly those related to mitigating commercial risks.

This report benefited from comments from the G20 Investment and Infrastructure Working Group, from the G20/OECD Task Force on Institutional Investors and Long-term Financing, from the following OECD bodies: the Committee on Financial Markets, the Insurance and Private Pension Committee and the Working Party of Private Pensions, and from the following private sector institutions (amongst others unnamed): the Long-term Investors Association and the Club of Long-term Investors. The report was submitted to the G20 IIWG meeting in Berlin on 20-21 August 2015, and then transmitted to the September 2015 meeting of the G20 Finance Ministers and Central Bank Governors.

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Introduction¹

Traditionally, infrastructure investments have been financed with public funds. Governments were the main actor in this field, given the inherent public good nature of infrastructure and the positive externalities often generated by such facilities. However, public deficits, increased public debt to GDP ratios and, at times, the inability of the public sector to deliver efficient investment spending, have in many economies led to a reduction in the level of public funds allocated to infrastructure.

Budgetary pressures have been compounded in some cases by the need to repair bank balance sheets and rebuild capital and liquidity buffers, owing in part to strengthened prudential regulation in the banking sector. As a consequence, it is increasingly acknowledged that alternative sources of financing are needed to support infrastructure development. In this context, much attention is being focused on the institutional investor sector, given the long-term nature of the liabilities for many types of institutional investors and their corresponding need for suitable long-term assets. For various reasons, including a lack of familiarity with infrastructure investments, institutional investors at present allocate a very small fraction of their investments to infrastructure assets. These investors have traditionally invested in infrastructure through listed companies and fixed income instruments.

Infrastructure can be financed using different capital channels and involve different financial structures and instruments. Some, like listed stocks and bonds, are market-based instruments with well-established regulatory frameworks. Banks have traditionally been providers of infrastructure loans. Efforts are underway to develop new financial instruments and techniques for infrastructure finance². These efforts appear to be having some success. Data indicate, for example, that developments in the equity market for investments in infrastructure are promising and that the creation of a liquid market for project bonds can be a good complement to syndicated loans for project finance. Done properly, the securitisation of bank loans could help support lending and diversify risks, while also assisting in the development of transparent capital market instruments.

Many investors nonetheless perceive a lack of appropriate financing structures. Only the largest investors have the capacity to invest directly in infrastructure projects. Smaller pension funds in particular require pooled investment vehicles. Collective investment vehicles have been available, such as infrastructure funds, but problems with high fees, potential mismatches between asset life and fund vehicle, and extensive leverage mean

¹ See Annex A. for a list of reports and OECD publications that were consulted for this project. In particular, the authors would like to acknowledge the contributions drawn from Veronica Vecchi, Mark Hellowell, and Stefano Gatti in “Government Policies to Mitigate the Risks of Infrastructure Projects: A Framework for Classification And Analysis”, Part II of this report.

² IOSCO (2014), Market-Based Long-Term Financing Solutions for SMEs and Infrastructure, Report to G20 Finance Ministers and Central Bank Governors.

that these investment options may not be suitable for all investors. Yet the market is evolving to address some of the concerns. Several newer unlisted equity funds in the market are offering longer investment terms.

Infrastructure financing can present particular challenges owing to the nature of infrastructure assets. The following are some common characteristics of infrastructure assets that differentiate them from other assets:

1. **Capital intensity and longevity:** Capital intensity, high up-front costs, lack of liquidity and a long asset life generate substantial financing requirements and a need for dedicated resources on the part of investors to understand the risks involved and to manage them. Infrastructure projects may not generate positive cash flows in the early phases, which may be characterised by high risks and costs due to pre-development and construction; yet they tend to produce stable cash flows once the infrastructure facility moves into the operational phase. Some infrastructure assets, where users do not pay for services, do not generate cash flows at all, requiring government intervention in order to create investment value.
2. **Economies of scale and externalities:** Infrastructure often comprises natural monopolies such as highways or water supply which exhibit increasing returns to scale and can generate social benefits. While the direct payoffs to an owner of an infrastructure project may be inadequate for costs to be covered, the indirect externalities can still be beneficial for the economy as a whole. Such social benefits are fundamentally difficult to measure. Even if they can be measured, charging for them may not be feasible or desirable.
3. **Heterogeneity, complexity and presence of a large number of parties.** Infrastructure facilities tend to be heterogeneous and unique in their nature, with complex legal arrangements structured to ensure proper distribution of payoffs and risk-sharing to align the incentives of all parties. The uniqueness of infrastructure projects in terms of the services they provide and their structure and potential complexity makes infrastructure investments less liquid.
4. **Opaqueness:** Infrastructure projects tend to lack transparency due to opaque and diverse structures. This also applies to Public Private Partnerships (PPP) models. The information required by investors to assess these risk-structures and the infrastructure market in general is lacking or highly scattered, creating uncertainty. The lack of a clear benchmark for measuring investment performance is also seen by many investors as one of the main barriers to infrastructure investment. The lack of transparency and adequate data increase risks for those engaging in infrastructure financing.

The potentially large information asymmetries that may exist in infrastructure, along with the long-term nature of infrastructure investment, may lead parties to deviate ex post from ex ante decisions, a risk which among others may impede private financing.

To attract institutional investors to the full spectrum of infrastructure assets, such assets need to be structured as attractive investment opportunities, providing risk-return profiles that match investors' return expectations and liability structures. Some projects are clearly and unequivocally commercially viable and these projects are typically able to attract private sector finance. However, for other projects where the rate of return may be insufficient to compensate private sector investors for the level and/or character of risk, various risk mitigation techniques and incentives may be employed to manage risks

and/or enhance returns. Any government intervention to these ends may, however, generate unintended consequences, such as moral hazard and market distortions, which should be addressed ex ante in policy design to the extent possible. Generally, the expected benefits of providing risk mitigants should be balanced against their costs, and their provision should serve to supplement market-based approaches to infrastructure finance.

This report³ provides a structured framework for understanding the range of instruments and vehicles for infrastructure finance along with risk mitigation measures and incentives that may be used to support such financing. By providing a structured overview and description of instruments and incentives for infrastructure finance, it can serve as a starting point for further discussion and analysis of infrastructure financing and related challenges, including the development of analysis on the advantages and disadvantages of these instruments and incentives and guidance on the various options for their use.⁴

Background of the taxonomy

In 2013, G20 Finance Ministers and Central Banks Governors launched a project on “The Analysis of Government and Market-Based Instruments and Incentives to Stimulate Long-Term Investment Finance”⁵. The project focuses on:

Part I: Access to finance – broadening the financing options

- Mapping the full range of financial instruments available to facilitate investment in infrastructure, at different stages of the project life cycle and across the entire risk-return spectrum, focusing on new forms of equity and debt investment.
- Improving the understanding about opportunities and challenges of financing instruments alternative to traditional debt, in different economic and regulatory environments, and in light of on-going financial reforms.

³ This taxonomy forms part of the programme of work of the OECD’s Committee on Financial Markets and Insurance and Private Pensions Committee and was developed by the G20/OECD Task Force on Institutional Investors and Long-term Financing. It has benefited from feedback provided by Committee delegates and Task Force members but does not necessarily reflect their official views.

⁴ Further OECD work is planned on instruments and incentives for infrastructure finance as part of OECD efforts to identify opportunities to leverage private sector capital for infrastructure investment within sound prudential frameworks. For further information on OECD work on long-term investment, see: www.oecd.org/finance/lti.

⁵ At their meeting in Moscow on 15-16 February 2013, G20 ministers welcomed diagnostic reports by international organisations assessing factors affecting long-term investment financing. At that time several international organisations were given mandates and the OECD was asked to (see February Communique):

- Develop G20/OECD High Level Principles on Long-term Investment Financing by Institutional Investors, subsequently endorsed by G20 Leaders in September 2013;
- Conduct an annual survey of Large Pension Funds and Public Pension Reserve Funds, circulated in October 2013;
- Prepare an analysis of different government and market based instruments and incentives used for stimulating the financing of long-term investment.

Part II: Addressing the risks: policy actions to mitigate risks and secure project bankability

- Mapping the risk mitigation mechanisms the public sector can use to encourage private sector financing of infrastructure, in particular targeting institutional investors (for example guarantees, grants, fiscal incentives, etc.). These actions may be aimed at fostering a more accommodating investment environment and/or at mitigating project-specific risks to increase bankability.
- Better understanding of market instruments and public support capable of aligning the risk profile of infrastructure assets with the risk tolerance of those involved in financing infrastructure.

To date, several reports have been circulated to G20 Finance Ministers and Central Bank Governors in support of this project⁶. This, taxonomy of infrastructure financing instruments and incentives, builds on this earlier work as well as relevant work of other IOs and presents a comprehensive overview of infrastructure financing options, risk mitigants and incentives that may serve to enhance financing.

Objectives of the taxonomy

The taxonomy provides the foundation for the identification of effective financing approaches, instruments, and vehicles that could broaden the financing options available for infrastructure projects and increase as well as diversify the investor base, potentially lowering the cost of funding and increasing the availability of financing in infrastructure sectors or regions where investment gaps might exist. The taxonomy also identifies the range of incentives and risk mitigation tools, both public and private, that can foster the mobilisation of financing for infrastructure, particularly those related to mitigating commercial risks.

More specific objectives include:

1. Promote a common understanding of infrastructure financing and related risks

Infrastructure investments are heterogeneous. By presenting available financing options and emerging practices (including capital markets which may support long-term infrastructure investment), the taxonomy will help bring greater clarity to the asset allocation framework for institutional investors. It will also bring clarity to policymakers and regulators trying to identify appropriate support mechanisms to foster investment where such measures are deemed necessary.

2. Reduce uncertainty – address risk perception

Investments in infrastructure require that investors understand the risk and expected performance of the investments before deploying capital, and over the lifecycle of expected economic environments. The taxonomy, by increasing transparency of available

⁶ Three OECD papers have been circulated, namely: Pooling of Institutional Investors Capital – Selected Case Studies in Unlisted Equity Infrastructure (2014), Private Financing and Government Support to Promote Long-term Investments in Infrastructure (2014), Mapping Channels to Mobilise Institutional Investment in Sustainable Energy (2015b), Green Finance and Investment, OECD Publishing, Paris.

financing methods, may enhance investor understanding of the range of potential investments and associated risks, allowing them to better allocate capital to the investments most suitable to them. The lack of information on financing options and risks may reduce investor readiness to engage and result in higher than necessary risk premiums to compensate for this uncertainty or the result may be an avoidance of this investment.

3. Identify the scope for enhanced infrastructure financing approaches and methods, including the development of infrastructure as an “asset class”

Infrastructure investments are complex and require proper understanding and analysis. Although infrastructure is often considered as one of the alternative investment options to traditional debt and equity, it has characteristics in common with debt, equity, structured vehicles, and direct/indirect ownership. By identifying financing channels for infrastructure investment in a structured manner, the taxonomy may help promote the development of new financing approaches and methods.

4. Optimise the role of governments, MDBs and NDBs

The taxonomy will help to optimise the role of governments, MDB and NDB in long-term investment financing, allowing the targeting of instruments covering different risk categories to investors with different risk appetites, matching the demand for and supply of long-term capital, and offering a set of options to governments of policy initiatives to attract investors to infrastructure investments.

By developing a framework for categorising the risks related to infrastructure projects, the taxonomy will also identify where gaps between the supply and demand for risk mitigation continue to impede investment.

5. Enable more fine-tuned financial regulatory framework

Regulators need to have a better understanding of the investment channels for infrastructure investment and related risks in order to calibrate the risk-based regulatory frameworks adequately to the risks of such investments. The taxonomy should help in this regard by creating an agreed framework to better understand the wider financing landscape for infrastructure.

6. Provide a framework for addressing data gaps in infrastructure financing

The existence of data gaps in infrastructure markets is well recognised. The taxonomy may help in structuring analysis of infrastructure financing and thus support the development of relevant statistics and indicators for infrastructure financing.

Part I

Financing instruments and channels

Corporate finance is the dominant channel in private infrastructure finance. For instance, private investment in regulated entities such as utilities has a relatively long track record, most often on the balance sheets of these companies. The same is true for developers in other sectors, such as waste, ports, oil and gas, and also traditionally in electricity generation. Companies listed on public exchanges are sizeable owners of infrastructure assets, providers of infrastructure services and investors in infrastructure projects. They range from specialist businesses to diversified conglomerates.

More recently, as a result of increased budgetary constraints, the financing of infrastructure has increasingly taken the form of project finance⁷. This technique has later emerged to be the financial solution for infrastructure involving public entities in the role of either regulator or counterparty. Project finance has been an increasingly popular technique to attract private capital, most notably investment in projects characterised by high specificity, low re-deployable value and high intensity of capital.

Recent market trends have seen the development of co-investment platforms to leverage institutional investors' capital in project finance. The main driver for the creation of these mechanisms has been the recognition that not all investors have the resources and expertise necessary to make direct infrastructure investments, but that some have built significant scale and market presence, along with the expertise to perform due diligence on infrastructure assets. These co-investment platforms pool investor capital to deploy directly in infrastructure projects, bypassing intermediaries such as investment managers or banks. This trend is reinforced by large funds looking to reduce the cost of infrastructure investment, and to align internal governance and portfolio management models with direct infrastructure investments.

Not all investors access the same investment routes. For example, the lack of liquidity in some infrastructure instruments implies that the universe of possible interested investors is only a subset of the more general group of investors in debt and equity markets. In the case of listed equity and market-traded debt, investors can build exposure through allocations to traditional investment in stocks and bonds. Given the higher liquidity of such investments, mutual funds and exchange-traded funds (ETFs) have included these instruments in the portfolios of retail investors, high net worth individuals and institutional investors. Unlisted equity or private debt, however, do not benefit from an active liquid secondary market. For this reason, they are typical "buy and hold" asset

⁷ Project finance is the financing of long-term infrastructure, industrial, extractive, environmental and other projects / public services (including social, sports and entertainment PPPs) based upon a limited recourse financial structure where project debt and equity used to finance the project are paid back from the cash flow generated by the project (typically, a special purpose entity (SPE) or vehicle (SPV)).

classes, suited to long-term investors with a clear preference for long-dated cash flows and diversification benefits.

Different competencies are required to assess the risk and return of infrastructure investments. Direct investment requires significant expertise and resources on the part of the investor. An investor in unlisted infrastructure must be able to assess the risk/return profile of the investment throughout its economic life including its construction phase (greenfield investments) and during the operational phase (brownfield investments). This ability is even more important if the investment is made directly in the equity of the project or if the investor lends directly to the project. However, the need for additional, more sophisticated valuation skills also remains in the case of the indirect investment in unlisted infrastructure (i.e. private equity infrastructure funds or debt/credit funds). In fact, the risk analysis process is carried out by the asset management company/general partner on behalf of the investors with specialised capabilities in the field.

There is a wide range of financing channels for infrastructure investment, both direct and market-based – each with its own set of characteristics and implications for lending or investment portfolios. Capital markets can be an efficient way to allocate risks to those investors that are most willing to bear them at an agreeable rate of compensation – the taxonomy serves to clarify the role of market-based financing for infrastructure across the spectrum of investors and instruments.

Financial instruments of the taxonomy

The taxonomy sorts the instruments based on several dimensions (see Table 1). The left hand margin describes modes of investment, recognizing that there are broad asset categories (fixed income, mixed, equity), followed by principal instruments. Besides the fact that investors can be either creditors or equity-holders, some investments, particularly PPP contracts and concessions, may have debt-like characteristics due to contracted cash flows. Categories are defined by their nature (creditors, equity-holders, or creditors with equity options and participation rights), with the distinction drawn from whether an investor receives priority claims in corporate or project cash flows (creditor), or residual claims to cash flows (equity).

Further along the top of Table 1 are the finance instruments followed by market channels. There are essentially two ways to finance infrastructure through private investment: stand-alone infrastructure projects, or through corporate balance sheet finance and other balance sheet-based structures. Each financing instrument will be described further in a later section, drawing attention to how investors might access instruments through market vehicles (such as through capital pools), and also on the enabling investment environment and factors that open channels of investment.

From an investor's perspective, the instruments and pooling mechanisms selected for investment will depend on the nature of the asset (debt, equity, listed or unlisted), regulatory and tax considerations, and on how the investors have defined and allocated infrastructure in their portfolios, based on their asset/liability framework. Other considerations are diversification and level of investor sophistication: small investors with limited resources and small amounts of capital allocated to infrastructure are limited to capital pool channels and corporate investments while large funds may be able to commit capital directly to projects.

The instrument column divides the asset categories into the principal modes – fixed income into bonds and loans, equity into listed and unlisted shares, and hybrids being

combinations of both. These instruments can further define the level of control in an investment, liquidity and the types of contractual claims on cash flows.

Table 1. Taxonomy of instruments and vehicles for infrastructure financing

Modes		Infrastructure Finance Instruments		Market Vehicles
Asset Category	Instrument	Infrastructure Project	Corporate Balance Sheet / Other Entities	Capital Pool
Fixed Income	Bonds	Project Bonds	Corporate Bonds, Green Bonds	Bond Indices, Bond Funds, ETFs
		Municipal, Sub-sovereign bonds		
		Green Bonds, Sukuk	Subordinated Bonds	
	Loans	Direct/Co-Investment lending to Infrastructure project, Syndicated Project Loans	Direct/Co-investment lending to infrastructure corporate	Debt Funds (GPs)
Syndicated Loans, Securitized Loans (ABS), CLOs			Loan Indices, Loan Funds	
Mixed	Hybrid	Subordinated Loans/Bonds, Mezzanine Finance	Subordinated Bonds, Convertible Bonds, Preferred Stock	Mezzanine Debt Funds (GPs), Hybrid Debt Funds
Equity	Listed	YieldCos	Listed infrastructure & utilities stocks, Closed-end Funds, REITs, IITs, MLPs	Listed Infrastructure Equity Funds, Indices, trusts, ETFs
	Unlisted	Direct/Co-Investment in infrastructure project equity, PPP	Direct/Co-Investment in infrastructure corporate equity	Unlisted Infrastructure Funds

Source: OECD analysis drawing on OECD (2015b)

Together, *loans and bonds* form the largest categories of infrastructure finance, mirroring the broader fixed income markets: global debt markets are the deepest capital markets in the world. Debt instruments can be structured to have long-term maturities that extend over the life of long-term assets. Debt financing can be provided through multiple instruments; debt instruments can take the form of direct loans held on the balance sheets of financial institutions or may be structured for resale to investors or distribution in markets, be it private markets (such as private-placement debt) or public markets through registered corporate and government bonds. Furthermore, financiers of infrastructure projects can take advantage of clientele effects⁸ in debt markets: issues can be tailored to fit the demands and preferences of certain investors such as pension funds and insurance

⁸ Certain investors have preferred habitats and may be willing to pay more for certain securities or instruments than others. For instance, pension funds that require instruments to hedge long-dated liabilities are a natural fit for long-dated fixed income instruments. Strong demand from a certain group of investors could affect the price of the asset. Debt instruments can therefore be tailored to the specific demands of certain investors.

companies thereby broadening the appeal of infrastructure finance to a larger potential pool of capital.

Hybrid instruments such as mezzanine finance are debt instruments with equity-like participation, thus forming a bridge between debt and equity instruments.

Equity finance refers to all financial resources that are provided to firms in return for an ownership interest. Investors may sell their shares in the firm/project, if a market exists, or they may get a share of the proceeds if the asset is sold. They are crucial in the financing of infrastructure investments as the providers of risk capital to initiate a project or refinancing. Listed shares are indirect participation rights in corporations, projects and other entities; investors hold minority positions with limited ability to influence management. Unlisted shares often confer direct ownership, control, and operation of the corporate entity or project asset due to concentrated shareholder positions and closer ties to managers.

Equity investors are interested in maximizing total return on equity – in the case of infrastructure, these objectives can be met through maximizing dividend yield since many projects lack a strong growth component. Other investor requirements (private equity) such as exit strategy are an important consideration.

*Infrastructure project finance*⁹

Project finance is distinct from corporate finance in that it represents the financing of a standalone, clearly demarcated economic unit (Weber and Alfen, 2010). Lending arrangements are based solely on the cash flow generation of the project. Risk sharing structures amongst the various project partners (financiers, managers, public sector) are allocated based on their varying abilities to manage and control risks (ibid). Liability is limited to the contributed equity capital, and lenders often have limited recourse to project sponsors.

Principal amongst the finance channels are project bonds and sub-sovereign issues in bond markets, loans and direct lending in non-public markets, listed entities such as yieldcos in public equity markets, and direct/co-investments in project equity. The use of Public Private Partnerships (PPP) contracts is common in project finance; however PPPs have few standardized structures and are often project-specific. PPPs are not the only structures available in project finance, but they have emerged as a major legal structure to define project finance investment.

Project debt finance

Infrastructure projects often have higher levels of leverage than non-infrastructure investments, given less volatile cash flows and the willingness of sponsors of infrastructure projects to accept higher levels of debt (Beeferman and Wain 2012)¹⁰. Debt instruments have historically comprised 70-90% of the total capitalisation of infrastructure projects (see Figure 1). Infrastructure's capital intensive nature, generally low-to-manageable operating risk, and the long-term importance of infrastructure services can help to support higher levels of leverage than similarly rated non-financial corporations (Moody's 2015). There are some examples where debt finances 100% of the

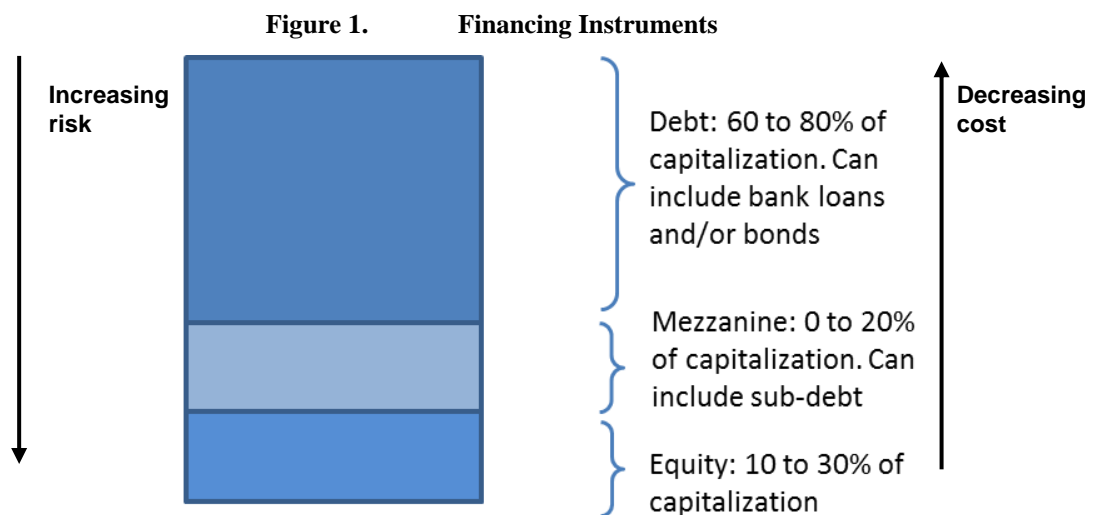
⁹ Refer to Table 1, third column from left

¹⁰ Statement is based on a survey distributed by the authors of U.S. public pension funds on their beliefs on infrastructure investments.

project such as Second Severn and Skye Bridge crossings in the U.K. (Sawant 2010). In these cases the lender operates the asset. Tranching of issues, collateralisation, covenants, and other credit enhancements create a wide variety of instruments with different credit profiles that can meet differing investor preferences.

Most issuance for project finance debts occurs in the local currency in order to minimize currency mismatch between project revenues and financing flows, although hard currency issuance is possible. In regions where currency derivatives are available, cash flows may be hedged, allowing for multi-currency financing structures. For countries with shallow debt markets or emerging capital markets, certain legal frameworks and the enforceability of contracts need to be established, along with other supportive conditions such as sound fiscal and monetary policy frameworks.

Infrastructure debt is usually classed as a fixed-income product for investors and can be broken down into a number of different types. In greenfield projects, there are typically two types of debt financing: project loans (predominant) and project bonds (smaller volumes although increasing), with mezzanine debt or subordinated issues added to provide credit support to lead lenders. For brownfield assets, institutional investors are able to invest in long-term bonds that are linked to the infrastructure company.



Source: Adapted from Weber and Alfen (2010)

Project mezzanine finance

Subordinated debt and mezzanine tranches provide further credit support for the senior notes and can be a crucial keystone in securing the senior debt tranche of a project finance deal. Such issues would absorb credit losses before senior issues, thus having the effect of raising the credit quality of senior tranches. Development banks, commercial banks, or project SPVs can issue subordinated debt as private placements or issues can be floated on the market. Tranching of debt also creates different risk/return profiles for investors. For instance, mezzanine debt offers higher yields and can also include equity participation rights which may be attractive to certain investors like pension funds.

Project equity finance

In project finance, risk sharing and control arrangements are often determined through contracts such as concessions, long-term leases, and PPPs. In most cases, equity investors are exposed to the asset-specific risk, as no security is provided by the investee, thus the investment return is determined by the success of the asset.

Project sponsors initiate projects by initially contributing equity to an SPV, or in the case of PPP structures, act as bidders for projects tendered by the public sector (Weber and Alfen 2010). Project sponsors are closely involved with the management of the asset; financial sponsors contribute equity but are generally not involved in operations. Equity typically constitutes between 10-30% of a project capitalisation; however, during periods of financial stress such as the credit crisis, creditors may request higher levels. From the perspective of equity holders, they prefer to keep the share of equity as low as possible, which limits their liability and increases the return on capital employed (leverage effect).

Equity markets are key for infrastructure assets that seek long-term engaged investment, to sustain innovation, value creation and growth. Equity financing is especially relevant for projects that have a high risk-return profile, such as new, innovative and high growth technologies and projects – it may be more difficult to secure debt financing for projects that have unstable or unpredictable cash flows, or where future growth is a large component of expected return.

Balance sheet finance¹¹

Corporate finance is the traditional form of non-public infrastructure finance. Companies that are in business to build and operate infrastructure issue shares on the market, or borrow funds through capital markets to finance projects. Companies consist of a diversified portfolio of projects with differing performance and operational risks. Retail and institutional investors may purchase shares of infrastructure companies directly, or hire asset managers to select securities for them.

Debt instruments

Bond markets are a potential large source of finance for companies: straight corporate bonds, subordinated bonds, convertible bonds, and preferred stock are all common corporate finance debt instruments. Corporate entities may also borrow from banks through the syndicated loan market, where loans are packaged and sold on the market to investors. Securitisation allows banks to pool individual smaller loans and sell them on the bond market as securities. CLOs are similar to securitisation technologies and further expand potential liquidity for banks by tapping capital markets. Corporate entities may raise equity and debt financing through private market channels through direct or co-direct investment by large institutional investors.

Taxation has been a powerful tool used by governments and regulators to shape capital markets. The treatment of interest payments as a before-tax expense has the effect of lowering the after-tax cost of issuing debt, thus making debt part of an efficient capital structure for infrastructure corporate finance. Low interest rates combined with the benefits of the tax shield has had the effect of lowering the weighted average cost of capital (WACC) for infrastructure projects, enhancing returns to equity holders (Bitsch et al. 2010). In addition to the WACC benefits, increased levels of debt reduce the agency

¹¹ Refer to Table 1, second column from right.

costs of separating ownership by reducing free cash flow available to managers to use at their discretion, the so called “discipline of debt” (Helm and Tindall 2009).

Hybrid instruments

Hybrid instruments by nature possess both debt and equity characteristics. Within corporate finance, convertible bonds, subordinated debt, and preferred stock provide credit support to senior debt instruments due to their loss absorbing capacities, but also offer a higher return potential due to the greater amount of credit or equity risk.

Equity instruments

The main categories of equity finance are public equity (listed) and private equity (unlisted). Whereas public equity concerns companies, funds, or assets that are traded in some form of vehicle listed on a stock exchange, private equity investors provide capital to unlisted companies. Also, while public equity investors are not generally involved in the management of the company (and are for the most part minority shareholders), private equity financiers can be heavily involved with or assist the owners or managers in the development and management of the asset.

Closed-ended funds, MLPs, REITs and IITs are corporate-like entities that invest directly in infrastructure assets. It may seem like they should be listed amongst capital pools; however, such entities issue shares on the market similar to a corporation, and in the case of MLPs and REITs, can issue debt like a corporation to finance investment and growth. REITs are not a major part of infrastructure finance; however, policy changes affecting the rules of what REITs may invest in can have significant effect on available finance channels for certain infrastructure investments.

Market vehicles¹²

Market vehicles enable the pooling of capital for infrastructure finance in a diversified portfolio of securities, loans, or private investments. Public market funds such as mutual funds, index funds, ETFs, and open-ended funds have broad appeal to a diverse set of investors. They offer daily liquidity, are regulated by financial markets authorities, and sometimes, in the case of ETFs and listed open-ended funds, are themselves tradable shares on stock exchanges. Infrastructure securities like bonds and corporate shares may be accessed through such channels by retail investors and institutions, providing a high level of diversification and transparency. Most investors that gain exposure to public infrastructure assets like shares and bonds invest through funds. The formation of indices that track infrastructure shares facilitates product creation, allowing for both passive and active management in listed infrastructure companies. Bond and loan indices generally track broad market issuance¹³ but may include infrastructure related debt that meets index inclusion rules.

¹² Refer to Table 1, last column on right.

¹³ For example, the Barclays Global Aggregate Index tracks the broad universe of global investment grade bonds, including sovereign, mortgage-backed securities, and corporate issues. Bonds issued by corporations that own and operate infrastructure would be included as a sector within the broader corporate bond segment of the index.

General partnerships (GPs)¹⁴ are private markets funds that are a distinct investment channel focused on the institutional investment market. As limited partners (LPs) in such funds, investors gain access to infrastructure investments such as unlisted equity or private debt in a diversified manner. Such funds can be appealing to smaller pension funds or insurance companies that do not have the internal expertise to manage assets directly.

Financing instruments - descriptions

This section will describe the financial instruments through which investors may gain exposure to infrastructure investments. Descriptions will flow from the arrangement in Table 1: a section first on debt, followed by mixed instruments and equity. Each section contains a detailed write-up on each instrument, including a short definition, description, and investment channels and mobilising factors. Write-ups will include instruments where financial markets policy and regulation can have an impact on capital markets formation and facilitation of investment – this will include product creation, capital pools¹⁵, and mobilising factors which describe the market conditions that enable investment in the specific instrument.

Debt instruments: Government, municipal, and other sub-sovereign bonds

Securities in this category include bonds issued by public entities in capital markets in order to finance the construction and operation of an infrastructure asset. Issues are sponsored by federal governments, local governments and sub-sovereign entities such as government agencies and multi-lateral development banks that bear an implicit backing of the sovereign entity.

Government finance has long been a traditional source of funding for infrastructure, recognising the link between the services that infrastructure provides to the public with the financing source. In the framework of the taxonomy, government or municipal bonds, also called “general obligations” (GOs) that are backed by the taxing authority of the issuer, would not be considered as infrastructure finance. The performance of such issues is linked more to the fiscal creditworthiness of the borrower, rather than the infrastructure asset.

Government and municipal “revenue bonds” are project bonds whose payments are directly linked to an infrastructure project, and would fall under the taxonomy as a market-based instrument to finance infrastructure. Revenue bonds, though technically linked to an issuer, would not contribute to public deficits. These bonds are sold directly to investors through the fixed income markets, generally have long-term maturities, pay fixed or floating coupon rates (and are sometimes zero coupon bonds), and are rated by the major rating agencies. The majority of the bonds in this category are listed securities though some issues can be quite illiquid due to small issue size and infrequent trading.

¹⁴ General partnerships are private-equity style vehicles where a fund manager, the “general partner” invests committed capital on behalf of investors, the “limited partners” (LP). The GP is responsible for asset selection, due diligence, and management of the portfolio and collects a fee.

¹⁵ Recognising that there can be overlap with some capital pool investments with specific instruments (i.e. corporate bonds and corporate bond funds), capital pools will be highlighted under financial instruments where they are applicable.

Certain quasi-sovereign issues where the bond proceeds are used to finance infrastructure projects may also be included in this category. For instance, 20% of the sterling market of infrastructure corporate bond issuance was through government-owned entities (e.g. Network Rail) (Western Asset 2012). Such issues will trade with yields close to the sovereign, depending on the level of government support or guarantees. Closer to 50% of Euro-denominated infrastructure corporate bond issuance is through sub-sovereign entities (ibid).

In many countries, sub-sovereign issuance by government controlled entities such as development banks plays a major role in infrastructure finance. MDBs can provide credit support for projects by issuing subordinated or mezzanine debt, or by acting as a lead originator and investor in senior issues.

Government and sub-sovereign bonds are core investments in most institutional and retail investment grade bond portfolios. The long-dated maturities of many issues and high credit quality make them core instruments in liability driven investment (LDI) portfolios. Mutual funds (both active and passive), ETFs, and indices all facilitate investment in core investment grade bonds.

The special tax treatment of municipal debt in the United States has contributed to the growth of this market while keeping borrowing costs low for municipalities and projects. Such issues in the United States have strong demand from household taxable savings, commercial banks, and insurance companies, though some revenue bonds are not tax exempt. AAA rated municipal debt, under normal market conditions, trades at a yield-to-maturity that is lower than US Treasuries, reflecting the after-tax rate of return to investors (Morgan Stanley 2014). This translates to lower financing costs for issuers. There is a well-developed asset management industry that invests in municipal bonds which includes actively managed strategies, index funds, mutual funds, and ETFs. There are reportedly over one million different municipal bonds outstanding (SEC 2012).

Box 1. Qualified Public Infrastructure Bonds (QPIBs)

In the framework of the taxonomy, QPIBs are an innovative development within the public infrastructure bond markets in the United States. In January 2015, the U.S. Government proposed an innovative class of municipal bonds (that benefit from the existing tax exemptions) to spur private investment in infrastructure.

In essence, QPIBs would extend the benefits of municipal bond finance to Public Private Partnerships (PPP), providing supportive financing in transportation, airports, ports, sewer, and water. This in effect opens new channels of financing (namely taxable investors) to PPPs, and can help reduce the cost of financing. To be eligible for QPIBs, projects must be owned by state or local governments and be available for general public use.

Source: White House Factsheet: Increasing Investment in U.S. Roads, Ports, Drinking Water Systems Through Innovative Financing

Debt instruments: Syndicated loans and bank loans

Syndicated loans are originated by commercial or development banks and are either directly sold to investors through syndicated loan markets, or large institutional investors may participate through co-investment arrangements. Loans may be issued through a corporate finance structure or through a project finance entity, and can possess a high level of customisation.

In the banking model of infrastructure finance, banks underwrite loans for infrastructure projects, hold them on their books, and service the loan through maturity. Increasingly, loans are being originated by a lead underwriting bank, or a consortium of banks, and syndicated amongst financial institutions and investors. A club deal refers to a situation where several banks form a syndicate to structure the loan. The lead underwriting bank collects fees for arranging the deal, or fees are shared depending on level of participation in the syndicate (Weber and Alfen 2010). Syndicated loans can be underwritten with the intent to sell portions of the loan in the syndicated bank loan market¹⁶. Syndicated loans may be requested by a project SPV or a corporate entity (traditional balance sheet financing)¹⁷.

Like a mortgage, loans often have prepayment options at little to no cost to the debtor (Blanc-Brude et al. 2014), allowing project companies to potentially refinance at lower rates. Prepayment risk is an undesirable characteristic to investors, particularly those that seek long duration instruments.

Project finance loans can be used during the construction phase of an asset and/or during the operational phase and are more flexible than bonds. Loan repayment terms, coupons, and structure can be adjusted to reflect the requirements of the project over the course of the loan's life. Interest rates can be fixed or floating and are generally based on benchmarks such as LIBOR or EURIBOR. Maturities are usually linked to the life of the project but can range from shorter 7-12 year loans to longer term 20-30 year lending facilities, with the latter usually tied to PPP companies, though bank loan appetite for longer-dated issues is low compared to bonds.

Bank loans have the lowest level of risk on the project finance debt risk scale: they are senior debt instruments and are usually secured to a sufficient extent by collateral. The amount of the loan is related to the liquidation value of the asset and in its ability to generate cash flow to service debt payments. Non-recourse asset-based debts such as loans differ from generic credit risk such as unsecured corporate bonds in that the performance of the asset itself is critical to service the debt, rather than the general ability of a debtor to meet payment obligations. Repayment of the loan is not necessarily tied to the success of the project during the operation phase; but in the event of a default, lenders drive the restructuring process. Since loan syndicates have concentrated creditors as opposed to diffuse bond holders, debt restructuring can be cheaper and quicker (Sawant 2010).

¹⁶ Syndicated loans trade in over-the-counter markets through counterparties such as investment managers and dealers. Loans are not registered securities, thus transactions and settlements do not clear through the major clearinghouses.

¹⁷ Corporations can borrow from banks (loans) or issue debt; some companies have mixed capital structures with both loan and bond tranches. The taxonomy (table 1) lists loans under both corporate and project finance channels.

Investors may find unique risk/return characteristics of loans attractive by way of diversifying existing fixed income exposure, adding yield through senior secured issues, or adding floating rate exposure. In the post-credit crisis period, leveraged loans became a popular credit investment amongst institutions due to the dramatic sell-off and attractive valuations. Liquidity is generally lower for syndicated loans compared to bonds.

Although it is early to predict the impact of Basel III, the need for banks to seek more stable longer term funding to better match long-term lending will potentially impact the way that projects are structured. Thus the most likely outcome would be an increased cost of project loans due to increased capital intensity (Chan and Worth, 2011). In this light, the use of project bonds as a more stable and liquid form of finance versus loans may be an attractive alternative.

The growth in popularity of investment strategies in leveraged loans after the credit crisis has broadened the appeal of this asset category and has increased access. Indices such as the S&P/LSTA Leveraged Loan Index track performance of major corporate issues in the market. Prior to the crisis, CLOs were the largest holders of syndicated loans. CLOs are still the largest holders of leveraged loans; however, pension funds, insurance companies, mutual funds and ETFs have now garnered a larger share of the market. Project loans, though different from corporate bank loans, can be structured to be index-eligible which can improve secondary market liquidity for issues and improve access. The size of the bank loan market, which includes mostly non-infrastructure corporate loans, is around USD 1.5 trillion, of which only about half is considered investible due to issues of liquidity and tradability (BlackRock 2014). Strengthening dealer and syndicate networks can also improve the tradability and liquidity of project loans.

Box 2. Freeport LNG liquefaction project

Freeport LNG closed on USD 12.5 billion in debt and equity financing through 2015, making it the largest non-recourse construction project financing to date. The planned facility will be a major centre for natural gas liquefaction and transportation, located in Freeport, Texas, United States.

For the development of the second liquefaction production facility, a syndicate of 25 commercial banks provided approximately USD 4 billion, over a seven-year construction term. Due to the exceptionally large size of the project, a large syndicate of lenders was necessary in order to secure financing. The loan is structured for issuance to capital market investors.

Debt instruments: Corporate bonds

Corporate bonds are standardised securities that finance the balance sheets of corporations. They can be issued in public markets, or placed privately. Publicly traded infrastructure companies and utilities are the primary issuers of such debt; public bond markets in developed countries are some of the deepest capital markets in the world, providing a relatively reliable source of finance for corporations that are able to access the market.

Compared to loans, bonds usually have longer tenors, allowing borrowers to lock-in long-term financing; most have fixed coupon rates and sometimes inflation-indexed payments. Corporate bonds are bound by bond indentures which describe the contractual obligations of the security. Bonds are usually registered with security markets regulatory authorities (such as the SEC in the U.S.), although private market placements are

possible. Publicly listed bonds require regular financial reporting and offer theoretical benefits of daily liquidity, pricing and higher levels of transparency (Weber Alfen 2010).

Instead of bearing the risks of an individual project, corporate bonds bear the risk of the issuing corporate entity. Thus credit-worthiness is determined by an issuer's general ability to service the debt, making them less risky than project bonds. Corporate capital structures can be complex with many debt issues at varying levels of seniority; issuance of corporate bonds is tied to the general financing strategy of the corporate balance sheet. Credit quality can range from investment grade to below investment grade.

Plain vanilla corporate bonds have broad appeal to institutional (such as pension funds and insurance companies) and retail investors alike. They are core holdings in most investment portfolios and provide an alternative to lower-yielding government bonds.

Corporate bonds that are large enough to be included in the major bond indexes benefit from access to more liquidity. For example, bond index funds that track market performance are committed to purchase new issues, which theoretically helps to reduce the cost of finance for issuers. Investment products such as index funds, actively managed strategies and ETFs provide diversified access to bond markets for institutional and retail investors. Issues are traditionally brought to market by investment banks which act as underwriters. Market prices for such issues are readily available and credit quality of issues is independently observable by many market participants (Western Asset 2012). Most large infrastructure businesses are funded at least in part through the corporate bond market (ibid).

Bonds mostly trade over-the-counter with large investment banks acting as dealers and market makers. A strong banking industry and liquid capital markets are a precondition to well-functioning corporate bond markets. Yet concerns exist amongst market participants regarding liquidity. Shrinking dealer balance sheets due to stricter capital requirements combined with the growth of corporate debt markets makes credit markets more vulnerable to shocks. Under normal conditions corporate bonds trade with relatively tight bid/ask spreads; however, lower liquidity in bond markets could increase volatility. The formation of clearinghouses and exchanges to process the trading of corporate bonds (and other OTC instruments like derivatives) would improve market stability, but limited action has been undertaken to address the problem of liquidity.

Debt instruments: Project bonds

Project bonds are standardised securities that finance individual stand-alone infrastructure projects. They can be issued in public markets, or placed privately. Project bonds are a growing area of project finance and provide a potential solution to finance brownfield projects with long-term debt.

Project bonds are a salient part of this taxonomy: they are an emerging part of infrastructure finance and a growing source of long-term funding for infrastructure projects. Project bonds are issued solely to finance a specific project, whereas straight corporate bonds bear the credit risks of the issuing entity whose projects are diversified across a portfolio of assets. In this sense project bonds are more risky because the risk of loss to credit holders is higher for any one specific project versus a diversified portfolio of projects. Bonds become a more viable option when project volume is large (in excess of USD 100 million), and where longer duration finance is needed (Weber and Alfen 2010).

Project bonds are issued by a project company SPV formed as a distinct legal entity as part of the project finance procurement process and sold to either banks or, more

frequently, to other bond investors. The bond can be a straight bond, whose creditworthiness depends on the cash flow performance of the vehicle, or a secured bond assisted by credit enhancement (CE) mechanisms. In the past few years, at least until the onset of the financial crisis, one of the most used forms of CE was monoline insurance provided by highly rated monoline institutions¹⁸. Project bonds are most often used during the operational phase of an asset – this is the time period after construction risk has ended and the asset begins to generate positive cash flow.

Project bonds differ from loans in that the terms of lending arrangement are bound by a bond indenture, which is a more standardised contract than loan agreements. Features such as covenants are stipulated in the bond indenture. Publicly listed bonds are securities requiring registration with the local regulatory authorities. The theoretical benefits of listing are a higher level of transparency, greater liquidity and pricing (Weber and Alfen 2010). The provision of audited financial statements are usually required by regulatory authorities for publicly issued securities such as bonds – private placements circumvent the more costly regulatory requirements of listing, prospectus preparation, ratings, and placement (*ibid*). Deferred bond structures (also called forward purchase bonds) are also possible.

Supportive conditions in corporate bond markets such as dealer networks, depth and liquidity of the market (particularly in lower credit quality segments) and asset management industries can help to build project bond markets. Supportive PPP policies can also encourage project bond issuance.

Some of the differences in project bonds compared to corporate issues may cause them to be viewed as an alternative investment, or a niche category of fixed income by investors. Compared to syndicated loans, project bonds present some contractual features that make them more attractive to institutional investors rather than banks.

- First, bonds are more standardised capital market instruments and show better liquidity if the issue size is sufficiently large to generate enough floating securities. A higher degree of liquidity can trigger a lower cost of funding vis-à-vis syndicated loans.
- Second, larger issue sizes can become a constituent of bond indices, adding further demand from passive benchmark strategies of bond market investors.
- Third, project bonds can be issued with maturities longer than the tenors of syndicated loans that banks normally accept. Deals with maturities of 50 or even 99 years have been completed (Weber and Alfen 2010, and Sawant 2010).

However, existing evidence on the asset allocation strategies of institutional investors regarding project bonds indicates that some characteristics of this instrument does not make it completely suitable for a traditional asset management approach. Gatti (2014) indicates four factors:

- Investors seem more interested in project bonds only after construction risk has ended (i.e. brownfield investments). Since bonds provide a large lump sum for investment, the project company bears a significant interest cost during the construction phase when funds may not be needed depending on the construction cycle (Weber and Alfen 2010).

¹⁸ A wrapped bond bears the credit rating of the monoline insurer. For instance, an insurer with a AAA rating would confer a AAA rating on a wrapped bond. The use of monoline insurance declined steeply after the GFC.

- Bullet repayments typical of bonds cannot be tailored to the cash flow pattern of infrastructure projects.
- The bullet repayment structure triggers a refinancing risk.
- Investors find it hard to assess the degree of risk of complex infrastructure ventures and rely on the rating issued by external rating agencies. Performing due diligence on project specific risk is more complicated than the credit process undertaken on a corporate issuer. Although not mandatory, ratings are certainly a prerequisite to reach a broader base of bond investors.

Box 3. Project Bond Case Study - South Africa's Touwsrivier Solar Project

The Touwsrivier Solar Project bond is an innovative example of using fixed income capital markets to finance infrastructure projects. South Africa has a developing financial system with a growing base of institutional investors – ZAR 3 trillion in assets under management according to Deloitte. The bond, issued in the local currency with a face value of ZAR 1 billion, was launched to finance the construction of a 44 MWp Concentrated Photovoltaic Plant in an economically impoverished part of the country (such an issue would also qualify as a “green bond”).

The bond, issued with a 15 year maturity and 11% coupon, has an amortizing repayment structure similar to a mortgage – an innovative feature. Mentioned earlier, the bullet structure of typical project bonds can be difficult to adapt to project finance and can create a refinancing risk. This structure effectively deals with this risk. Another feature of this project were incentives through South Africa’s REFIT programme, which allow for national electric utilities to purchase power from renewable sources at predetermined prices through the backing of the South African Department of Energy. This has the effect of raising the credit quality of the issue. The bond was rated Baa2 by Moody’s at issuance.

Source: Deloitte report on Project Bonds: An Alternative Source of Financing Infrastructure Projects. www2.deloitte.com/za/en/pages/finance/articles/project-bonds-an-alternative-to-financing-infrastructure-projects.html

Debt instruments: Green bonds

Green bonds are corporate bonds, project bonds, and sub-sovereign bonds that finance investment in green infrastructure assets such as clean energy.

Green bonds can be originated through development banks, governments, municipalities, corporations, banks (as covered bonds) or by SPVs as project finance and asset backed instruments. They also cut across the major categories already outlined such as loans, project bonds, securitisations, and revenue bonds. Covered bonds are “covered” by both the issuer and the reference portfolio of projects.

Definitions of what characteristics actually confer the label “green bond” are not universally agreed and are only just beginning to be described by well-defined standards. In previous research, the OECD has called for more common standards and issuing principles to help foster the growth of a green bond market with integrity (OECD 2015b). Efforts such as the Climate Bonds Standard (through the Climate Bonds Initiative), and the Green Bond Principles (Capital Markets Association) are making progress in creating standards and formalising issuance protocols for the description of the green bond market (ibid).

From a financial markets perspective, green bonds are not different from other project bonds or debt instruments. The modalities described earlier are essentially the same. However, green bonds are included separately in this taxonomy due to their growing prominence and appeal to investors – and to their potential role in financing clean energy and climate change initiatives. Some green bonds can be classified as infrastructure investments; institutional investor fund governance that employs ESG criteria as part of the investment management process may desire to create a separate mandate for green bonds.

Trends in indices such as the Barclays/MSCI Green Bond Index, launched in 2014, help to raise the profile of green bonds, and provide a benchmark for investment strategies and mutual funds. By stipulating ratings standards and minimum issue sizes, a benchmark can also help in developing liquidity and broadening the investor base.

The green bond market is growing fast, with the issuer base expanding notably beyond sub-sovereign into corporates. In 2013, SolarCity issued USD 54 million in securitised bonds backed by pools of customer contracts on rooftop solar installations. This is an innovative example of both securitisation technology in infrastructure finance, and in green bond issuance. (Box 3. also describes an example of a green bond).

Debt instruments: Sukuk and Sharia compliant finance¹⁹

Sukuk are a class of investments that are structured to comply with Sharia law. They are not true interest-bearing instruments, but are structured in a way to channel rents, changes in capital gains/losses, or income to investors in periodic payments.

Sukuk may be issued by governments, MDBs or private entities such as corporations. There are multiple structures that can include project finance sukuk, asset-backed sukuk, sale/lease-back structures or rent/income pass-throughs. The asset-backed nature of Islamic financial instruments make sukuk well suited to infrastructure assets. Generally the underlying principal of such instruments are a sharing of risk and return amongst the parties in a transaction – cash flows are determined by incomes generated by the asset, and the return to investors is linked to the performance of the asset. In effect, sukuk resemble Public Private Partnerships due to this risk- and return-sharing arrangement.

Growing pools of longer-term capital in Islamic countries have contributed to financial innovations to create sharia compliant finance structures, including sukuk. There is strong demand for income generating investments, particularly from growing retirement savings in provident funds and individual savings accounts – both in institutional and retail channels.

The Islamic Development Bank is a major player in creating a market for sukuk. The IDB along with the ADB have encouraged issuance by providing technical assistance and credit guarantees (Fitch 2015). Several trends including growing government support for Islamic finance, increasing acceptance, and large financing requirements in the Gulf Cooperation Council, Turkey, and Asia, are raising the profile of sukuk (ibid). The G20, under the Turkish presidency, included sukuk for infrastructure finance as an agenda item in recent communiqués.

Despite the strong demand and growing issuance, the market is still in its early days. Liquidity can be low in some issues, especially those that are smaller in size. The overall

¹⁹ The inclusion of sukuk in the debt category may be a misnomer; however, this report includes them due to their debt-like characteristics.

trend however is for greater issuance volumes, a maturation of Sharia interpretation of the various instruments, and also growing appeal from western countries to access savings in Islamic countries. However; in order for this potential to be realised, regulatory, supervisory, and international coordination will be necessary in order to foster stability.

Box 4. Recent developments in the market for sukuk

Some countries outside of the Islamic world are issuing sukuk in order to tap the growing pools of Sharia compliant savings. In 2013, Nigeria and Senegal both issued sukuk to finance large infrastructure investments. Part of the growing trend is due to the cost: due to strong demand, sukuk can be cheaper than issuing straight debt. In 2014, the United Kingdom became the first western government to issue a sovereign sukuk – this particular issue was linked to real estate property. In 2014, the overall size of the global sukuk market stood at over USD 610 billion.

Source: Deloitte report on Project Bonds: An Alternative Source of Financing Infrastructure Projects. <http://www2.deloitte.com/za/en/pages/finance/articles/project-bonds-an-alternative-to-financing-infrastructure-projects.html>

Debt instruments: Securitisation and asset-backed securities

Asset-backed securities are bonds backed by infrastructure loans that are sold to investors directly through the capital markets. Infrastructure loans are pooled together and the issued securities are arranged in tranches, creating different levels of credit and prepayment risk.

Securitisation is a financial technology referring to the bundling of various types of contractual debt (usually loans) for the purpose of pooling and selling them to investors. Typically, a bank removes a pool of loans from its balance sheet which are generally similar by asset type (such as infrastructure loans) and places them in a Special Purpose Vehicle (SPV). The infrastructure loans could be heterogeneous in size, sector, region, credit quality or tenor. The SPV, which is a separate legal entity from the bank, issues notes in order to purchase the pool of loans from the bank. These notes are in turn rated by agencies and placed with capital market investors. Through this process, the bank effectively generates liquidity via third parties. The bank also earns a fee for originating the ABS portfolio. Securitisation also allows banks to transform long-term infrastructure loans into cash, thus increasing lending capacity.

What is probably most noteworthy about securitisation is its ability to transform a pool of illiquid infrastructure loans into tradable securities. Through the structure of the securitisation, this transformation also has other dimensions such as credit quality and tenor. For instance, a typical asset-backed security will have various tranches ranging from senior notes to the equity tranche. The cash flow waterfall which is essentially the payment structure of the deal can vary significantly; however, in general the highest quality senior tranches receive priority in payment of interest and principal and equity tranches are first to absorb losses.

The flexibility of securitisations allows them to access different types of investors. For instance, high quality short-maturity tranches may appeal to short-term bond investors or money markets. Medium and longer term issuers with varying credit qualities offer alternatives to government bonds due to the increased yield.

Securitised debt portfolios can offer risk-diversification advantages to investors, as the returns are based on the fundamentals of the underlying assets. Moreover, securitisation allows investors to access asset classes in which they do not invest directly.

A supportive asset management industry, bond dealer networks, and investment products all help to provide access to securitised assets by institutional and retail investors. Due to prepayment options on loans, ABS present prepayment risks to investors, which is generally an undesirable characteristic. Such risks can be modelled and evaluated by asset managers and investors; transparency of the underlying pool of loans is essential in order to properly price ABS.

Debt instruments: Debt funds

Debt funds gather capital commitments from limited partners that are invested by the general partner (asset manager) in infrastructure debt instruments. They usually invest in private market loans, but may also invest in bonds.

Debt funds and direct lending are described in the taxonomy not because they are different financing instruments, but rather because the capital market channels and sources of financing are different. Through funds and direct lending arrangements, institutional investors can bypass banks and lend directly to infrastructure projects or companies. From a policy and regulatory perspective, this represents an innovation in capital markets and an emerging source of non-bank capital for infrastructure investments.

In the debt fund model, an institutional investor provides funding to a resource pool (the fund) managed by an asset manager that acts, in all senses, as a delegated agent for the investors with full responsibility for the selection/screening process and monitoring of the investments. The manager may participate in bank syndications, club deals, or lend directly to infrastructure projects.

While debt funds can represent an important way to deploy institutional investors' money into infrastructure, the drawback is that - compared to partnerships or securitisations - they are based on fixed and pre-agreed investment criteria, while the other two alternatives have more possibility to adapt the financial structures to their needs. High fee structures may be an issue for some investors as well.

Debt funds have been marketed by General Partner firms as an alternative to traditional debt from banks. Such funds are offered as a way of investing in assets that are relatively high quality but offer a yield higher than government and straight corporate bonds. Given that the typical debt-to-equity leverage ratios for infrastructure projects are on the order of 75:25 or 90:10, there is considerable opportunity for investors to invest in senior debt over equity.

There exist several different vehicles with most focusing on loans and some bonds. Funds can target higher quality senior secured issues, or lower quality subordinated debt that offers a higher yield. Such funds are available nearly exclusively to institutional investors such as pensions or insurance companies.

Debt instruments: Direct lending and co-investment platforms

While not specifically a financial instrument, direct lending and co-investment deserve mention because they are an important development in infrastructure finance.

Large investors that have the expertise to lend directly to infrastructure projects and companies bypass capital markets.

In the direct and co-investment model, an institutional investor invests in infrastructure loans originated by an internal investment team or other institutional investor. The lead underwriter organizes a syndicate and retains a pre-agreed percentage of each loan in its loan portfolio, selling the remaining portion to other investors (banks, the traditional source of issuance, may participate in such deals, but the distinction is that the due diligence process and procurement is completed by the lead investor such as a pension fund or insurance company).

Loans could be for greenfield projects or for brownfield investments. The characteristics of the loans themselves would be similar to the description in previous sections on debt.

With this co-investment, an institutional investor can build a portfolio of infrastructure loans and can rely on the servicing of the loans in the portfolio provided by the originator. This does not differ much from the syndicated loan market; however, these types of arrangements involve institutional investors more closely and do not operate through other intermediaries such as investment managers or banks.

This trend of direct origination of loans is confined to the most sophisticated investors that have decided to invest in internal skills development and to create internal teams dedicated to infrastructure investment.

Familiarity with underwriting deals, project finance, and infrastructure is essential. The desire to reduce fees associated with debt funds, along with the attractiveness of infrastructure lending and search for yield, are some of the driving forces opening up this channel of investment.

A trend since the financial crisis amongst institutional investors has been the popularity of credit strategies and direct lending to SMEs. Infrastructure loans have emerged as a niche area in this market.

Hybrid instruments: Mezzanine and subordinated debt

Mezzanine loans are subordinate tranches of debt often used in project finance to provide credit enhancement for senior debt tranches. Mezzanine is higher risk and pays higher yields than senior issues and often includes equity participation.

Hybrid instruments deserve to be mentioned as a distinct finance instrument – because despite the fact that they are essentially debt instruments, they often possess both equity- and debt-like characteristics. Subordinated loans and bonds are the chief category in this section and can be part of a corporate finance structure, or project finance. Corporations can have complex capital structures with multiple debt issues and different seniority in the capital structure. Sub debt includes all junior tranches.

Mezzanine debt is a type of privately-placed subordinate loan or bond unique to project finance or private equity investments, often with equity participation. Mezzanine debt can be interest-bearing instruments that include a share in the value growth of the project, or interest-only instruments. Payment in kind (where debt payments would be delivered through equity offerings) features are increasingly being used.

Equity capital can prove difficult to raise for infrastructure projects because of higher cost and higher risk, especially in infrastructure sectors prone to regulatory change and

involving new technologies. Equity sponsors might also be reluctant to dilute their exposure to an asset and would prefer debt finance to additional equity. Public entities such as MDBs can step in to reduce the amount of equity to be raised by more reluctant private investors by initiating subordinated debt or mezzanine tranches, providing internal credit support for the whole project structure. Additional solvency for example might make the project eligible for commercial loans and investment by entities requiring a minimum level of equity.

Mezzanine debt strategies are emerging as a niche investment area for pension funds, insurance, and other institutional investors. Similar to debt funds, general partners raise money from limited partners and deploy capital into subordinated or mezzanine debt instruments. Some GPs are involved in originating issues or participating in syndicates and club deals. They can prove instrumental in securing the entire financing of a project by providing the bridge financing between commercial lenders and equity investors.

The risk/return profile of mezzanine finance would lie between equity and senior debt. Mezzanine capital is useful in projects where the issuance of higher quality debt is limited or in instances where equity holders attempt to limit dilution. There is also a clientele effect: mezzanine finance offers attractive yields on shorter to medium term issuance, which can make it suitable for private-equity type structures designed for institutional investors. Such niche strategies can appeal to investors looking to diversify private markets investment, or to diversify corporate credit exposure.

Subordinated debt issues can have strong appeal to institutional and retail investors seeking higher yields than government bonds. Index eligibility is possible for issues that are large enough and that meet certain liquidity requirements. Sub debt may be publicly or privately placed.

Hybrid Instruments: Convertible bonds and preferred equity

Both convertible bonds and preferred equity are subordinate classes of debt used in corporate capital structures to provide credit enhancement, or to tap special sectors of the capital market due to the unique attributes of the securities. Infrastructure companies may issue convertible bonds or preferred equity depending on corporate finance strategy.

Convertible bonds are junior bond issues that include imbedded call options on the price of shares. They are a cheaper method of borrowing funds for an issuer because coupon payments are offset by the value of the conversion option – investors are willing to accept a lower coupon rate for the possible participation in share price appreciation. Their unique investment profile provides downside protection, like a bond, but also upside participation in the growth of the issuer through conversion to common shares. Convertible bonds are popular instruments amongst publicly listed green technology companies such as solar panel manufacturers due to the low cost, and expected share price increases attributed to fast growing companies.

Preferred shares are debt-like instruments usually limited to companies with listed shares, although it is possible for private companies to issue preferred share classes. Preferred stock receives priority claims compared to common shares, but are subordinate to all other debt classes. Omitting preferred dividend payments is not a technical default, but holders of preferred shares are usually entitled to missed dividend payments at a future date, unlike common stock. Issuing preferred stock is cheaper than issuing common stock and does not dilute ownership, but is more expensive than issuing bonds. Preferred shares are perpetuities (no stated maturity date).

With respect to infrastructure finance, convertible bonds and preferred stock are corporate balance sheet instruments and would not be considered for project finance.

Through corporate finance channels, convertible bonds, subordinated bonds or preferred stock can all be considered part of the global fixed income opportunity set. If issues are large enough and meet certain liquidity or quality standards, such issues may be included in indexes that track the broader fixed income markets. Convertible bonds are unique instruments in that, depending on the value of the conversion option, they can have strong equity-like or strong fixed income-like performance. Depending on market cycles, convertible arbitrage hedge funds can be major investors in convertible bonds.

A deep local bond market, dealer network, and asset management industries are all supportive for issuance of convertible bonds and preferred stock. Major index providers such as Merrill Lynch and Barclays have created specialized indexes that track the performance of convertible bond and preferred stock markets. Mutual funds and ETFs also provide channels to invest in these asset classes.

Equity instruments: Listed infrastructure corporates

Public infrastructure companies raise capital through public equity markets by selling shares to investors through organised stock exchanges. Shares are considered to be perpetuities and confer ownership rights to shareholders (prospective capital gains and dividends), and are a form of long-term investment finance for infrastructure.

Listed infrastructure companies such as utilities, transportation, heavy construction, airports, seaports, and some communications entities have been a part of public capital markets for quite some time, dating back to time periods when such assets were first privatised. In some emerging markets, infrastructure-related companies can constitute a relatively large part of the public equity market.

Ultimately there is no official definition of an ‘infrastructure company’. There is a dispute about how far the term ‘infrastructure’ can be stretched. For example, companies in the utilities and telecom sectors often undertake activities in competitive services that would not be classified as ‘infrastructure’ in a strict sense, e.g. electricity generation or telephone services²⁰. It may come down to the percentage of revenues that need to be infrastructure-related to become an ‘infrastructure stock’²¹.

In total, infrastructure companies constitute about 5-6% of global stock markets (S&P 2007, Inderst 2010). With the emergence of the infrastructure investment theme in the mid-2000s, the major index providers all started to offer specialist infrastructure indices. Indices can vary widely based on coverage rules or in terms of country weightings. As an example, the MSCI World Infrastructure Index, the broadest index within its family, tracks 145 companies in mostly advanced economies and had a total market capitalisation of USD 2.6 trillion on January 31, 2015. Stocks within the infrastructure universe tend to have higher dividend yields than the broader market due to their maturity and high dividend payout policies.

²⁰ As an example, an ‘infrastructure investment universe’ created by RREEF (2011) has 213 ‘pure-play’ infrastructure companies globally. In addition, they have ‘core’ infrastructure that includes 171 diversified and integrated companies and 214 stocks in ‘broad’ infrastructure goes as far as power generation, shipping and timber.

²¹ For example, Rothballer and Kaserer (2012) identified listed companies worldwide that own or have a concession for physical (economic) infrastructure assets and generate more than 50% of revenues from those.

A major problem with listed infrastructure indices are the rules with which infrastructure is defined and whether the listed index actually reflects the true infrastructure exposure that investors seek. The core economic infrastructure and social infrastructure defined above are associated with steady, inflation-linked cash flows derived from appropriately leveraged, contracted assets with low technology, market, and development risk (Orr 2009). The constituents of the indices mentioned in this section, however, also include growth companies such as sellers of construction, electrical and engineering equipment, the performance of which is much more volatile and vulnerable to new infrastructure development and business cycle risk (Orr 2009).

Box 5. Main Infrastructure Indices

The S&P Global Infrastructure Index was launched in 2007 to track the performance of the largest 75 companies in the infrastructure sector (energy, transportation, utilities). The constituents of the index are capped at 40% each from transportation and utilities and 20% from energy. A total of 15 stocks must come from emerging markets. At the beginning of 2015, the index included 75 companies from 18 countries with a combined market capitalisation of USD 1.197 trillion. The S&P Emerging Markets Infrastructure Index tracks 30 of the largest publically listed emerging market companies in the global infrastructure industry. The index is made up of companies from the energy, transportation, and utilities sectors with weights capped at 20%, 40%, and 40%, respectively. The combined market capitalisation at the beginning of 2015 was USD 221.7. The index is quite concentrated: the top ten issues comprise 59% of the index capitalisation (S&P 2015a, 2015b).

The Macquarie Global Infrastructure Index (MGII) was introduced by Macquarie and FTSE in 2005. The MGII comprises a broad range of infrastructure stocks in the sectors (water, transport services, pipelines, multi-utilities, gas distribution, electricity, and telecommunications hardware) (FTSE 2008). As of February 2015, MGII consisted of 247 stocks with a combined market capitalisation of USD 1.677 trillion (compared to USD 1.6 trillion in 2007). This index figure has grown from USD 383 billion in 2000 (Macquarie 2009). The MGII is heavily biased towards utilities with over 80% representation. The investable Macquarie International Infrastructure Securities Fund uses the MGII as its benchmark. Macquarie, in conjunction with FTSE, has a total of 16 benchmarked tradable indexed funds covering all geographic regions and infrastructure sectors (FTSE 2008).

One index that stands out from the vaguely defined infrastructure indices is the Dow Jones Brookfield Infrastructure Index, which was formed in July 2008 (Orr 2009, Dow Jones 2008). Here, the index components are derived from companies that exhibit the following strong infrastructure characteristics: high barriers to entry, royalty stream based on economic growth/inflation, high operating margins, low capital and maintenance expenditure and growing long-term cash flows. The market capitalisation of the Dow Jones Brookfield Global Infrastructure Index as at February 2015 was USD 827.5 billion. The dividend yield was 3.41%. The sector with the highest allocation in the index was oil, gas & transportation, with 48.7%, followed by transmission and distribution with 19.5% (Dow Jones 2015).

Infrastructure indices that have been formed to track the performance of listed companies in this asset class have given rise to the opportunity for product creation based on such indices. Investment products such as managed equities, mutual funds, index funds, and ETFs that are benchmarked against such indices allow investors to make targeted allocations to infrastructure in a diversified manner. Strategies can be passive or active. ETFs, in particular, are a fast growing segment of the asset management industry,

and have been particularly popular amongst retail investors. The 2000s saw an explosion of ETF offerings, many of which played on themes in natural resources and commodities. On December 31, 2014 the iShares Global Infrastructure ETF had USD 1.1 billion in assets under management. Listed infrastructure companies in well-established stock market indices have provided attractive investment opportunities for retail and institutional investors for a number of years.

Equity Instruments: Listed infrastructure funds

Listed infrastructure funds raise capital through public markets either by issuing shares (like an IPO), or by gathering investment capital from investors to deploy into infrastructure investments (open-ended). The fund managers are responsible for selecting assets and for managing day to day operations on behalf of investors. Such funds are a way for retail investors to invest directly in infrastructure assets (not through a corporate structure) by purchasing units of a fund.

Listed infrastructure funds may be closed- or open-ended vehicles or investment trusts. These products are similar to common equities in that there is a liquid public market where shares may be bought and sold on exchanges; however, the capital raised by such funds is deployed directly into infrastructure assets in a diversified manner, or in sector specific funds based on the fund strategy. Thus they can be viewed as “direct” investments in infrastructure assets that are owned and operated by the fund managers, rather than balance sheet-style finance like an infrastructure corporation²².

Funds may invest in listed project companies, or in unlisted project companies (project finance entities).

Listed infrastructure funds provide quick access to infrastructure equity investment, offering geographic and sector diversification for investors with small investment amounts. Thus retail investors are a primary channel of investment, though larger institutional investors may also allocate to listed funds.

A potential drawback of listed funds is their exposure to the vicissitudes of capital markets. The stated objective of funds may be to invest in long-term infrastructure assets with stable cash flows that pay high dividend yields; however, fickle investors that frequently trade assets may increase the price volatility of these funds. High leverage in such funds can amplify price volatility.

Equity Instruments: Yieldcos

Yieldcos are special power projects with multi-year power purchase agreements (contracted tariffs for power generation) that are placed into a new subsidiary. Shares of the subsidiary are listed on exchanges through an IPO, while the parent maintains an equity stake.

Yieldcos have provided attractive opportunities for utilities to spin-off power plants or projects. From an investor perspective, yieldcos can provide stable attractive returns through long-term contracts, hence the term “yieldcos” linkage to current income and dividend payments. This financing vehicle has been especially applicable to renewable energy projects such as solar and wind generation. The tax benefits in yieldcos are not as

²² For example, the Macquarie Infrastructure Company (NYSE: MIC) is a listed closed-ended fund that invests in airports, storage, transportation, gas production and distribution, and contracted energy. The fund had a capitalisation of USD 5.1 billion in November 2014.

distinct as in MLPs or REITs, however due to accounting treatments of depreciation expense, which can outstrip total revenue, taxes payable at the yieldco level can be deferred for many years (yieldcos can be viewed as an alternative to MLP and REIT structures, which utilities cannot access).

Yieldcos provide another financing avenue through public markets for renewable energy, helping to reduce the cost of capital by broadening the investor base and improving liquidity. Yieldcos also provide a niche equity investment that can diversify traditional equity allocations in institutional and retail investor portfolios.

The emergence of yieldcos themselves is a trend in renewable energy finance. The market is still relatively young, but growing – much of the growth has been prompted by investor demand for assets, which can provide a higher yield in an environment where bond yields are low. Much of the future growth of yieldcos will probably be closely linked to the trends in renewable energy projects, particularly in the wind and solar sectors.

Similar to equities, investors can access yieldcos through fund investments and asset management products. An ETF was launched to track the performance of the Indxx Global Yieldco Index, which is a market-cap weighted index of the global yieldco market. Yieldcos can be appealing to both retail and institutional investors.

Equity instruments: MLPs, REITs and IITs

All instruments in this category of infrastructure finance are related in that, through beneficial legal structures, they are able to flow tax advantages and/or profits directly to investors. This makes them distinct from a traditional corporate structure. Units are traded in public markets.

Master Limited Partnerships (MLPs) combine the tax benefits of limited partnerships with the benefits of being listed on an exchange. In the United States where such vehicles were first launched, the application of MLPs has been only limited to certain areas where the tax codes allow. Businesses involved in oil and gas, natural resources, and distribution qualify for the special tax treatment. Since MLPs are structured as partnerships, they avoid corporate taxes, thus eliminating the “double taxation” that corporate investments face (from the perspective of a taxable investor holding the asset). MLPs have high dividend yields compared to common shares.

Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (IITs) are a small part of infrastructure finance, but still deserve mention. REITs are special trusts that invest directly in properties, with shares listed on stock exchanges (although some REITs are private and unlisted). The trust managers are involved in the operations and management of the specific assets held in the trust. REITs are usually associated with real estate; however, there are certain segments of the infrastructure market that qualify as real estate assets for the purpose of applying the REIT rules. In 1960 the United States first passed legislation creating financing vehicles for real estate assets using modified tax rules. Many countries have since followed suit with establishing REIT regimes, with others planning such regimes. Depending on a country’s rules, REITs are required to pay at least 90% of their taxable income in the form of dividends.

There is potential to expand the use of MLPs and REITs to finance infrastructure; however, such efforts may require changes to the rules that govern such investments. Including infrastructure segments eligibility for MLP and REIT finance is key to opening this investment channel to both retail and institutional channels.

Legislation in the United States introduced in 2013 sought to include renewable energy to qualify for MLPs – thus creating a new channel of investment in green energy, expanding the potential investor base for such projects, and contributing to efforts to lower the cost of finance. Similar to other MLPs, such investments would pass-through income and capital gains directly to investors (Flannery and Rickerson, 2014).

MLPs have been appealing to both taxable (retail) and non-taxable (institutional investors). Besides the United States, Germany also has laws permitting similar investments. The size of the U.S. MLP market at the end of 2013 was estimated to be USD 400 billion (Flannery and Rickerson, 2014).

In 2010, MLP-only mutual funds and ETFs were first introduced in the market, providing yet other ways to access this growing form of equity financing in a diversified manner.

Since the establishment of the REIT rules, qualifying properties have been expanded to include infrastructure-related properties such as railroad lines, pipelines, communications towers, and storage facilities, but this can also vary by country. Some “social infrastructure” segments such as senior housing and prisons also qualify. Since REIT income is generated through rent, the properties commonly attributed to infrastructure investment such as inflation linked cash flows, steady sources of income, and high current yield also apply. Countries such as India have modified the typical REIT rules to form IITs, which have a more focused mandate in infrastructure finance.

Infrastructure Investment Trusts (IITs) are vehicles listed on India’s stock market. The vehicles are similar to REITs, though some of the tax treatments and rules differ (as do most REIT regimes amongst countries).

Equity instruments: Unlisted direct equity investment and co-investment platforms

Direct equity investment refers to investments made directly in unlisted stand-alone infrastructure assets (often project finance), bypassing fund managers. Large sophisticated investors source investments, perform due diligence, select assets, and manage the asset through its life. Funds that invest directly in assets often have long-term investment horizons.

Direct investment has been utilised by institutional investors that have the in-house resources and capability to source assets, perform due diligence, finance the investments and manage/maintain them. Clark *et al.* (2011) estimate there to be approximately twenty direct institutional investors in the market, although this number is now likely larger as more large investors enter the marketplace.

Institutions such as pension funds and insurance companies with skills and expertise perform due diligence on infrastructure assets and bid to acquire an equity stake in the business entity. Since outlays can be quite substantial, it is increasingly more common for large institutions to pair up with other investors or even fund managers to acquire stakes in infrastructure investments. Project finance instruments are the most common form of investment; however, private equity stakes in corporate structures are also possible.

Co-investment platforms have started to emerge in response to the dissatisfaction that many institutional investors shared with the infrastructure fund models being offered by financial intermediaries. In order to bypass the large fees associated with investing through unlisted equity funds, a number of large pension funds and sovereign wealth

funds have looked at pooling their financial and internal resources to invest jointly in infrastructure projects. There have also been initiatives of partnering with other funds with more expertise (i.e. Canadian and Australian pension funds) on a deal-by-deal basis.

Direct and co-direct investment in infrastructure also aligns the long-term investment interested of institutional investors, who have long-term liabilities, with that of the management of infrastructure assets. Since investment funds often have an investment lifespan that is shorter than the underlying assets, direct investors can commit capital and manage assets over longer time periods.

Large investors have opted to collaborate amongst themselves to benefit from a number of advantages: better alignment of interest with other pension funds, like-minded investment horizon, lower fees, better control of the characteristics of the investment, larger commitments, local knowledge, and a spreading of risk.

Furthermore, the ‘network effects’ from working with like-minded peers will, it is hoped, minimize the funds’ reliance on the for-profit financial services and asset management sector for deals and intelligence (Bachher and Monk 2013). Other benefits of collaborating in co-investment platforms include: higher returns, better access to deal flow, diversification, governance rights, and reduced headline risk (ibid). However, pooled vehicles face a number of challenges. Pension plans often have different strategies based on differences in strategic orientations, diversification targets, and exposure limits. Other potential challenges could result from issues such as governance, fees and compensation of investment professionals. In order to overcome these challenges, government support may be required to either help achieve co-ordination between the parties or provide access to attractive investment opportunities.

Box 6. Co-investment platform example

The Global Strategic Investment Alliance (GSIA) is a global co-investment alliance platform launched in 2012 by the Ontario Municipal Employees Retirement System (OMERS). The GSIA was designed to gather sophisticated like-minded investors (mainly pension funds) to directly invest in infrastructure assets. Through the GSIA, participating alliance members will invest in core infrastructure assets with an enterprise value of more than USD 2 billion in sectors such as airports, railways, ports, power generation & distribution, and gas pipelines mainly in North America and Europe.

The GSIA aims to raise USD 20 billion with OMERS providing USD 5 billion. In April 2012 Mitsubishi Corporation (MC) entered into binding commitments to jointly invest up to USD 2.5 billion in quality infrastructure assets, together with leading Japanese pension funds and financial institutions, namely Pension Fund Association, Japan Bank for International Cooperation, and Mizuho Corporate Bank. In March 2014 OMERS entered into a co-investment agreement with Japan's Government Pension Investment Fund (GPIF), the world's largest pension fund, and the Development Bank of Japan (DBJ). The participation by GPIF and DBJ brings the total capital committed to the GSIA to USD11.25 billion.

While obtaining a figure for the total amount of direct investment in infrastructure is difficult, 15 funds (out of a total of 35 funds that reported unlisted infrastructure equity exposure) from the “Annual Survey of Large Pension Funds and Public Pension Reserve Funds” conducted by the OECD in 2014, found that USD 42.9 billion had been directly invested in infrastructure by institutional investors (OECD 2014 a). These funds represented Australian, Canadian, Danish, Dutch, New Zealand, South African and UK

pension funds. As the complex nature of infrastructure investing becomes more readily understood, an increasing number of sufficiently large investors will be looking to invest directly and avoid the fees associated with the fund manager route.

Equity instruments: Unlisted infrastructure equity funds

Unlisted infrastructure equity funds provide a channel of investment into direct infrastructure assets (often project finance) for institutional investors. Funds provide diversification across sectors and geographies and allow smaller investors to commit capital to direct infrastructure.

Institutional investors participate in unlisted infrastructure funds as limited partners (“LPs”). The fund is managed by the general partner of the fund (“GPs”), often an investment bank or investment management firm. The general partner is responsible for investing capital commitments to the fund in various infrastructure assets on behalf of the LPs.

Some institutional investors have raised concerns over the terms and conditions of infrastructure funds. The conflicts of interest have arisen due to the perceived capital gains-oriented short-term opportunistic approach of fund managers compared with the long-term patient yield-oriented outlook of institutional investors such as pension funds, insurers and sovereign wealth funds.

One of the ongoing difficulties in determining an appropriate fee structure for infrastructure funds is the holding period for investments. Unlike private equity, where the typical holding period is 2 or 5 years, infrastructure investments may be held for 10 years or more, with many investors’ preferences moving towards even longer holding periods. Measurement of the value added by a manager where there are long periods without a market event (i.e. divestment) is particularly challenging.

From the fund manager’s perspective, there seems to be a challenge in satisfying various conflicting objectives such as time horizon, liquidity, rate of return, while also generating performance incentives and cash flow. This has been successfully overcome in some funds which now more typically operate between 15 and 25 years. Previous funds have typically been just 10-14 years with a limited investment period of 4 or 5 years. The shorter-term focus is more suited to turn-around or development deals and the mandatory exit is not consistent with the long-term hold philosophy of core infrastructure. Contributions, valuations and liquidity are all controlled at the manager’s discretion and distributions are only made towards the end of the fund life (Prequin 2013).

Long-term funds are now more available which better match long-term investment objectives with a structure that is suitable for a wider range of investors to participate, particularly smaller pension funds that cannot access direct investment. Such funds, in partnership between GPs and LPs, make distributions regularly over the life of the fund for yield orientated assets or towards the end of the typically shorter fund life for more capital gains style strategies

Asset management industries, combined with a competitive bidding process for assets and a project pipeline are conducive to investment funds raising capital for deployment into infrastructure projects. Since many funds invest in PPP/PFI assets, a supportive project finance environment, and liquidity in debt markets is also supportive, since private equity investors also seek to secure debt financing for investment.

Open-end funds or funds of length greater than 15 years seem to be more appropriately matched to the long-term liabilities of institutional investors. Open-end funds have an investment period that is ongoing, and provides immediate exposure to income generating assets. With open-end funds, there is greater ability to grow and diversify the fund over time and no rush to deploy capital. With regards to contributions, investors have more control, valuations are regular and independent and liquidity is available from cash yield with the option of matching buyers to sellers at exit and redemption if appropriate. Investors also have control over reinvestment and distributions decisions (IFM 2013). On the other hand, management of the fund during a downturn could prove challenging due to the potential simultaneous withdrawal of funds following liquidity constraints of several fund participants.

Management fees will remain a contentious issue for infrastructure funds moving forward. There is now greater appreciation of the diversity of risk/return profiles of infrastructure assets and this should be reflected in the fees charged to investors. It is understandable that a fund investing in greenfield assets in the emerging markets carrying greater risk and requiring appropriate management resources will charge a higher fee compared to a fund investing in brownfield assets in developed countries. There are various developments in fee structure that have taken place as a result of the market adjusting for differing opinions.

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Part II

Risk mitigation and incentives for infrastructure finance

Given the important role of private finance for infrastructure development and desire to ensure effective and efficient policy interventions, there is broad recognition among international organisations, governments, investors and infrastructure operators of the importance of understanding the risks linked to infrastructure investments. Also critical is an understanding of the strategies being deployed to mitigate risks and enhance returns for infrastructure investment, along with evaluating their efficiency and effectiveness.

Historically, government intervention to mitigate risks was applied to infrastructure investment projects in emerging economies.²³ More recently, these policies have become a prominent feature of infrastructure projects in advanced economies where investors are increasingly asking governments to mitigate specific risks, which could serve to enhance the availability and/or reduce the cost of private capital. This is especially true in developed economies that need to upgrade ageing and sometimes failing infrastructure.

Infrastructure investment involves complex risk analysis, risk allocation and risk mitigation, given the highly idiosyncratic and illiquid nature of such investment. From an investor perspective, it is important to carefully analyse all risks that the project will bear during its economic life, while determining an acceptable compensation for bearing such risks. From a government perspective, the decision to provide the infrastructure itself or in partnership with the private sector will be based on a range of factors, including the nature of the infrastructure project and the type and magnitude of related risks; insofar as the government provides risk mitigants, their expected benefits should be balanced against their costs, and their provision should serve to supplement market-based approaches to infrastructure finance.²⁴

This part of the taxonomy seeks to classify infrastructure risks and incentives and identify their relevance for infrastructure transactions. It describes the range of strategies and instruments, both public and private, that serve to reduce risks and enhance returns for infrastructure operators and investors, enabling these parties to make the required high-quality and long-term investments in infrastructure.

²³ For example, guarantee schemes have been used by development finance providers to mobilise private investment in developing countries, including in infrastructure projects (Mirabile, M., J. Benn and C. Sangaré, OECD, 2013).

²⁴ The provision of risk mitigants and financial incentives, particularly where offered on advantageous terms, may affect incentives and potentially distort behaviour (“moral hazard”), or may adversely affect market competition. Potential adverse impacts on government budgets, both current and future, also need to be considered.

Infrastructure risks are classified by their main source – namely political and regulatory, macroeconomic and business, and technical. Much of the literature focuses on risk mitigants and incentives available for project finance – this taxonomy covers a broader spectrum of infrastructure finance and, with this Part, seeks to link strategies to mitigate risks and enhance returns to the financing instruments and channels found in Part 1. This Part recognises that there are both public and private sector risk mitigants that can increase the viability of infrastructure finance. Policy actions designed to enhance project bankability, in particular by addressing business risk, are discussed in order to define the range of potential measures that could mobilise infrastructure financing.

Risks in infrastructure investment

There is no single, consistent definition of risk in the literature on infrastructure. Risk, sometimes called measurable risk, is defined as a case where there is a range of possible outcomes that are each associated with an objectively (i.e. statistically determined) or subjectively ascribed numerical probability. Formally, risk is defined as the measurable probability that the actual outcome will deviate from the expected (or most likely) outcome (see OECD 2008)²⁵. Knight's (1921) definition of risk states that statistical (objective) probabilities reflect measurable risk while subjective probabilities, which are largely based on opinion, represent unmeasurable uncertainty (Holton 2004). Probability is often used as a metric of uncertainty, but its usefulness is limited; probability therefore quantifies perceived uncertainty (ibid).

Risk can be broken down into two essential components: exposure and uncertainty, exposure being an important part of this definition (Holton 2004). In the case of financial investments, downside risk (or the risk of loss), and its severity, are key points to be made. For example, the probability of default on a debt is a distinct risk with its own probability of occurrence. The recovery rate on the debt (loss severity) depends on the credit exposure and resolution of default and is itself a range of outcomes with associated probabilities. Loans to project companies are non-recourse; recoveries in event of default are driven solely by the value of collateral.

For infrastructure operators, economic losses can be incurred either through a reduction of expected cash flows (due to a multitude of factors), or through the default of a project counterparty to meet obligations. The various financial instruments linked to infrastructure projects and companies expose investors to the underlying infrastructure risks to differing degrees. Effective risk mitigants, which may target aspects of infrastructure projects (e.g. operations, cash flows) or financing channels, either alter exposure to risk and reduce potential severity of losses, or reduce uncertainty. Risk mitigants or incentives may also increase prospective returns, which provide an acceptable compensation given a certain level of risk.

For instance, a public guarantee on debt may not reduce the probability of default, but it does alter the exposure to losses by ensuring either complete or partial compensation. Similarly, insurance does not reduce the risk of an event occurring, but it does cover losses. The provision of capital or credit support instruments (subordinated debt increasing credit quality of senior debt) can reduce the severity of loss given default for senior issues. Revenue grants and guarantees, and tax breaks, can strongly affect the

²⁵ OECD Public Private Partnerships In Pursuit of Risk Sharing and Value for Money, 2008

volatility of revenues and reduce project risk by reducing potential losses to equity holders, or by increasing returns.

Classification of risk in infrastructure

Risks linked to investment in infrastructure projects can be differentiated by their source. Three broad categories can be identified (see Table 2 which shows a classification of the main risks linked to investment in infrastructure projects, grouped according to the project development phases), namely :

1. **Political and regulatory risks:** Arise from governmental actions, including changes in policies or regulations that adversely impact infrastructure investments. Such actions may be broad in nature (like convertibility risk) or linked to specific industries or PPP contracts. In some cases, this risk may emerge from the behaviour of government contracting authorities. Political risks can be highly subjective, difficult to quantify, and therefore difficult to price into infrastructure finance. Table 2 lists those risks that are closely associated with infrastructure investment.
2. **Macroeconomic and business risks:** Arise from the possibility that the industry and/or economic environment is subject to variation. These include macroeconomic variables like inflation, real interest rates and exchange rate fluctuations. An asset's exposure to the business cycle, namely, shifts in demand is a principle business risk of the asset. Finance risks (such as debt maturity) are also a major part of business risk.
3. **Technical risks:** Determined by the skill of the operators, managers and related to the features of the project, project complexity, construction and technology.

The risks associated with a specific infrastructure project generally arise from the nature of the underlying asset itself, contracts with the public sector, and its exposure to the environment in which it operates. The magnitude of a risk varies depending on the country (and its underlying investment climate), sector (and its institutional maturity) and project (and its complexity).

Risks also vary across the life of the project divided into project development phase (before submission of the bid and financial close), construction phase, operational and termination phases. Certain risks may only be present at certain stages of project finance, while others may be present at all stages. Some investors perceive a higher risk in the first phases of the project i.e. bidding process and construction. These considerations affect the optimum risk allocation.

Certain political and regulatory risks, though likely material in the event of occurrence, are closer to the realm of subjective risks. For instance, the risk of a new government gaining power and changing PPP legislature is an uncertainty and difficult to price into assets. However, governments can take steps to mitigate such risks. When covering political risk, a distinction between sovereign risk – the general risk that market conditions and creditworthiness change at the national or municipal level – and political risk at the project level should be made. Government bond yields or credit default swaps on traded government issued debts are efficient means to price sovereign risks into infrastructure finance. Other political and regulatory risks that are more specific to infrastructure finance are more difficult to correctly price and would not be completely

captured by sovereign spreads. Table 2 contains those political risks that are most associated with infrastructure finance.

Table 2. Classification of risk linked to infrastructure assets

Risk Categories	Development Phase	Construction Phase	Operation Phase	Termination Phase
Political and regulatory	Environmental review	Cancellation of permits	Change in tariff regulation	Contract duration
	Rise in pre-construction costs (longer permitting process)	Contract renegotiation		Decommission
				Asset transfer
	Currency convertibility			
	Change in taxation			
	Social acceptance			
	Change in regulatory or legal environment			
Enforceability of contracts, collateral and security				
Macroeconomic and business	Prefunding	Default of counterparty		
	Financing availability		Refinancing risk	
			Liquidity	
			Volatility of demand/market risk	
	Inflation			
	Real interest rates			
Exchange rate fluctuation				
Technical	Governance and management of the project			Termination value different from expected
	Environmental			
	Project feasibility	Construction delays and cost overruns	Qualitative deficit of the physical structure/ service	
	Archaeological			
	Technology and obsolescence			
	Force majeure			

Note: (See Annex for full description of the risks in Table 2)

Risk management environment

Private investors, through the financial instruments described in Part I, are well equipped to analyse and bear certain risks. Yet the financing of infrastructure often requires large cash outlays and the assets themselves operate in heavily regulated industries. Through economic development schemes, governments can help to mitigate some of the risks described in Table 2 using various techniques and instruments. Some incentives may provide compensation that increases returns to investors, making investment more attractive. In order to attract private investment in infrastructure projects, governments can influence the magnitude of these risks and in some cases reduce the probability of their occurrence, or exposure to losses. The objectives of risk mitigants and incentives are to correct certain market failures or inefficiencies in the procurement of infrastructure investment and delivery of infrastructure assets by private entities, or in the financing of infrastructure investment²⁶.

²⁶ See the “G20/OECD High-Level Principles of Long-term Investment Financing by Institutional Investors”

First, governments can influence **political and regulatory risks** by creating a more conducive institutional environment, including making credible commitments to honor the terms of the agreement, developing reliable guidance on development and construction costs, and tariff and demand definition and trends. This would particularly help projects in the planning and construction phase. Actions may entail:

- i. a stable long term plan for infrastructure development: enhanced certainty and social acceptance regarding novel approaches to infrastructure development (e.g., PPP, privatisation or pure private development); enhanced transparency and accuracy of the infrastructure pipeline; reliability of feasibility studies; credible commitment to provide necessary authorisations; guidance on environmental reviews;
- ii. certainty of rules about, inter alia, public procurement, permits, expropriation, taxation, litigation, and tariff definition; and
- iii. bilateral investment treaties and protection agreements that provide international law protection from non-commercial risks associated with cross-border direct investment.

According to the *OECD Principles for Public Governance of Public-Private Partnerships*²⁷ three elements are useful to define governments' support of PPP and therefore create a suitable institutional environment: i) establish a clear, predictable and legitimate institutional framework supported by competent and well-resourced authorities; ii) ground the selection of Public-Private Partnerships in Value for Money; and iii), use the budgetary process transparently to minimise fiscal risks and ensure the integrity of the procurement process.

Political risks like changes in taxation, legal environment, and issues of expropriation are uncertainties, described earlier as subjective risks. These risks are hard to quantify and can have potentially large impacts on the profitability and viability of investment. In some instances they may even be barriers to address before a finance package can be secured.

Business risks should, where possible, be managed by private players, both in a PPP and under privatisation of private developments (due to the fact that such risks can be both endogenous or exogenous in nature). However, in some circumstances, governments may introduce specific instruments, even with a temporary validity or for a specified range of assets, to make infrastructure investments more appealing and financially viable. In recent years, policymakers have introduced a number of actions/instruments to cope with the infrastructure investment gap and the shortage of traditional financial resources, especially on the debt side (specific examples are described in a later section).

Technical risks should be better mitigated through the know-how of specialized operators and should be shifted to the private sector in order to generate an incentive for effective project delivery. However, some technical risks could be retained, even partially, by the public sector without compromising performance as they are external to private sector control and/or their impact on the economic case for the project. This is the case of archeological and environmental risks, especially in PPP/concessions, where the authority should be aware about the condition of the designated land for the investment.

²⁷ See the OECD "Recommendation of the Council on Principles for Public Governance of Public-Private Partnerships", May 2012

Risk management of infrastructure asset cash flows

Focusing more on business risks, government may play a role in working with the private sector to manage certain risks. Once the risks of a project are analysed and understood, the risk management process should identify the strategies to mitigate the impact of risks on project cash flows. This process is important for all infrastructure assets and sectors, but in particular, is important in project finance since lending facilities are often non-recourse and solely based on the ability of the asset to generate cash flows.

The first option to control the risk is to retain it and to try to limit its effects on the infrastructure by means of well-designed internal risk procedures. For existing corporations, risk retention as a risk management policy is more effective than for SPVs operating an infrastructure investment. This is because in standard corporate finance, operational risk can be diversified over the entire portfolio of real assets managed by an existing firm. This is not the case for an SPV that is only dedicated to a single project.

Risk retention is a common practice in established corporations because a firm considers risk allocation to third parties too expensive or the cost of insurance policies excessive compared to the effects determined by that risk. For this reason, the unallocated portion of risk plays a key role in the credit spread and debt/equity ratio setting and represents the most relevant variable that financial investors look at when deciding to commit capital to a given infrastructure. Internally managing risks is a continual process of monitoring project progress and asset performance, requiring competent managers and governance procedures.

Risk transfer by means of nonfinancial contracts is the most used risk management strategy in project finance and is based on an intuitive principle. Key contracts signed by the SPV (supply, purchase, O&M agreements, agreements with regulatory authorities) allocate rights and obligations to the SPV itself and to its respective counterparties. These contracts can be used as business risk mitigation techniques if the counterparty best able to control and manage the risk is considered responsible for the effects of risk occurrence on project cash flows. If the risk occurs, some form of indemnification must be paid to the SPV. If a risk arises and it has been allocated (transferred) to a third party, this same party will bear the cost of the risk without affecting the SPV or its lenders (*risk pass-through*).

Risk mitigation instruments and techniques for infrastructure finance

Described in the following section are specific policy actions and tools that may be employed by governments to mitigate risks (principally business risks) and attract capital into this industry (external private sector risk mitigants are also described where appropriate). These actions are grouped into six main categories and are specifically oriented to reduce or eliminate the demand risk, increase and/or stabilize free cash flows, and sustain the projects' bankability or may be targeted toward specific finance instruments (Hellowell et al. 2014). Each measure can then be articulated in specific instruments. Table 3 summarizes these types of measures and instruments. These policy actions and tools may have potential costs and side effects, which should be taken into account and may require some form of compensation.

Table 3. Financial risk mitigants and incentives for infrastructure finance

Type of Measure	Instrument
1. Guarantees, realised directly by Government or by its own controlled agency or development bank	1. Minimum payment, paid by contracting authority
	2. Guarantee in case of default
	3. Guarantee in case of refinancing
	4. Exchange rate guarantees
2. Insurance (private sector)	1. Wrap insurance, technology guarantees, warranties, commercial and political risk insurance
3. Hedging (private sector)	1. Derivatives contracts such as swaps, forwards, options etc.
4. Contract design, paid by contracting authority	1. Availability payment mechanisms
	2. Offtake contracts
5. Provision of capital, realised directly by Government or by its own controlled agency or development bank	1. Subordinated (junior) debt
	2. Debt: 2.1 at market condition 2.2 at lower interest rate
	3. Equity: 3.1 at market conditions 3.2 at more advantageous conditions
6. Grants, generally delivered by contracting authority, even if some dedicated fund at national level may exist. Tax incentives can be delivered by national or local authorities	1. Lump sum capital grant
	2. Revenue grant: 2.1 Periodic fixed amount (mitigating the demand risk) 2.2 Revenue integration (it leaves the demand risk on the private player)
	3. Grant on debt interests
	4. Favourable taxation schemes for SPV
	5. Favourable taxation schemes for equity investors

Source: OECD and Vecchi V. et al. (2015 forthcoming)

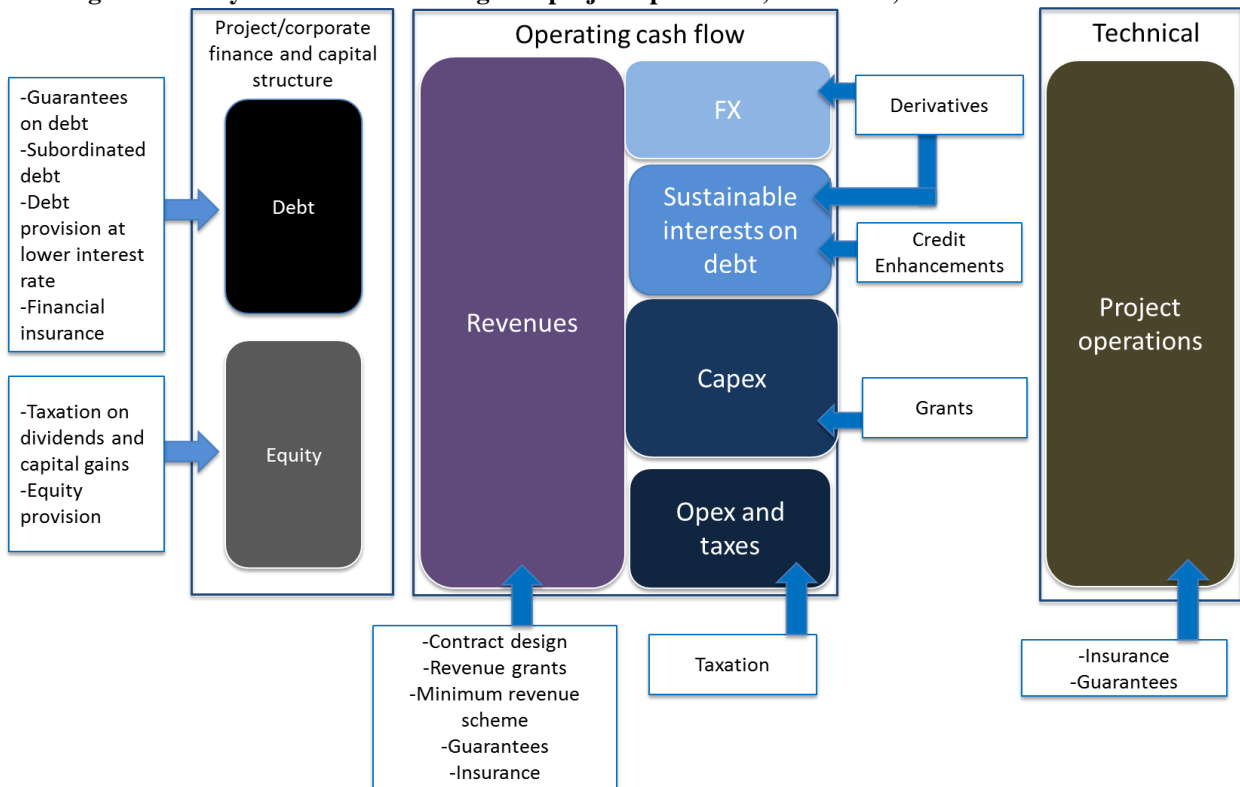
Instruments can directly reduce objective risks, those risks that incur economic losses to an asset by either a reduction in project revenues, or through the default of a counterparty; or they can reduce subjective risks. Other instruments may not serve to mitigate risks directly, but instead may partially offset risks or share risks with the public sector on an equal basis.

Figure 2 is a stylized chart summarizing the forms of public and private supports by showing their effects on the main components of the project cash flow (revenues, capital costs, capital expenditures, operating costs, corporate taxation, interest on debt and FX losses), and financing instruments. Risk mitigants may be targeted to specific financial instruments, or to the project SPV in general (operations/cash flow), which can dampen exposure to commercial risk.

A guarantee on project loans or bonds explicitly protects creditors, although guarantees directed at debt instruments can also impact the financial viability of the entire project by increasing credit quality and lowering the cost of finance, which in turn enhances cash flow by reducing interest expense. Minimum revenue guarantees and grants can directly reduce the volatility of cash flows, enhancing credit quality and cash flows to equity holders. Reduced corporate tax rates free up cash flow for other purposes and enhance return to equity holders; higher cash flow also supports creditworthiness. Reduced tax rates on dividends and capital gains enhance returns to equity holders.

Lump sum grants, land grants, or grants tied to project milestones are more closely related to direct financing instruments – they reduce the need for privately-sourced capital expenditures for the project and can also reduce initial outlay. This has the effect of enhancing returns to investors and can also enhance creditworthiness and viability of the financing structure.

Figure 2. Policy instruments and targets – project operations, cash flows, and finance instruments



Source: OECD and Vecchi V. et al. (2015 forthcoming)

The provision of finance through debt instruments with below market interest rates reduces interest expense, enhancing project returns. Debt subordination, debt covenants, and efficient capital structures can also improve project viability, protecting against commercial risk and aligning management’s interests with equity owners.

Also included in Figure 2, are private sector mitigants such as insurance and derivatives contracts which can also be used to mitigate risks. Insurance contracts can cover many of the issues described by guarantees, such as the default of counterparty

(bond insurance), political and regulatory risk, and certain business risks. Incidentally, the most active insurance underwriters have started to propose “non-payment insurance solutions” in response to the demise of monoline intervention in project finance (*wrapped bonds*). These insurance packages represent unconditional obligations by the insurer to guarantee the debt service of the borrower (the SPV) to bank creditors or bondholders. *De facto*, the insurer takes a typical lender risk in addition to the standard risks underwritten under more traditional insurance policies²⁸. Derivatives contracts are useful for hedging specific financial risks like interest rate risks, currency, or credit. They essentially function like a type of insurance: at a market priced premium, holders of derivatives contracts receive a payment in the event that the contract is triggered.

Impact of instruments on financial viability

Governments use different mechanisms to overcome constraints and barriers for higher institutional investor involvement, including fiscal incentives, capital pooling platforms and risk mitigation mechanisms (guarantees, insurances, credit enhancement, currency risk protection, and other instruments). (OECD 2014, OECD 2014b²⁹) Similar mechanisms are tried for renewable energy and green infrastructure (Kaminker and Stewart 2012, OECD 2015).

In this context it is relevant to understand and assess the effects of these measures and in particular their capacity to attract private capital without generating or increasing moral hazard and adverse selection phenomena, thus safeguarding the microeconomic benefits produced by the involvement of private capital and competencies. Policy makers should prioritize those instruments that enable the projects’ bankability, incentivizing at the same time the private sector to correctly assess investments and to reach desirable level of project efficiency, without unduly creating untenable market distortions.

Multilaterals, national development banks and export credit agencies in particular have a catalytic role to play in leveraging private sector capital in both developing and developed countries. This will require a different level of risk taking, new resources and expertise at the level of these institutions and the use of new financial instruments such as mezzanine finance and project bonds.

Risk mitigation and incentives – descriptions of instruments

The following section reviews the main risk mitigation instruments available for the financing of infrastructure. Recall that in Part I, the various financial instruments were presented, along with the channels of investment. Risk mitigation techniques may at times be unique to project finance – such situations will be noted in the description. Otherwise, risk mitigation instruments are available to all types of investors including public and private equity, and the various debt investment instruments.

²⁸ While very similar, the two insurance solutions show a clear difference. Wrapped bonds were based on a wrapping insurance solution bought by the SPV, while the non-payment insurance is bought by the lenders (with a premium based on a percentage of the margin over euribor or other leading interest rates). Typically lenders choose to buy such policies to reduce the capital absorption determined by the participation to a syndicate, particularly with big ticket amounts. Discussions with insurers indicate that this solution is required by the same lenders that, for reasons of confidentiality, are more comfortable in showing direct commitment to certain infrastructure and then back up these exposures with a proper insurance hedging without necessarily disclosing it.

²⁹ Inderst, G (2009), Pension Fund Investment in Infrastructure. OECD Working Paper on Insurance and Private Pensions No. 32.

Public sector guarantees and insurance

Public sector guarantees can come in many forms, including revenue guarantees, credit guarantees on debt instruments, or export credit guarantees. They may be disbursed either by governments, or sub-sovereign entities like MDBs.

A minimum revenue guarantee (MRG) may be suitable for projects considered commercially viable, but where uncertainty about future revenue substantially reduces the available financing. The amount of revenue usually covered under the guarantee is the amount necessary to cover debt payments. However, a project constantly relying on the guarantee to complete revenues might be more vulnerable to political risk, or if the guaranteed revenue would also be used to cover equity investors, it would diminish the incentives to deliver quality facilities and service, and thus create moral hazard. Furthermore, if the public entity takes on the revenue risk, there should be excess-revenue sharing as compensation (Yescombe 2014). An MRG may not be appropriate if it is clear that the project cannot generate enough revenue to be viable (*ibid*).

Long-term investors, when investing in a project with MRG, essentially assume a credit exposure to the guaranteeing authority. Minimum revenue guarantees can be used for transportation assets such as toll roads where high traffic uncertainty may make a project unattractive. Certain tariff subsidies can also fall into this category; in this arrangement, user fees themselves can be subsidized by contracting authorities. The effect is to boost revenue, but unlike in an MRG, the project company still bears usage risk (Yescombe 2014). A sliding scale can apply to subsidies based on overall usage.

In some cases, countries have established guarantee funds to help back MRG commitments. For example, the Indonesian Infrastructure Guarantee Fund was established in 2009 to back guarantees by contracting authorities. The fund undertakes its own monitoring and due diligence of projects and has the effect of increasing the creditworthiness of a project (Yescombe 2014).

Besides revenue guarantees, public entities can issue guarantees, letters of credit, and insurance contracts on infrastructure finance instruments. Guarantees on debt differ from other risk mitigation instruments in that public funding will only be provided to service debt held by third-party investors if the project does not generate enough revenue to cover interest or principal payments. The cause of the default does not play a role and the procedure to call on the guarantee is usually simple and the payment occurs in a timely manner. Typical guarantees are a contracted minimum payment or guarantees in case of default and guarantees in case of inability to refinance the loan at maturity. Credit guarantees can be applied to many different types of infrastructure projects and come in two main forms, but in general are bespoke to meet the requirements of specific projects:

- Full credit guarantees (FCG) (wrap guarantee) cover the entire amount of debt service in the event of default, or the entire amount of specific tranches of debt. Such guarantees are useful to increase the credit quality of a project's debt financing package. Other guarantees can have first-loss coverage providing credit support for senior tranches. As examples, first-loss guarantees are available in the U.S.'s SIB, TIFIA, and in Europe, The Europe 2020 Project Bond Initiative³⁰ (Yescombe 2014)

³⁰ U.S. State Infrastructure Banks (SIB) provide support to projects through supporting loan guarantees and bond insurance, as well as standby letters of credit. The U.S. Transportation Infrastructure Finance and Innovation Act (TIFIA) provides direct federal loans or guarantees on projects up to 33% of project cost. The EIB's Project Bond Initiative provides first-loss support for senior lenders, up to a maximum of 20% coverage (pilot phase).

- Partial credit guarantees (PCG) may cover a portion of debt service, up to a certain predetermined amount, or certain targeted instruments in the capital structure of a project SPV. Also called *pari-passu* guarantees, private lenders and public-sector guarantors share in credit losses up to the amount guaranteed. Partial coverage promotes risk sharing and can reduce moral hazard.

Export credit guarantees are a particular form of guarantees usually provided by export credit agencies. They cover risks linked to the export of goods and services, covering a percentage of both political and commercial risk. Usually the nationality of the exporter plays a role in the availability of such a guarantee; however some bilateral institutions may offer guarantees regardless of nationality (Matsukawa and Habeck 2007).

Guarantees have been issued by national and subnational governments, multilateral and bilateral institutions, development banks, and other public entities (Matsukawa and Habeck 2007). For instance the Overseas Private Investment Corporation (OPIC) provides both political risk insurance and loan guarantees, which are in turn backed by OPIC's own reserves and the US government (Weber and Alfen 2010). Some issuers of guarantees charge fees.

As an example of which risks may be covered, OPIC insures new ventures and expansion projects, covering the full spectrum of investment instruments including equity, loans, technical assistance agreements, leases and other instruments that expose investors to long-term risks (ibid). Investors can purchase insurance from OPIC in the following main risk areas³¹: currency convertibility, expropriation, regulatory risk, and political violence.

Guarantee mechanisms can be set up in a number of different ways, involving direct commitments from public budget or through a separate guarantee fund; commitments in turn can be funded or unfunded. The extent to which the public entity guarantees repayment can also vary. PCG only cover a limited amount of debt, while FCG or wrap guarantees cover all debt commitments. PCGs and FCGs can be useful to mitigate refinancing risks, covering bullet payments at maturity. They may also be useful to help extend maturities of issues, or to help project companies raise debt through market channels such as project bonds. To the extent that revenue streams are not completely smooth, and that forecasting long-dated cash flows can be difficult, guarantees can help to mitigate these risks. Furthermore, governments can also provide standby letters of credit (Gatti 2014, Matsukawa and Habeck 2007).

Guarantees or insurance can differentiate between the cause of a default, usually either political or commercial in nature. In such instruments, payouts would depend on the cause of loss (Matsukawa and Habeck 2007). An insurance policy would require filing a claim and waiting for the review process to complete prior to payout.

The public guarantee reduces repayment risk and through this lowers the cost of credit. The impact of the guarantee can be substantial and render the project eligible to investment by institutions facing regulatory barriers, hence the better the credit rating of the guarantor, the stronger the impact will be. The eligibility for a guarantee scheme should be examined via a thorough examination process followed by monitoring procedures to avoid negative consequences such as moral hazard.

³¹ <https://www.opic.gov/what-we-offer/political-risk-insurance/types-of-coverage>

Private sector insurance and external credit enhancement

Private insurance contracts, letters of credit, and guarantees also play a role in the risk mitigation of infrastructure. Similar to public guarantees, insurance can come in many forms including revenue guarantees (insurance against business risks), credit guarantees on debt instruments (wrappers), or insurance against political and regulatory risks. What differs is the manner in which payments are settled. The process to draw on a guarantee is rather straightforward and payments are disbursed relatively quickly. Filing an insurance claim and receiving settlements can be a longer process than drawing on public guarantees (Matsukawa and Habeck 2007). Banks can issue letters of credit that provide credit enhancement for debt issues.

Private insurance contracts for business and commercial risks can be expensive; such risks may be better managed by internal means and through operational efficiencies. For instance, the diversification of business risks across multiple assets (corporate finance model) can effectively reduce commercial risk and reduce the need for insurance.

Wrap insurance covers debt instruments written into the policy (usually senior issues, but it could also include subordinate issues). Private monoline insurers were a major player in providing credit enhancements before the financial crisis – since then availability has diminished, but is slowly returning. Monoline insurers generally require that the issuing entity have at least an investment grade credit rating. A drawback of monoline insurers, which became evident during the financial crisis, is that guaranteed issues can only maintain a maximum rating that is equal to the wrap entity. Thus a downgrade of the wrapper would translate to a downgrade on wrapped issues.

From the private sector, guarantees can come in the form of certifying the performance of new technologies like solar panels or wind turbines (OECD 2015). In the clean energy sector, insurance products can protect investors against construction and operational risks, certain market risks such as price changes, weather related production risks³², and political and regulatory risks.

Insurance contracts are useful for mitigating exogenous risks and uncertainties that are difficult to price into infrastructure finance. Force majeure, sovereign risk, and project related political and regulatory risks are some of the main areas where insurance contracts are used.

Hedging: Derivatives contracts

Interest rate swaps, forwards, or other derivatives contracts can provide flexible alternatives to alter the payment profile on debts. For instance, floating rate loans and bonds are common instruments in project finance. In low rate environments, managers may be inclined to lock-in fixed rates using derivatives, effectively changing the payments on debt from floating to fixed, or vice versa. Derivatives can therefore be used to hedge certain interest rate exposures and facilitate long-term planning security of future cash flows (Weber and Alfen 2010). More complex hedging involving interest rate options can set caps or floors on financing rates, facilitating financial planning. Like insurance, the buyer of interest rate protection pays a premium to hedge risks.

Currency derivatives such as swaps, forwards, futures, or options can also reduce financial risks in infrastructure by hedging currency exposures. These instruments are

³² A lack of sunshine for solar, or lack of wind for Aeolian.

particularly useful if currency mismatches occur between revenues and liability payments. Alternatively, to reduce currency mismatches, assets could be financed using local market instruments to match revenues; however, this is not always an option if capital in local markets is not available. Derivatives can be used to hedge market exchange rate fluctuations and to also hedge convertibility risks.

Credit derivatives such as credit default swaps (CDS) can hedge credit risks borne by project financiers – both debtors and creditors. CDS contracts can be written on virtually any reference instrument such as a bond, note, or loan. Infrastructure projects that bear credit risks from governments or corporate entities can buy protection in the CDS market that could hedge the default risk of a counterparty. Likewise, creditors to infrastructure projects could buy CDS contracts on the actual debt instruments themselves. CDS in this sense work like a type of insurance, the buyer of a CDS contract pays a premium to hedge an event of default. A particularly useful characteristic of CDS is that the value of a contract will change as the market perceived credit risk of a counterparty changes. Thus its ability to hedge a risk is not just dependent on an event occurring (like insurance where an event of default must occur to file a claim), but instead on the market perceived probability of default. The buyer of a CDS contract written on a counterparty would profit from a deterioration in the creditworthiness of said counterparty. CDS contracts represent the uncoupling of credit risk from interest rate risk and exchange rate risk which when combined cover a great deal of the financial market risk borne by infrastructure investors.

Derivatives however are not a panacea. They are useful tools for hedging certain risks, but OTC contracts themselves can create counterparty risks – the limits of which were tested during the financial crisis. Furthermore, the cost of derivatives contracts may also not always allow for their use. The cost/benefits of hedging must therefore be compared to the possible losses incurred to the infrastructure asset, or to the impact on cash flow volatility.

Contract design: Availability payments and offtake contracts

Availability payments are used by governments in cases where the underlying infrastructure asset does not offer predictable direct revenue; for example when end users do not pay for the use of public facilities via a user fee, but rather via a broader tax pool. Instead, the contracting authority pays the counterparty for the provision of the facility. In cases where the private entity is contracted to maintain and operate the facility or provide additional services, the availability payment can be complemented by fees paid by the public entity to ensure the delivery. Both the availability payment and eventual fees can be tied to quality requirements as a performance incentive for the private contractor in an effort to reduce moral hazard risk.

Output and performance measures are defined in the contract, while the means to achieve this output (design, construction and maintenance specifics) is usually left to the private contractor, which is thus accountable for any deficiencies in design or delivery of the facility. The public sector thus transfers construction and other risks related to the physical nature of the facility to the private sector, while taking on the demand risk through the availability payment.

Availability payments are common in the social infrastructure sector, such as schooling, social housing or hospitals, and can also be used for economic infrastructure when the end user does not pay a usage fee (some roads, railways, tunnels, or bridges). The public authority thus assumes demand risk from the private partner (Gatti 2014). The term “shadow tolls” designates a payment agreement where the user does not pay directly

for the usage of a facility, but the private company responsible receives payment from a public authority based on usage volume - demand risk is thus not fully transferred to the public sector (this structure has been used in the transport sector). Availability payments can be complemented by other forms of payment such as financial incentives to provide quality service to mitigate moral hazard risk.

Offtake contracts are common in power generation and infrastructures that “produce” outputs (water included). Such contracts allow the project company to supply output at a pre-agreed price, which can help to reduce future revenue uncertainties. The regulation of public utilities companies is similar: in order to deal with the monopoly position of utilities, regulated prices limit monopoly power. Offtake contracts both limit the monopoly power of certain projects, but also lock-in an agreed upon rate with regulators. Offtake contracts are signed with contracting authorities. Limiting exposure to market risk has the effect of lowering cash flow volatility and can lead to better credit rating (providing that leverage is not too high)

Throughput contracts are another way to limit revenue volatility. Users of infrastructures such as pipelines agree to use the infrastructure to carry not less than a certain agreed volume, and would pay a minimum price for the usage (Yescombe 2014).

Contract design can be effective at mitigating commercial risks such as the business cycle, fluctuations in demand, and sometimes inflation risk if payments are linked to prices. Revenue risk is a chief risk in modelling infrastructure performance and valuation. Contracted payments are a method to reduce this risk which would benefit both debt and equity holders in a project. While availability payments are mostly discussed in the project finance context, corporations that build and operate infrastructure can also benefit from such arrangements.

Provision of capital

Capital finance choices, covered in Part I of the taxonomy, can help to mitigate the overall risk of the project or sponsoring entity (such as avoiding high levels of leverage). Governments or MDBs can play a role in risk mitigation by providing equity or debt investments alongside private investors, and by offering more favourable financing terms to investors. Guarantees, which can be closely related to the provision of capital, are treated separately in this taxonomy.

Government involvement in the provision of capital can be applied to virtually all infrastructure sectors. Equity and debt can be provided at i) market or ii) more advantageous conditions:

- The first case should be based on the project’s profitability and a satisfying risk/return ratio, much like the decision to invest taken by a private investor. Public commitments early in the investment process can however help to attract private investors by acting as a “cornerstone investor”, demonstrating support for the project and trust in its viability (OECD 2015). In such instances, the project would not be viable if it were to rely solely on private sources of capital. Public sector involvement can also help to reduce certain political risks.
- Public sector loans in “first loss” position provide credit enhancement for senior tranches. Gap financing that is pari-passu to other lenders can demonstrate government commitment to a project, and share credit losses (Yescombe 2014).

- The second case can be viewed as a type of subsidy, reducing financing costs and freeing up capital for other commitments. When providing financing at more attractive rates than the market, it is important to ensure that it is justified from an economic and social viewpoint and does not crowd out private investment, and ensure that bidding processes are competitive. The volume provided should encourage more private investment or close a possible financing gap.

As an example, through the U.S.'s TIFIA program, low cost loans based on Treasury rates are offered for qualifying transportation projects. Repayments may be made after long grace periods after project completion and is usually in the form of a mezzanine loan, providing credit enhancement for senior tranches (Yescombe 2014).

Debt, in particular, has some characteristics that inherently reduce endogenous risk to projects and corporate finance. Large interest and principal payments can force management to improve performance and operational efficiency, the so-called “discipline of debt” (Tuck 2002). Debt payments also reduce free cash flow available for managers to use at their discretion (Helm and Tindall 2009). Debt covenants also enhance the ability for creditors to monitor the risks that managers take.

Properly financed projects that use a mix of debt and equity without excessive levels of leverage can be effective at mitigating many of the market risks and technical risks covered in the previous table. For instance, debt instruments with amortizing structures can reduce refinancing risk. Equity or debt instruments offered at below-market rates can enhance project profitability, offsetting some business and macroeconomic risks. MDBs that provide credit support through subordinated and mezzanine debt can mitigate political risks and market risks.

With respect to currency, there are some past examples where price increases or rate hedging clauses are structured into the project to mitigate a currency mismatch (Weber and Alfen 2010).

Grants and taxation

A grant is a payment usually made by the contracting authority to the entity executing the project. These payments can be free of charge or subject to a fee (e.g. a concession fee). Grants can be paid out at any time during the project life-cycle, reducing financing costs during the development and construction phases or stabilising revenue in the operation phase by providing public funds. While not a risk mitigation instrument per se, a grant can effectively reduce or offset objective risks in project finance but does not eliminate risks entirely. They can be lump-sum payments, tied to project revenues, or also tied to certain milestones to be achieved in the project lifecycle.

In some cases, the public entity might provide the private counterpart with public assets, including the right to use public land for free or at reduced cost. The concession of public facilities for refurbishment and/or operation for a defined period can be taken as an illustrative example, where the public entity provides the counterparty with the asset in exchange for capital and services, eliminating or reducing construction risk (Gatti 2014).

Taxation is a powerful tool that can be used to increase the attractiveness of infrastructure investment. Reducing or suspending property taxes and/or extending tax breaks on investment revenues can subsidize projects throughout the life of the asset. Taxation is included in grants because it essentially amounts to a fiscal transfer either enhancing revenue directly, or reducing outlays needed at project inception.

Direct or indirect fiscal transfers are effective at mitigating risks in the construction and operation phase, but can also provide prefunding in the development stage of projects (e.g. taxation). They are effective at reducing commercial risks of projects by enhancing revenues. They can also specifically address the availability of funding for a project or certain technical aspects such as funding feasibility studies and investment plans. Land grants can help address certain environmental and archaeological risks, assuming that before the land is transferred, the government has assessed such risks.

Yescombe (2014) notes that an excessively large capital grant (> 50% of total capital cost) could result in the reduction of risk transfer to the private sector and linked advantages. Grant disbursement during the construction phase is typically connected to reaching certain stages of development and would also lead the contracting authority to assume construction risk. The public authority may alternatively provide a grant in connection with reduced contract payments to the private partner, ultimately only shouldering the additional cost of credit which is usually lower for the contracting authority than for the private partner.

*Appendix II.1.***Description of risk linked to infrastructure assets****Political and regulatory risk**

Procurement of permits (land, construction, environmental): Obtaining the necessary land, construction or environmental permits might prove more costly or take longer (and thus increase costs) than expected.

Cancellation of permits: The risk of a public authority cancelling necessary permits.

Contract renegotiation: The risk of a public authority forcing renegotiation of contracts, thereby changing the financial arrangements of the original project.

Change in tariff regulation: The risk of a price change in regulated markets due to a political decision.

Contract duration: The length of the contract is appropriately matched to the length of the useful lifespan of the asset.

Decommission: Risk related to the disposal of the asset at the end of the contract agreement, or useful life of the asset. This risk is especially related to large assets that may generate toxic wastes or environmental risks that need to be cleaned up before the asset may be retired.

Asset transfer: The feasibility and cost of transfer of the asset at the end of the contract agreement. The risk that an asset could become “stranded” due to changing government regulation or policy

Enforceability of contracts, collateral and security: This risk is closely related to the legal environment that is associated with infrastructure finance such as PPP frameworks, and the enforceability of leases, concessions, and other contracted payment schemes.

Changes in wider regulatory or legal environment: Any modification of the regulatory or legal environment can have widespread consequences on affected companies. This risk can be differentiated through the range of affected entities. A general change in law applies to all businesses in the country, a specific change in law to a defined industry and a discriminatory change in law singles out one company. The ability to cope with or even anticipate such changes can be important for the continued economic viability of a project.

Changes in taxation: Changes in taxation of company or project revenues, output delivered by the project, financial transactions or any other element of the project structure including taxation levied on investors themselves. Changes might be categorised similarly to changes in regulatory or legal environment.

Currency convertibility: sufficient amounts of requested foreign currencies are available at the time needed to repay foreign debt or repatriate dividends and principal. This risk generally does not apply to developed economies with stable and developed foreign-exchange markets.

Social acceptance: This risk applies specifically to large-scale public infrastructure projects and is explained by the condition when the general population does not support the project. Consequences can impact all phases of the project. Protest might lead to a delay in construction or hamper proper operation leading to a loss of revenue; official bodies supporting the project might come under pressure from public opinion translating into political action.

Macroeconomic and business risk

Default of counterparty: default of any party involved in the project agreement including government, suppliers, lenders, and insurers.

Availability of Prefunding: The availability of funds to perform viability and feasibility studies. Prefunding is a sunk cost thus making it difficult to raise from private sources before commercial viability can be established.

Exchange rate fluctuation: If liabilities and revenues are in different currencies from one-another, project participants can be exposed to exchange rate risk due to the volatility of exchange rates over time.

Liquidity risk: The risk that assets will generate enough cash flow to service debt payments and any other obligation. Also the risk associated with pricing assets where market prices are not observable.

Refinancing risk: if a project is initially financed via agreements with shorter duration than the project life itself, there is a risk of an inability to refinance loans at maturity due to performance issues or unfavourable market conditions (liquidity, interest rates).

Inflation risk: The risk that aggregate prices increase in an economy, and the asset is exposed to rising prices in a detrimental manner. The risk that the replacement cost of the asset increases over time. Interest rates tend to be correlated with inflation, thus inflation risk can be thought of as interest rate risk.

Real interest rate risk: A component of nominal interest rates, an increase in real interest rates translates to an increase in the real cost of finance, which can strongly affect profitability.

Volatility of demand/revenue risk: The risk that the project company might fail to generate sufficient demand (usage of facilities or service) at the projected price of usage, ultimately leading to a lower level of revenue than projected. Profitability can also be affected by an unforeseen increase in costs.

Technical risk

Archaeological: Additional costs might arise if archaeological discoveries (historical sites, fossils) are discovered on the land intended for construction.

Obsolescence: The technology might become outdated and lose its economic appeal, or become the subject of constraining regulation rendering it uncompetitive in the market. This is true for established technologies but is also applicable to new technologies, where unintended consequences might lead to higher costs or removal from the market.

Technology risk: A (new) technology might not perform as projected or have unforeseen consequences, for example on the environment. Lenders are more reluctant to lend against a project using novel technologies due to a lack of performance benchmarks and increased uncertainty of risks. Yescombe (2014) notes that project finance is more suitable for projects using established technologies.

Governance and management of the project: Failure to deliver and operate the project to the standards agreed due to poor management or poor risk control procedures.

Reliability of forecasts for construction costs and delivery time: The risk that the construction authority fails to deliver the project on time and on budget. The reasons can be due to a performance deficit of the construction contractor, unexpected events leading to a longer construction period or the failure of third parties to provide auxiliary services necessary for operation. The consequences could be a rise in financing costs, including interest payments during a prolonged construction period, loss or deference of project revenue, as well as financial penalties payable to the contracting authority. A delay in construction thus very often leads to the need for additional funding, responsibilities for which should be allocated in the contract signed between the relevant parties.

Qualitative deficit of physical structure/service: The risk that the project might not deliver the agreed output at agreed conditions.

Force Majeure: Risk of forces outside the control of any project participant and affecting the proper delivery, operation and termination of the project. This includes direct (physical damage) and economic (loss of revenue) consequences from natural disasters, as well as economic (strike) and political (war) developments. Force Majeure events might be defined in insurance or risk transfer agreements.

Environmental risk: A project's impact on the environment does not only have significant financial implications, but is also an increasingly important factor for potential investors operating under ESG guidelines. The direct, quantifiable impact on the environment such as the production of waste and carbon emission may be reflected in the form of permits or additional taxes, thus creating a cost factor which needs to be estimated and managed. Indirect risks stemming from a project's impact on the environment include public opposition to construction or operation, as well as negative image effects for involved sponsors or lenders. Legislation and regulation defining environmental requirements and standards might substantially change, in extremis rendering a technology obsolete. New technologies might have unintended negative consequences on the environment, exposing projects to a possible surge in costs and endangering the business model. Since infrastructure assets are built for long operation phases, this risk is especially relevant for them. An Environmental Impact Assessment might help quantifying the exposure to environmental risk and establish compliance with current laws, but does not protect from unforeseen events. On the financing side, environmental factors become increasingly important to potential investors, illustrated by the spread of guidelines and principles they are adhering to.

Termination value: Since infrastructure assets are long-lived, any issues with forecasting, particularly related to salvage values and depreciation of assets over time can affect the expected termination value of an investment. For PPP contracts where the terminal value is zero, this is less of an issue. This risk can be greater for direct equity owners such as corporate balance sheets or direct equity sponsors.

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