WHO SPONSORS INFRASTRUCTURE PROJECTS?

Disentangling public and private contributions

20 YEARS PPIAF Enabling Infrastructure Investment

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Acknowledgement & Disclaimer

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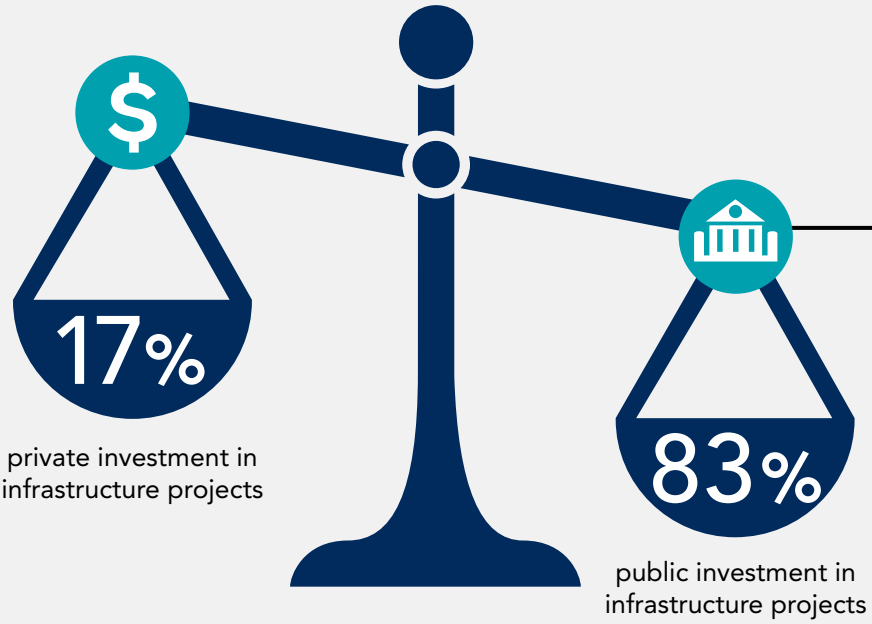
2017

Who Sponsored Infrastructure in 2017?
SNAPSHOT



34% investment by public entities (treasuries, ministries)

66% investment by SOEs

Corporatized sponsors in both private sector (company investors) and public sector (SOEs) had a preference for greenfield projects

59% of public projects had more **equity financing**

70% of private projects had more **debt financing**

73% of SOE investment project commitments were financed by public banks and public equity

55% of private investment was financed by non-private sources (public banks, bilaterals and multilaterals)

72% of public/SOE debt was financed by DFIs

87% of public/SOE investment projects were heavily concentrated at the national level

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Asia, including both East Asia and the Pacific and South Asia, attracted more investment commitments to infrastructure projects than all other regions combined

1.7%

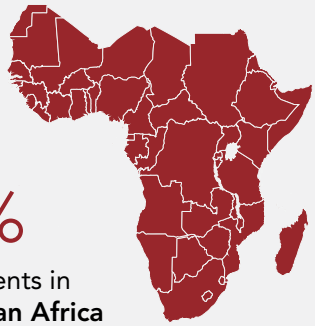
investment share of GDP in **East Asia and the Pacific** is the lowest among all other regions

84%

of the total public/SOE investment in **East Asia and the Pacific** came from China and Indonesia

64%

of the total private investment in **East Asia and the Pacific** also came from China and Indonesia



95%

of investments in **Sub-Saharan Africa** were by public/SOEs

40%

Latin America and the Caribbean had the highest share of private investment

---

50% of total investments were accounted for within these top five countries

10 countries recorded **higher private** investments than public investments

Brazil	Ghana	Mongolia
Cambodia	Jordan	Philippines
Colombia	Mexico	Turkey
Egypt		

45%

of total investments applied to transport sector. Public/ SOEs accounted for 88 percent of the investment.

4%

of total investments applied to water sector. Public entitites accounted for 80 percent of the investment.

50%

of total investments applied to energy sector. Public/ SOEs accounted for 80 percent of the investment.

1%

of total investments applied to ICT sector. Private enti- ties accounted for 76 per- cent of the investment.

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* "Investment" refers to **investment commitment to infrastructure project** recorded at a stage at which construction for the project at which construction for the project can begin, after all conception, planning, documentation and contracts, financing (if any) and alignment of counterparties and contractors has concluded. It is reported for energy, transport, water and ICT backbone projects serving the pubic in low- and middle-income countries, including natural gas transmission and distribution, but excluding oil and gas extraction.

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Abstract

Infrastructure investment has been recognized as an accelerator of economic development, but little is known about the levels of total infrastructure investment and spending across the private and public sectors. The Private Participation in Infrastructure (PPI) database has 28 years' worth of data on private-sector investment commitments (measured at financial close) to infrastructure projects in developing countries. However, there is little data on the corresponding public-sector investment commitments to infrastructure. With support from the Public-Private Infrastructure Advisory Facility (PPIAF), data was collected on infrastructure projects sponsored in 2017, either directly through public budgets or indirectly through state-owned entities (SOEs).

The data collection complements the PPI database and covers investment commitments in energy, transport, water and information and communications technology (ICT)-backbone projects in low- and middle-income countries. Projects are recorded at the stage at which construction can begin—after the completion of the conception, planning, documentation and contracting tasks; the financing (if any); and the alignment of counterparties and contractors. Importantly, although we believe this data offers new and unique insights into the world of infrastructure projects, it is not meant to be representative of public-infrastructure investment as a whole, because it only covers public investments channeled through a project vehicle and does not attempt to measure all public infrastructure investments. Furthermore, because it relies on publicly available information, projects not reported by major news sources, databases, government websites, market submissions and other sources may be omitted. As a result, the database may be biased towards middle-income and larger countries, and larger projects.

This report documents and analyzes the SOE/public project data collected ("SPI data") and compares it to the PPI data, in order to see the relative proportion of investment commitments made by the public, SOE and private sectors to infrastructure projects at the global, regional and sectoral levels in 2017.

Executive Summary

Annual global infrastructure investments are known to have fallen short of levels required to support social and economic development goals in emerging markets and developing economies (EMDEs). But governments, developers, investors, financiers and other stakeholders in the infrastructure arena are challenged by the dearth of information regarding current levels of spending and future investments being committed to infrastructure projects by public, private, and multilateral participants. Moreover, there is limited understanding of the distribution of investment sources, their geographical and sectoral allocations, and the patterns of public versus private infrastructure project sponsorship.

Governments have historically accounted for the bulk of infrastructure investment and development, whether funded directly, or indirectly via corporatized SOEs. The emergence and development of public-private partnerships (PPPs) and other forms of PPI over the past couple of decades has expanded the options for infrastructure development and financing.

Interestingly, despite the consistent dominance of public funding for infrastructure, far more information is available about private investment. The PPI database contains a large dataset of private-sector infrastructure investment commitments since 1995. Although extremely useful for understanding the role of the private sector in committing to infrastructure development, there is limited complementary information about investments committed by governments to infrastructure development. This has undermined efforts to estimate the proportions of public and private investment in infrastructure across markets, regions, project types, and sectors.

Two recent efforts have aimed to close this knowledge gap. First, Fay, Han, Lee and Mastruzzi (2019) draw on several data sets (primarily fiscal and national accounts data) to estimate overall infrastructure investments, which are estimated to be between US$0.8 and US$1.2 trillion. This report represents the second effort—a bottom-up, project-level analysis of investment commitments made to infrastructure projects. The analysis examines investment commitments made in 2017, by both public- and private-sector participants in infrastructure development, for infrastructure activities that are conceptualized on a ring-fenced, project basis (i.e., the data set excludes informal or rolling, non-project infrastructure spending).

Data for this study combines investment information gathered from two sources—the World Bank's existing PPI database and a new, purpose-built data set of state-owned enterprise (SOE) and public sector-funded projects ("SPI"). This SPI data set has been developed with support from Public-Private Infrastructure Advisory Facility (PPIAF), with an initial data collection exercise for SOE and public projects in 2017 and is designed to be complementary to the PPI database. The combined data set allows an examination of relative proportions of investments in infrastructure projects by public and private sector sources, as well as the number of projects for which public or private participants act as the primary sponsor.[1] It is not meant to be representative of public-infrastructure investment as a whole, because it only covers public investments channeled through a project vehicle.

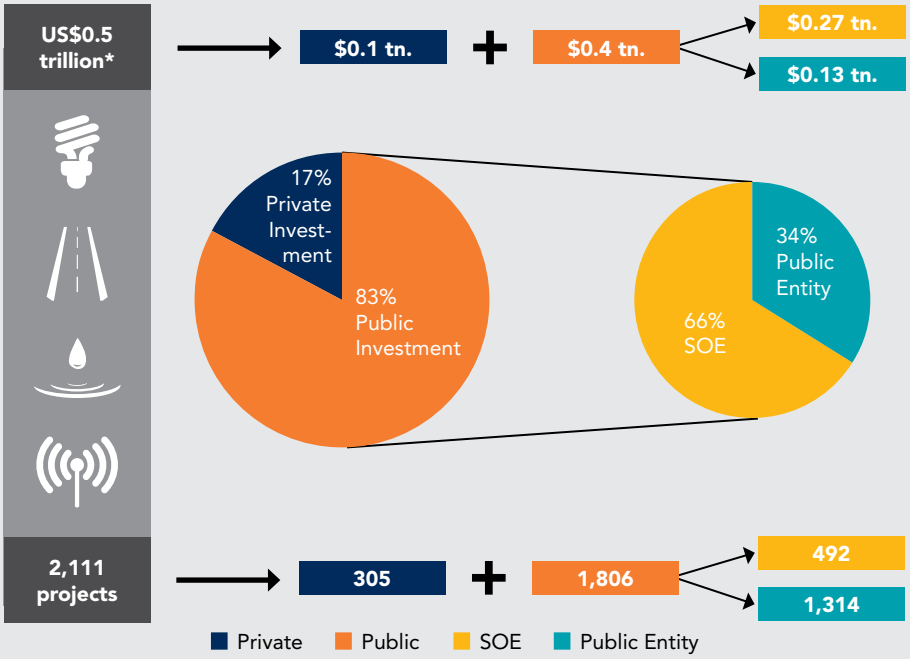
1 In this analysis, a project is considered a 'PPI project' if its majority partner(s), with respect to investment commitment, is/are from the private sector. Conversely, a project is considered an 'SPI project' if the majority investor(s) is/are SOE or government entity. In analyzing investment levels, any investment made by either type of participant (public or private) to any project (regardless of proportion of ownership) is counted towards the recorded measure of PPI or SPI investments.

Global Highlights (2017)

The 2017 SPI and PPI data sets confirm that **infrastructure development is dominated by the public-sector**. Both project sponsorship (i.e., the number of projects being implemented) and the volume of infrastructure project investments are overwhelmingly attributed to the public sector. While the public sector continues to drive overall infrastructure investment and project implementation, private participation plays an important role in offsetting financing shortfalls and injecting much-needed management and technical expertise into public services, and their dominance is observed in certain sectors like the renewable-energy and ports subsectors.

Public sector 'SPI' investments[2], including investment by government entities and state-owned enterprises (SOEs), accounted for 83 percent of the US$0.5 trillion of infrastructure project investment commitments in EMDEs in 2017. Private sources, on the other hand, accounted for only 17 percent of investments.[3] Moreover, the number of projects with majority public sponsorship, known as SPI projects, far exceeded PPI projects, for which the majority ownership was private. In 2017, 1,806 new projects were wholly, or majority sponsored by the public sector, compared to 305 PPI projects.

FIGURE A
Infrastructure Project Investment Commitments in 2017



*Rounded to nearest decimal

Sources: SPI and PPI databases, World Bank, as of November 2018

2 "SPI investment" refers to investment commitments to infrastructure projects made directly by the public sector through ministries and treasuries or indirectly through SOEs, while "PPI investment" or "private investment" refers to investments in private sector-sponsored projects or "PPI projects" as defined in the PPI Database.

3 "Investment" refers to investment commitment to infrastructure project recorded at a stage at which construction for the project can begin, after all conception, planning, documentation and contracts, financing (if any) and alignment of counterparties and contractors has concluded. It is reported for energy, transport, water and ICT backbone projects serving the public in low- and middle-income countries, including natural gas transmission and distribution, but excluding oil and gas extraction.

More specifically, **state-owned enterprises serve as primary sponsors for less than a quarter of the projects initiated in 2017** (488 of 2,111), but still make up the largest proportion of global infrastructure investment commitments, accounting for 55 percent of overall infrastructure investment, and 66 percent of public investment. But interestingly SOEs. This is because SOE investments are concentrated in large-expenditure projects in a handful of markets. In fact, almost half of SOE investment was accounted for by just 12 transport and energy mega-projects (each valued at more than US$5.0 billion) in seven countries, including four projects in China.

With respect to project types, **greenfield projects captured most of the investment from corporatized sponsors in both the private sector (company investors) and public sector (SOEs)**. Whereas the public sector, overall, invested almost equally in greenfield and brownfield projects, the private sector revealed a clear preference for greenfield investments (84 percent), particularly in the energy sector. This is not surprising, because energy-sector projects are often characterized by short construction phases and relatively quick recoupment of investments.

The commercial appeal of greenfield projects to corporatized entities was duly reflected in the investment choices *within* the public sector: SOEs committed to more greenfields (384) than brownfields (108), whereas non-SOE public entities committed to more brownfields (754 brownfields versus 558 greenfields).

FIGURE B
Numbers of Greenfield and Brownfield Projects in 2017, by SPI and PPI per Region

Sources: SPI and PPI databases, World Bank, as of November 2018

All infrastructure investments were heavily concentrated at the national level (87 percent of SPI projects and 80 percent of PPI projects), though SPIs and PPIs both sponsored a fair number of subnational projects, albeit at lower average levels of required project investments. More specifically, half

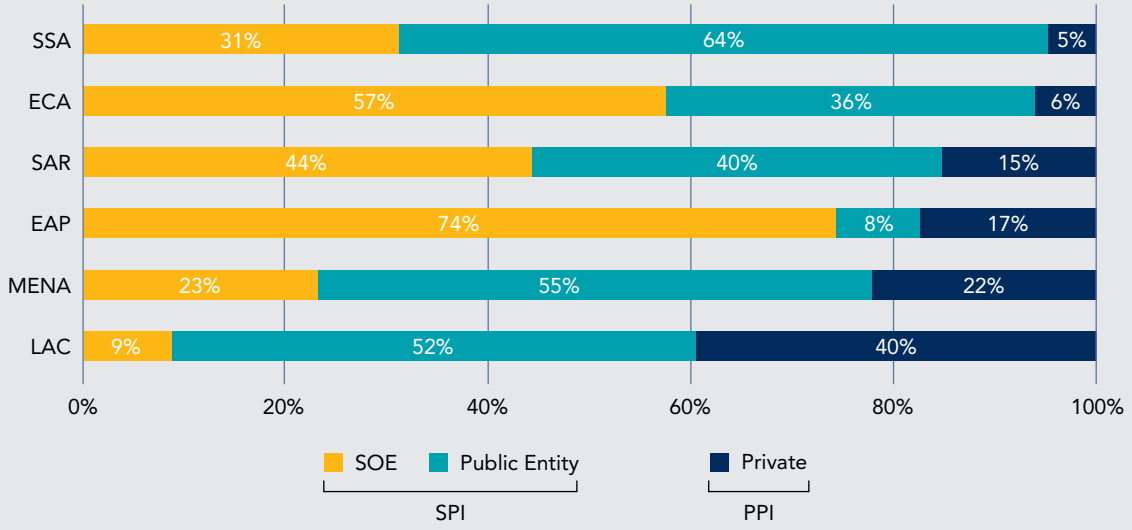
of all SPI-sponsored projects were sponsored by state-level entities, and 23 percent of PPI projects were initiated at the municipal level, but these accounted for only eight percent of private investments.

Regional Highlights (2017)

Whereas global infrastructure investment patterns show the clear dominance of public-sector investment (particularly by SOEs), there are **important regional differences in the relative share of public and private investments**, as well as investment distributions—investments are typically concentrated in a few regions. Perhaps most importantly, East Asia and the Pacific—particularly China—account for a large proportion of infrastructure-investment commitments.[4]

With respect to the distribution of public versus private investments, **public (SPI) investments accounted for more than three quarters of investment in all regions, except Latin America and the Caribbean (LAC)**, where the public sector accounted for 60 percent of investment. At the opposite end of the spectrum, SPI investments accounted for an overwhelming 95 percent of investment in Sub-Saharan Africa (SSA).

FIGURE C
SOE, Public Entity and Private Project Investment as a Share of Total Infrastructure Project Investment by Region, 2017



It is also important to note that **more than half of global investments committed in 2017 were concentrated in five countries**—China, Indonesia, Russia, India and Bangladesh—whose investments accounted for 62 percent of total global public (SPI) investment commitments and 57 percent of private infrastructure-project investment commitments.

Whereas most countries recorded higher government commitments, in line with global results, **10 countries recorded higher private investment commitments than public investment commit-**

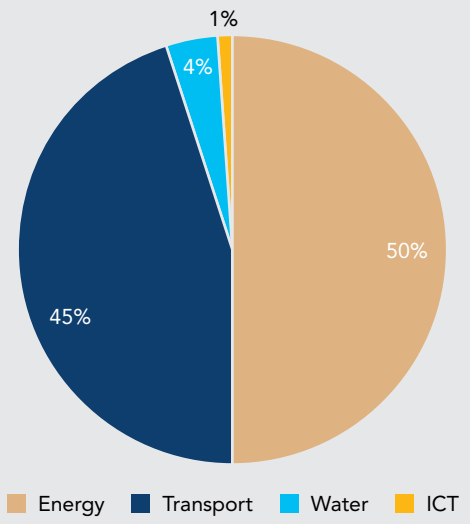
4 See Table 3 in Section 4.3 for comparison with other sources on overall regional spending in infrastructure as a share of GDP

ments. Cambodia, Mongolia, the Philippines, Ghana, Jordan, Egypt, Turkey, Colombia, Brazil and Mexico each drew greater PPI than SPI commitments, potentially attributable to policies aimed at promoting private-sector participation.

Sectoral Highlights (2017)

The vast majority of infrastructure investments committed in 2017 were attributable to transport (50 percent) and energy projects (45 percent). However, sector investments were concentrated in different regions. Both public- and private-sector investors in the Middle East and North Africa (MENA), the South Asia Region (SAR), and SSA invested heavily in energy, whereas the Europe and Central Asia (ECA) and East Asia and Pacific (EAP) regions directed more investment into transport. LAC displayed a clear public-private division in the sectoral distribution of investments: public investment was mainly used for transport projects, whereas private investment was primarily allocated to energy projects.

FIGURE D
Total Infrastructure Project Investment by Sector, 2017



Within the energy sector, **the public sector (primarily SOEs) focused investments on conventional energy, whereas the private sector showed a clear preference for renewable energy**. Private investors accounted for 95 percent and 85 percent of total wind and solar project investments, respectively, but hydropower remains predominantly public, with only a 10-percent private-investment share. The public sector dominated investments in natural gas (concentrated in large-scale SOE projects in Indonesia), whereas coal projects received almost an equal share of investment from the public (SOE) and private sectors.

Transport investments were largely attributable to SOEs for rail transport, public entities for roads and airports, and public-private sector investment for ports.[5]

Water and ICT projects represented only four and one percent, respectively, of all project investments. **Water-investment commitments (totaling only US$20 billion) were largely made by public entities** (80 percent), because their high input costs and low cost recovery levels have dampened private investors' appetite. In fact, private investment commitments to water projects were recorded only in EAP and LAC, mainly for treatment plants in China and water utilities in Brazil. Conversely, **ICT commitments were primarily private** (76 percent).

5 SOEs accounted for almost 80 percent of railway investments, mainly on account of Chinese SOE projects, whereas road-transport investments were 86 percent public (52 percent public entity and 34 percent SOE). SOEs made road investments in only 14 countries, with 72 percent of investments taking place in China and Indonesia.

Financing Highlights (2017)[6]

This analysis examined not only project sponsorship, but also the primary sources of financing raised by public-sector and private-sector participants to fulfill the infrastructure commitments. Financing for project commitments in 2017 was derived largely from public and development-finance-institution (DFI) sources:

- Public sources of finance, including public banks and equity, accounted for 73 percent of total project investment commitments for SOE-sponsored projects, 49 percent for public-entity-sponsored projects, and 25 percent for PPI projects.
- DFIs were the second-largest overall source of finance, serving as a significant source for both PPI and SPI projects. In terms of volume, DFIs allocated significantly more resources to public-entity and SOE investment commitments (US$205.7 billion) than to PPI projects (US$12.6 billion), but DFI finance accounted for approximately 30 percent of the investment commitment volumes in both publicly and privately sponsored projects.

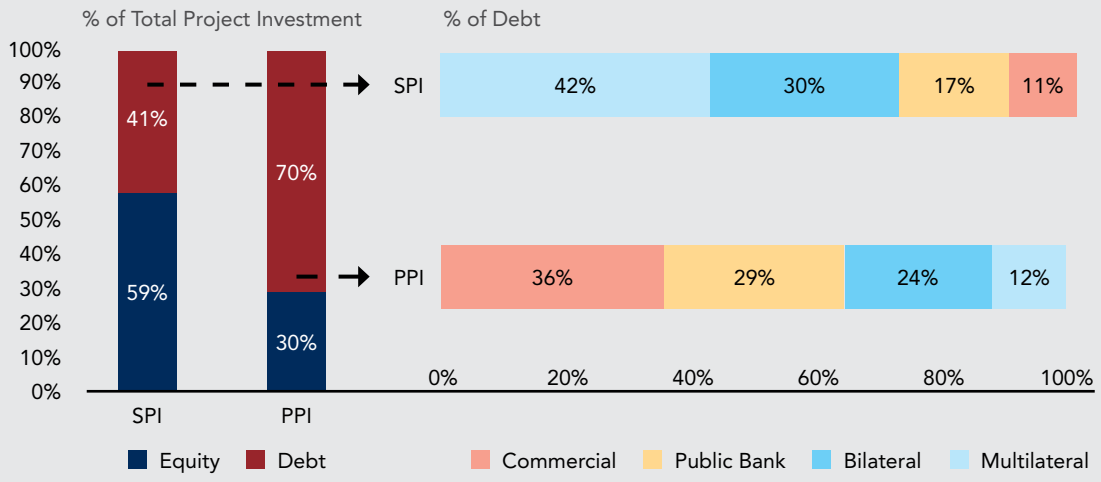
Private sources accounted for very little of the public investments—six percent and three percent of SOE and public-entity investments, respectively. Interestingly, even for PPI projects, most of the financing came from non-private sources (30 percent from DFI sources and 25 percent from public banks and public equity), with private sources (commercial banks and private equity) financing 45 percent of PPI investments.

Nearly three quarters of SOE investment commitments were financed by public banks and public equity (73 percent), whereas commitments made by non-SOE public entities were almost entirely backed by public sources and DFIs, with near-equal distributions.

Apparent patterns emerged with respect to the use of equity versus debt to underpin investment commitments. Whereas equity financing was prevalent in public investments (59 percent of public/SOE projects), debt was more common among private projects (70 percent).

6 Based on available financing information from 98 percent of total projects (2,066 out of 2,111).

FIGURE E
Debt Breakdown SPI and PPI Infrastructure Project Investment, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

For projects financed by debt, SPI projects relied primarily on DFI debt (72 percent), wheareas private projects relied more on commercial debt (36 percent). These patterns are not surprising—governments often have better access to lower-priced DFI loans, and commercial debt is often easily raised by private projects that are perceived to be more bankable.

Sources of finance also differ regionally and by sector. Whereas DFIs accounted for the largest shares of debt for public entity and SOE projects in most regions, higher dependence on commercial debt in ECA (44 percent) and public bank debt in EAP (47 percent) was due to the characteristics of the infrastructure projects in those regions. In ECA, two large natural-gas transmission projects with high proportions of commercial debt tipped the regional balance toward private sources of debt. In EAP, on the other hand, the prevalence of Chinese public-sector banks resulted in high levels of public-bank debt financing in that region (86 percent of regional debt for public/SOE projects went primarily to China).

Generally speaking, international sources of finance far outstripped local sources. Local sources of finance played a significant role in SOE investments (44 percent of finance), primarily because of projects in China financed by the country's four large public banks. For public-entity and PPI investments, more than three quarters of financing came from international sources.

1. Introduction and Stock Taking

1.1 CONTEXT

The mismatch between supply and demand in basic infrastructure presents one of the most serious constraints to economic and social development in emerging economies. Global trends in terms of population growth, rapid urbanization and a rising middle class will continue to generate even greater demand for access to energy, water and sanitation infrastructure, as well as transportation and telecommunications services.

It is widely agreed that it is critical to increase investment in infrastructure to support and sustain economic growth and development. However, despite continuous efforts by governments, the private sector, and international and non-governmental organizations to address widening infrastructure gaps, funding allocated to infrastructure assets has not been commensurate with existing, let alone future, demands.

Constrained resources and inefficient allocations are often identified as some of the key obstacles to providing sufficient infrastructure facilities. While this likely holds true in most cases, there is also very limited understanding of existing investment patterns, and this constrains the testing of hypotheses that could explain supply-demand mismatches in the infrastructure market.

To date, there is very limited information about the levels of financial resources being invested to meet infrastructure needs, their geographical distribution and allocation across sectors, as well as their management and asset ownership (public or private). Governments have traditionally been the largest implementers of infrastructure projects, either directly through treasury funding, or indirectly through SOEs or subnational entities. However, there is currently no centralized information resource covering the quantum of infrastructure spending or investment commitments undertaken through SOEs and/or direct public/treasury funding. Although there is some data on private-sector investments, the lack of data on corresponding public-sector investments has made it very difficult to estimate public-private investment proportions in the infrastructure investment landscape.

Developing a comprehensive and consistent data resource that allows an understanding of global investment and/or spending patterns, whether public or private, is therefore a Herculean effort, requiring the collation of information not only across hundreds of sources within each country, but also across different government agencies (which themselves may not be tracking the data in a consistent and accurate manner), as well as streamlining methodological differences to ensure cross-comparability of measurements.

At the same time, building a clearer picture of actual infrastructure spending and future investment commitments will be instrumental to improving infrastructure policy planning.

1.2 ESTIMATING INVESTMENT COMMITMENTS IN INFRASTRUCTURE PROJECTS

The purpose of this effort is to shed light on the world of infrastructure projects. A separate World Bank report (Fay, Han, Lee and Mastruzzi, 2019) attempts to estimate overall spending in infrastructure, relying on a combination of data sets (fiscal and national accounts data, supplemented as needed by the PPI database); it estimates the spending to be between US$0.82 trillion and US$1.21 trillion, with a central estimate of about US$1.00 trillion. This report focuses instead on the sub-set of infrastructure investments that happen through projects and excludes government investments in infrastructure that occur on a rolling, non-project basis, without any definite contractual agreements with outside parties. Its goal is to complement the PPI database in order to provide a reasonably complete view of the world of infrastructure projects.

Our approach is to look at *future investment commitments* being made towards the capital expenditure for specific infrastructure projects, defined through certain underlying contractual obligations ("Infrastructure Project Investments"). Some of these commitments may not materialize into later spending if the project is cancelled or distressed. In such cases, there are benefits to investigating the reasons for cancellations and, where possible, deriving respective policy lessons.

The PPI Database: An Existing Approach to Measuring Investment Commitments to Infrastructure Projects by the Private Sector

The PPI database managed by the World Bank records private investment commitments at a project level at the time of financial close in energy, transport, water and ICT-backbone projects serving the public in low- and middle-income countries.

PPI data captures *project-related investments with at least 20-percent private participation* in the project company's shareholding structure. The projects are considered to have private participation if a private sponsor bears at least a share of the project's operating risks.

At the same time, the database deliberately excludes projects with a budget of less than US$1 million, as well as captive projects (such as co-generation power plants or private ICT networks), unless a significant share of output (20 percent) is sold to serve the public, private-private subcontracting, operation and management contracts. It is important to note that, for the purposes of the PPI database, investments by public entities and SOEs in foreign jurisdictions are classified as private. The database also takes account of projects that are strategically supported but not owned by the public/SOEs.

SPI Database: A New Approach for Measuring Investment Commitments to Infrastructure Projects by the Public Sector (Including SOEs)

The corresponding project-level data on investments made directly by the public sector (hereafter referred to as public projects) or indirectly through SOEs (hereafter referred to as SOE projects) has not been available up to now. With support from PPIAF, data was collected for public and SOE projects sponsored in 2017. This report documents and analyzes this SOE/public-project data (hereafter referred to as the SPI dataset) and compares it with the PPI data to get a perspective of the relative proportion of investment commitments being made by public/SOEs/private investors at the global, regional and sectoral levels.

The detailed methodological design for the SPI dataset is described in Chapter 2, but in summary, this database explores the world of infrastructure projects to whose capital expenditures the public sector—either directly through treasuries and ministries or indirectly through SOEs—has committed to invest (SPI projects). Therefore it does not include the investment or spending commitments made by governments to technical-assistance projects, O&M contracts, non-project investments (i.e., when infrastructure investments are not executed by the governments on a project-by-project basis, but on a rolling, non-project basis without any definite contractual agreement). As such, it is not representative of the entire universe of public investments in infrastructure but is only a subset of the futuristic investment commitments being made by governments in developing countries.

Designed to mirror the methodology of the PPI database, the SPI database offers an internally consistent view of the investment-project world. It too is unlikely to be fully comprehensive, because it excludes projects under US$1 million, and those not publicly reported. Nevertheless, it is likely to capture the bulk of projects and give reasonable estimates of infrastructure-project investments. Furthermore, no other infrastructure datasets offer such insights into the role of SOEs in infrastructure investments.

The SPI dataset is only one more data source that attempts to provide a piece of the puzzle on infrastructure spending and investments. Because currently available datasets do not allow one to derive comprehensive estimates on SOEs, SPI data may become the only source that offers a bird's-eye view of SOE-project investments globally in all four sectors. As such, this is a critical addition to the ongoing efforts aiming to understand total resources allocated to infrastructure. Exhibit 1 shows how the different data sources complement each other.

2. Understanding the New SPI Projects Initiative

2.1 WHAT THE STUDY USING THE SPI DATASET AIMS TO ACHIEVE

The PPI data only covers part of the puzzle in the universe of infrastructure projects, pertaining only to private-sector projects (those with a minimum of 20-percent private ownership) in low- and middle-income countries. Building a dataset that adds pieces to the puzzle requires keeping track of projects with less than 20 percent private participation (i.e., projects being mostly funded by the public sector, through government departments, treasuries and SOEs (the SPI dataset)). With support from PPIAF, such project-level data was collected for 2017, spanning both low and middle-income countries.

By looking at data from the SPI dataset alongside data from the PPI database, the study aims to build an estimate—to the extent possible given data-availability constraints—of infrastructure-project investment commitments in 2017, and, more importantly, what proportion is contributed by private sources, SOEs, and public agencies. Hence this exercise enabled a comparison of relative investment shares based on two similar, non-comprehensive data sources.

This SPI database pilot also aims to explore whether the project-level data approach for estimating public investment is feasible, cost-efficient and useful. Additionally, this study helps to test data availability at the project level and to develop a high-level indication of the magnitude of the investment commitment to infrastructure projects being undertaken by the public sector and SOEs.

2.2 WHAT IS THE SPI DATASET?

The SPI dataset compiles project-level information for SOE and publicly sponsored projects in excess of US$1 million that meet a certain set of criteria (see below). SPI projects can be viewed as the public-sector counterparts of PPI projects and, as such, the criteria that have been developed to record SPI projects complement, to a large extent, the criteria adopted for recording projects in the PPI database.

1. Sector Coverage Criteria

The projects must belong to one of the following sectors:

- Transport: roads, railways (including light rail), ports, airports;
- Energy: generation, transmission, distribution;
- Water & Sewerage: water utility, treatment plants, sewerage collection and treatment; and
- ICT backbone infrastructure: hard assets only.

2. Ownership Criteria

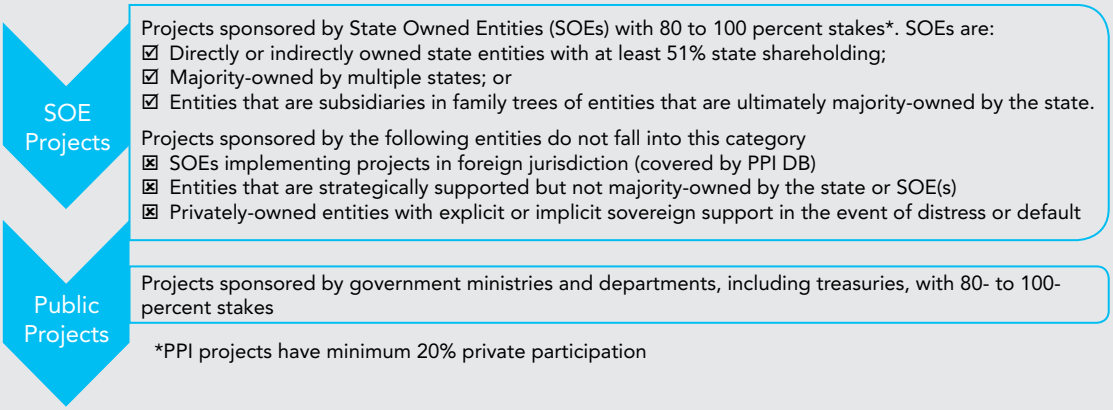
The newly-created SPI database only includes *projects with more than 80 percent public/SOE ownership in the project company*. The 80-percent threshold was chosen because projects with less than 80-percent public/SOE participation have by definition more than 20-percent private participation and, as such, will have already been captured in the PPI database. For example, a project with 90-percent ownership

by an SOE or public entity and 10 percent ownership by a private entity is an SPI project. Conversely, a project with 75-percent ownership by an SOE or public entity and 25-percent ownership by a private entity is classified as a PPI project. However, in this report, when calculating public/SOE investment commitments, the amount invested by SOE/public entities in PPI projects is excluded from private-investment commitments and included in public/SOE-investment commitments.

3. Sponsor Qualification Criteria

As mentioned above, for SPI projects, the main sponsors and/or implementing agencies must be public entities or SOEs. Listed below are the details of the public entities and SOEs whose projects are recorded in the SPI dataset.

EXHIBIT 1
SOE Versus Public Project Criteria



1. Public projects are those sponsored by government ministries and departments, including treasuries. Projects containing a mixture of such entities and SOE(s) are also recorded as public projects, if this combination of sponsors accounts for at least 51 percent of ownership.

2. SOE projects are those implemented by the following types of entities:
   - Organizations that are at least 51 percent owned by the state. Nuances of part-ownership, majority-ownership and full-ownership were routinely recognized during research.
   - Entities that are subsidiaries in a family tree of entities ultimately majority-owned by the state. Research has been carried out to distinguish between entities that are immediately owned by the state, as opposed to entities indirectly owned by the state.
   - Publicly-listed entities that are majority-owned by the state through ownership of listed shares, unless that ownership falls below majority-ownership through regular trading.
   - Entities that are majority-owned by more than one state.

Projects implemented by the following types of entities are not included in this category:

- Entities that are majority privately owned but with state-sanctioned public or social obligations, such as institutions obligated by laws or regulations to support various economic activities.
- Entities that are privately owned but with explicit or implicit sovereign support in the event of distress or default.

A distinction has been made between public entities and SOEs within the data structure, to allow the segregation of project data related to publicly backed activities from data related to SOE-backed activities. The data also distinguished between national and sub-national public entities, with the former implying a federal or central government mandate, and the latter involving regional, provincial, state, city or local remits.

To be consistent with the PPI methodology, the dataset also excluded non-infrastructure projects, such as operation and management contracts, and all projects pre-classified as private in the PPI methodology (i.e., public investments abroad). A comparison between the SPI and PPI datasets is provided in Exhibit 2.

EXHIBIT 2
SPI Projects Versus PPI Projects

	SPI PROJECTS	PPI PROJECTS
	Project Sponsors	
	Public: Govt. ministries and departments, treasuries **State-owned Enterprises (SOE):** 51% state ownership **Both:** At least 51% combined share	**Private entities** investing in infrastructure projects as recorded in the PPI database
	Project Company Stake	
	SOE/public can have 80% to 100% stake in project company & Private company can have 0% to 20% stake	
PROJECT INVESTMENT COMMITMENTS	**Project Inclusions**	
	Projects implemented by Public/SOE. SOEs are: ☑ Directly/indirectly owned by state with at least 51% stake ☑ Majority-owned by multiple states ☑ Subsidiary in a tree of entities ultimately state owned **SPI investments also include the amount invested by SOE/public in PPI projects, which is subtracted from PPI projects to avoid double counting**	Projects by private company ☑ Management/lease contracts ☑ Concessions ☑ Divestitures
	Project Exclusions	
**Covered under PPI database* *~Covered under PPI database if it is a private entity*	☒ Non-infra projects (like TA, O&M, etc.) ☒ Public/SOE ownership < 51%, rest by non-public entities (NGOs/civil society) ☒ SOEs implementing projects in foreign jurisdictions* ☒ Entity strategically supported by public/SOE but not owned~ ☒ Investments less than US$ 1 million	☒ Captive projects ☒ Private-Private Subcontracting ☒ Operations & Management contracts ☒ **PPI Investments excludes the investment by public/SOE entity in PPI project**

4. Moment at which Projects are recorded- Project Execution Date:

Unlike projects with private participation, public and/or SOE projects may not have financial-close events and dates that are more commonly associated with project financing. Hence the SPI database uses the term "executed" to describe a project that is at a stage when construction can begin (after all conception, planning, documentation and contracting tasks are finished; financing (if any) has been secured; and alignment of counterparties and contractors has concluded).

One or more of the following milestones were used to determine the date of execution for a project:

- Date of financial close was used in instances where a financial-close event was feasible and expected, given the nature of the financing and contract structure.
- Date of contract-award date was used in instances where the nature of financing (if any) and contract structure were such that no financial close event was expected.
- Date of start of construction was used in instances where financing existed and financial close might be expected and assumed, but where a financial-close date could not be determined yet, or a financial close event was neither appropriate nor excepted, and the contract award date could not be determined.
- Date of discounted start of operations was used as a proxy for the execution date in instances where financial-close, contract-award and/or start-of-construction dates were missing or inappropriate. However, the start-of-operations date was only used if an actual or assumed period of construction could be reasonably discounted from that date to arrive at a start-of-construction date, which could in turn be used as a proxy for execution date.

2.3 DATA COVERAGE AND LIMITATIONS

SPI projects have been recorded for **110 countries** out of 137 low- and middle-income countries. A total of **1,806 SPI projects** have been recorded; these were combined and compared with the 305 PPI projects recorded in the PPI database for 2017, for further analysis.

The project data have been compiled based on extensive research from a) publicly available information in secondary sources, i.e., third-party media platforms, government agency websites, or websites of private parties involved in implementing public/SOE projects (e.g., engineering, procurement and construction (EPC) contractors, or law firms); b) market submissions to the data providers (IJ Global) from banks, financial institutions, or EPC contractors on infrastructure projects, and c) World-Bank country-expert contributions. The dataset represents the research team's best efforts to compile publicly available information, and, as such, projects not reported by major news sources, databases, government websites, market submissions or other sources may have been omitted.

Given the above, the **SPI dataset is just a snapshot of public infrastructure projects and associated investment commitments (not the full universe of public infrastructure investment or spending)**, based on publicly available information and, as such, should not be treated as a comprehensive resource. In this context, it is important to note that under present data-availability constraints, the analysis performed on the final dataset is not immune to errors of exclusion.

The methodology behind the study and data-collection results in the public-infrastructure investment commitment estimates based on this data have a downward bias due to the exclusion of a) projects with investments below US$1 million; b) technical assistance projects; c) operations and maintenance (O&M) contracts; d) non-project investments; and e) investments not reported in publicly available sources. When governments spend or invest in building infrastructure on a rolling, non-project basis, without any definite contractual agreements, rather than on a project-by-project basis, the investment commitments that do not take the form of a project are not captured in the SPI methodology, which only focuses on investment commitments in infrastructure projects.

The exclusion of projects below US$1 million, as well as smaller projects that are typically not reported by media and other secondary sources, may result in two biases: Municipal projects are likely to be under-reported, because they tend to be smaller sized and low profile, and there is also likely to be a bias towards middle-income countries, where projects are better defined and reported.

3. 2017 Infrastructure Investment Overview

This and all subsequent chapters present the analysis of the relative proportion of public/SOE/private participation, based on an estimate of the total investment commitment to infrastructure projects in 2017, derived from the newly collated SPI dataset and the existing PPI data. The SPI dataset recorded 1,806 individual project entries, but the investment commitment across these projects does not represent all public investment commitment to infrastructure projects. This is primarily because the SPI dataset only included projects with more than 80 percent public/SOE ownership and hence, the infrastructure project investments of the public sector in projects where the public sector has less than 80 percent stake would have been excluded. To avoid such exclusion errors, the estimate of the total public-sector investment commitments in infrastructure projects also took into account the public share of investments in the PPI infrastructure projects. This public share was correspondingly removed from the PPI investment commitments being reported, to avoid double counting.

It is also important to remember that this analysis is based on data for only one year and, as such, is not reflective of historic trends in the proportions of public and private sector investment commitments in infrastructure projects. The analysis only provides a snapshot for a single year only (2017).

3.1 SNAPSHOT OF INFRASTRUCTURE INVESTMENT COMMITMENTS IN 2017

In 2017, total infrastructure-project investment commitments across both the public and private sectors in low- and middle-income countries amounted to about US$0.5 trillion. Governments have traditionally served as the main sponsors for infrastructure projects, and this is reflected in the 2017 data. Total public investment commitments to infrastructure projects, including SOE infrastructure-project investment commitments,[7] accounted for 83 percent of the total (about US$0.4 trillion, of which US$0.13 trillion came from China), while private-sector investment commitments accounted for 17 percent of the total (see Figure 1). Within the public sector, SOEs accounted for 66 percent of the public infrastructure-project investments and 55 percent of the total infrastructure-project investment commitments (see Figure 1).

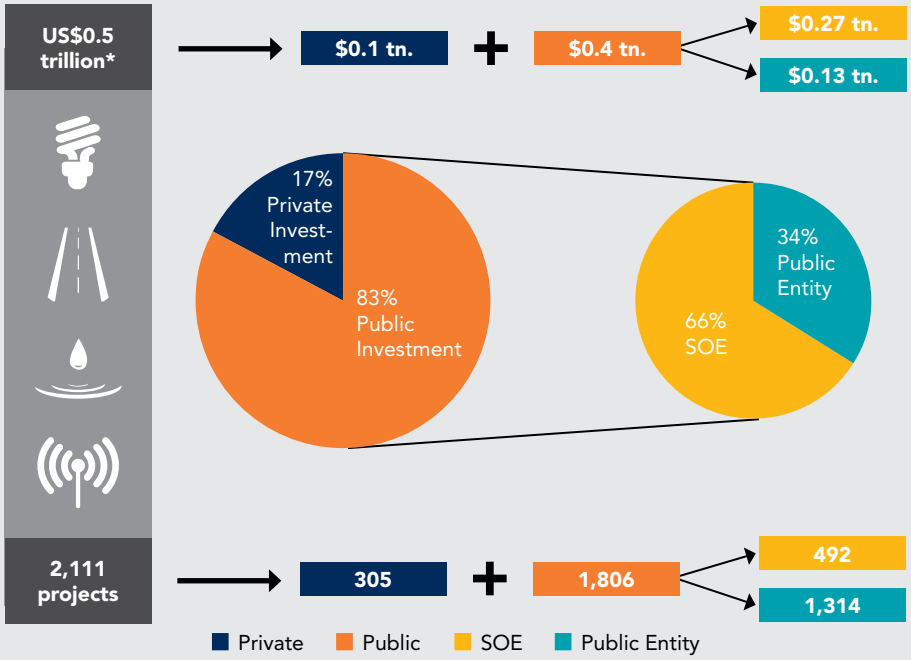
These proportions are reflective only of 2017, when PPI investments showed an upwards trend, with a 37 percent increase over 2016,[8] with US$93.3 billion committed across 305 projects. This indicates that private-sector investment levels are getting back on track after a sharp dip in 2016, when investment levels only reached US$71.5 billion, compared to a five-year average of US$121.4 billion from 2011 to 2015.[9]

7 When calculating public/SOE investment commitments, the amount invested by SOEs/public entities in PPI projects is excluded from private investment commitments and included in public/SOE investment commitments

8 World Bank. Private Participation in Infrastructure Annual Report (2017).

9 World Bank. Private Participation in Infrastructure Annual Report (2016).

FIGURE 1
Infrastructure Project Investment Commitments in 2017



*Rounded to nearest decimal

Sources: SPI and PPI databases, World Bank, as of November 2018

The above figures suggest that, because of rising fiscal constraints, governments are increasingly moving towards mobilizing private-sector resources to meet the financing gap for building much-needed infrastructure. In addition to bringing in additional financing resources, private players also bring in external innovation and technological know-how, thus leading to a higher probability of on-time and on-budget project delivery. However, it is important for governments to take into account that public-private partnerships (PPPs) are not completely off-balance-sheet and often come with contingent liabilities that may materialize and add to the government's debt burden. For a PPP to succeed, it is critical that, inter alia, adequate time and resources are spent in structuring the project and ensuring that risks have been allocated to the parties best equipped to bear them.

In 2017, there were almost six times more SOE/public-entity sponsored projects (1,806) than private-sponsored projects (305). Although SOEs dominate in terms of total infrastructure-project investments, the total number of projects sponsored by other public entities was higher (see Figure 1).

FIGURE 2
Median Value of Total Infrastructure Project Investments by Sponsor Type

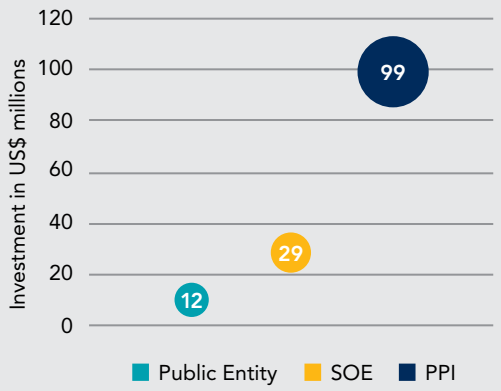
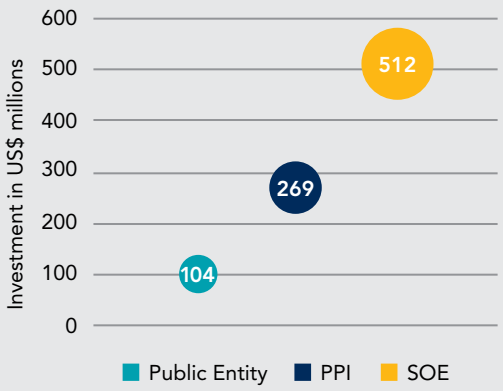


FIGURE 3
Average Value of Total Infrastructure Project Investments

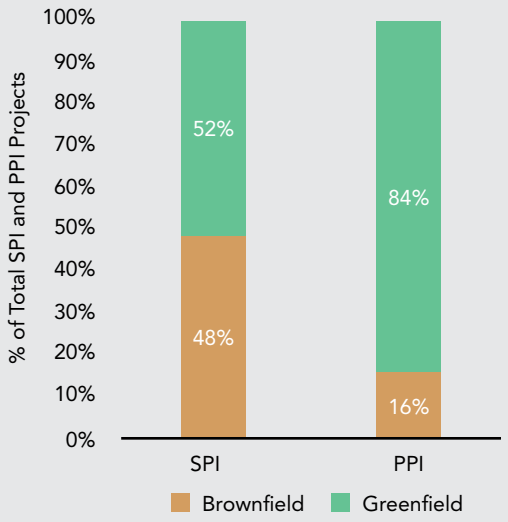


Sources: SPI and PPI databases, World Bank, as of November 2018

Although SOEs account for just a quarter of all public infrastructure projects by number, they account for more than two-thirds of the total infrastructure-project investment commitments made by the public sector (see Figure 1). Typically, the average size of private projects is the largest, at about US$100 million (Figure 2). SOE project sizes typically average about US$30 million (Figure 2), but due to 12 very large SOE projects in the transport and energy sectors, with investments greater than US$5 billion each (which accounted for 48 percent of total SOE infrastructure-project investments), the average investment size is US$512 million (Figure 3). Of these 12 projects, China leads with four projects, followed by two each in Indonesia and Russia, and one each in India, Azerbaijan, Thailand and Malaysia. Similarly, three multi-billion-dollar projects being implemented by public entities skewed the average public-sector investment size to US$104 million (Figure 3), even though the typical investment size for these projects is only about US$12 million, based on the data collected.

3.2 GREENFIELD VERSUS BROWNFIELD ANALYSIS

FIGURE 4
Share of Brownfield and Greenfield Projects, 2017

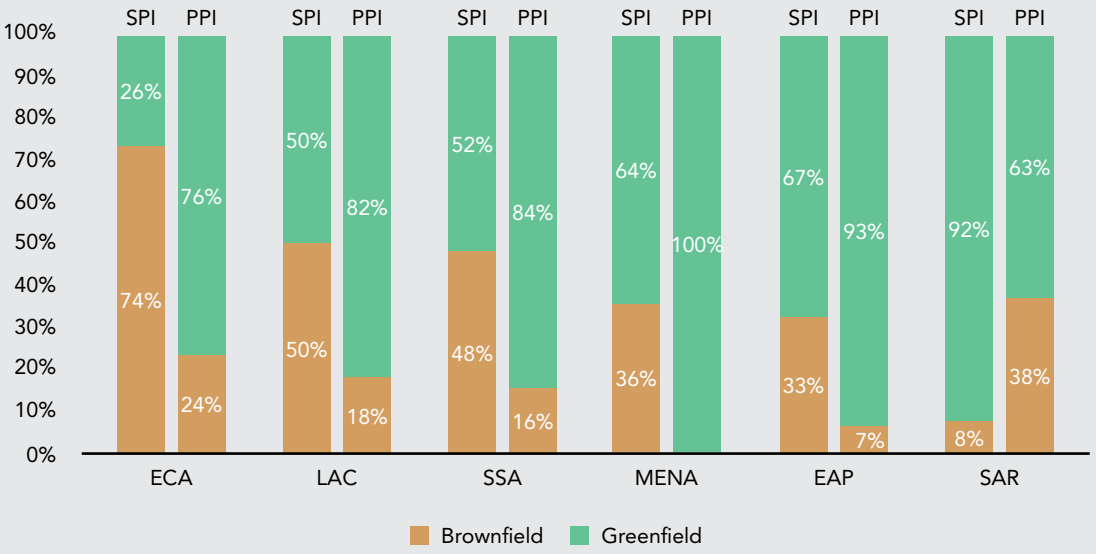


Sources: SPI and PPI databases, World Bank, as of November 2018

SPI projects invested almost equally in both greenfield (52 percent) and brownfield (48 percent) projects (see Figure 4). However, analyzing the two separately reveals that more than three quarters (78 percent) of SOE projects were greenfield projects (384 greenfield SOE projects versus 108 SOE brownfield projects), whereas slightly more than half (58 percent) of public-sponsored projects were brownfields (756 brownfield public projects, compared to 558 public greenfield projects). The private sector, on the other hand, invested more in greenfield projects, especially energy projects, which constituted 64 percent of the total number of projects with private investment. This is possibly because the construction phase for energy projects is relatively short, providing investors with a chance to start recouping their funds more quickly.

On a regional basis, the ECA allocated more public/SOE investment commitments to brownfield projects (542) than the other regions combined (this represented 59 percent of total brownfield projects). Fifty-four percent of the ECA brownfield projects were in Russia.

FIGURE 5
Numbers of Greenfield and Brownfield Projects in 2017, by SPI and PPI per Region



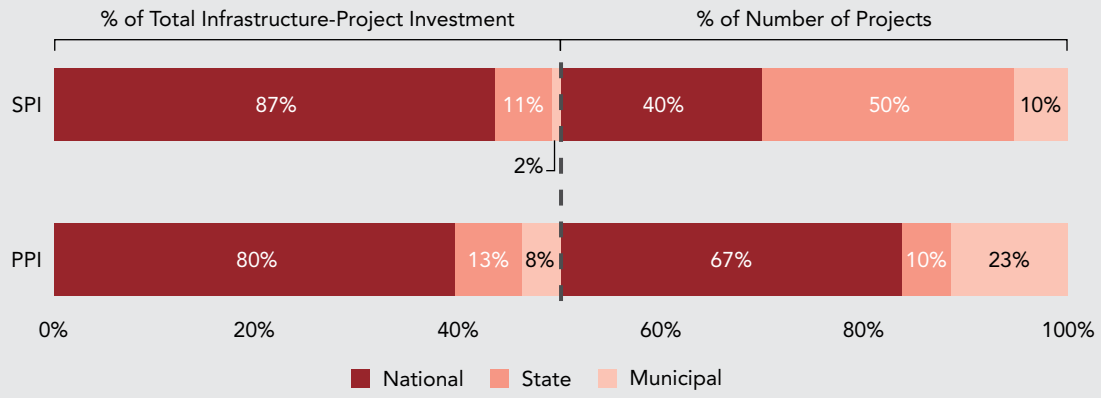
Sources: SPI and PPI databases, World Bank, as of November 2018

At the other end of the spectrum, the largest concentration of greenfield public/SOE projects was in SAR, which accounted for 39 percent of total greenfield public/SOE projects (see Figure 5). Ninety-four percent of all SAR projects were based in India, as the country's economic growth is driving up demand for new infrastructure.[10] Except for one port project, all of the greenfield private projects in MENA were energy related, and 76 percent of them were in Egypt (25 out of 33 projects).

3.3 GOVERNMENT GRANTING-ENTITY ANALYSIS

Overall, it can be seen from Figure 6 that a large proportion of both public/SOE and private infrastructure-project investment commitments were concentrated at the national level (87 percent and 80 percent respectively). However, in terms of absolute numbers of projects, national-level projects only comprised 40 percent of all public/SOE projects. The higher investment value for national-level SPI projects is mainly due to higher concentration of large SOE projects at the national level, whereas projects at the state level, though numerous, are typically smaller in size.

FIGURE 6
Shares of SPI and PPI Investments and Number of Projects by Government Granting Entity, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

It is interesting to note that the share of municipal projects in PPI projects is higher than that of SPI projects, which is a good sign indicating the increasing abilities of municipalities to raise private financing. However, please note that as municipal projects tend to be smaller and lower profile, they may be under-reported due to less coverage in media/secondary sources, as well as the US$1 million project cut-off.

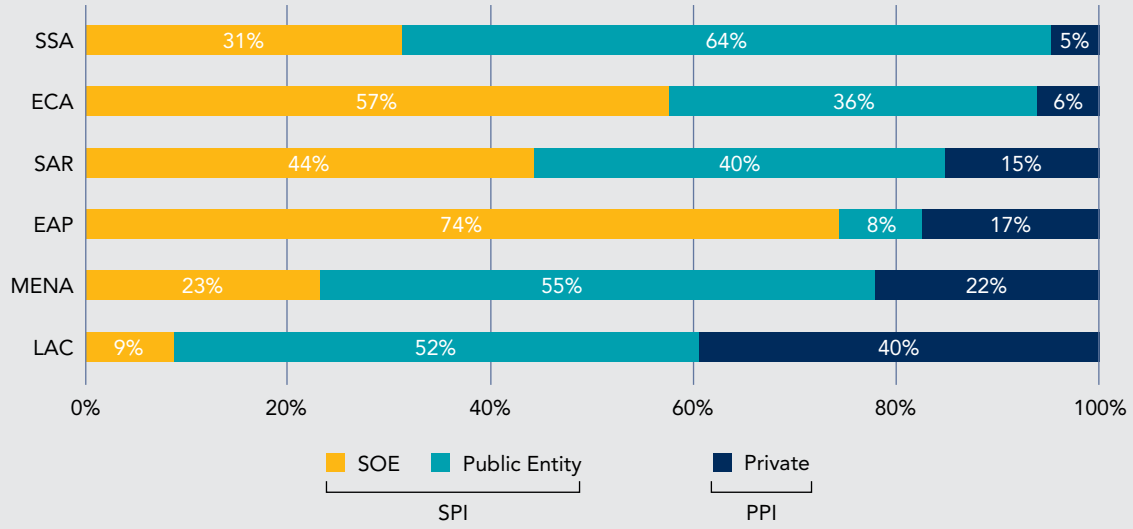
10 India's real GDP growth rate for 2017 is 6.7 percent, according to the IMF's World Economic Outlook, as of April 2018.

4. Regional-Level Analysis

4.1 OVERVIEW OF REGIONAL-LEVEL INVESTMENT

At the project level, public/SOE investments exceeded private-sector investments across all six regions (see Figures 7 and 8). SPI investment commitments accounted for more than three quarters of total infrastructure project investments in most regions (see Figure 7). SSA had the highest share of public/SOE project investment commitments (95 percent), whereas LAC had the lowest (60 percent). Of public-sector investment commitments made to infrastructure projects, direct public-entity investments were more dominant in SSA, MENA and LAC, accounting for more than half of the regional investments, whereas in ECA and EAP, SOEs dominated total infrastructure investments, accounting for 57 percent and 74 percent of regional investments.

FIGURE 7
SOE, Public Entity and Private Project Investment as a Share of Total Infrastructure Project Investment by Region, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

In fact, **LAC is the only region where private investment constituted more than a third of total infrastructure-project investment commitments (40 percent)**. Of the total US$18.1 billion in private investment commitments in LAC, 90 percent was comprised of projects in Mexico (US$8.6 billion), Brazil (US$6.4 billion) and Argentina (US$1.3 billion). Coincidentally, all of these countries have introduced national policies that promote infrastructure-project investment. Mexico is pursuing a national infrastructure plan that aims to attract roughly US$600 billion in both public and private infrastructure-project investments from 2014 to 2018.[11] Brazil is implementing an infrastructure concession plan that, after a deep economic recession, strives to raise US$14.4 billion in private investment

11 Mexico's National Infrastructure Plan 2014-2018, 4th Mexico Infrastructure Projects Forum

for infrastructure projects from 2017 onwards.[12] Following adoption of a new PPP law in February 2017, Argentina's RenovAr plan (to increase the share of renewable energy in electricity generation to 20 percent by 2025) was instrumental in mobilizing US$35 billion of investment in 2017, mainly through private sources.[13] [14]

Asia (including both EAP and SAR) attracted more investment commitments (totaling US$305.3 billion) to infrastructure projects than all other regions combined (see Figure 8). Four of the five countries with the most public/SOE infrastructure-project investment, and three out of five countries with the most private investment, are in Asia (see Tables 1 and 1.1 below).

TABLE 1: TOP SOE/PUBLIC INFRASTRUCTURE-PROJECT INVESTMENT MOBILIZERS

Country	Investment Commitment	# of Projects
China	US$114 billion	55
Indonesia	US$44.3 billion	19
Russia	US$36 billion	396
India	US$33.9 billion	361
Bangladesh	US$20.2 billion	7
Total	**US$248.4 billion**	**838**

TABLE 1.1: TOP PRIVATE INFRASTRUCTURE-PROJECT INVESTMENT MOBILIZERS

Country	Investment Commitment	# of Projects
China	US$13.9 billion	73
Indonesia	US$11.8 billion	11
Mexico	US$8.6 billion	20
Brazil	US$6.4 billion	24
Pakistan	US$5.9 billion	4
Total	**US$46.6 billion**	**132**

SOE investment commitments to infrastructure projects in EAP are almost twice the level of SOE investments in other regions combined. In fact, the total investment amount of the region's 10 highest-valued SOE projects is higher than the 438 SOE-sponsored projects across the rest of the regions added together. Nine of the 10 projects were concentrated in just three countries—China (six projects worth US$108.1 billion), Indonesia (two projects worth US$38.2 billion), and Malaysia (one project worth US$14 billion). Although EAP is only fourth in terms of regions with the highest relative share of public/SOE investment commitment to infrastructure projects (with an SPI share of 83 percent), it is not surprising that this region alone accounts for 47 percent of all global public/SOE infrastructure-project investments.

Of the total EAP SPI investment commitments, 84 percent came from just China (60 percent) and Indonesia (24 percent). The Government of the Philippines invested US$2.1 billion across significantly more projects (85), but this pales in comparison to the US$158.3 billion committed by its Chinese and Indonesian counterparts to 55 and 19 projects in China and Indonesia, respectively.

Private investment commitments in EAP are also roughly equal to those of the other regions combined (see Figure 8). Out of the US$40 billion in private investment commitments, **China and Indonesia once again dominated, accounting for 64 percent of total private investment** and 84 out of 108 projects. Thailand, Vietnam and the Philippines also constituted a sizeable portion of the private investment commitment amount in the EAP region, with a combined share of 22 percent.

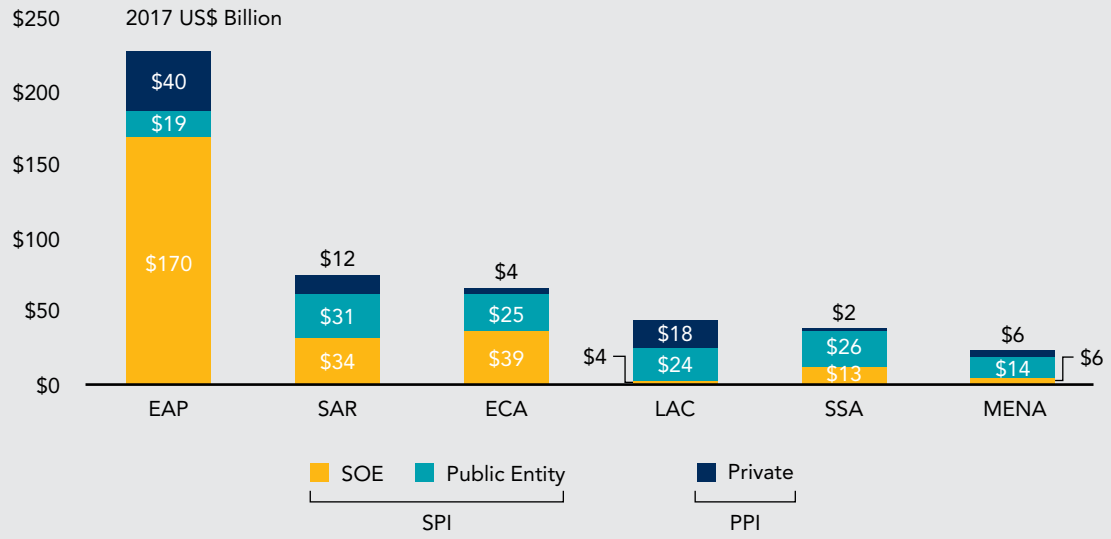
12 "Brazil's Temer launches 45 billion reais infrastructure concession plan," Reuters

13 "IRENA Presents President of Argentina with award for Year of Renewable Energy," IRENA

14 "Argentina taps its renewable energy potential," The World Bank

Although China has had a long history of carrying out infrastructure mega-projects, Indonesia's large share of the public/SOE-and-private infrastructure-project investment commitments reflects the strong push by President Jokowi to complete 245 national strategic infrastructure projects. The total cost of these projects is estimated to be US$305 billion, of which the government, SOEs, and private partners are expected to cover US$35.9 billion, US$86.2 billion, and US$165.3 billion, respectively.[15]

FIGURE 8
SOE, Public and Private Infrastructure-Project Investments by Region, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

Overall, in most regions, one or two countries represented 50 percent or more of their respective region's total public/SOE infrastructure-project investment commitments. These countries are: China, with 60 percent of EAP's commitment; Russia, with 57 percent of ECA's commitment; Argentina and Mexico, with a combined 64 percent of LAC's commitment; Iran, with 60 percent of MENA's commitment; and India, with 53 percent of SAR's commitment. Some of these countries are also among the top private investment mobilizers within their respective regions—e.g. , China, with 35 percent; Russia, with 30 percent; Mexico, with 47 percent; and India, with 41 percent. China and Indonesia committed the most public and private investment resources to infrastructure projects globally, followed by Russia, India and Bangladesh for public infrastructure-project investment, and Mexico, Brazil and Pakistan for private investment commitments to infrastructure projects. The top five investment mobilizers accounted for 62 and 57 percent of the total SOE/public and private infrastructure-project investment commitments, respectively.

15 National Strategic Projects, Committee for Acceleration of Priority Infrastructure Delivery (KPPIP)

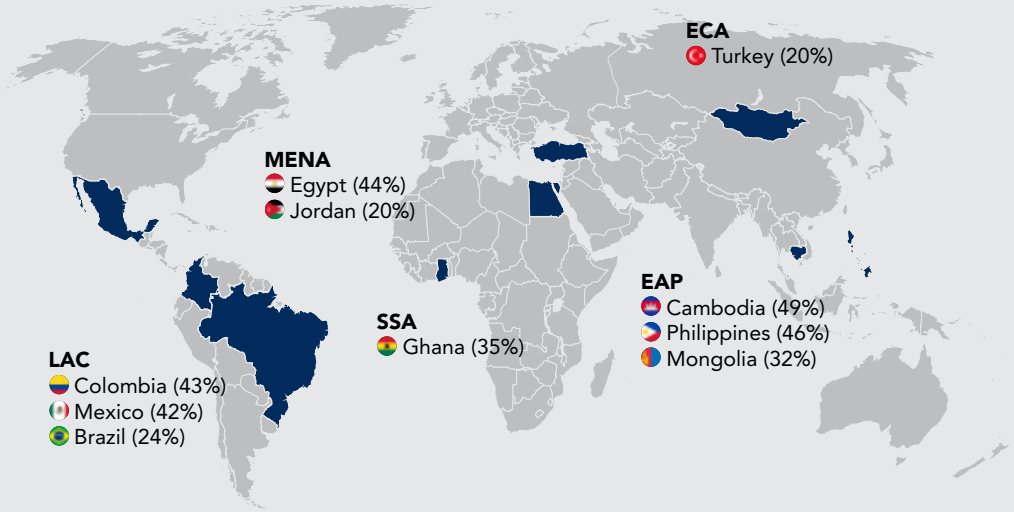
4.2 COUNTRIES WITH PUBLIC/SOE INFRASTRUCTURE-PROJECT INVESTMENT LOWER THAN PRIVATE INVESTMENT

As indicated previously, public/SOE investment commitments to infrastructure projects accounted for a significantly larger overall share of the total infrastructure-project investment amount across all of the regions. However, there are certain countries—e.g., Cambodia (51 percent), Philippines (54 percent) and Mongolia (68 percent) in the EAP— where private investments accounted for a larger share of the total infrastructure-project investment commitments.

In a number of countries in other regions (as illustrated in Figure 9), private investment commitments accounted for more than half of total infrastructure-project investments. Most of the countries shown in Figure 9, except for the aforementioned EAP countries and Colombia, had the largest amounts of private investments in their corresponding regions.

FIGURE 9

Countries with SOE/Public-Entity Infrastructure-Project Investments Lower than Private Investments



* All countries where the share of public financing is less than 50 percent are depicted.

( ) The number in bracket represents the SOE/Public infrastructure- project investments as a share of total infrastructure project investment commitment for 2017.

Sources: SPI and PPI databases, World Bank, as of November 2018

A closer look at each of these countries revealed that most of them have been pursuing a strong policy shift and institutional reforms aimed towards promoting PPPs (see Table 2).

TABLE 2: 2017 INVESTMENT AS SHARE OF GDP AND PPP REGULATORY FRAMEWORKS					
Country	2017 Investment as Share of GDP	National Strategic Plan Promoting PPP	PPP Law	PPP Guideline	PPP Unit
Brazil	0.4%	Yes	Yes	Yes	Yes
Cambodia	8.9%	Yes	No	Yes	Yes
Colombia	0.2%	Yes	Yes	Yes	Yes
Egypt	2%	Yes	Yes	Yes	Yes
Ghana	1.8%	Yes	No	Yes	Yes
Jordan	8.6%	Yes	Yes	Yes	Yes
Mexico	1.3%	Yes	Yes	Yes	No
Mongolia	1.5%	Yes	Yes	Yes	Yes
Philippines	1.4%	Yes	Yes	Yes	Yes
Turkey	0.2%	Yes	No	Yes	Yes

Source: Author's compilation from various sources

4.3 REGIONAL INVESTMENT AS A SHARE OF GROSS DOMESTIC PRODUCT (GDP)

In terms of public/SOE and private investment commitments as a share of GDP, the SAR and SSA regions invested the highest proportions of their GDPs in infrastructure projects, at 2.4 percent and 2.8 percent, respectively, compared to the combined share for all regions of 1.8 percent of GDP. In SSA, most investments were carried out by the public sector and SOEs (2.7 percent of GDP), whereas in SAR, the private sector was more active, at 0.4 percent of GDP (see Figure 10).

However, in terms of absolute values, investment commitments in the SSA region were second to last—SSA's GDP (US$1.5 trillion) comprises only five percent of the combined GDP for all six regions (US$27.3 trillion). Thus SSA's US$38.8 billion public/SOE infrastructure-project investment commitment accounted for 2.7 percent of the region's relatively lower GDP.

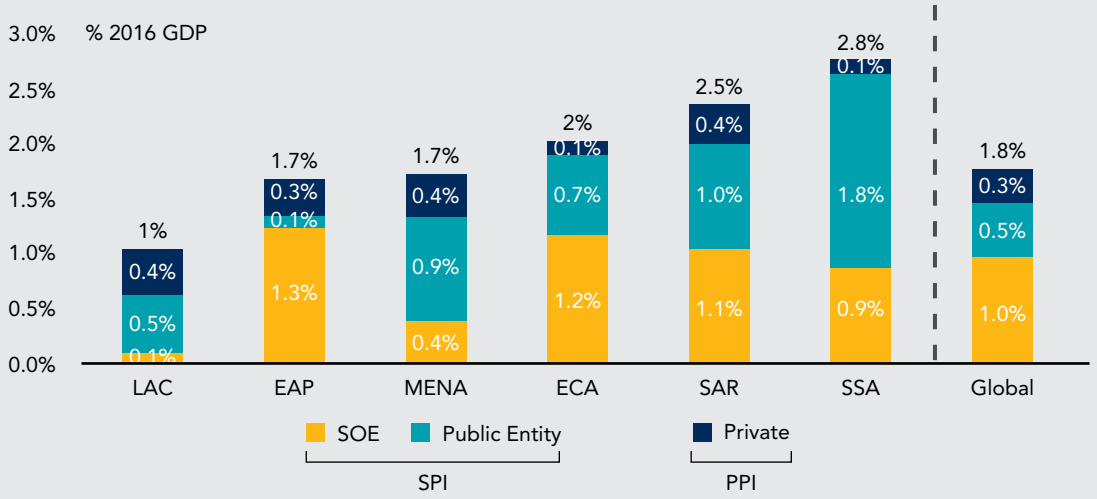
Three of the top 10 countries with higher GDPs in SSA—Nigeria, Angola and Tanzania—comprised 49 percent (US$19.1 billion) of the total public/SOE infrastructure-project investment commitment in the region. At the same time, these countries accounted for less than 10 percent of all public projects (15 out of 198 projects). The rest of the top 10 countries—South Africa, Sudan, Ethiopia, Kenya, Ghana, Côte d'Ivoire, and Cameroon—managed to mobilize only US$7.4 billion in public/SOE infrastructure-project investment commitments, which represents 19 percent of the total public/SOE investment commitment to infrastructure projects in SSA, and 32 percent of the total number of public projects.

An interesting case is the EAP region, where, as can be seen in Figure 8, despite the largest absolute public/SOE-and-private infrastructure-project investment commitment, the investment share of GDP (1.7 percent) is not as significant when compared to other regions (see Figure 10). The region's GDP for countries where investment was reported (US$13.5 trillion) comprised 49 percent of the combined GDP of all regions. Hence the US$229.5 billion public/SOE-and-private infrastructure-project investment amount was rather low as a share of GDP.

The only regions in which the proportions of SOE infrastructure-project investments as a share of GDP were above one percent were EAP, ECA and SAR, where the proportions stood at 1.3 percent, 1.2 percent and 1.1 percent, respectively. At the same time, these investments also represent the largest share of investment-to-GDP ratios in their respective regions. EAP is the only region with a proportion of publicly sponsored investment to GDP lower than the global average, whereas ECA and SSA have lower levels of private investment as a percentage of GDP. With a total public infrastructure-project investment of US$19 billion, the relatively low share of public infrastructure-project investment to GDP for EAP could be due to its disproportionally large regional GDP, as indicated earlier. As for ECA and SSA, it could simply be the result of small amounts of private investments (US$4 billion for ECA and US$2 billion for SSA).

FIGURE 10

SOE, Public and Private Project Investments as Percentage of GDP* by Region, 2017



*Based on 2016 GDP (latest available) at the time of analysis

Sources: SPI and PPI databases, World Bank, as of November 2018

The World Bank report (Fay, Han, Lee and Mastruzzi, 2019) that attempts to estimate overall spending in infrastructure, relying on a combination of data sets, found regional spending as a share of GDP to be as shown in the table below. Because this report focuses only on infrastructure-project investments, and on a different year compared to the Fay et al (2019) report, the numbers vary.

TABLE 3: OVERALL REGIONAL SPENDING IN INFRASTRUCTURE AS A SHARE OF GDP: COMPARISON WITH FINDINGS FROM FAY ET AL (2019)				
	Lower Bound Estimate Refinement 1 (fitted values)	Central Estimate Refinement 2 (BOOST or min of two FCFs)	Upper Bound Estimate Refinement 3 (0.9 GFCF_CE)	Refinement 4 (SOE- augmented BOOST & fitted values)
Percent of GDP				
SSA	1.87	2.54	3.47	2.35
EAP	5.36	5.72	6.71	5.61
ECA	1.51	2.73	4.36	2.16
LAC	2.02	2.39	3.22	2.52
MENA	1.67	4.79	4.73	2.45
SAR	3.59	4.42	4.25	4.71
Global Average Weighted	**3.38**	**4.11**	**4.99**	**3.88**

5. Sectoral-Level Analysis

5.1 SECTORAL INVESTMENTS: OVERVIEW

The energy and transport sectors dominated in terms of attracting both SPI and PPI investment (see Figure 11). **The lion's share of investments in these sectors took place in EAP**, which accounted for 35 percent of global energy and 61 percent of global transport investments. Yet again, China's focus on financing infrastructure has helped drive this region's remarkable performance. **China represented 41 percent of the total global infrastructure-project investments in transport and was the second-highest investor in energy** (15 percent), only edged out by Indonesia (16 percent). Within the EAP region, China mobilized 69 percent and 55 percent of the investments in transport for the public/SOE and private sectors, respectively.

In the MENA, SAR and SSA regions, both the public and private sectors invested most heavily in the energy sector (see Figure 12). In terms of public energy-infrastructure-project investments, Iran accounted for 80 percent in MENA; Bangladesh accounted for 44 percent in SAR; and Nigeria accounted for 43 percent in SSA. As for private energy investments, the leading contributors for the MENA, SAR and SSA regions were Jordan (51 percent), Pakistan (75 percent), and Rwanda (35 percent), respectively.

FIGURE 11
Total Infrastructure Project Investment by Sector, 2017

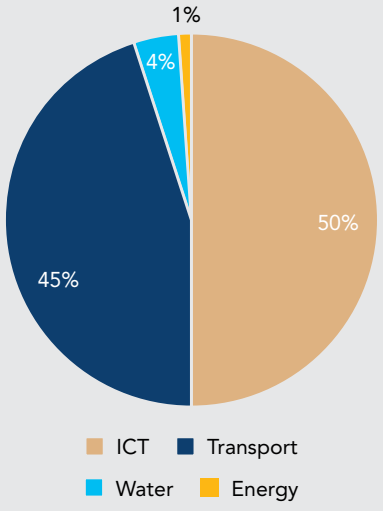
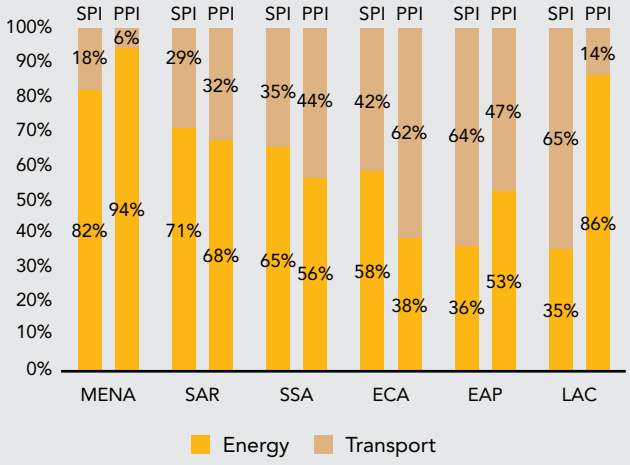


FIGURE 12
SPI and PPI Investments by Region and Sector, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

LAC is an interesting case of bifurcation, where public/SOE infrastructure-project investments were mainly used to fund transport projects, while private investments went into the energy sector. Mexico mobilized the most public infrastructure-project investments for transport, and the most private investments commitments for energy projects, accounting for 36 percent and 45 percent of the region's

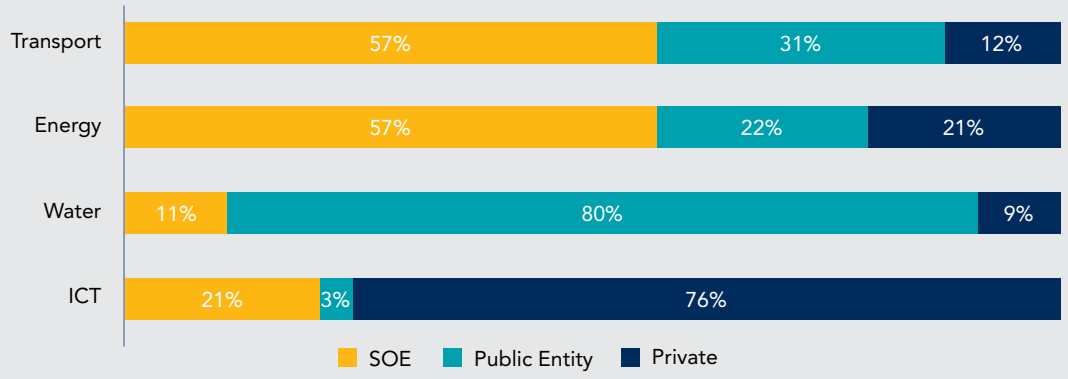
investments, respectively. ECA and EAP investment commitments were directed more into transport. Russia led both public/SOE (45 percent) and private (44 percent) infrastructure-project investment commitments in transport in ECA.

Total public/SOE-and-private infrastructure-project investments in water and ICT only made up four percent (US$20.2 billion) and one percent (US$3.3 billion), respectively, of the total US$484.8 billion in investment commitments.

5.2 SECTORAL INVESTMENTS: SOEs VS PUBLIC ENTITIES

SOEs tend to dominate investments in the energy and transport sectors, whereas public-entity and private infrastructure project investments were prevalent in the water and ICT sectors, respectively (Figure 13).

FIGURE 13
Break Down of Sectoral Investment by the Sponsor Type



Sources: SPI and PPI databases, World Bank, as of November 2018

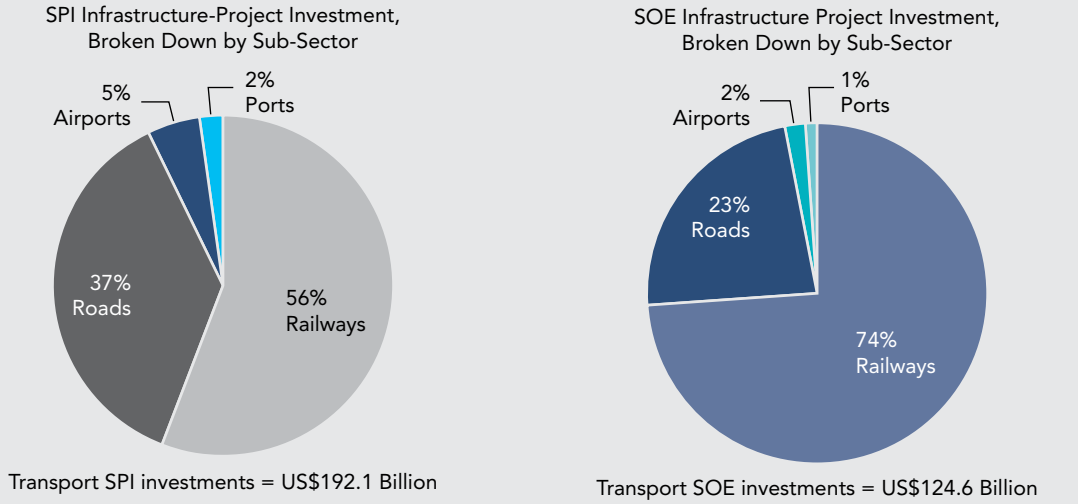
In the transport sector, public/SOE infrastructure-project investments were directed mainly to railway and road projects, accounting for 56 and 37 percent, respectively. Railways' domination extends even further in the case of SOE infrastructure-project investments, as this sub-sector accounted for 74 percent, compared to 23 percent, two percent and one percent for roads, airports and ports, respectively (see Figure 14). Eighty-six percent of these investments took place in the EAP region, mainly due to the large number of SOE-sponsored roads and railways projects in China (25 projects).

Although railways dominate in terms of SPI and SOE infrastructure-project investments, it should be noted that roads are more ubiquitous than railways, both in terms of number of projects and network length. The number of SPI road projects is more than 10 times the number of SPI railway projects, and the network length of the SPI road projects is five times the network length[16] of SPI railway projects. The reason for railways dominating in terms of investment can be largely attributed to the very high capital costs of high-speed railway (HSR) projects, with 10 HSRs accounting for half of all railway SPI

16 The network length analysis and per-kilometer investment analysis is based on available information for about 80 percent of projects.

investments. The per-kilometer investment in HSRs (about US$34 million) is much higher than that of the per-kilometer investment in roads (about US$2 million).

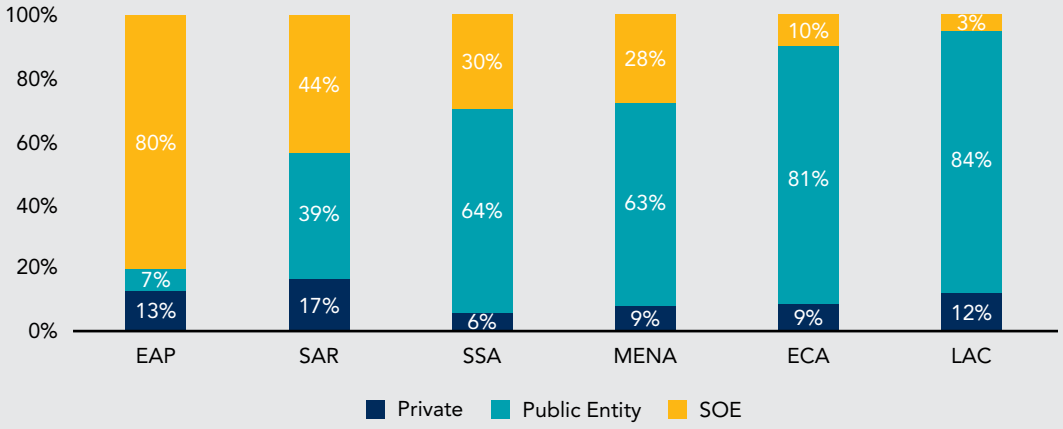
FIGURE 14
Transport Sub-Sector Breakdown for SPI and SOE Infrastructure-Project Investments, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

Notably, in line with the Belt and Road Initiative, China has been making sizeable investments in transport projects in other countries in the region, such as the US$6.0 billion Laos-China high-speed-railway project, which is funded primarily by the China Exim Bank.

FIGURE 15
Investments in Transport Sector by Region



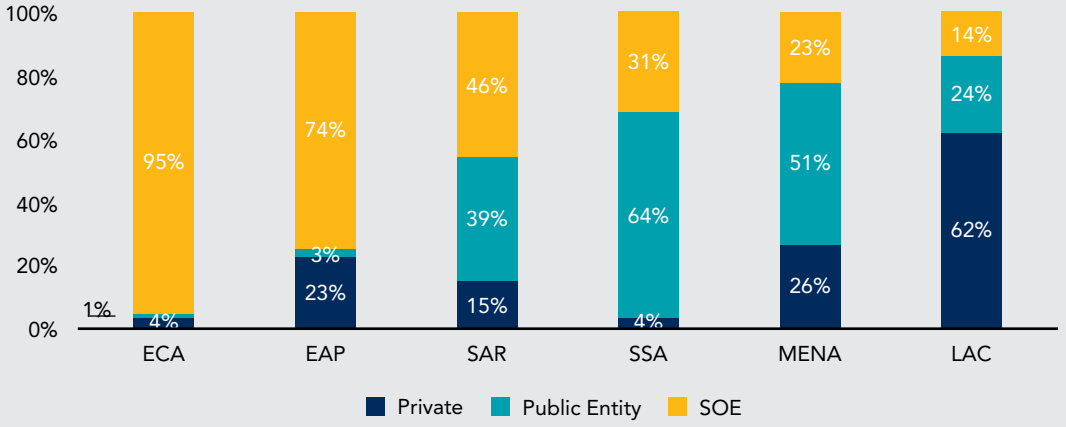
Sources: SPI and PPI databases, World Bank, as of November 2018

As shown in Figure 15, **except in EAP and SAR, transport projects were undertaken primarily by public entities.**

In the energy sector, 72 percent of the share of all SPI investment commitments to infrastructure projects were taken up by SOEs, mostly driven by the EAP (74 percent) and ECA (95 percent) regions (see Figure 16). In ECA, the Azerbaijan-SOE-sponsored Trans Anatolian Natural Gas Pipeline Project (TANAP) accounted for almost one fourth of all public infrastructure-project investments in energy. In the EAP region, China and Indonesia dominate, with SOE-sponsored electricity-generation-and-transmission projects. **Together, Chinese, Indonesian and Russian SOEs accounted for almost 45 percent of all public energy-sector infrastructure-project investments.** Public-entity investment was more prevalent in LAC, SAR, MENA and SSA, accounting for 25 percent or more of the totals, with the highest share found in SSA, at 64 percent. LAC is the only region where private investments constitute more than half of the regional investments in energy.

Globally, 84 percent of SOE investment commitments to infrastructure projects in the energy sector were allocated to electricity-generation projects, followed by 14 percent to transmission projects and only two percent to distribution projects.

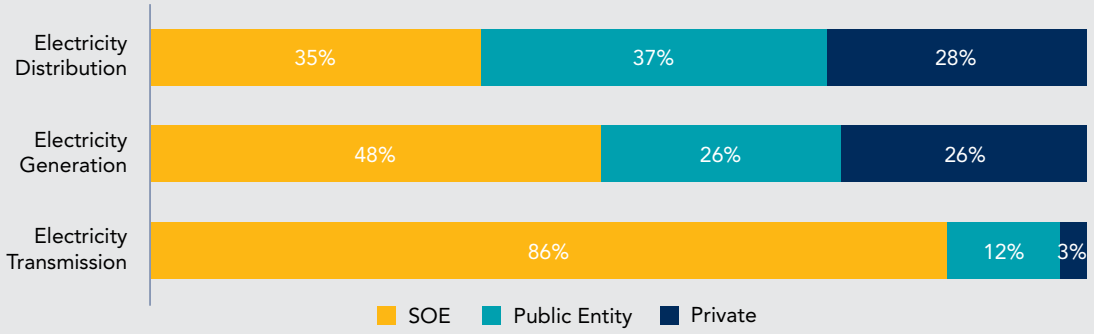
FIGURE 16
Investments in Energy Sector by Region



Sources: SPI and PPI databases, World Bank, as of November 2018

5.3 SECTORAL INVESTMENTS: ENERGY

FIGURE 17
Investments in Energy Sector by Sponsor Type

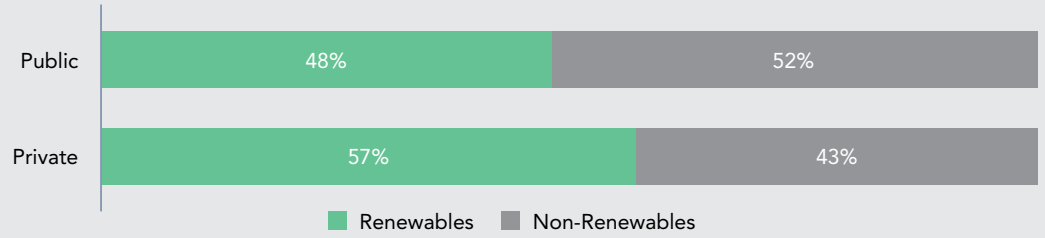


Sources: SPI and PPI databases, World Bank, as of November 2018

As illustrated in Figure 17, SOE-sponsored infrastructure-project investments are prevalent in electricity transmission, accounting for almost 90 percent of total electricity-transmission investments. Although the share of private investment in electricity distribution might seem comparable to that of electricity generation (28 percent and 26 percent, respectively), in terms of absolute investment amounts, private investment in electricity generation far exceeds private investment in distribution (US$46.8 billion versus US$1.4 billion). The private sector supported more generation projects than either the public or SOE sectors (196 versus 39 and 60, respectively), with a relatively small average project size of US$239 million. In distribution projects, private investment was provided for relatively few projects (three projects supported by private investment, versus seven and 23 projects supported by public and SOEs investments, respectively), but with a larger average project size of US$459 million.

In 2017, in line with the United Nation's sustainable development (SDG) goal 7 ("Ensure access to affordable, reliable, sustainable and modern energy for all"), **efforts to shift to renewable energy were noticeable, especially in the private sector (renewables accounted for 57 percent of PPI investments), but public/SOE infrastructure-project investment commitments to renewables still fell slightly short of 50 percent of total public-sector energy investments** (see Figure 18).

FIGURE 18
Public and Private Energy-Sector Investments by Type



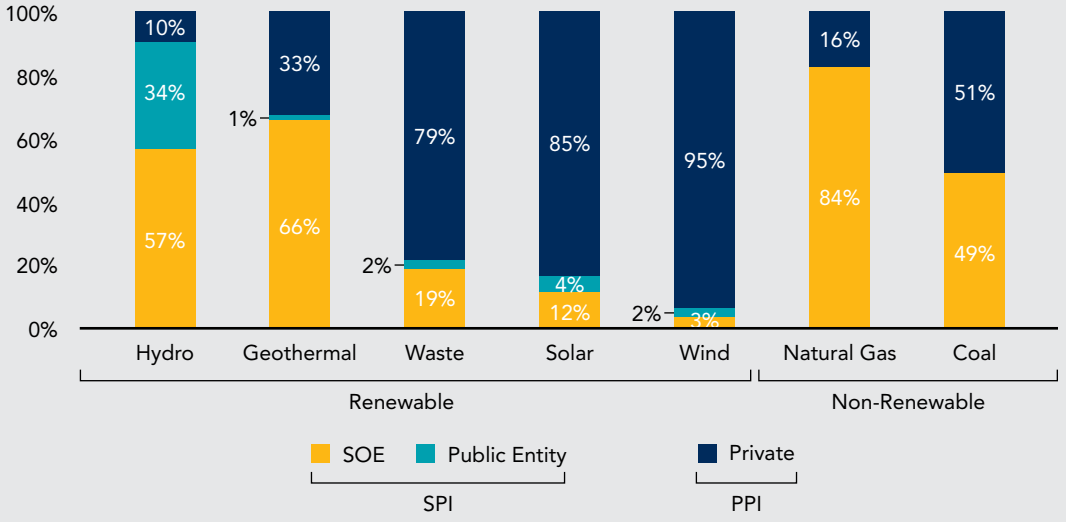
Sources: SPI and PPI databases, World Bank, as of November 2018

Public infrastructure-project investments in the renewable-energy sector were comprised mainly of investments in hydropower projects (see Figure 19) in China, Nigeria and Pakistan. Capital intensive and with long gestation periods, hydropower projects carry high risks for private-sector sponsors and, as such, are traditionally carried out by the public sector. In 2017 there were a total of 42 projects in the hydropower sector, with an average investment size of US$1.3 billion. A US$24 billion investment in the 16,000-megawatt Baihetan hydropower station in China, sponsored by a Chinese SOE (China Three Gorges Corporation (CTG)) accounted for 13 percent of all public energy-infrastructure-project investments.

On the other hand, **wind and solar power projects are predominantly privately funded (see Figure 19), led by projects in Brazil, China and Mexico.** These are more attractive sub-sectors for private investors, because of relatively shorter construction periods and reduced capital costs (particularly for solar).

On the non-renewable side, two projects in Indonesia significantly drove up the public share of infrastructure-project investments (see Figure 19). A mega gas-fired power plant in Indonesia accounted for 90 percent of all public-sector infrastructure-project investments in natural gas. Similarly, the power plants in Indonesia represented 61 percent of all public-sector infrastructure project investments in coal. Altogether, SOEs/public entities funded only eight natural-gas projects and seven coal-power projects.

FIGURE 19
Investments in Energy Sector by Source Type

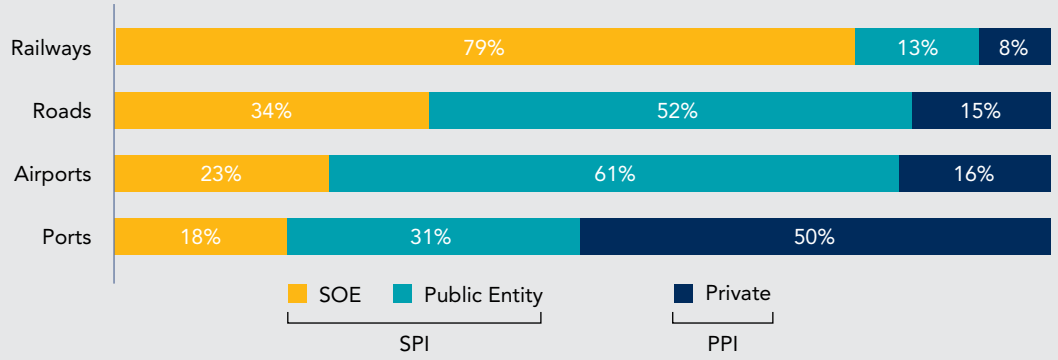


Sources: SPI and PPI databases, World Bank, as of November 2018

5.4 SECTORAL INVESTMENTS: TRANSPORT

As for transport, public/SOE investment commitments to infrastructure projects comprised three quarters of the investments in railway, road and airport projects, while the private sector invested mainly in ports (Figure 20). SOEs dominated railway investments, accounting for almost 80 percent of the total investment amount, whereas investment from public entities accounted for more than half of road and airport investments.

FIGURE 20
Share of SOE, Public and Private Infrastructure Project Investments by Transport Sub-Sector, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

It can be seen from Figure 21 **that public/SOE and private projects in ECA and SAR were mainly comprised of investments in roads.** In ECA, Russia contributed the most to public/SOE infrastructure-project investment in roads (60 percent), whereas Turkey mobilized the largest share of private investments in roads (52 percent). As for SAR, India dominated in terms of both public/SOE as well as private infrastructure-project investments in roads, accounting for 72 and 100 percent of the region's investments, respectively.

SOE infrastructure-project investments in roads came mostly from two countries, China and Indonesia, with a combined share of 73 percent of total SOE infrastructure-project investments in roads, equating to 24 percent of total road infrastructure-project investments of US$84.8 billion in 2017.

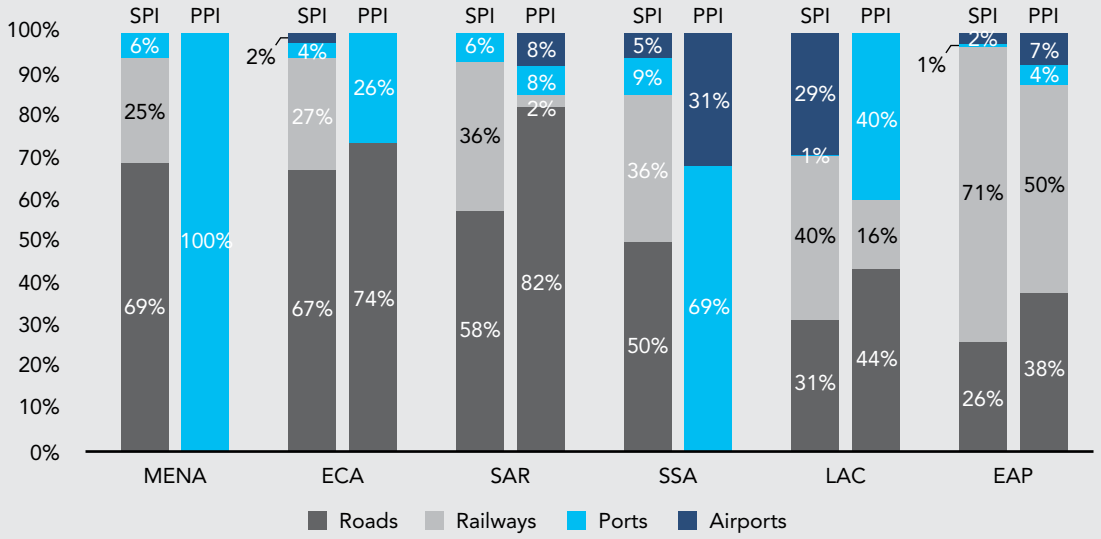
Railways constituted the majority of investments in EAP. Seventy-one percent of public/SOE and 40 percent of private regional-railway investment commitments to infrastructure projects can be attributed to China. In fact, about 50 percent of the total global railway infrastructure-project investments were comprised of investments by Chinese SOEs.

Investments in ports accounted for major portions of private-sector investment commitments in MENA (one project in Egypt accounted for 100 percent of the region's investments), SSA (a project in Ghana accounted for 69 percent of the region's commitments), and LAC (ports accounted for 40 percent of the region's investments).

Airport projects in SSA mainly attracted private investments, whereas those in LAC were implemented by public entities and SOEs. Investments in the airport sector in these regions were driven by projects in just two countries—Mexico (four projects) for LAC, and Madagascar (one project) for SSA. One Mexican project (an airport terminal building project for the New International Airport of Mexico City) accounted for 44 percent of global airport infrastructure-project investments, and significantly drove up the global public-sector share in airport infrastructure-project investment commitments.

FIGURE 21

Transport Sub-Sector Share of Public/SOE and Private Infrastructure Project Investments by Region, 2017

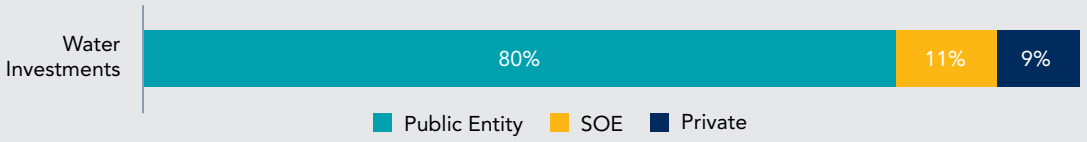


Sources: SPI and PPI databases, World Bank, as of November 2018

5.5 SECTORAL INVESTMENTS: WATER

Infrastructure investments in the water sector, including public-utility and treatment-plant projects, totaled US$20.2 billion (representing four percent of total infrastructure-project investments; see Figure 11). Water projects have traditionally been primarily sponsored by the public sector, as high input costs and long or low-cost recovery rates make such projects unviable from the private sector's perspective. The 2017 data is effectively in line with the trend of water being a public-service good (see Figure 22), as **over 90 percent of water-sector investments were implemented by the public sector.**

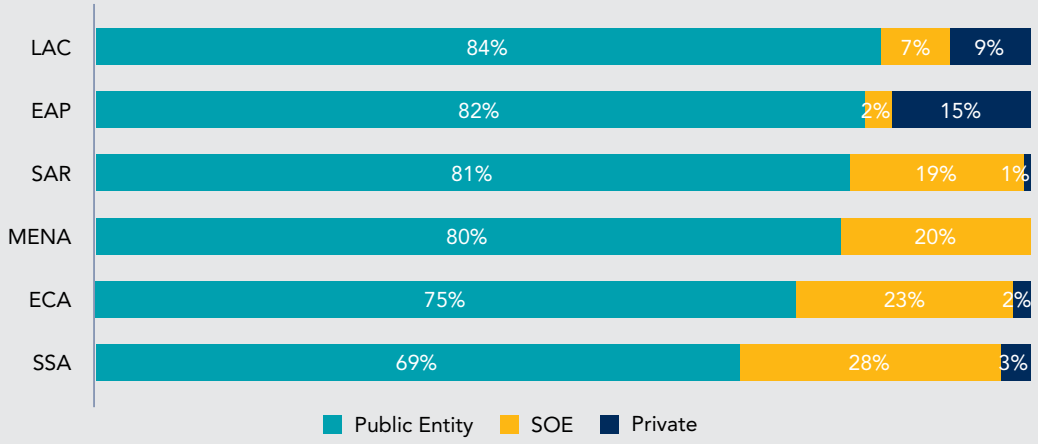
FIGURE 22
Investments in the Water Sector by Sponsor Type



Sources: SPI and PPI databases, World Bank, as of November 2018

Public-entity infrastructure-project investments, comprising 80 percent of total water-investment commitments to infrastructure projects, dominate across all regions (see Figure 23). Private investments are only marginally present in EAP and LAC, mainly through treatment plants in China and water-utility projects in Brazil.

FIGURE 23
SPI and PPI Investments in Water-Utility and Treatment Plants



Sources: SPI and PPI databases, World Bank, as of November 2018

6. Analysis of Sources of Financing

DFIs contributed significant amounts of financing to all three types of investment commitments to infrastructure projects, amounting to 21 percent of SOE investments, 49 percent of public investments, and 30 percent of private investments (see Figures 24, 25 and 26). In absolute amounts, DFIs allocated more resources to public/SOE investment commitments to infrastructure projects—US$60.6 billion for public and US$45.1 billion for SOE infrastructure-project investments—compared to only US$12.6 billion for private infrastructure-project investments.

A large portion of the financing for SOE and public investments came from the public sector, at 73 percent and 49 percent respectively, whereas 45 percent of private-sector investments were financed by the private sector (see Figures 24, 25 and 26).

FIGURE 24
Financing Sources for SOE Infrastructure-Project Investments (Equity+Debt)

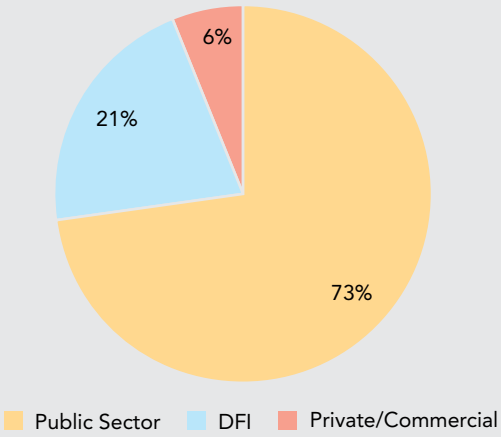


FIGURE 25
Financing Sources for Public Infrastructure-Project Investments (Equity+Debt)

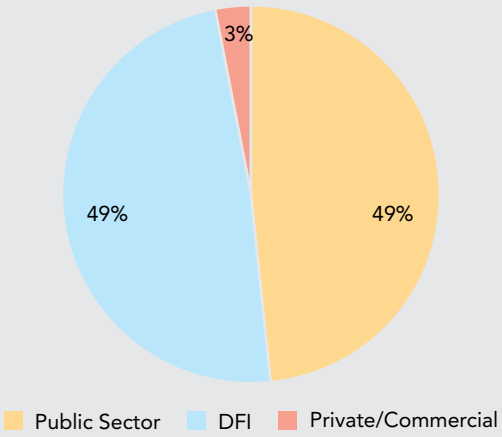
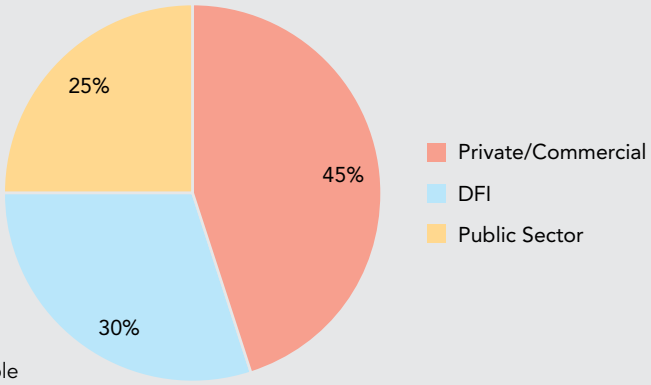


FIGURE 26
Financing Sources for PPI Infrastructure-Project Investments (Equity+Debt)

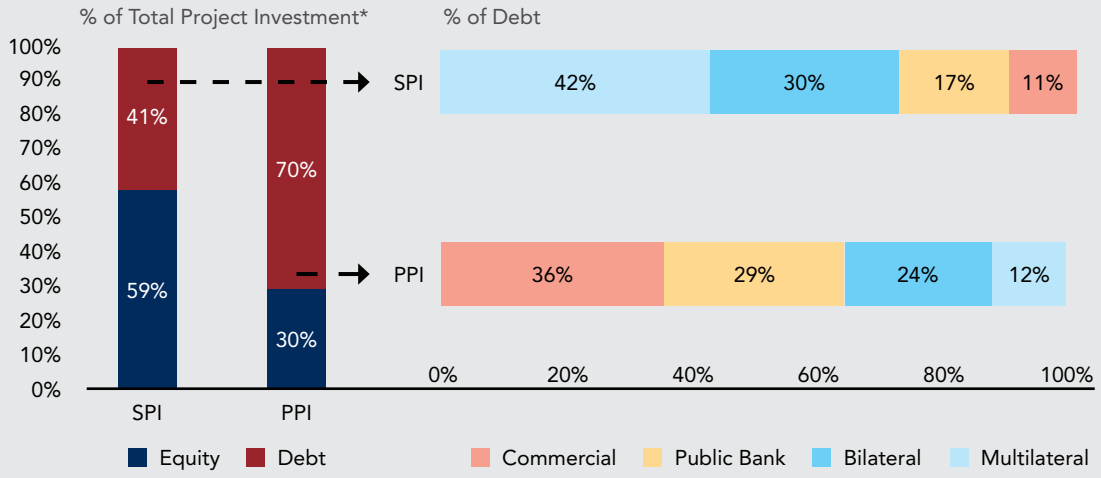


All graphs % of total infrastructure project investments, based on available financing information from 98 percent of the total number of projects (2,066 out of 2,111).

Sources: SPI and PPI databases, World Bank, as of November 2018

As shown in Figure 27, 59 percent of total public/SOE investment commitments to infrastructure projects were equity financed. On the other hand, 70 percent of the private investment was debt financed. As the public sector typically has more interactions with DFIs, allowing the latter to work closely with governments to oversee infrastructure-project implementation, it is not surprising that public/SOE projects raised more debt from DFIs (72 percent), while private projects relied more on commercial debt (36 percent).

FIGURE 27
Debt Breakdown SPI and PPI Infrastructure Project Investment, 2017



* Based on available financing information from 98 percent of projects (2,066 out of 2,111)

Sources: SPI and PPI databases, World Bank, as of November 2018

EAP accounted for the biggest shares of the two main sources of financing for both public/SOE and private projects. Government financing in EAP represented 50 percent of total public-sector financing of public/SOE infrastructure-project investments. This region also attracted 42 percent of total private/commercial-sector financing of private investments. Investments in EAP mobilized the largest shares of equity and debt for both public/SOE and private projects—45 percent of equity and 31 percent of debt for public projects, and 41 percent of equity and 49 percent of debt for private investment projects.

As previously mentioned, China's infrastructure investments comprised a major share of EAP's public/SOE infrastructure-project investment commitments, and were financed by the government and the four main public banks—Agricultural Bank of China, Industrial and Commercial Bank of China, China Construction Bank, and Bank of China. In contrast, a number of countries in EAP were able to attract a significant amount of private financing for private-sector projects in the region.

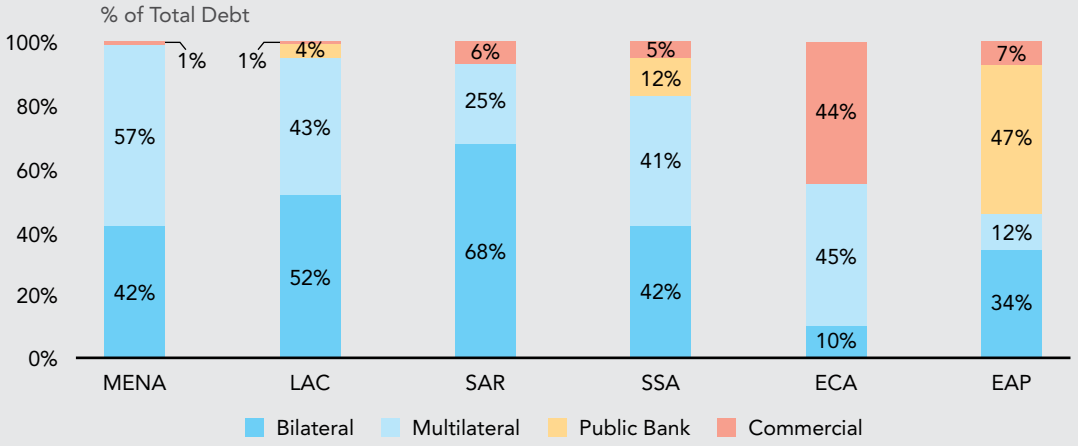
6.1 DEBT TYPE: REGIONAL AND SECTORAL ANALYSIS

DFIs accounted for the biggest shares of SPI debt across most regions—MENA (100 percent), LAC (95 percent), SAR (93 percent), and SSA (83 percent) (see Figure 28).

The ECA was an exception; there, commercial debt constituted a higher portion of the total regional debt, with 44 percent of its debt finance for public/SOE investment commitments to infrastructure projects being mobilized from commercial sources, including debt from other corporations. Almost all of the commercial debt in ECA (96 percent) was provided to two energy (natural-gas transmission) projects (US$8.1 billion out of US$8.4 billion). **EAP raised most of the debt from public banks (47 percent)**, which represented 85 percent of total public debt for public/SOE infrastructure-project investments. Moreover, 74 percent of the SPI-project debt in EAP was attributed to debt raised for public/SOE infrastructure-project investments in China, which was provided by the four big public banks, as mentioned in the previous section.

At the same time, MENA and LAC were the only two regions that did not raise any commercial debt for public/SOE investment commitments to infrastructure projects.

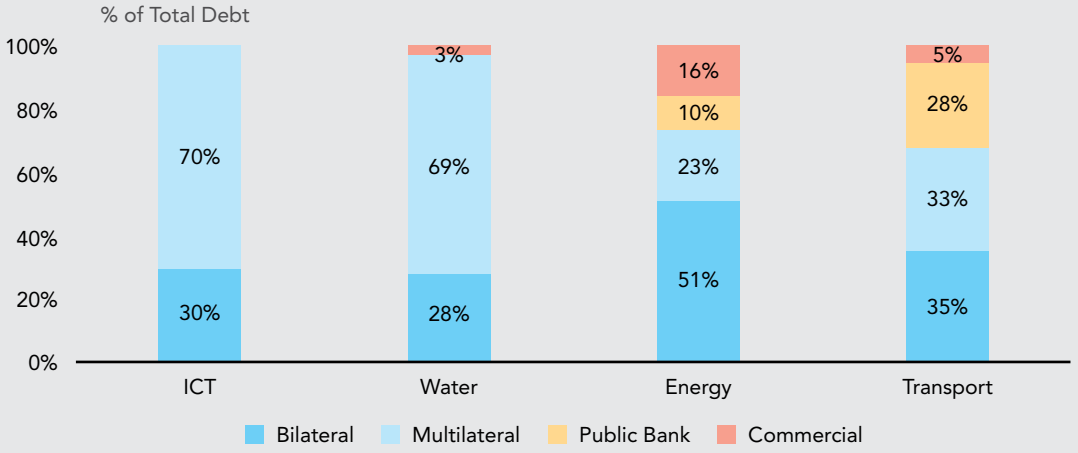
FIGURE 28
Share of Debt for SPI Debt Finance by Region



Sources: SPI and PPI databases, World Bank, as of November 2018

Within each sector, DFIs provided the majority of loans for public/SOE investment commitments to infrastructure projects (see Figure 29). **Public/SOE-financed energy projects attracted the largest amount of commercial debt (16 percent).** Two natural-gas transmission projects in ECA accounted for 71 percent of the commercial debt raised. This is hardly surprising, because commercial banks are more inclined to provide loans for projects with higher cost-recovery ratios and shorter construction periods. **Transport projects raised the largest share of debt from public banks**, and 84 percent of it was attributed to China, primarily for railway projects (88 percent).

FIGURE 29
Share of Debt Type for SPI Debt Finance by Sector

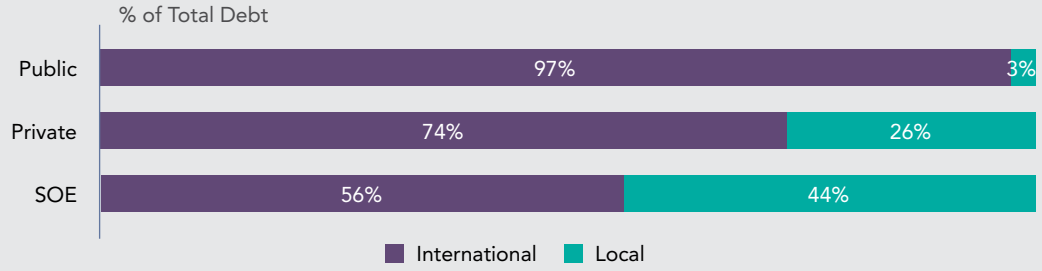


Sources: SPI and PPI databases, World Bank, as of November 2018

6.2 DEBT TYPE: INTERNATIONAL AND LOCAL DEBT

International debt accounted for up to three quarters of the debt raised across the regions for public and private infrastructure-project investments, and more than half of the debt raised for SOE projects (see Figure 30). Locally sourced debt accounted for almost half of total debt raised for SOE infrastructure-project investments, and a quarter of debt raised for private projects, but only a minute portion of debt raised for public infrastructure-project investments. Local debt raised for SOE infrastructure-project investment commitments in China accounted for 95 percent of locally sourced debts for SOE projects. **A lion's share of locally sourced debt was also provided for projects in EAP**, and 98 percent of that was allocated to public/SOE infrastructure-project investments in China by the big four public banks.

FIGURE 30
Share of International and Local Debt for SOE, Public and Private Infrastructure-Project Investments, 2017



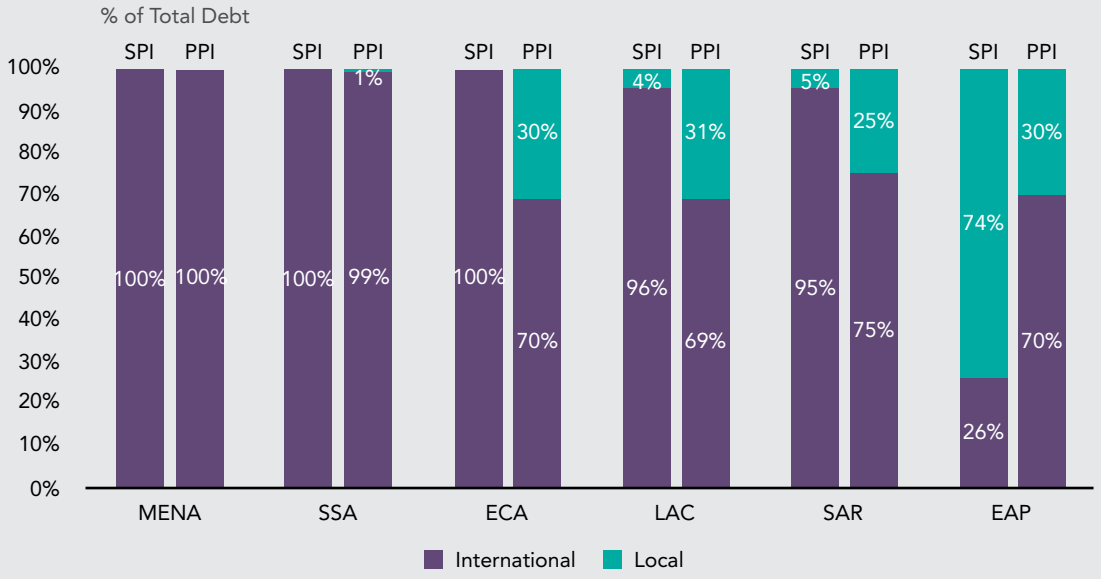
Sources: SPI and PPI databases, World Bank, as of November 2018

LAC and SAR are the only other regions that had a locally sourced portion of public/SOE debt financing, but it was relatively small in both regions.

ECA (30 percent), LAC (31 percent), SAR (25 percent), and EAP (30 percent) utilized local debt for roughly a quarter of their private-debt financing (see Figure 31). Turkey accounted for most of the local debt in ECA, having raised funds mostly from commercial banks. On the other hand, Brazil, which sourced the most local debt in LAC, raised most of its local debt from the National Bank for Economic and Social Development (BNDES). India attracted the majority of the local debt for privately financed projects in SAR. In EAP, local debt for private projects was distributed more evenly across different countries.

FIGURE 31

Share of International and Local Debt for SPI and PPI Debt Finance by Region, 2017



Sources: SPI and PPI databases, World Bank, as of November 2018

7. Learnings from the Exercise

A more in-depth understanding of the sources of investments in infrastructure projects (public, SOE and private) across the regions, countries, sectors and projects will be essential to help design and implement policies that promote efficiency of allocations in infrastructure markets. However, the task of taking stock of current infrastructure-investment commitments and/or actual spending remains challenging, especially with respect to the actual infrastructure spending and/or future investment commitments being made by the public sector. The latter is particularly important, because the public sector plays a dominant role in investing in the provision of infrastructure services.

Unfortunately, there is currently insufficient data to accurately assess the levels of public-sector infrastructure investments and, in cases where such data is available, it is usually spread across multiple sources with inconsistent formats. There is also a high degree of variation in the different methodologies used to try and capture infrastructure investments and assess how these resources are being allocated and spent. These data deficiencies limit the ability to take stock of recent commitments, and certainly preclude the ability to perform historical analyses of infrastructure investments.

In light of the above, the process of trying to build a more informed understanding of the overall infrastructure-investment landscape can be best compared to putting together the pieces of a puzzle. To move towards systematic and reliable time-series estimates of infrastructure investments, approaches to reconciling disparate data sets will be required. The robustness of estimates will also require consideration of and compensation for the various data sources' advantages and limitations.

This report looks at the subset of infrastructure investments that are done via project instruments. And although it only covers a portion of the overall infrastructure investments (based on a comparison with the findings of Fay and others [2019]), it is the most detailed database available on infrastructure investments. As such, and again keeping in mind that it focuses on projects and may not be representative of infrastructure investments as a whole, it does offer interesting insights into the likely composition of those investments.

- **Dominance of SOEs:** The most important finding is that a significant portion of all infrastructure investments worldwide is being implemented by SOEs. The significant role that SOEs play in infrastructure investments has important implications for policy-makers and multilateral organizations worldwide. In particular, given the scope of SOE involvement in infrastructure investments, there should be more initiatives to a) identify and develop comprehensive data sources on SOE activities in the market, and b) develop SOE-targeted policy-level interventions and support mechanisms that can help promote efficient infrastructure investments.
- **The limited role of the private sector:** The data confirms the fact that the private sector's share of infrastructure investments remains relatively small, despite the numerous initiatives to try and mobilize more private-sector investments. Although the private sector is active in some sectors (e.g., wind, solar, airports and ports), by and large, infrastructure investment still remains a public-sector "business." In this context, it will be important to look deeper into those examples where certain countries have managed to attract higher shares of private-sector investment, as this might reveal some important policy learnings on what works in attracting the private sector. In particular, it will

be interesting to determine to what extent SOE investment (see above) is crowding out private-sector investment and, if so, what can be done to address this.

- **Disparities in public infrastructure spending:** The study provides a bird's-eye view of the dramatic regional, country-level and sectoral disparities in public infrastructure spending across the globe. EAP accounts for up to half of global public and private investments, with China alone accounting for a quarter. The study also confirms that, despite its importance, the water sector remains seriously underfunded in comparison with energy and transport.

It is important to note that the methodology is subject to some sampling error, because the study does not capture investments with values of less than US$1 million, nor non-project infrastructure investments, nor investments that are not publicly reported. But these deficiencies are highly unlikely to invalidate the inferences made from the data. Although they may skew detailed results towards conditions in middle-income and larger countries, as well as towards the characteristics of larger projects, they nevertheless provide a compelling picture of the major trends in infrastructure investments.

Additionally, the analysis is a snapshot of 2017 infrastructure spending and, as such, cannot be generalized to apply to historical investment patterns. Although the analysis is highly informative regarding current conditions, examining project-level data over a longer period of time, and complementing project data with fiscal and national accounts data, would increase the ability to generalize from the findings and also provide a better sense of the comparability of results derived from top-down and bottom-up approaches to estimating infrastructure expenditures.

In spite of these limitations, this exercise confirms the value of mining project-level data on public investment commitments in infrastructure. SPI and PPI data are specific and granular, allowing detailed analysis of project structuring and financing. Secondly, construction of a complementary SPI dataset allows extended use and better contextualization of the widely used PPI dataset. As the only currently available source on SOE commitments, and the only source that allows detailed analysis of public infrastructure investments at a global scale, the SPI dataset can be further utilized in research that combines available data sources, as well as to triangulate results from alternative methodologies for estimating government expenditures. It is hoped that this study will spur further discussions on the most effective approaches to integrating available data sources, while minimizing inherent biases and errors.

Appendix A: Countries with More Private Investment Than Public Investment

BRAZIL

Private investment commitments in infrastructure were US$6.4 billion in 2017, compared to US$2.1 billion worth of public investments. The country has a well-recorded history of engaging the private sector in infrastructure investments, and 1,787 private investment projects reached financial closure between 1993 and 2017. The federal government has established a comprehensive PPP-enabling regulatory framework by enacting Law 8.666 on Public Procurement as well as Concession Law 8.987 in 1995; PPP Law 11.079 in 2004; and the Decree on Expressions for Interest and Unsolicited Proposals 8.428 in 2015. They also created a PPP unit called the Steering Committee for the Federal PPP (PPP Committee) in 2005.[17] After one of Brazil's most devastating recessions subsided in 2016, the government aimed to further utilize PPPs in the recovery process by enacting a new PPP Law 13.334 in 2016 and creating the PPI Council. President Temer's administration also launched the Investment Partnership Program in the same year, to facilitate the concessions of 55 infrastructure projects worth up to US$14.4 billion.

CAMBODIA

In 2017, private infrastructure investments amounted to US$1 billion across two projects and accounted for 51 percent of total infrastructure investments. The shift to private investment was a result of an improved PPP-enabling regulatory and institutional framework, as well as a significant cut in development assistance due to the transition to a lower-middle-income economy in 2016. The Royal Government of Cambodia (RGC) first engaged the private sector for investing in an ICT infrastructure project in 1992, amid an ongoing civil war.[18] The RGC further enacted the Law on Investment in 1994, the Land Law in 2001, the Law on the Amendment to the Law on Investment in 2003, and the Law on Concession in 2007.[19] From 2011 to 2016, however, no PPP managed to reach financial closure, mainly due to the 2011-2012 Cambodia-Thailand conflicts and the prolonged protests contesting the 2013 election results. With the ensuing political stability, the RGC approved the Policy Paper on PPPs for Public Investment Project Management 2016-2020, a first draft of the PPP Procurement Manual, and a PPP task force in 2016[20].

COLOMBIA

While Colombia saw six state-led projects amounting to US$274 million, there was also one PPP project worth US$368 million. With the political instability decreasing, the government has been looking to increase infrastructure investments in order to boost the country's slowing economy.[21] In the past six years, Colombia has made changes to its initiatives in developing PPPs, such as the development of

17 Brazil, Procuring Infrastructure Public-Private Partnerships, The World Bank.

18 PPI Database, World Bank, Source: http://ppi.worldbank.org/

19 PPP Country Profile – Cambodia, Public-Private Partnership in Infrastructure Resource Center (PPPIRC).

20 Ministry of Economy and Finance, Policy Paper on PPPs for Public Investment Project Management 2016-202

21 Bell, Amy, and Andres Schipani. 2015. "Colombia Prioritises Infrastructure Plans | Financial Times". Financial Times. https://www.ft.com/content/39e07b96-4b3d-11e5-b558-8a9722977189.

the Fourth Generation (4G) Toll Road Program, to stimulate the provision of capital for infrastructure investment. These include strengthening the regulatory framework with new PPP and infrastructure laws, and standardizing contracts and processes, such as the Ley 1508 de 10 de enero de 2018, the Concession Law and the Modification to PPP Law.[22] There were also new institutions created, including the Financiera de Desarrollo Nacional (FDN) and Agencia Nacional de Infraestructura (ANI). However, there are no ministerial-level organizations. The ANI is a state agency under the Ministry of Transport. The FDN is jointly owned by the National Government, the International Finance Corporation (IFC), CAF, and Sumitomo Mitsui Banking Corporation. The Department of National Planning and the Ministry of Finance also play supervisory roles.

EGYPT

Egypt was one of the pioneers in attracting the private sector's participation in infrastructure investment, having constructed the Suez Canal in 1869 via a build-operate-transfer (BOT) model. A total of US$2.7 billion worth of private investments across 25 projects, 24 of which were renewable-energy electricity-generation projects, accounted for 56 percent of total investment in 2017. As indicated earlier, the government engaged the private sector in infrastructure investment early on, and enacted the Law on Concessions of Public Utilities in 1947. They followed up with Law No. 89 on Public Tenders in 1998, a PPP Central Unit in 2006, and finally the PPP Law and implementing rules and regulations (IRR) in 2010.[23] Unfortunately, violent protests and terrorist attacks plagued the country, delaying US$6.1 billion worth of loans and aid from the IMF, and halving U.S. private investment. As the dust settled, the IMF provided a US$12-billion loan to help Egypt recover from the resulting economic crisis. Along with the 2016 inauguration of Egypt's Vision 2030, in which a feed-in tariff for renewable energies was introduced, the efforts led to an exponential increase in private investments in 2017.[24]

GHANA

Private investment in 2017 was recorded at US$550 million, accounting for 65 percent of total investment. The figure is representative of the government's efforts to attract private investments in infrastructure, which was even embedded in the 1992 constitution. The government also enacted the Public Procurement Act in 2003 and created the PPP Toolkit for Unsolicited Proposals in 2012.[25][26] Unfortunately, no private-investment projects reached financial closure in 2015, due to high debt-to-GDP ratios—70 and 72 percent in 2014 and 2015—and inflation (almost reaching 15 percent), which led to nationwide protests in 2014. The government responded by enacting the Public Procurement Amendment Act and National Policy on PPP in 2016, and created the PPP Project Advisory and Project and Financial Analysis Units. The revised regulatory framework and newly established institutions streamlined PPP procedures, regaining trust from the private sector, with close to one-fifths of all private-investment projects reaching financial closure in 2016 and 2017.

22 "Colombia | PPP Knowledge Lab". 2018. PPP Knowledge Lab. https://pppknowledgelab.org/countries/colombia

23 Egypt, Arab Rep., Procuring Infrastructure Public-Private Partnerships, The World Bank.

24 Nihal El-Megharbel, Sustainable Development Strategy: Egypt's Vision 2030 and Planning Reform.

25 Ghana, Procuring Infrastructure Public-Private Partnerships, The World Bank.

26 The Coordinated Programme of Economic and Social Development Policies, 2010-2016, Republic of Ghana

JORDAN

In 2017, private investment reached its highest amount per annum, totaling US$2.7 billion, compared to total public investment of US$0.7 billion. The strong emphasis on private-sector engagement in infrastructure investments can be traced back to the enactments of the Privatization Law No. 25 and its IRR, passed in 2000 and 2008.[27] The framework led to financial closures of 11 projects worth US$3.4 billion between 1997 and 2007. Large-scale, prolonged protests and five changes of prime minister from 2009 to 2013 hindered further progress. After a stable government was established in late 2013, the PPP Law and its IRR were finally enacted in 2014 and 2015, and the PPP Council and Unit were created as well.[28] Along with the PPP-enabling Jordan 2025 National Vision and Strategy approved in 2015, these regulatory and institutional frameworks led to the financial closure of 23 projects worth US$4.4 billion between 2014 and 2017, which is more than half of the total number of projects in the country.[29]

MEXICO

In 2017, Mexico had a total of 103 state-led projects and 20 PPPs. However, investment-value-wise, state-led projects amounted to US$6.2 billion, whereas PPPs amounted to US$8.6 billion. The average PPP project size was 7.1 times higher than the average size of public projects, with 68 percent of public projects costing less than US$10 million. The strain on public finances and the decrease in oil revenue caused the government to seek greater financial commitment from private sources to achieve the goals set in the National Infrastructure Programme 2014-18.[30] While there is no single national-level PPP agency, each sector and level of government is in charge of implementing and supervising projects. A National Infrastructure Fund Trust, which promotes and encourages private participation in infrastructure investment, was created in 2008. Mexico also implemented PPP laws and policies in place, such as the Reglamento de la Ley de Asociaciones Público Privadas (2012) and Lineamientos para un esquema de asociación público-privada (2013).[31]

MONGOLIA

The Mongolian government turned to the private sector for infrastructure funding, due to constraints in public resources and the fiscal space. Investment in the state-funded project in 2017 amounted to 46 percent of investments in the PPP project that year. Mongolia's latest initiative aims to raise US$16 billion for infrastructure projects, with 90 percent coming from private funds. With a 44-percent increase in foreign and domestic direct investments in 2017 (US$10.3 billion), the government is hopeful that its efforts will increase investor confidence and increase the number of PPPs in the country. Responsibility for PPPs has been shifted to the Ministry of Industry, with a PPP unit established at the National Development Agency, to signal a commitment to the Sustainable Development Vision of Mongolia. Major reforms in the regulatory framework for public=expenditure management have also been under-

27 Murad Sawalha, Public-Private Partnership in Jordan, Al Tamimi & Co.

28 Jordan, Procuring Infrastructure Public-Private Partnerships, The World Bank.

29 Jordan 2025: A National Vision and Strategy, Ministry of Planning and International Cooperation.

30 "Private Time: Public-Private Partnerships Will Play A Key Role In Making Up For Gaps In Infrastructure Funding". 2015. Oxford Business Group. https://oxfordbusinessgroup.com/analysis/private-time-public-private-partnerships-will-play-key-role-making-gaps-infrastructure-funding.

31 "Mexico | PPP Knowledge Lab". 2018. PPP Knowledge Lab. https://pppknowledgelab.org/countries/mexico.

taken to boost investor confidence. These include the Law on Concessions (2010) and a revised Public Procurement Law (2011), which aim to increase transparency and smoothen the process.[32] However, these laws have yet to be implemented effectively and face opposition.

THE PHILIPPINES

Private investments in 2017 amounted to US$2.4 billion across four projects, compared to public investments of US$2.1 billion across 85 projects. The Philippines have consistently attracted multi-billion-dollar private investments in infrastructure projects every year, ever since President Corazon Aquino's administration. The government enacted the BOT Law and IRR in 1990, and the Government Procurement Reform Act in 2003.[33][34] These initiatives contributed to the financial closures of more than 70 projects receiving private investment between 1987 and 2003. As well as establishing a PPP regulatory framework, the government also established two PPP units—the PPP Center in 2010 and the PPP Governing Board in 2013. These efforts, along with the current national strategy to utilize PPPs as a means to accelerate annual infrastructure investment by five percent of GDP from 2016 onwards, has resulted in a constant flow of successful PPPs. A total of 189 projects receiving private investment, worth US$70.6 billion, reached financial closure between 1990 and 2017.

TURKEY

In 2017, five projects worth US$1.5 billion reached financial closure; this was significantly more than the total public investment of US$385 million across 57 projects. Private engagement in Turkey's infrastructure investment scene started slowly, but the country eventually managed to attract a sustained flow of private investment, with more than 237 projects from 1990 to 2017. An overarching PPP Law is not present, but in its absence, there are specific laws for certain types of PPPs. Law No. 3996 on Certain Infrastructure and Public Investments and Services with BOT Model and Law No. 4283 on Building and Operation of Thermal Power Plants with the BO Model were enacted in 1994 and 1997.[35] The High Planning Council, under the Ministry of Development, was selected to be the PPP unit. The government also enacted the Public Procurement Law No. 4734 and its IRR in 2002, and announced its commitment to increase total installed electricity to 125 gigawatts in its Vision 2023.[36] As a result, 221 projects (50 of them in energy) worth US$133 billion reached financial closure between 2002 and 2017.[37]

32 "Mongolia | PPP Knowledge Lab". 2018. PPP Knowledge Lab. https://pppknowledgelab.org/countries/mongolia.

33 The Philippine Amended BOT Law R.A. 7718 and its Revised Implementing Rules & Regulations (IRR), Congress of the Philippines.

34 Republic Act No. 9184 Government Procurement Reform Act, Congress of the Philippines.

35 Benchmarking PPP Procurement 2017 in Turkey, World Bank Group

36 Turkey Vision 2023, Republic of Turkey Prime Ministry.

37 Sahin Ardiyok and Ilker Kil, Turkey: Turkish Public Procurement Law in Practice, Mondaq

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