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Introduction and Summary

The world is a messy place, and while we do our best when developing and financing infrastructure projects to identify, mitigate, and manage risks, we are beset by challenges – climate change, natural disasters, war, political upheavals, economic crises (e.g., exchange rate shifts, inflation, commodity price variations), global pandemics, rising sovereign and corporate debt levels, and the foibles of the human condition. A more fundamental concern relates to project management and efficiency. Infrastructure projects must be well managed, well planned, technically and technologically robust, economically impactful, effectively delivered, efficiently managed, and financially sustainable, and they must deliver good-quality services. The complexity of infrastructure straddles public and private mandates and capacities; a partnering arrangement, whether by contract or regulation, is best placed to deliver efficient and sustainable infrastructure.

Even assuming perfect foresight and an ability to manage risk, the level of investment needed for infrastructure far exceeds available public resources. Developing countries are constrained in funding of public infrastructure by tighter fiscal space, increased national debt from a costly pandemic response, and a prevailing global economic slowdown characterized by higher inflation and higher fuel and commodity prices, which are worsened by geopolitical conflicts that confuse logistics and complicate sourcing of inputs. In 2021, public debt had increased by more than 10 percent of gross domestic product in most developing East and Asia-Pacific countries compared to prepandemic levels and by more than 20 and 30 percent in the Philippines and Fiji, respectively.[1] Given the need for capital in developing countries

[1] World Bank, *World Bank East Asia and Pacific Economic Update (Spring 2022): Braving the Storms* (World Bank, 2022), DOI: 10.1596/978-1-4648-1858-5. License: Creative Commons Attribution CC BY 3.0 IGO.

and the creativity required to make projects in the developing world attractive to private capital, this book gives particular focus to developing country investments.

Public funding and financing are not enough; the need for infrastructure investment necessitates commercial funding and private finance as well as public support. This text specifically differentiates funding and financing. Financing is the debt and equity used to develop infrastructure assets, which may come from public or private sources, can have many different characteristics, and can be sourced through different instruments. Funding is the revenues earned by the project, from users or other beneficiaries, from commercial activities, or from public contributions. The two are fundamentally linked – more funding means better terms for financing.

Funding (revenues) for infrastructure is tricky. For example:

- Demand for infrastructure can be uncertain, driven by alternate service provision, new technology, economic cycles, and the ability of users to pay.
- Willingness of users to pay for services and the need to protect users from (sudden) price increases (e.g., inflation, foreign exchange risk, interest rates) make user fees risky, politically sensitive, and in some cases unreliable.
- Government sources of capital (whether local or national) are often used as project revenue to offset capital investment and to fill the gaps – for example, capital contributions during construction (often called viability gap funding) and/or availability payments.[2] These sources may include general fiscal revenues, dedicated taxes, and central government transfers. While government capital shows commitment to the project, it is also a drain on public resources and can cause friction with the population and with future governments, increasing the likelihood of future governments trying to unwind or renegotiate a deal due to its fiscal cost.

Finding additional, commercial, sources of funding can make the project more sustainable, better able to adapt to changes in costs (e.g., inflation), better connected to the local community through services delivered and jobs created, and less of a burden on fiscal resources and therefore less likely to be a target for future governments seeking to reduce fiscal burdens.

Part I of this book focuses on "funding," on the revenue streams that are the lifeblood of any infrastructure project. Finding innovative sources of funding not only improves the financial viability of the project, earning more profits and allowing lower user fees and fiscal contributions on the back of these funding sources, but will also make more finance available. Lenders will be comforted by a more robust financial foundation of the project and by the diversity of risk that innovative commercial revenue streams can provide.

[2] For further discussion of project financial structuring, see Jeffrey Delmon, *Public–Private Participation Projects in Infrastructure: An Essential Guide for Policymakers*, 2nd ed. (Cambridge University Press, 2017).

Part II introduces finance and key innovative financing models. Innovative sources of financing can provide an important advantage for infrastructure projects: mobilizing more capital on better terms from a more diverse set of financiers. Three interesting types of innovative finance will be discussed here:

- Climate finance – where financiers seek to support investments with positive climate externalities;
- Islamic finance – whose financiers follow Islamic tenants, which place specific restrictions on the characteristics of the financing structure; and
- Blended finance – where development finance (financiers seeking to achieve developmental impacts – often with lower interest rates or grant funds) is mixed with commercial finance to combine their respective advantages.

While innovative finance provides an important opportunity for infrastructure finance, the fundamentals of finance are still fundamentals, and mobilizing innovative finance will still follow the basic principles of financing and concepts of bankability.

1.1 INNOVATIVE SOURCES OF FUNDING

The more revenues a project can mobilize and the more robust the sources of revenues, the more sustainable the project is and the more likely it is to survive economic crises, changes in government, political upheaval, and other systemic risks.

There are two main sources of revenues for infrastructure projects:

- **User payments** – Charges are collected from the users of the infrastructure or service. The level of user charges allowed is generally defined by an agreement with the contracting authority and/or by the sector regulator. User fees need to be kept affordable and are generally ill suited to responding to sudden increases in inflation or input costs. Charges must be affordable to all potential users, and the demand for the services must be sufficient to ensure the anticipated revenues. Users may need to be disconnected for failure to pay, which may not be legal or practical for core services – for example, disconnecting underprivileged users from water, solid waste, or sewerage services can be unpopular and even dangerous.
- **Government payments** – The project company is paid a fee (an "availability payment") by the contracting authority (or some other public source) to make specified infrastructure or services available for use. This approach is used where the contracting authority itself is the main user (e.g., paying the private partner for providing a building or facility), where the contracting authority is itself collecting charges from users (e.g., where the contracting authority collects solid waste charges from households and pays the private partner for services), or where users cannot be charged directly at all (e.g., where a contracting authority pays the project company to provide street

lighting). The contracting authority may prefer to retain responsibility for collecting charges where placing collection risk on the project company is not efficient or practical (e.g., where people are less likely to pay charges to a private entity, where collection risk is too high for the project company to manage, or where it is illegal for the project company to collect user charges directly). Some projects may receive additional support in the form of grants from national government and/or external donors or agencies and in the form of capital grants to offset initial construction costs. The purpose of such support is usually to plug gaps in the projects' finances and/or to reduce the cost of services to users. But government payments are not necessarily the most sustainable sources of funding; as fiscal capacity evolves and political will shifts, such demands on budget can elicit resentment.

Infrastructure practitioners are often so accustomed to designing projects around user payments and government funding that we do not provide incentives for private investors to mobilize innovative funding. Often, we are so cautious about private sector focus on profit that incentives to be creative around revenues might seem contrary to a focus on infrastructure services. While the focus on service delivery is critical when planning and developing infrastructure projects, government should look to mobilize funding from a variety of sources. For example:

- ***Land value capture*** – The development of infrastructure assets will often result in an increase in land values adjacent to the project site or in the catchment area of infrastructure services; for example, the construction of a new public market can result in a significant increase in the value of the land around the market, where commercial activities will develop to respond to opportunities created by the market. Connecting a neighborhood to electricity or to fiber broadband can increase land values in that neighborhood. But these are windfall land value increases, and the landowner has done nothing to merit such increases; in fact taxpayers have funded the infrastructure investment that generates the windfall. It would be appropriate for such landowners to share in the land value increase only to help fund the investment in infrastructure that will create or has created the increase. The government has a number of methods available to capture part of this land value increase to help fund its investment (land value capture or LVC).[3] This topic is discussed in great detail in sector literature. This book will introduce and summarize the topic in Chapter 2, as a first step to understanding key concepts and issues. For a more detailed understanding of LVC, sector literature is referenced liberally in chapter footnotes.
- ***Commercial revenues*** – Often, an infrastructure project will have the potential to generate commercial revenues from part of, or in some way that is

[3] For further discussion of LVC, see "Module 16: Harnessing Land Value Capture," World Bank Municipal PPP Framework, www.worldbank.org/ppplrc. For further discussion of CVC, see https://ppp.worldbank.org/public-private-partnership/Innovative_Revenues_for_Infrastructure.

related to, the public infrastructure or service it delivers. The contracting authority can use the public assets or rights that it provides to the project company as part of the project – for example, concession, land, and access rights – to specifically enable the project company to leverage more additional revenues from commercial activities such as advertising, parking, office space, residential space, and retail facilities (commercial value capture or CVC). CVC is described in greater depth in Chapter 3.[4]

Governments often perceive investment needs, in particular infrastructure, solely as a public service, a cost center. In fact, such investments may also create commercial prospects, providing opportunities for higher value and more or new commercial activities. Such commercial activities can provide additional advantages to the community: more and better commercial services, economic growth, and jobs. CVC links the infrastructure with the community more completely, leveraging synergies. A project with well-developed CVC should be more sustainable, through diversified demand risk and revenue sources but also due to its links with the community; future governments should be less likely to seek to renegotiate or unwind the project.

Infrastructure can provide a useful mechanism to mobilize CVC to fund public services.[5] For example:

- A public market may not be able to attract sufficient revenues from letting space in the market to vendors to cover costs, but the project may offer other commercial activities in or near the market to generate needed revenues and offer additional services, such as residential or office space.
- Bus or truck terminals may not generate enough revenue from fees charged to buses or trucks, but they often provide an opportunity for retail activities, selling goods and services to passengers and the public, including parking, advertising, retail, and hospitality.
- Government offices normally do not generate revenues, outside of government lease payments, but in some circumstances they can be developed as mixed-use space, with commercial office and retail facilities, to generate additional revenues.

Chapter 3 provides a more detailed description of a few of the key commercial activities that can be adopted into infrastructure projects to mobilize CVC, including the following:

- Advertising and marketing – The project may be able to take advantage of user and other traffic and the space available on and around an infrastructure asset for advertising.

[4] For further discussion of CVC, see "Module 17: Capturing Commercial Value," World Bank Municipal PPP Framework, https://ppp.worldbank.org/public-private-partnership/municipal-and-subnational/municipal-public-private-partnership-framework and https://ppp.worldbank.org/public-private-partnership/Innovative_Revenues_for_Infrastructure.

[5] Delmon, *Public–Private Partnerships*.

- Naming rights – Where an infrastructure asset is iconic, like a stadium, companies may be willing to sponsor the structure for the right to display their names on that structure and for their names to be associated with it.
- Residential space (including low cost) – Housing can be built above or around the infrastructure to generate additional revenues. For some forms of infrastructure, such as transport, the asset may increase the value of housing and allow for mixed-use facilities that provide a further cross-subsidization of low-cost housing.
- Parking (above and/or below ground) – The space above, below, and around the infrastructure can be used for commercial parking facilities, to earn new revenues and to address congestion.
- Hospitality (e.g., hotels, restaurants, cafes, catering) and tourism – The location of the infrastructure might make hospitality facilities more attractive; for example, convention centers are often developed with hotels, sporting facilities with restaurants and cafés.
- Medical services (e.g., clinics, imaging, consultants, pharmacy) – Often developed alongside hospitals, specialist medical services provide additional services to the community and also leverage new revenues from high-value services.
- Logistics facilities (e.g., cargo handling, warehousing, chillers, dry ports) – Ports, airports, and other transport infrastructure can often provide an opportunity for logistics facilities, to improve the general transport offering of the country and the facility, but these high-value services can also cross-subsidize the large-scale infrastructure that creates the opportunity for logistics facilities.
- Vehicle services (e.g., petrol, mechanics, truck/bus parking) – Where vehicles use the infrastructure or where the infrastructure offers large amounts of space outside of congested urban areas, commercial revenues can be extracted from vehicle services in and around such infrastructure.
- Retail and commercial space – While other more specific examples of retail and commercial activities are listed here, the variety of such activities that might be appropriate for a given infrastructure investment is vast; hence, a catch-all category is included to encourage thinking outside of the box, looking at all activities that might be appropriate for the project and community in question.
- Development rights – Investments in infrastructure can increase the demand for additional property development, for example, more square footage, additional floors, and rezoning for different uses; these development rights can be sold at a premium that reflects the additional value of the property.
- Repurposing or adaptive reuse of idle assets – In some cases existing buildings or facilities may be linked to the infrastructure investment. By commercializing these assets, government addresses the challenge of disused or underused assets and creates new revenue streams at the same time.
- Infrastructure sharing (internally and externally) – An infrastructure project may also provide an opportunity for other infrastructure; for example,

road and rail projects require large rights of way that can also be used for telecoms, power, and water transmission infrastructure; central heating and cooling or similar services developed for one purpose can be expanded to provide services for a larger population, providing an additional public service and diversifying demand and sources of revenue.

- Usage of facilities during off-hours or off-seasons – Some infrastructure is used intensively only at certain times, for example, sporting facilities, convention centers, educational facilities, and school dormitories; these facilities can be used for revenue-generating purposes during off-periods.
- Cost reductions – An infrastructure investment may (or may be designed to) reduce the costs of the contracting authority; rather than structure payments to the project based on usage or availability, the payment stream may be linked to cost reductions achieved by the project. The revenues can be ring-fenced from allocations for costs that are reduced by the project.
- Additional offtake from the facility – The infrastructure can be used to create other forms of offtake; for example, methane captured from solid waste projects and sludge processed from wastewater treatment plants can be commercialized or processed to produce additional offtake.
- Beneficiary contributions and prepurchase of services – There may be large users of services who wish to enable project development. In some cases, these large users may need to provide contributions to capital costs; for example, large mines located along a new road corridor will have a specific interest in providing capital to improve their time to market, reduce wear and tear on vehicles, and so on and may therefore contribute to capital costs of the road. Future large users may be willing to prepurchase services, for example, universities prepurchasing bandwidth from a fiber-optic project.

When identifying potential infrastructure projects and performing prefeasibility and feasibility studies to assess and validate each project, the contracting authority should assess the possibility of CVC. The focus on commercial revenues must never take the focus off the public services to be provided by the infrastructure. For example, a public market looking for higher-value commercial space might be tempted to reduce the space made available for low-cost vendors. A low-cost housing project looking to mobilize commercial revenues through mixed-use space might be tempted to reduce the number of low-cost units developed.

Increasing commercial activities can place more pressure on public service requirements. For example, a parking garage that mobilized CVC by leasing office space developed above it will need to provide additional parking to address the needs of the tenants of the office space. A bus terminal mobilizing CVC by offering additional commercial services might need to be designed for increased foot traffic, as passengers remain in the terminal longer than normal to benefit from the commercial services and other customers come to the terminal who are not otherwise bus passengers.

Emission Reduction Credits

Other innovative sources of revenue come from services that an infrastructure asset can provide only if designed and managed accordingly; for example, as companies and governments seek to deliver on net-zero greenhouse gas emissions, they are, under various mechanisms, allowed to purchase the emissions reductions delivered by others. A well-designed infrastructure project can deliver such emissions reductions, get those reductions certified, and sell those emissions reductions around the world. These emissions reduction credits have to comply with different requirements and standards but can offer a significant new source of revenues for a project and at the same time certify the project's green credentials, which can also open the door for other forms of financing.

Turning Innovative Sources of Funding into a Programmatic Solution

A project should maximize sustainable revenues from all potential beneficiaries, and therefore the contracting authority should use the following hierarchy of revenue sources when designing a project:

- *First*, infrastructure projects should maximize sustainable revenues from service beneficiaries. Those who receive a service, or a better service, should pay for it. Sustainable means that the tariffs are progressive in nature and affordable for users and the contracting authority and that the users are willing and able to pay the proposed tariffs.
- *Second*, infrastructure projects should capture part of the land value increase resulting from the infrastructure.[6] This can be achieved through taxation, property development levies, contributions, and a number of other mechanisms.
- *Third*, infrastructure projects should maximize sustainable commercial revenues. Infrastructure should be used to create additional economic opportunities and improve existing economic activities.
- *Finally*, only after the first three revenue sources have been explored should public money be used as project revenue or public guarantees to enhance project viability, and only where that public support represents value for money for the government, the community, and the economy.

The project will be vulnerable if the private partner makes too little profit or makes too much. The public–private partnership (PPP) agreement needs to address payment risk, demand risk, and sharing of superprofits (when the project performs significantly better than the forecast at the time of bidding).

[6] Rana Amirtahmasebi, Mariana Orloff, Sameh Wahba, and Andrew Altman, *Regenerating Urban Land: A Practitioner's Guide to Leveraging Private Investment*, Urban Development Series (World Bank, 2016), DOI: 10.1596/978-1-4648-0473-1.

Transit-Oriented Development

Other approaches to infrastructure planning and design can be used as a vehicle for embedding innovative sources of funding into projects at an early stage and to approach project planning systematically to ensure the best generation of innovative sources of funding. Transit-oriented development (TOD) provides an excellent opportunity to leverage LVC and CVC consistently, and in fact in certain countries LVC/CVC is synonymous with TOD. Chapter 4 describes TOD as a generator of LVC and CVC.

1.2 INNOVATIVE SOURCES OF FINANCE

Finance is capital provided to develop an infrastructure asset, generally seeking to be repaid with the possibility of upside in the form of interest to be paid or a share of profit to be earned. Finance comes in the form of equity and debt.

- Equity funds are invested in the project company as share capital and other shareholder funds. They hold the lowest priority of the contributions; for example, debt contributors will have the right to project assets and revenues to meet debt service obligations before the equity contributors can obtain any return or, on termination or insolvency, any repayment, and equity shareholders cannot normally receive distributions unless the company is in profit.
- Debt contributions have the highest priority among the invested funds (e.g., senior debt must be serviced before most other debts are repaid). Repayment of debt is generally tied to a fixed or floating rate of interest and a program of periodic payments. Debt generally receives no upside; if the project is particularly profitable, the lenders will not receive a share of those profits but will only be paid the agreed debt service.
- Mezzanine/subordinated contributions (e.g., subordinated loans and preference shares) fall somewhere between equity and debt, with lower priority than senior debt but higher priority than equity. Mezzanine contributors will be compensated for the added risk they take either by receiving higher interest rates on loans than the senior debt contributors or by participating in the project profits or the capital gains achieved by project equity.

Infrastructure must be financially sustainable to attract private financing; its revenues need to be resilient and able to cover all operating expenses, including debt servicing, and provide shareholders with reasonable dividends. Lenders will be concerned about ensuring that the project is able to pay interest and repay the principal. They will have a conservative view on assumptions such as traffic forecasts and impose specific requirements (maintenance funds, reserve fund for debt service, minimum revenue guaranteed) to provide them with additional protections, which will have financial implications. Chapter 5 provides an introduction to the fundamentals of finance.

The decision as to which type of financing to adopt will depend on government fiscal position, the market availability of financing, and the willingness of lenders to bear certain project risks or credit risks according to their view of how the market is developing and changing and of their own internal risk management regime.

The most common types of financing are:

- *Government financing* – where the government borrows money and provides it to the project through on-lending, grants, or subsidies or where it provides guarantees of indebtedness. The government can usually borrow money at a lower interest rate but is constrained by its fiscal space (in particular its debt capacity) and will have a number of worthy initiatives competing for scarce fiscal resources. The government is also generally less able to manage commercial risk efficiently.
- *Corporate financing* – where a company borrows money against its proven credit position and ongoing business and invests it in the project. The size of investment required for an infrastructure project and the returns that such companies seek from their investments may result in a relatively high cost of financing and therefore can be prohibitive for the contracting authority.
- *Project financing* – where nonrecourse or limited recourse loans are made directly to a special purpose vehicle. Lenders rely on the cash flow of the project for repayment of the debt; security for the debt is primarily limited to the project assets and future revenue stream. By using such techniques, investors can substantially reduce their equity investment (through debt leverage) and exposure to project liability, thereby reducing the total project cost. This said, project financing requires a complex structure of contracts, subcontracts, guarantees, insurances, and financing agreements in order to provide lenders with the security they require and the risk allocation necessary to convince them to provide funding. This complexity requires significant upfront investment of time and resources by the contracting authority in project development. Further, project financing may increase the overall costs of debt for the project.[7]

Generally speaking, a sovereign government will be able to obtain financing at a lower cost than the sponsors or the project company.[8] The cost-effectiveness of government financing will depend on the credit profile of the government in

[7] Project financing is discussed in more detail in Chapter 5.

[8] Lower interest rates obtained by a government reflect the contingent liability borne by taxpayers. Michael Klein, "Risk, Taxpayers and the Role of Government in Project Finance," World Bank Policy Research Working Paper 1688 (World Bank, 1996). Thus, the risk that results in higher private finance interest rates reflects the actual project risk and is subsidized by taxpayers to achieve the lower public finance interest rates. Since the private sector is best placed to manage most of the commercial risk in infrastructure projects, it is argued that private finance is the most efficient method of financing infrastructure; the inherent subsidy of public finance is more appropriately used in other areas.