



Infrastructure Monitor 2020

Data-Driven Insights into Selected G20 Infrastructure Priorities

Global Infrastructure Hub
October 2020

DRAFT FOR DISCUSSION

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Executive Summary

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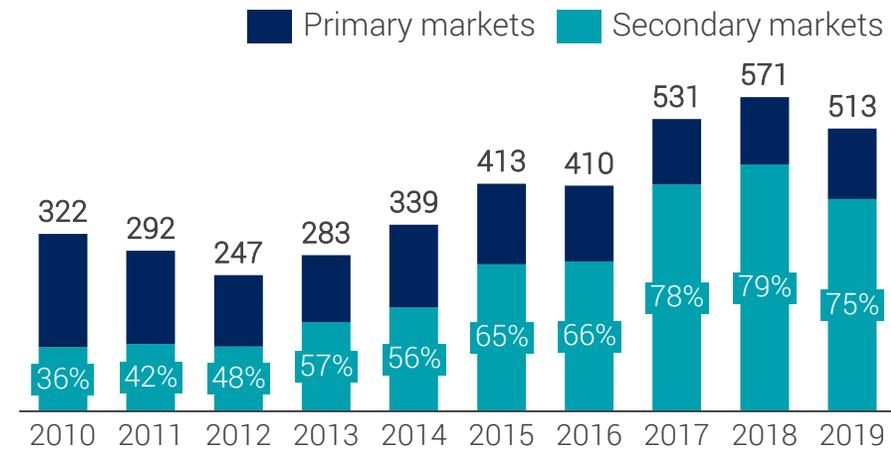
Infrastructure Monitor is intended to provide data-driven insights into selected G20 infrastructure priorities. This 2020 edition introduces reporting on private investment in infrastructure and infrastructure investment performance, as a first step in monitoring key items in the G20 infrastructure agenda.

A. Private Investment in Infrastructure

Mobilizing private capital is key to closing the infrastructure financing gap, which the Global Infrastructure Hub's (GIH) Infrastructure Outlook 2017 estimated at \$15 trillion out to 2040. Private capital is particularly important given the fiscal challenges resulting from COVID-19.

Total private investment in infrastructure (primary and secondary market transactions) has increased over the past decade, however, this increase has been driven by secondary market transactions. Secondary market transactions, i.e., the trading of existing infrastructure investments, amounted to 75% of all private financing in infrastructure in 2019.

Total infrastructure investment with private participation (USD bn)



Source: IJ Global and GIH calculations

Primary market transactions, i.e., new security offerings in either greenfield or brownfield infrastructure projects, is an important metric for private capital mobilization. Primary market transactions normally represent an incremental investment in infrastructure, which is typically not the case for secondary market transactions.

Worldwide private infrastructure investment in primary markets has been low, at \$106 billion in 2019, dropping from \$156 billion in 2010. In 2019, private investment in infrastructure (henceforth, referring only to primary market transactions) amounted to about 0.13% of total global GDP.

In 2019, 77% of private infrastructure investment was in high income countries (HICs). This suggests that the ambition of the international community to mobilize more private investment in upper and lower middle-income countries (UMICs, LMICs) and low-income countries (LICs) is not occurring at a pace consistent with transformational change.

Asia Pacific was the region, and renewables the sector, attracting the highest levels of private investment. Private investment in social infrastructure (health care, education and public facilities) declined the most from USD 20 billion in 2010 to only USD 3 billion in 2019. During 2010-2019, on an average, 73% of private infrastructure investment globally was debt financed, and 27% was equity financed. In low income countries, this pattern has been reversed, with equity accounting for 73% of total private infrastructure financing.

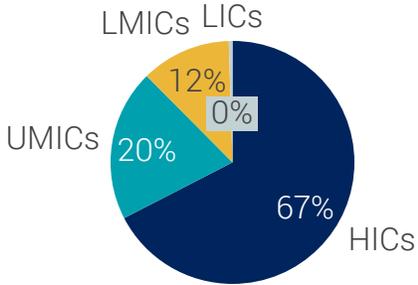
Private primary market investment in infrastructure transactions with private participation (USD bn)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
156.2	131.3	105.4	103.0	123.7	118.0	118.7	93.2	99.9	105.9
Private primary market investment as a share of global GDP (%):									
0.25	0.20	0.15	0.14	0.17	0.16	0.17	0.12	0.12	0.13

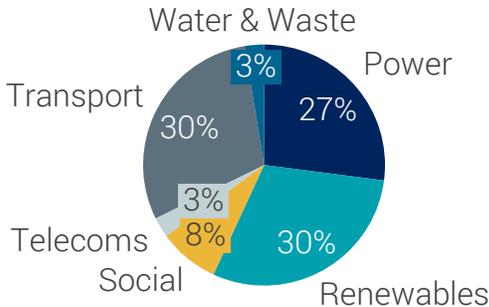
Source: GIH calculations based on IJ Global data, World Bank World Development Indicators.
 Note: Public investment involved in transactions with private participation was excluded to arrive at these estimates.

Share of private infrastructure investment (average 2010-2019)

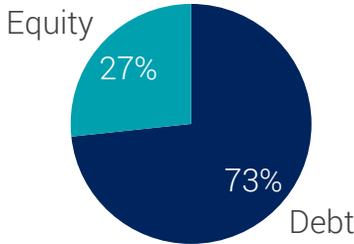
By country income



By sector



By investment type



B. Infrastructure Investment Performance

A transparent record of financial performance is a key requirement in building an infrastructure asset class, however, not all stakeholder communities may be fully aware of the track record of infrastructure investment around the world. This report highlights publicly available data on infrastructure investment performance around the globe.

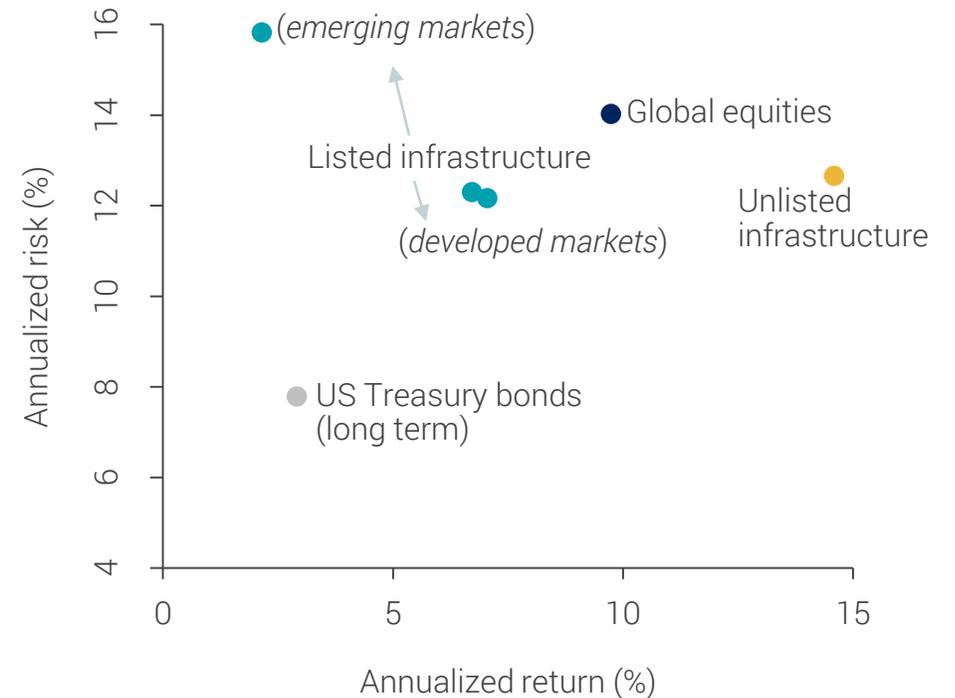
Equity investment

Over the past ten years, publicly **listed infrastructure equities** have on average provided lower returns and lower risk than global equities, with a lower price relative to fundamentals, suggesting that investors tend to treat infrastructure equities as value stocks.

Unlisted infrastructure equity has provided a higher return than listed global equities with lower risk. Emerging markets listed infrastructure has underperformed global equities on both return and risk.

Specifically, over a 10-year horizon, the MSCI index of publicly-traded global equities recorded a 9.7% annual return. In comparison, the MSCI index of infrastructure equities recorded a 6.7% annual return, which can be broken down to a 7.1% return in developed markets and a 2.2% return in emerging markets. The EDHEC*infra* index of unlisted infrastructure equities recorded a 14.6% annual return over 10 years.

10-Year Risk-Return of Different Asset Classes



Source: [MSCI Gross Returns](#), [EDHEC*infra*](#), [Damodaran NYU \(US T bonds\)](#)

Debt investment:

Infrastructure default risk slows considerably after an initial construction period, in contrast to other asset classes which typically experience a steady rise in default over time. Infrastructure loans on average perform like an investment grade security by year 10 in high-income countries and by year 14 in middle- and low-income countries, and even faster in PPPs, according to data from the Moody's Analytics Data Alliance Project Finance Consortium.

Infrastructure debt has a cumulative default rate over 20 years of 5.3% for high income countries and 7.0% for middle- and low-income countries, compared to the cumulative default rate of 11.7% over 20 years associated with the lowest credit rating (Baa3/BBB-) for an investment grade security.

Social infrastructure has experienced lower default rates than other infrastructure sectors. The Middle East and Africa have experienced the lowest default rates and highest recoveries in infrastructure debt. The recovery rates on infrastructure loans globally is 83%, compared to 78% for all project finance loans.

A public policy challenge is to best understand how public resources could potentially mitigate higher risk during the initial period (i.e., the construction phase) to enable greater private investment in infrastructure projects and enhance overall performance.

Number of Years by Which Infrastructure Debt Performs Like an Investment Grade Security

(on average)	High-Income Countries	Middle and Low-Income Countries
All infra	10	14
PPP	7	7
Non-PPP	11	15
<u>By sector</u>		
Transport	17	11
Energy	11	13
Social	1	10

1. Introduction

1.1 Background

Since 2013, the G20 has shown a sustained interest in infrastructure and long-term investment. While each presidency has focused on a specific set of priorities, there has been a consistent long-term agenda around:

- Mobilizing private capital, including through:
 - Risk mitigation,
 - Project preparation, and
 - Establishing infrastructure as an asset class
- Assessing the impact of infrastructure investment, including against the agreed principles of quality infrastructure

The 2020 priorities around Infratech may also emerge as another element of this long-term agenda.

1.2 Scope of the Report

Infrastructure Monitor provides data-driven insights into G20 infrastructure priorities, supporting continuity across presidencies.

The 2020 report introduces reporting on two variables as the basis for providing more systemic insights into the G20 infrastructure priorities:

- Private investment in infrastructure
- Infrastructure investment performance

Future reports of the Monitor could examine additional indicators. Options for G20 consideration are outlined at the end of this report.

In addition to this report, readers can access supporting statistical tables for digital download:

- [Data Tables for Private Infrastructure Investment](#) ***SUBJECT TO LICENCING DISCUSSIONS***

2. Private Investment in Infrastructure

2.0.1 Context

In 2017, the GI Hub's Global Infrastructure Outlook forecast global infrastructure investment needs of \$94 trillion out to 2040 – \$15 trillion more than projected spending based on prevailing trends. In order to close the infrastructure financing gap, it was estimated that annual infrastructure investment would need to increase from 3.0% of global GDP to 3.5%.

This funding gap calls for innovative approaches in how infrastructure projects are built, delivered and maintained; it also puts renewed importance on mobilizing private capital. New approaches are particularly important given the current pandemic, which has eroded the fiscal position of governments around the globe. In July 2020, the IMF estimated that global fiscal commitments in response to COVID-19 amounted to US\$11 trillion – a number that can be expected to grow in the near- to medium-term.

This section presents data on the levels of private infrastructure investment, highlighting trends in the size and nature of private sector involvement in global infrastructure transactions.

2.0.2 Data Sources and Limitations

Data Source

Private infrastructure investment data is sourced from IJ Global's transactions database, as at July 2020. IJ Global is the industry's largest database of infrastructure deals, capturing more than 28,000 transactions in almost 200 countries. It is also used by the World Bank to construct its Private Participation in Infrastructure (PPI) Database.

While IJ Global represents the best available comparable data on private infrastructure investment, the list of transactions it covers is not exhaustive. In particular, coverage of developing countries is limited and should be interpreted with care. The estimates in this document are most safely interpreted as indicative of the broad trends in the size and nature of private infrastructure investment.

Definition of Private Infrastructure Investment

Private infrastructure investment measures the private sector's share of the financial close value of infrastructure deals with private participation, covering debt and equity transactions in the following sectors: power, transportation, telecommunications, social, water and waste. Transactions in oil and gas, mining and metals and defence are excluded. Transactions with a total deal value less than USD 1 million and any debt transaction with maturity of less than 12 months are excluded. For additional detail on exclusions in the data, please see Appendix B.

Our headline estimates cover primary market transactions and exclude secondary market transactions such as acquisitions, refinancing or securities trading. For further details on the definition of primary and secondary markets, refer to Appendix A: Glossary.

The public and private share of investment is determined by tranche role and instrument type. Tranches financed by development banks, multilaterals, international financial institutions, public finance institutions and state lenders are classified as public investment. Instruments classified as IFI government support – regardless of tranche role – are also considered public.

State Owned Enterprises (SOEs) are treated as state lenders in debt transactions and as sponsors in equity transactions. If the percentage of SOEs in an equity tranche is more than 50%, the transaction is classified as Public Sector Finance (and therefore excluded from private investment estimates).

2.0.3 Key Findings

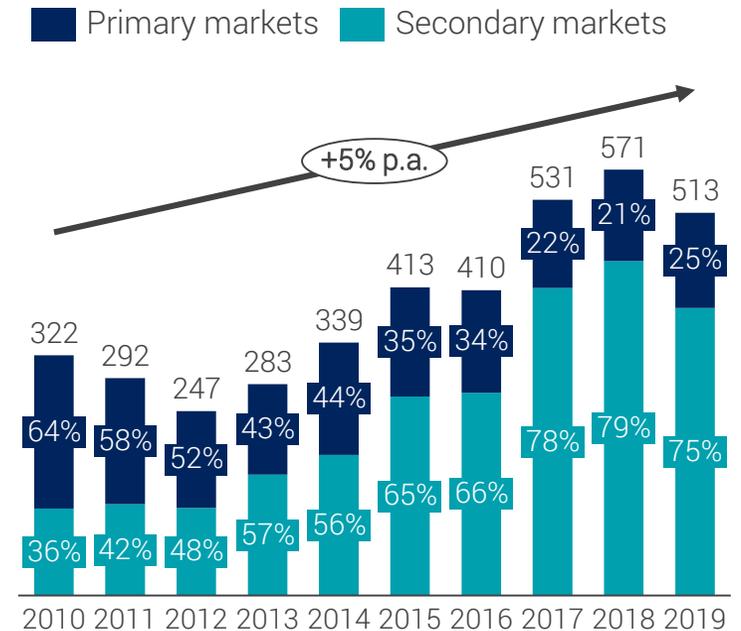
1. Private investment in infrastructure through primary market transactions remains low at around USD 100 billion per year, and has been declining over the past decade. While private infrastructure investment through secondary markets has been growing over the past decade, primary market transactions are essential for private capital mobilization, and represent new opportunities for greenfield or brownfield investments.
2. The sectoral mix of private infrastructure investment has changed over the past decade, with renewables growing and social infrastructure declining.
3. Over the past decade, Latin America, as well as the Middle East & North Africa (MENA) have been fast growing regions for private investment, while Europe has seen the largest decline.
4. Private infrastructure investment has been dominated by investment in high-income countries, accounting for around 67% of the total, on average over the past decade. While there has been some success in attracting investment in developing countries, progress in mobilizing private capital remains below desired levels.
5. Reliance on foreign equity sponsorship is particularly high in Sub-Saharan Africa and rising in MENA. The transaction value of private infrastructure investment in low-income countries is almost entirely denominated in foreign currencies, implying a structural foreign exchange risk for investors.

2.1 Total Infrastructure Investment in Transactions with Private Participation

Total private investment in infrastructure (primary and secondary market transactions) has significantly increased over the past decade. This increase has been driven by secondary market transactions, with investment in the primary market seeing a decline. Of the total infrastructure investment in transactions with private participation, only 25% occurred in primary markets in 2019, down from 64% in 2010.

Table 1: Total Infrastructure Investment in Transactions with Private Participation

(USD bn)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total value	322.2	291.5	247.4	283.4	339.1	413.4	409.6	530.8	570.9	513.4
Primary markets	205.7	169.0	129.9	121.2	150.7	146.4	137.6	118.4	122.3	127.9
• Private	156.2	131.3	105.4	103.0	123.7	118.0	118.7	93.2	99.9	105.9
• Public	49.5	37.7	24.4	18.2	27.0	28.5	18.8	25.2	22.4	22.1
Secondary markets	116.6	122.5	117.5	162.2	188.4	266.9	272.0	412.4	448.7	385.4
• Private	106.2	117.5	111.3	159.6	178.8	257.3	265.2	406.0	438.1	377.5
• Public	10.3	5.1	6.2	2.6	9.6	9.6	6.8	6.4	10.6	7.9



Source: IJ Global and GIH calculations

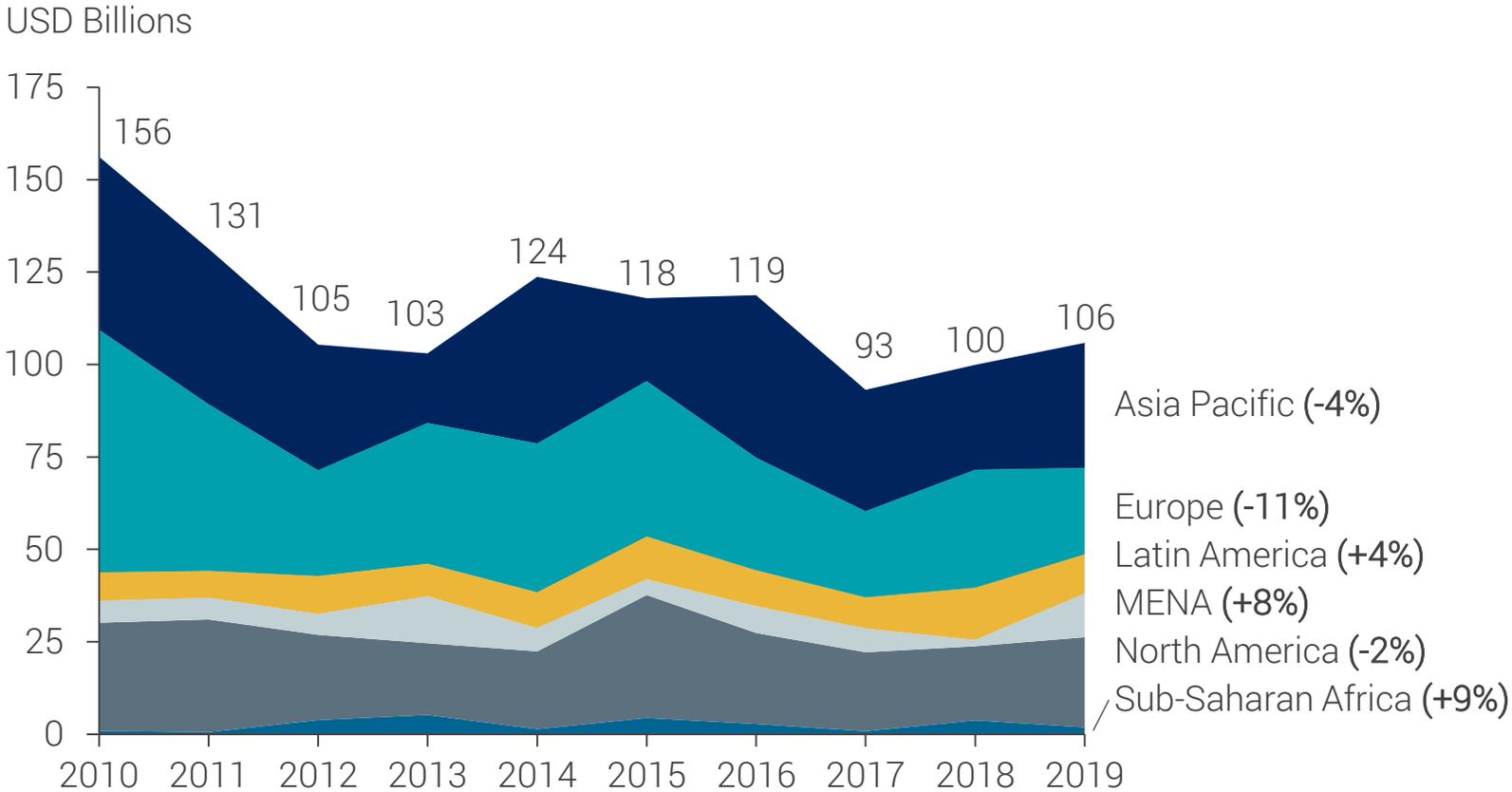
2.2 Private Infrastructure Investment by Region (2010-2019)

For this report, private infrastructure investment refers to primary market transactions only, as defined in Appendix A.

Over the past decade, private investment into infrastructure has amounted to around USD 100-150 billion annually.

In 2019, the USD 106 billion of private infrastructure investment was equivalent to 0.13% of total global GDP (USD 81 trillion).

Latin America and the Middle East & North Africa have been fast growing regions for private investment, while Europe has seen the strongest decline.



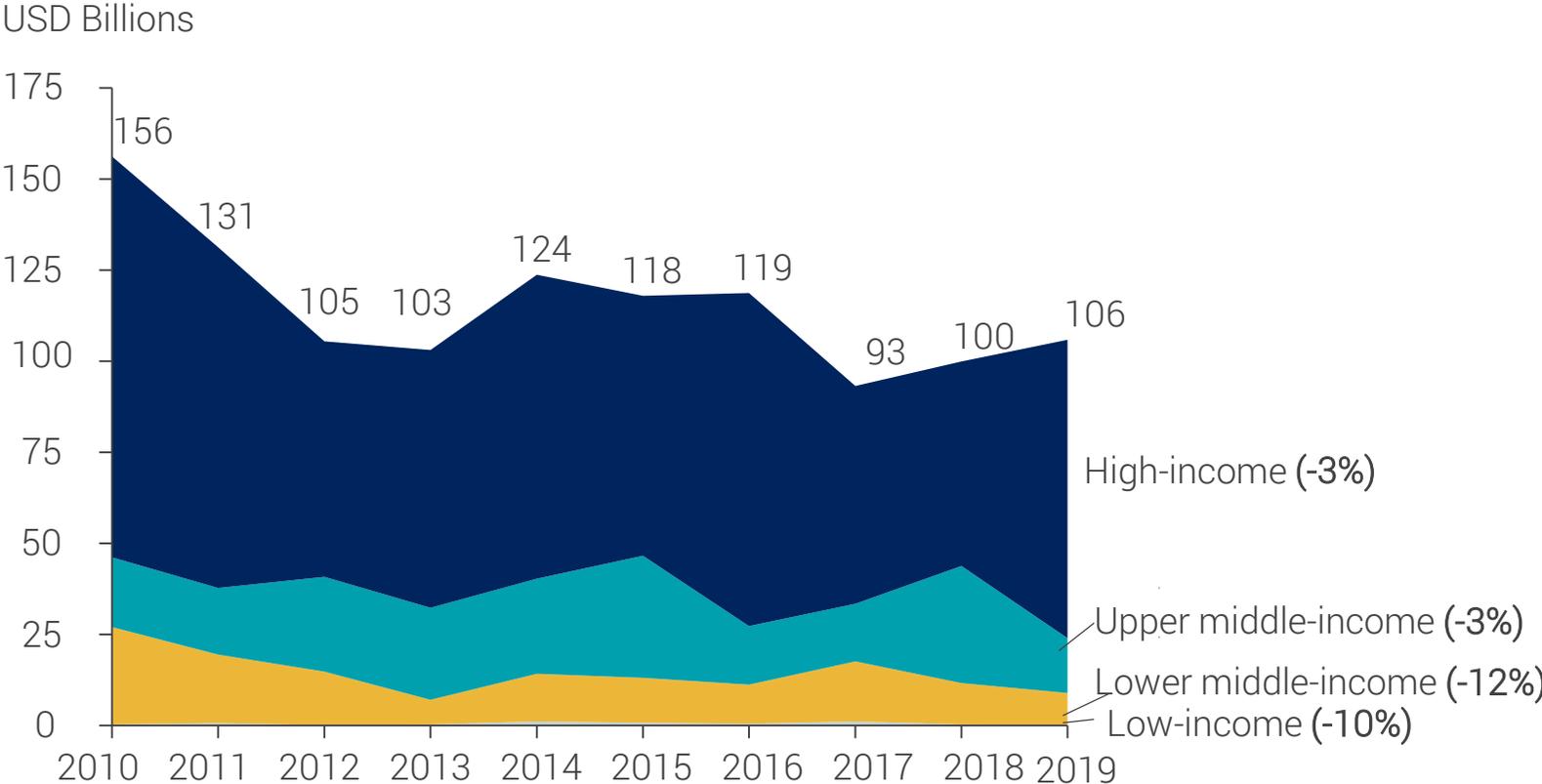
Source: IJ Global and GIH calculations
 Note: CAGR growth rates

2.3 Private Infrastructure Investment by Income Group (2010-2019)

Private infrastructure investment has been dominated by investment in high-income countries, accounting for around 67% of the total, on average over the past decade.

Transactions in upper middle-income and lower middle-income countries comprise around 20% and 12% of private infrastructure investment respectively.

Transactions in low-income countries have been negligible and/or are underreported in the source dataset.



Source: IJ Global and GIH calculations
 Note: CAGR growth rates
 Countries are placed into country groupings based upon their World Bank Income Group classification in 2010, in order to avoid selection bias given that countries with higher infrastructure investment rates tend to grow faster and graduate into higher income group classifications.

Table 2: Private Infrastructure Investment by Country Income Group and Region

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aggregate value (USD bn)	156.2	131.3	105.4	103.0	123.7	118.0	118.7	93.2	99.9	105.9
By country income:										
High-income	110.0	93.6	64.6	70.7	83.4	71.3	91.4	59.7	56.0	81.8
Upper middle-income	19.1	18.2	26.0	25.2	26.1	33.5	16.0	15.9	32.2	15.1
Lower middle-income	26.7	18.8	14.6	6.7	13.1	12.3	10.8	16.5	11.3	8.8
Low-income	0.4	0.7	0.1	0.3	1.1	0.8	0.5	1.1	0.4	0.1
By region:										
Asia Pacific	46.8	42.1	34.0	18.8	45.1	22.5	43.9	32.9	28.3	33.8
Europe	65.7	45.0	28.6	38.1	40.2	42.0	30.5	23.3	32.0	23.5
Latin America	7.7	7.3	10.3	8.8	9.7	11.6	9.7	8.4	14.1	10.6
Middle East, North Africa	5.9	5.8	5.6	12.7	6.3	4.2	7.2	6.5	1.7	11.8
North America	29.2	30.5	23.1	19.4	21.0	33.2	24.6	21.3	20.0	24.3
Sub-Saharan Africa	0.9	0.6	3.8	5.2	1.4	4.4	2.7	0.8	3.8	1.9

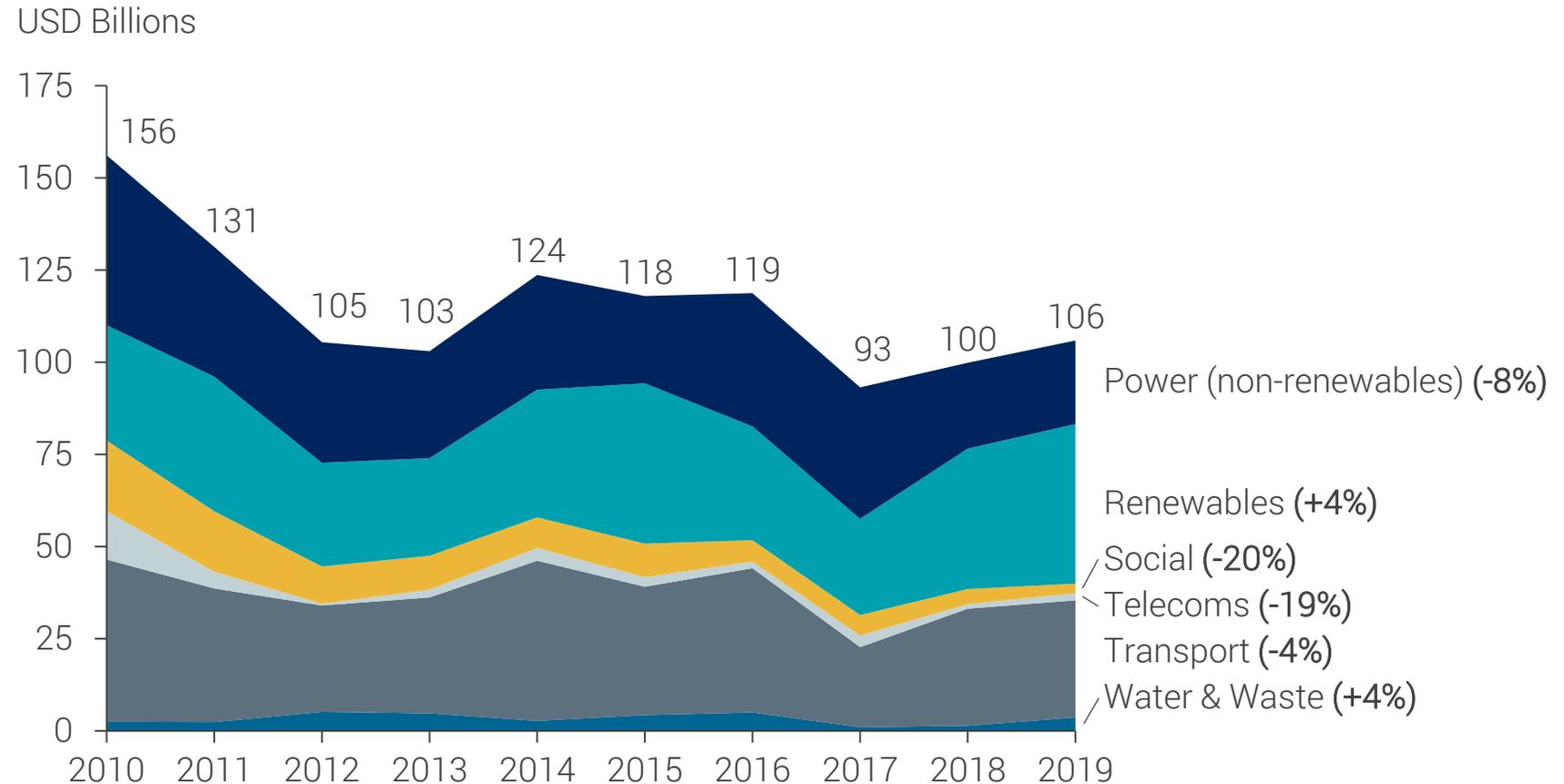
Source: IJ Global and GIH calculations

Note: World Bank Income Group classifications 2010 were used to examine trends by country income group during 2010-2019 to avoid self-selection bias.

2.4.1 Private Infrastructure Investment by Sector (2010-2019)

Over the past decade, private infrastructure investment has predominantly taken place in the transport and power (both renewables and non-renewables) sectors.

Private investment in social infrastructure declined from USD 20 billion in 2010 to less than USD 3 billion in 2019.



Source: IJ Global and GIH calculations
 Note: CAGR growth rates

Table 3: Private Infrastructure Investment by Sector

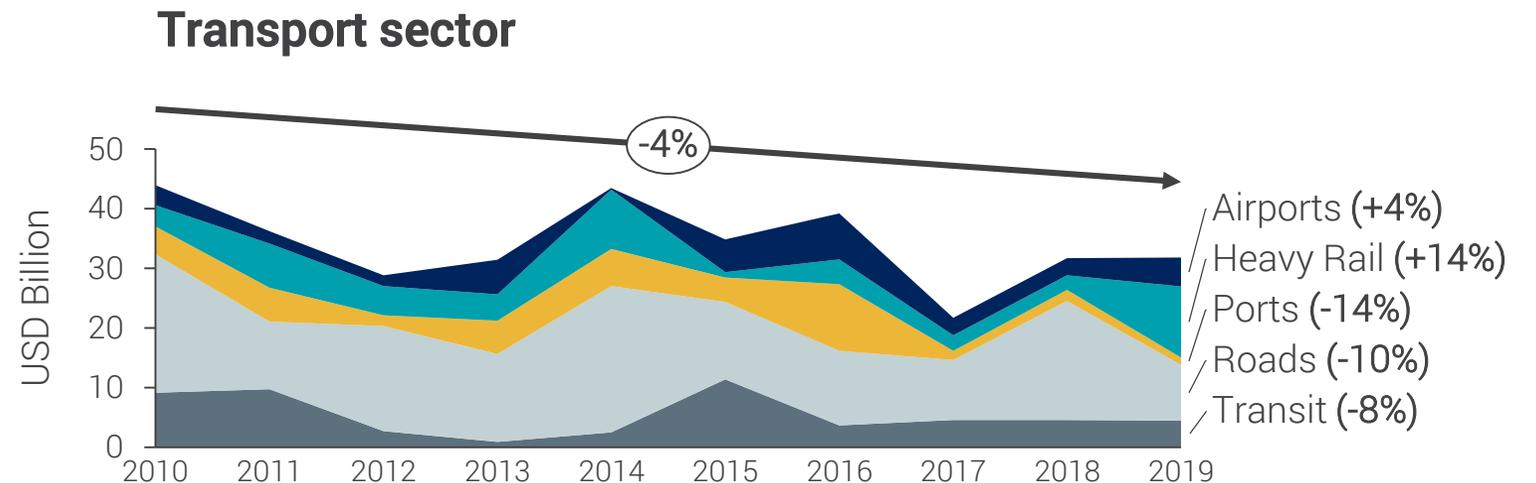
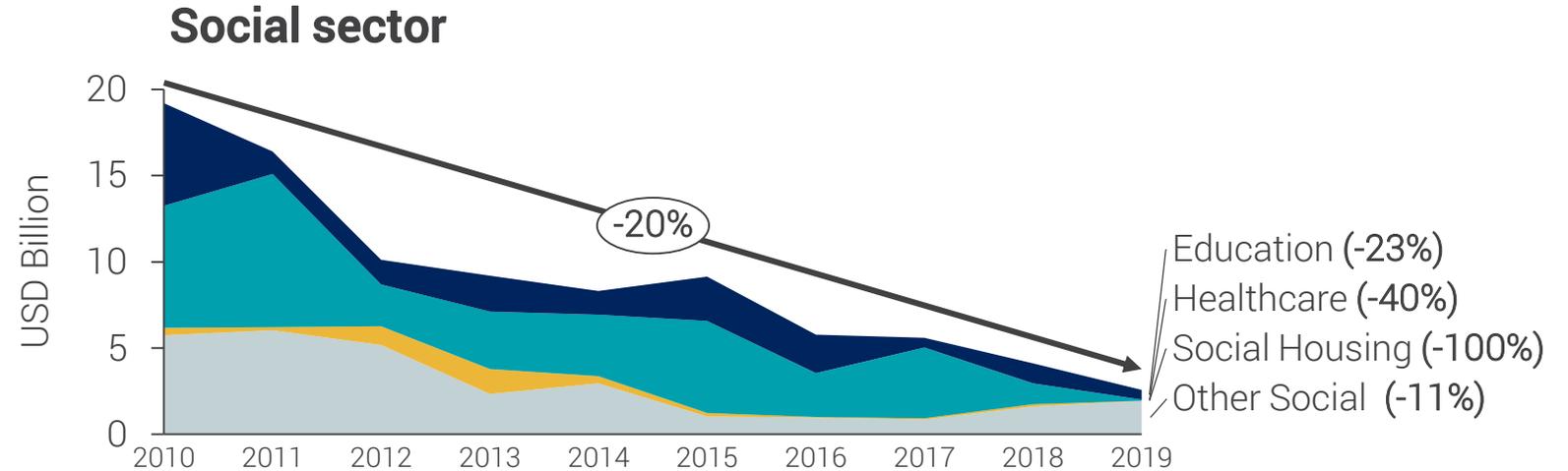
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aggregate value (USD bn)	156.2	131.3	105.4	103.0	123.7	118.0	118.7	93.2	99.9	105.9
By sector:										
Power (non-renewables)	46.1	35.2	32.7	29.0	31.1	23.6	36.1	35.7	23.3	22.6
Renewables	31.3	36.6	28.1	26.5	34.7	43.5	30.9	26.1	38.1	43.3
Social	19.2	16.4	10.1	9.2	8.3	9.1	5.8	5.6	4.1	2.6
Telecoms	13.1	4.5	0.5	2.2	3.5	2.5	1.8	3.1	1.3	2.0
Transport	44.0	36.2	28.8	31.4	43.5	34.8	39.2	21.7	31.7	31.8
Water & waste	2.5	2.4	5.2	4.7	2.7	4.3	5.0	1.0	1.4	3.6

Source: IJ Global and GIH calculations

2.4.2 Private Infrastructure Investment by Sub-sectors

Social sector comprises healthcare, education, social housing and others. During 2010-2019, the healthcare and social housing sub-sectors saw a sharp decline in private investment, which should reverse in 2020 due to the COVID-19 health crisis.

Transport sector: Over the past decade, the roads, tunnels and bridges sub-sector accounted for about half of private infrastructure investment in the transport sector. Investment in other transport sub-sectors was evenly distributed growing the fastest for heavy rail. A sharp decline can be expected in 2020 given the fall in transport activities related to COVID-19 lockdowns.



Source: IJ Global and GIH calculations
 Note: CAGR growth rates

Table 4: Private Infrastructure Investment by Sub-sectors

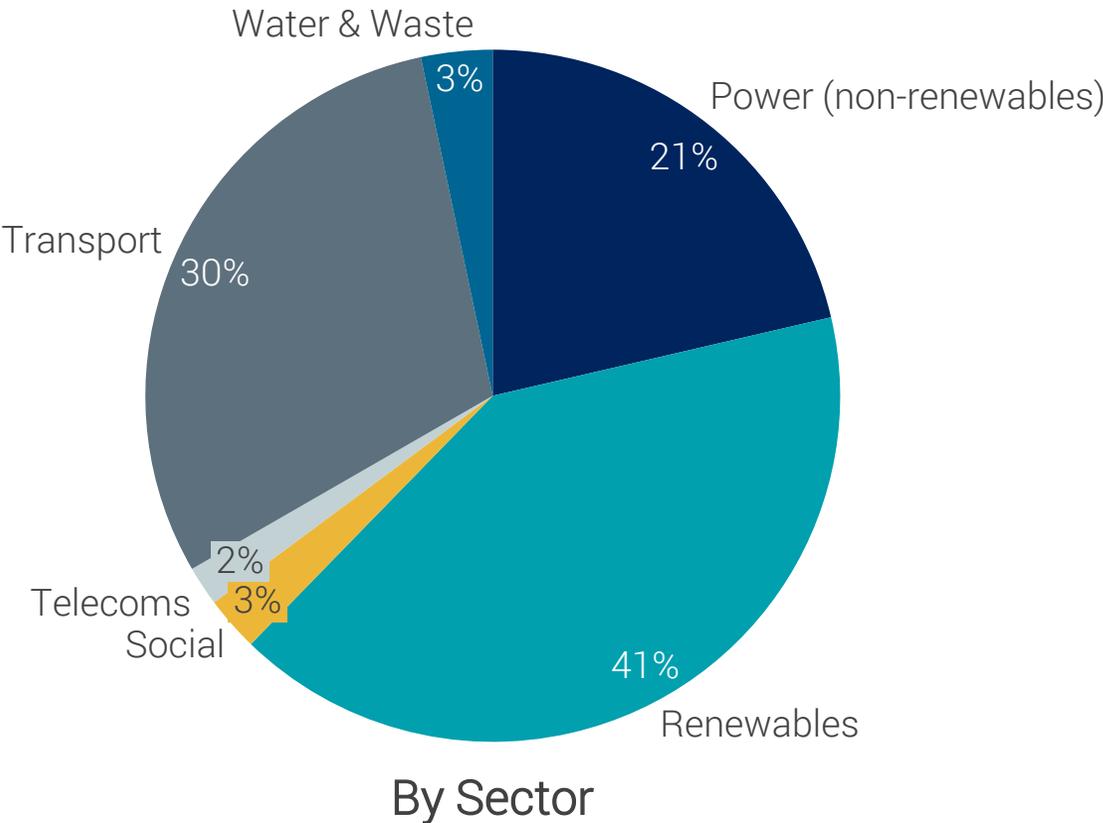
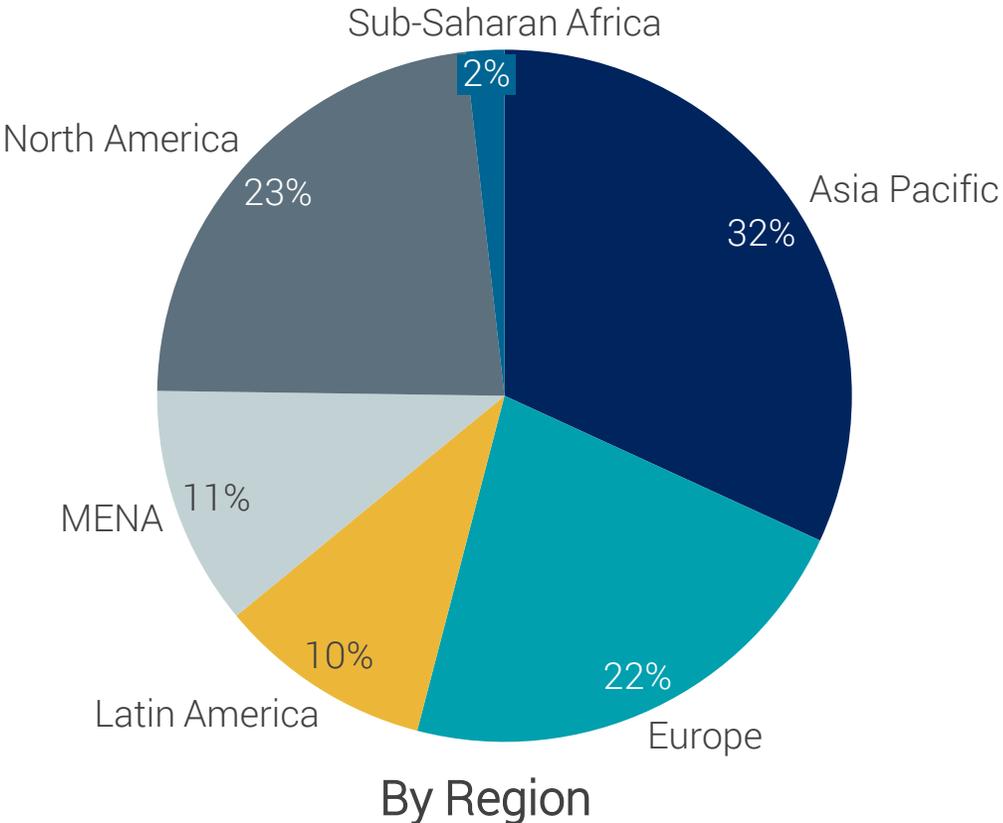
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Social sector	19.2	16.4	10.1	9.2	8.3	9.1	5.8	5.6	4.1	2.6
Education	5.9	1.3	1.4	2.1	1.4	2.6	2.2	0.6	1.2	0.6
Healthcare	7.1	8.9	2.4	3.3	3.6	5.3	2.6	4.1	1.2	0.1
Social housing	0.4	0.2	1.1	1.4	0.4	0.2	0.0	0.1	0.1	0.0
Other social	5.7	6.0	5.2	2.3	2.9	1.0	1.0	0.9	1.6	1.9
Transport	44.0	36.2	28.8	31.4	43.5	34.8	39.2	21.7	31.7	31.8
Airports	3.4	2.1	1.8	5.8	0.3	5.5	7.7	2.9	2.9	4.8
Heavy Rail	3.6	7.4	4.9	4.4	10.0	0.9	4.1	2.6	2.5	11.9
Ports and Maritime	4.7	5.7	1.8	5.6	6.2	4.1	11.2	1.6	1.9	1.2
Roads, tunnels, bridges	23.2	11.3	17.6	14.8	24.5	13.0	12.5	10.0	20.0	9.3
Transit	9.1	9.7	2.7	0.9	2.5	11.4	3.7	4.6	4.5	4.5

Source: IJ Global and GIH calculations

2.5.1 Private Infrastructure Investment by Region and Sector (2019)

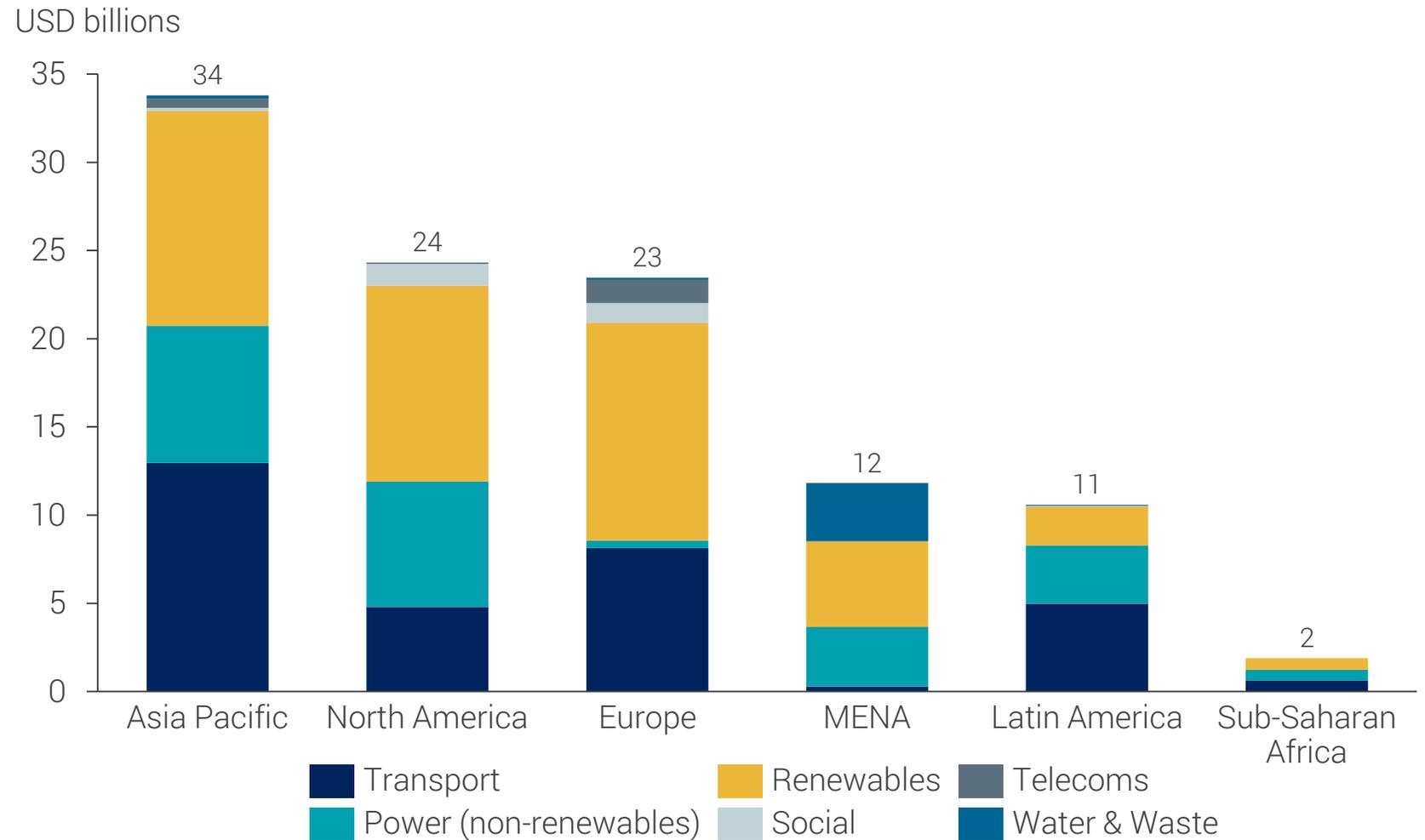
In 2019, the Asia Pacific region attracted the highest level of private investment, ahead of both Europe and North America.

By sector, renewables attracted the largest amount of private investment among infrastructure sectors, followed by transport and non-renewable power.



2.5.2 Private Infrastructure Investment by Region, by Sector (2019)

While transport accounted for the largest share of private infrastructure investment in the Asia Pacific region in 2019, renewables attracted the most investment in both Europe and North America.

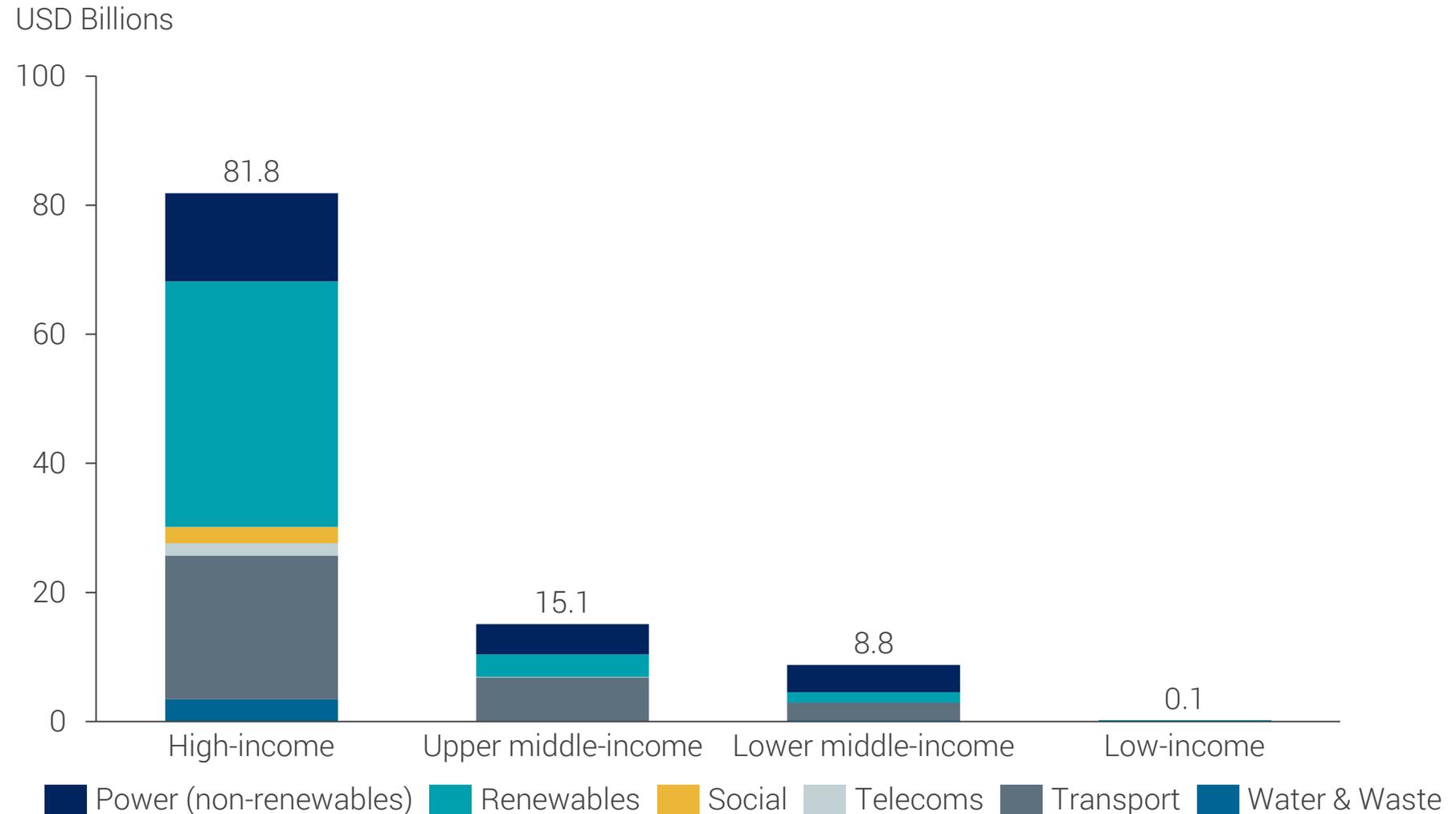


Source: IJ Global and GIH calculations

2.5.3 Private Infrastructure Investment by Income Group, by Sector (2019)

In 2019, 77% of private infrastructure investment was in high-income countries, more than triple the amount of capital invested in middle- and low-income countries.

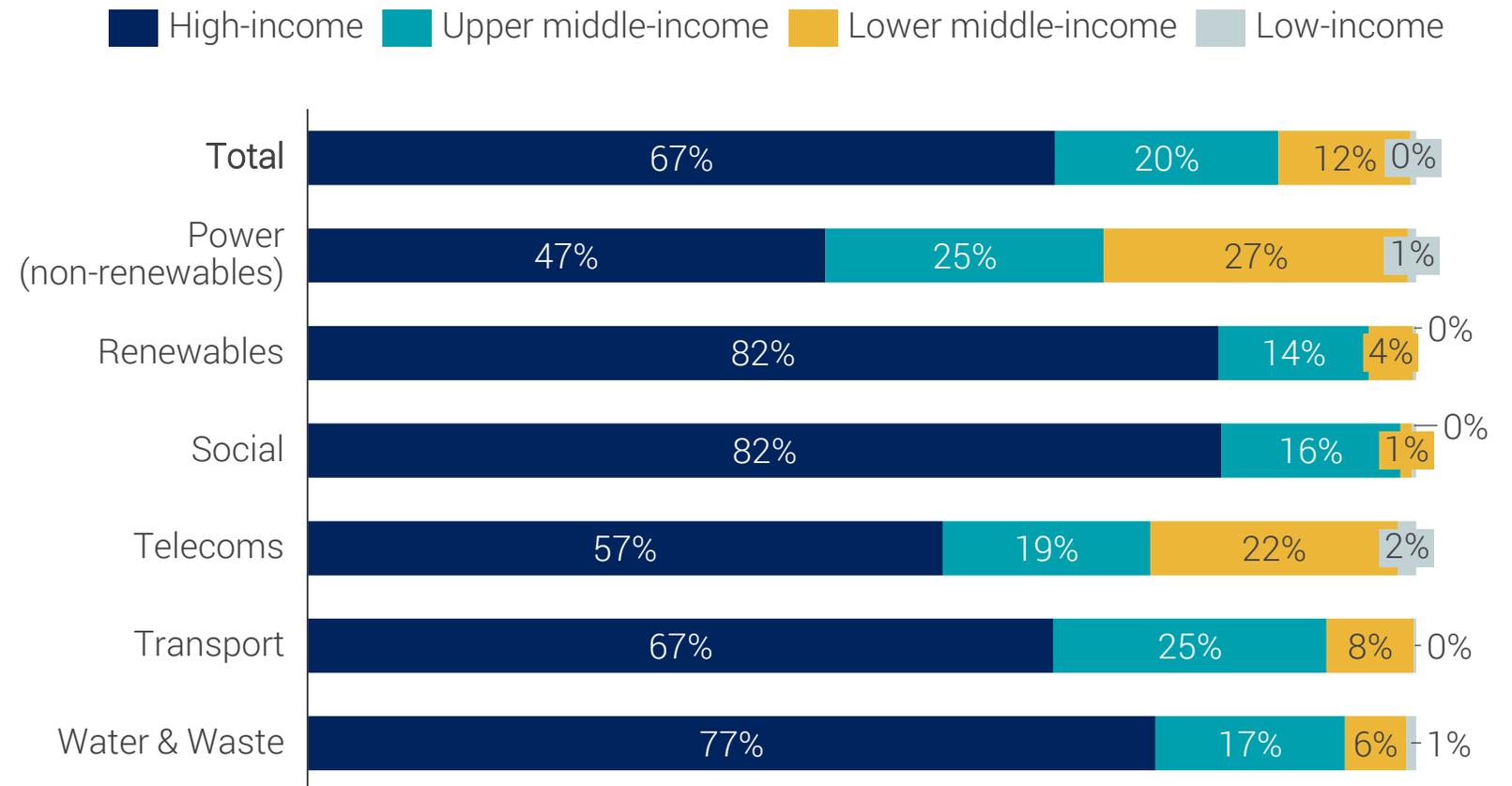
The objective of mobilizing private investment in developing countries does not appear to be happening at a scale that is consistent with international ambitions for transformation.



Source: IJ Global and GIH calculations
 Note: World Bank Income Group classifications 2020-21

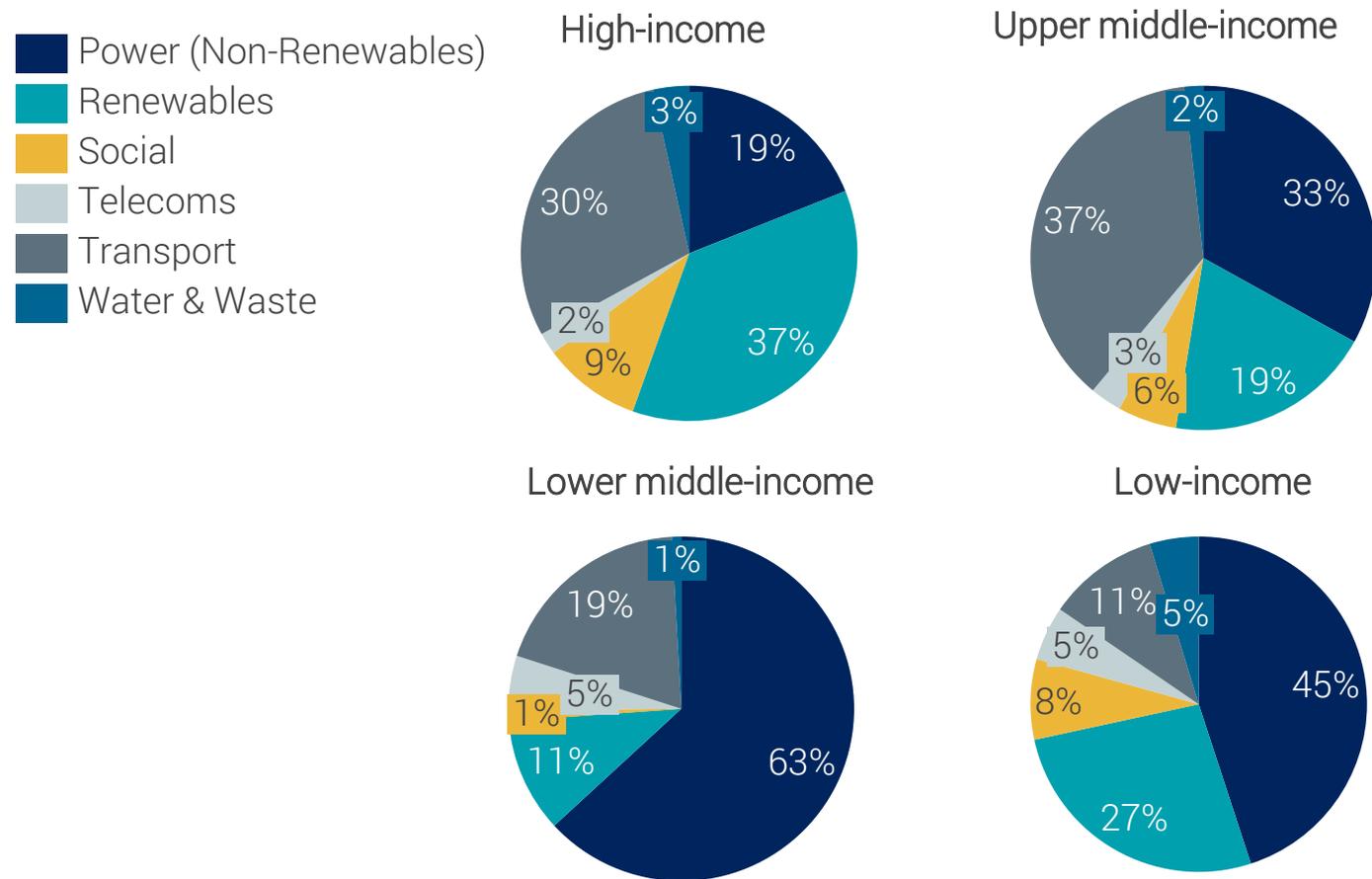
2.5.4 Private Infrastructure Investment by Income Group, by Sector (Average 2010-2019)

During 2010-2019, on average, 67% of infrastructure investment was in high-income countries. Lower-income countries attracted relatively higher private investment in power (non-renewables) and telecom infrastructure sectors but less in renewables, social, water and waste infrastructure sectors.



2.5.5 Private Infrastructure Investment by Income Group, by Sector (Average 2010-2019)

Over the past decade, infrastructure investment in non-renewables was greater than renewables in all country income groups except high-income countries. A significant transformation is required on this front to achieve global climate and sustainable development objectives.

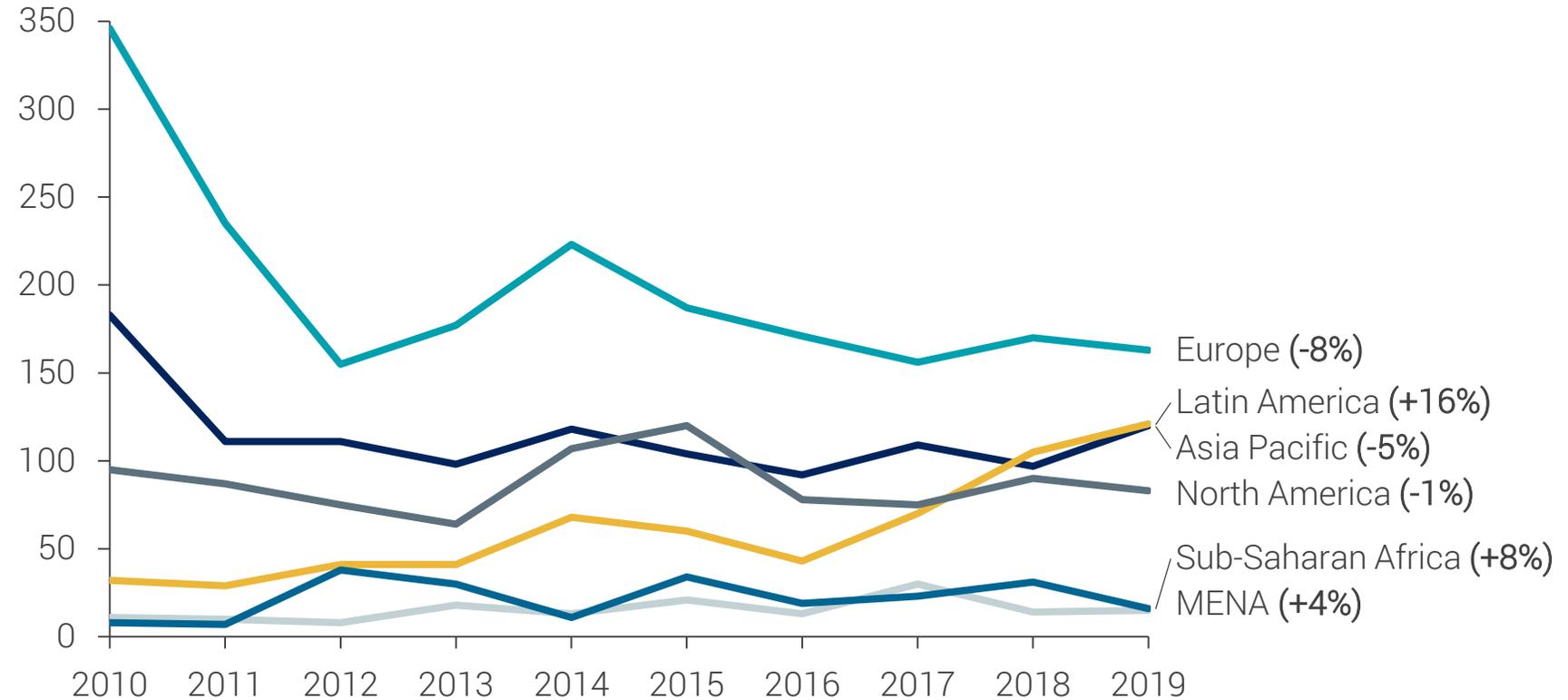


2.6.1 Number of Private Infrastructure Investment Transactions by Region (2010-2019)

Over the past decade, Europe has had the largest number of infrastructure transactions with private participation, accounting for almost a third of total transactions in 2019.

Latin America has been catching up in recent years, and in 2019 had a similar number of transactions as in Asia Pacific.

No. of transactions



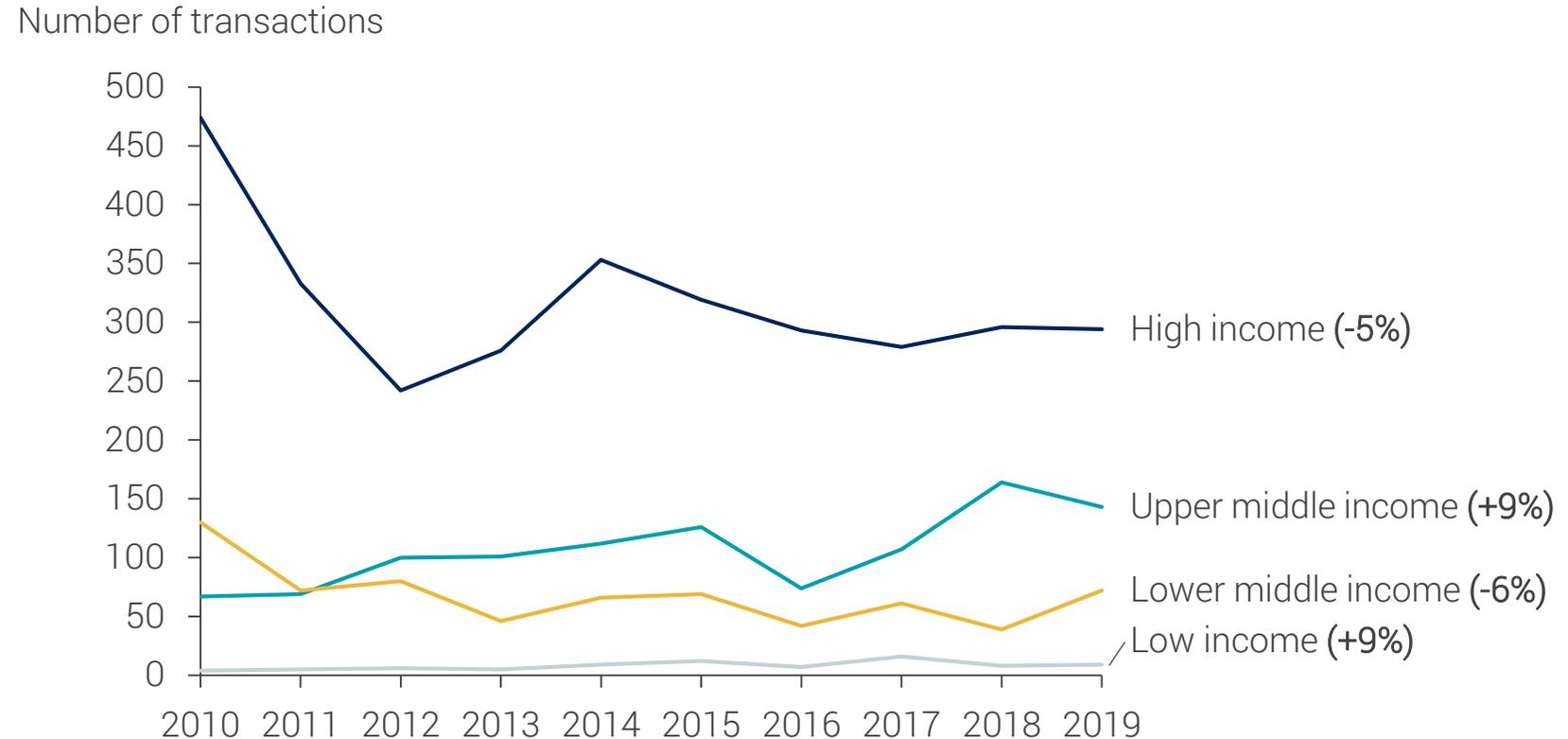
Source: IJ Global and GIH calculations

2.6.2 Number of Private Infrastructure Investment Transactions by Income Group (2010-2019)

Over the past decade, high-income countries accounted for over half of all global infrastructure investment transactions with private participation.

During 2010-2019, the share of high-income countries in these transactions declined from 70% to 57%, and that of upper middle-income countries increased from 10% to 28%.

Lower middle-income countries exhibit a declining trend in the number of infrastructure investments with private participation, while the number of transactions in low-income countries doubled albeit from a low base.

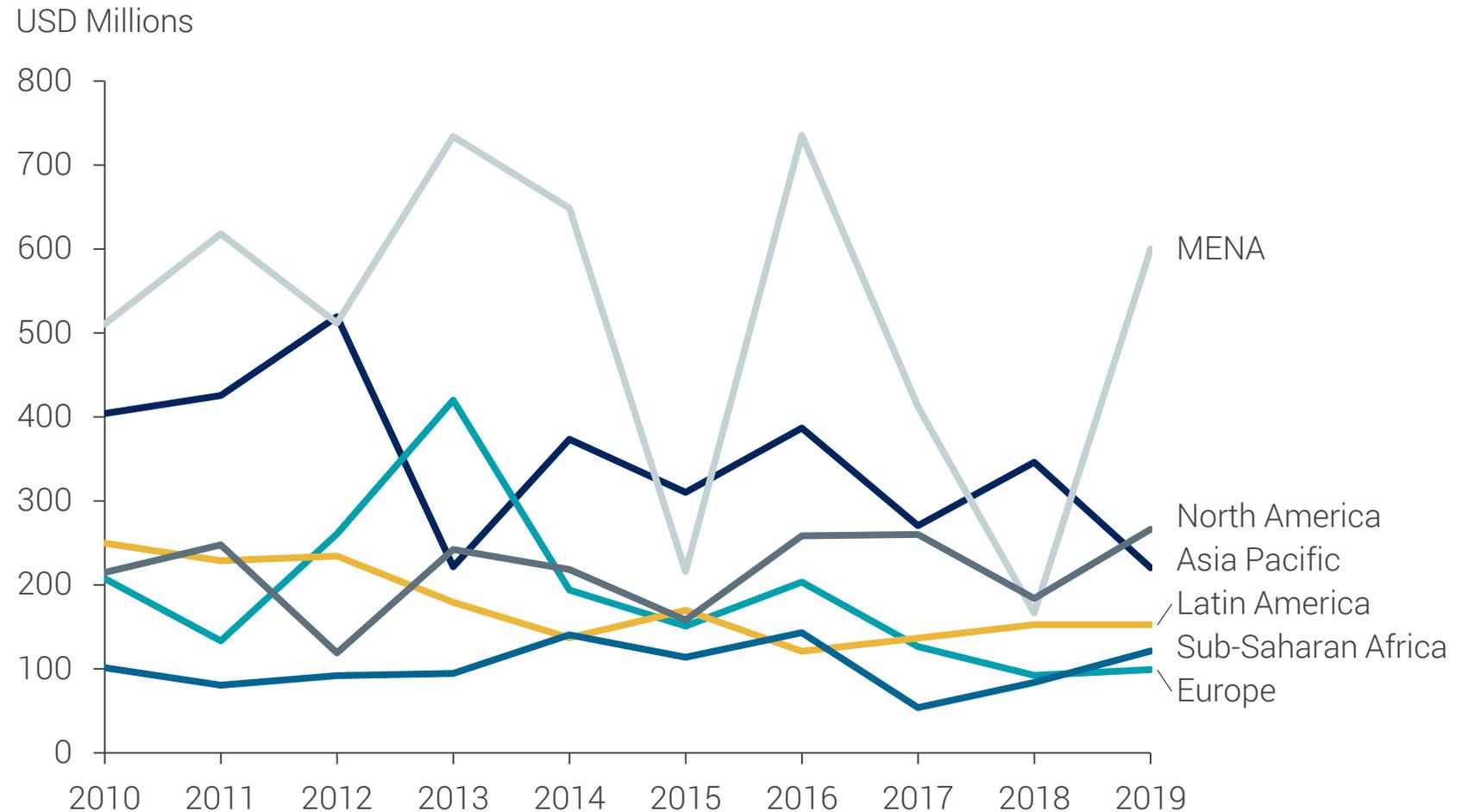


Source: IJ Global and GIH calculations
Note: CAGR growth rates 2010-2019

2.7 Average Transaction Size of Private Infrastructure Investment by Region (2010-2019)

The average value of private infrastructure investment is highest in MENA, although with considerable volatility.

While Europe has recorded the highest number of transactions, their value tends to be relatively small compared with other regions.

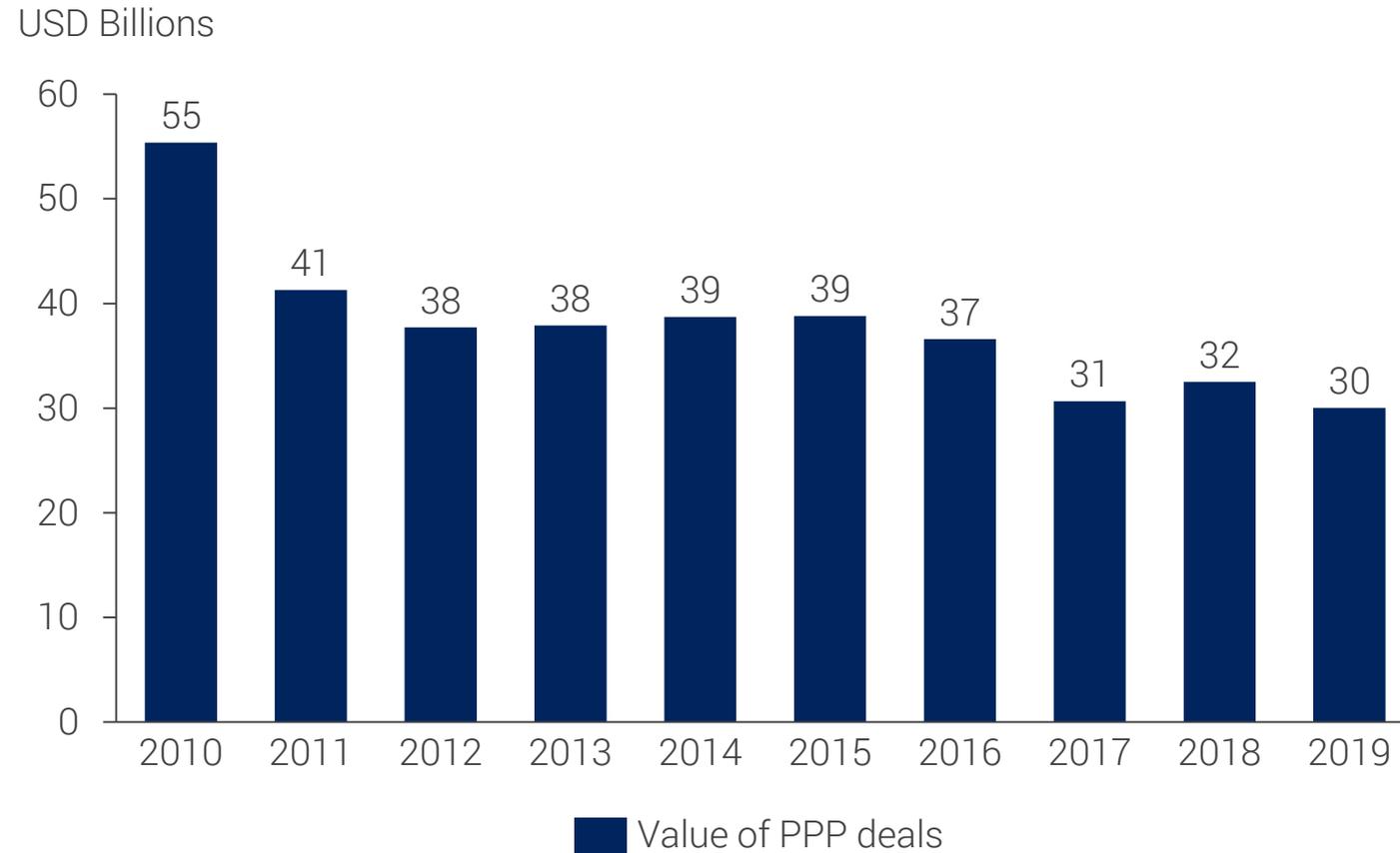


Source: IJ Global and GIH calculations

2.8 Value of Private Investment in PPP Infrastructure (2010-2019)

Over the past decade, private participation in PPPs has gradually declined as a share of private infrastructure investment – falling from 36% in 2010 to 28% in 2019.

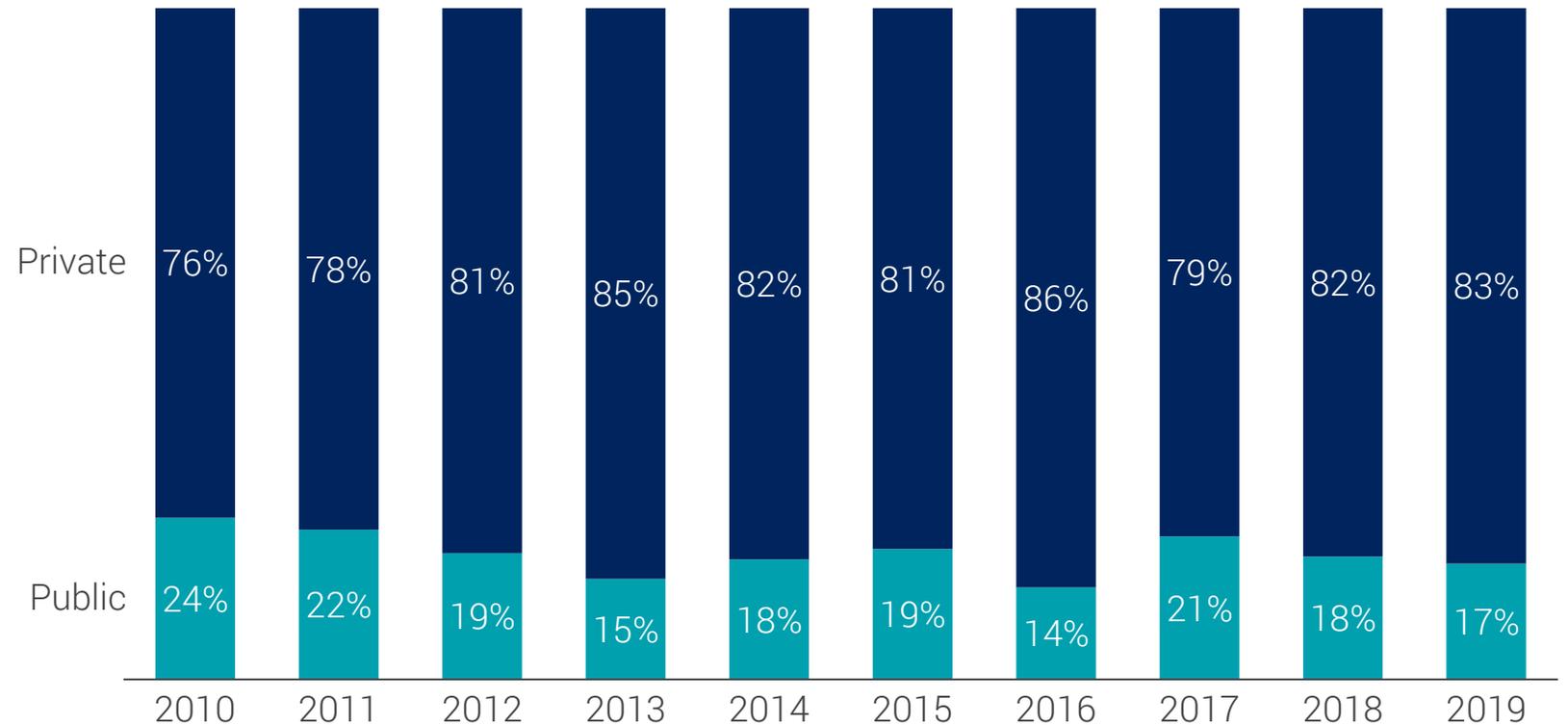
On average, PPP deals account for the smallest share of private investment in MENA, while Europe and Latin America have the highest shares of PPPs.



Source: IJ Global and GIH calculations

2.9.1 Share of Private and Public in Infrastructure Investments With Private Participation (2010-2019)

Over the past decade, about 80% of financing for transactions that involved private participation was provided by the private sector.

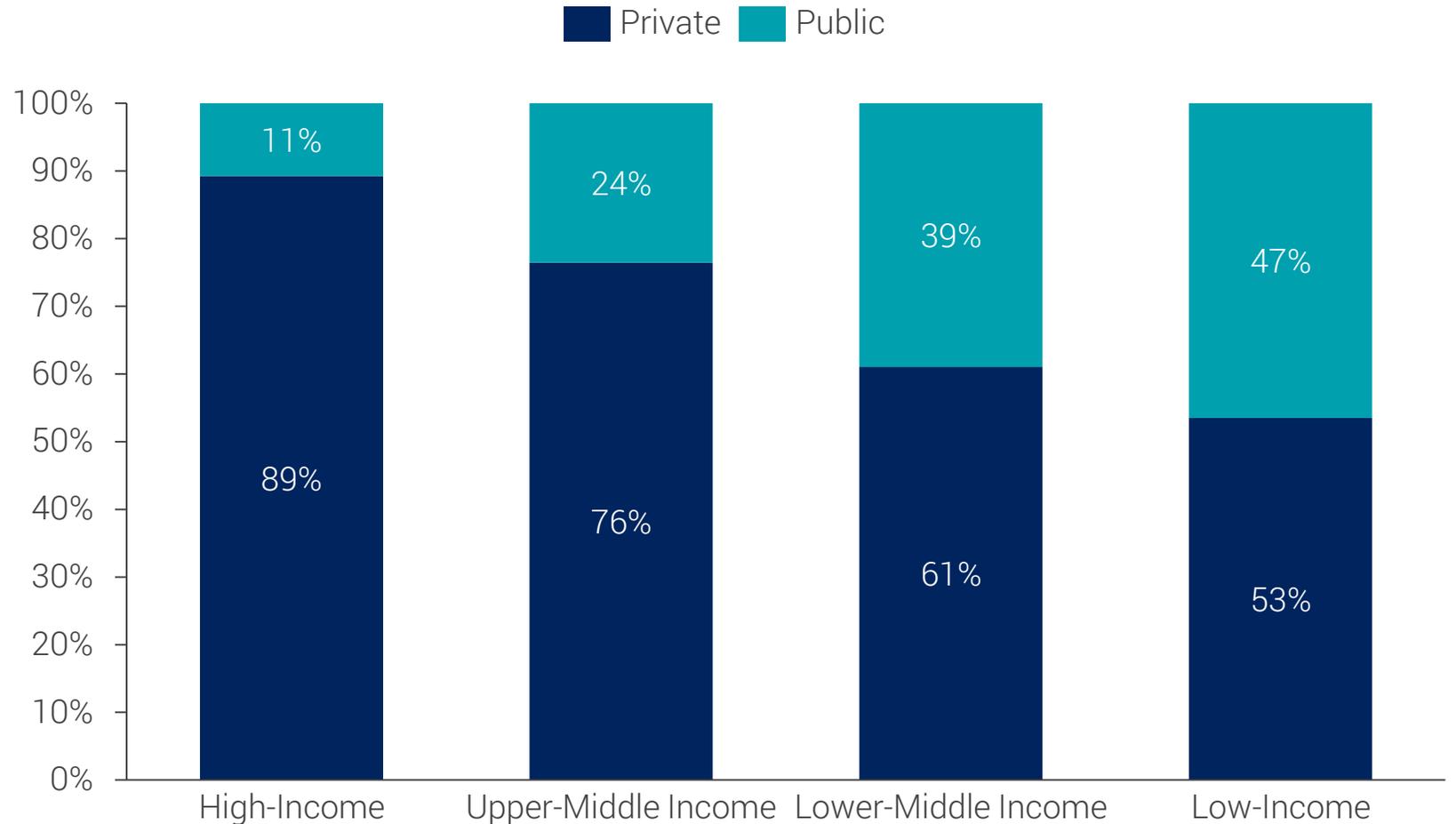


Source: IJ Global and GIH calculations

2.9.2 Share of Private and Public in Infrastructure Investments with Private Participation by Country Income Group (10-yr avg, 2010-2019)

For investments with private participation in high-income countries, around 90% of the total investment value is provided by the private sector. In comparison, this figure drops to around 50% in low-income countries.

The GI Hub's [InfraCompass](#) shows that high income countries tend to have stronger governance and regulatory frameworks, which are critical to establishing a strong enabling environment for infrastructure investment.



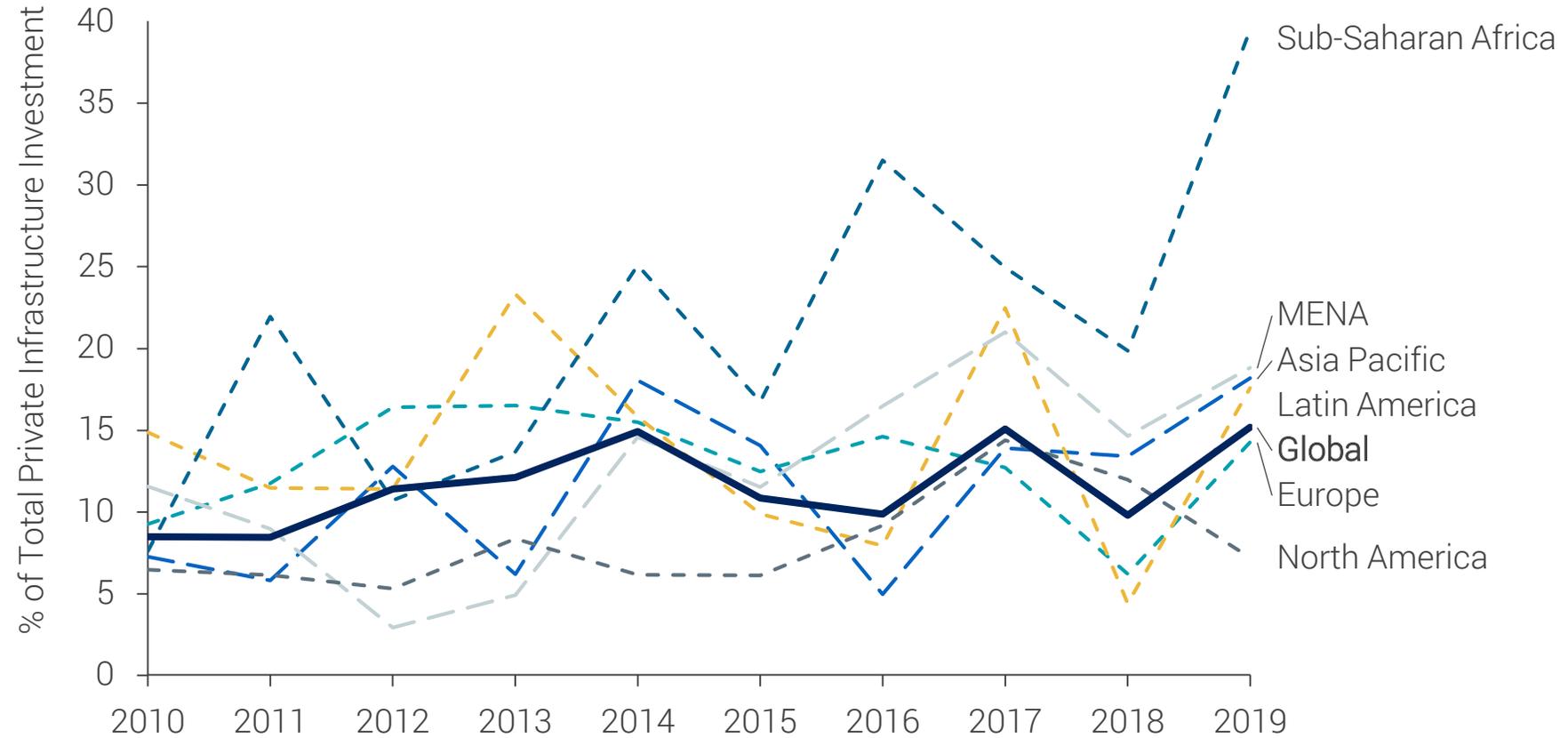
Source: IJ Global and GIH calculations

Note: World Bank Income Group classifications 2010 were used to examine trends by country income group during 2010-2019 to avoid self-selection bias.

2.10 Share of Foreign Equity Sponsorship in Private Infrastructure Investment (2010-2019)

Globally, foreign equity in private infrastructure deals amounted to around 12% of private infrastructure investment over the past decade, or on average about USD 13 billion per year.

Reliance on foreign equity sponsorship has been particularly high – and rising – in Sub-Saharan Africa. Transactions in MENA have also seen an increasing share of foreign equity sponsorship over the past decade.



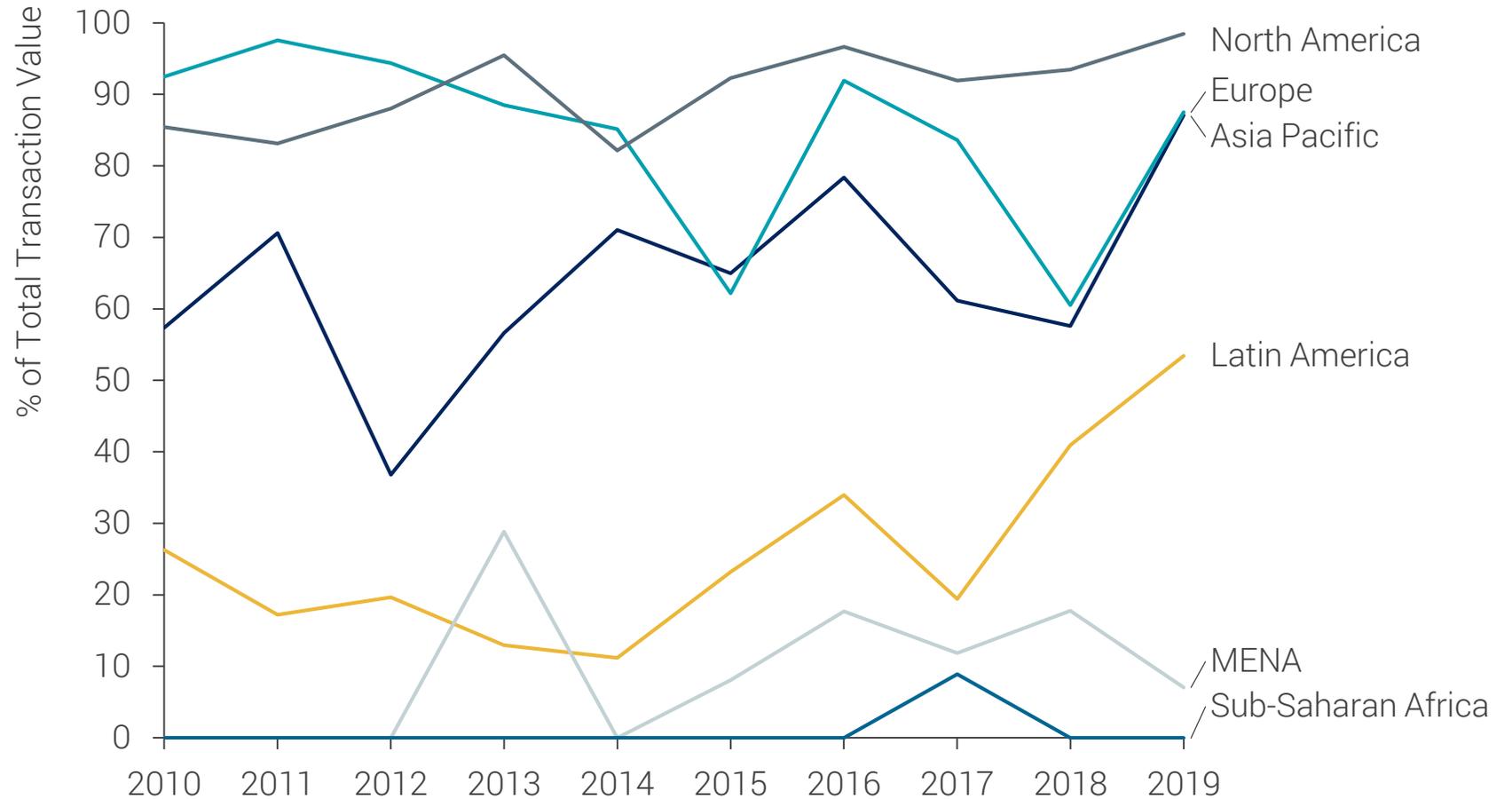
Source: IJ Global and GIH calculations

2.11.1 Local Currency Component in Private Infrastructure Investment by Region

Private infrastructure transactions in Sub-Saharan Africa and MENA are primarily denominated in foreign currencies.

Conversely, North American and European transactions are largely undertaken in local currencies.

The local currency component of transactions in Asia Pacific and Latin America has appreciably increased over the past decade.

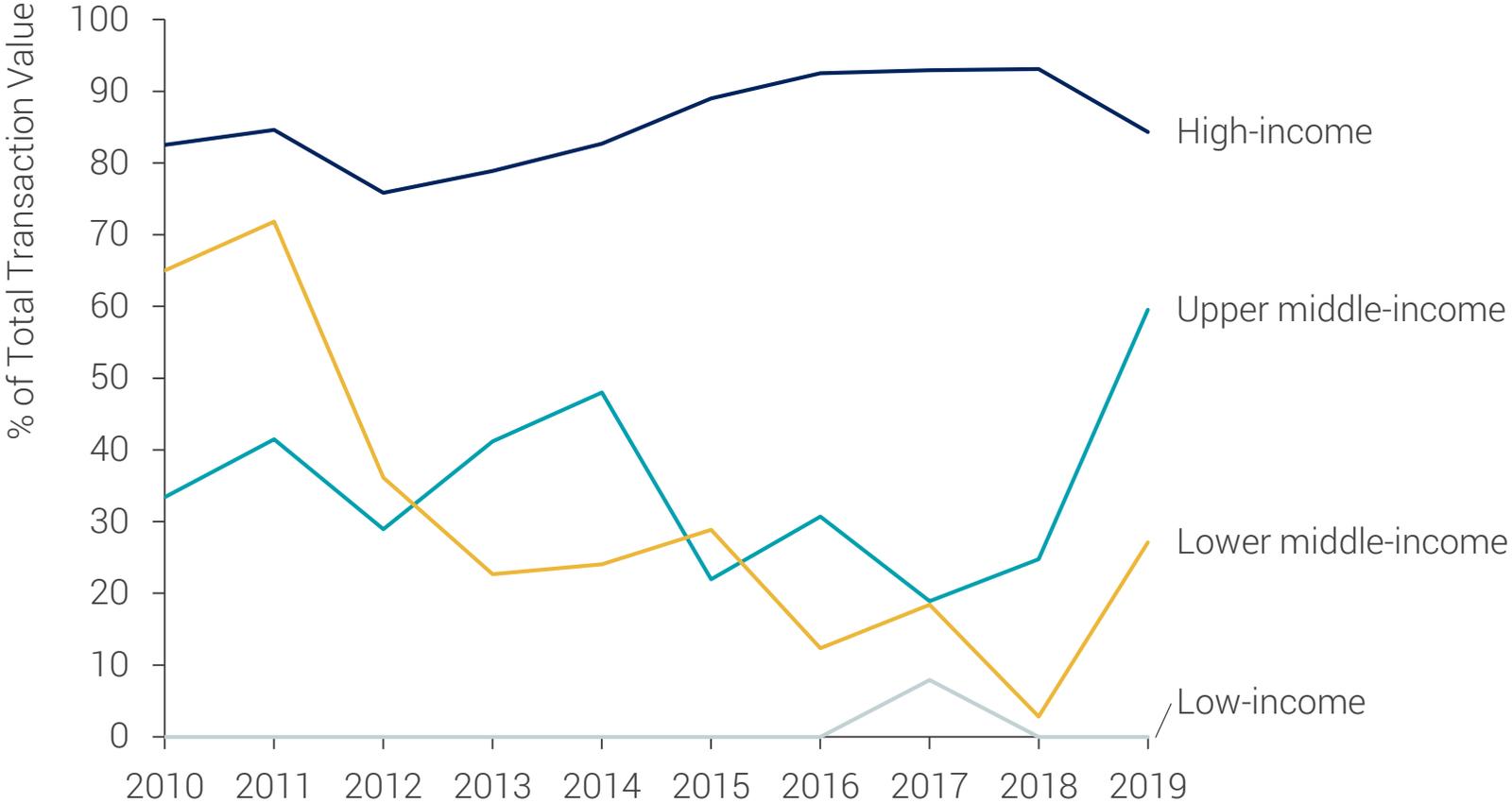


2.11.2 Local Currency Component in Private Infrastructure Investment by Income Group

In low-income countries, private infrastructure transactions were entirely structured in foreign currencies during 2010-2019 (except 2017), creating a structural foreign exchange risk.

For lower middle-income countries, the local currency component of transaction value sharply declined from two-thirds in 2010 to less than one-third in 2019. In contrast, a reverse trend was seen for upper middle-income countries.

High-income countries have had about 80-90% of transaction value held in local currency.



3. Infrastructure Investment Performance

3.0.1 Context

This section examines the track record of performance of infrastructure, which the G20 has identified as a necessary input on the road to infrastructure as an asset class. Over the past decade, about three-quarters of private infrastructure investment globally was debt financed, and about a quarter was equity financed.

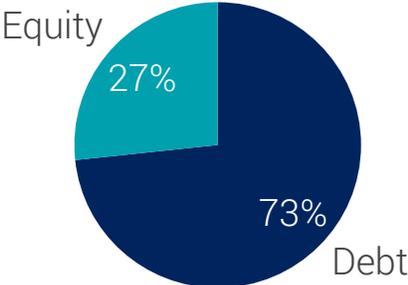
Table 5: Total Private Infrastructure Investment by Investment Type

(USD billion)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Equity	37.9	29.6	28.1	32.6	36.0	36.9	31.8	24.7	22.9	26.6
Debt	118.3	101.7	77.3	70.4	87.6	81.1	86.9	68.5	77.0	79.3

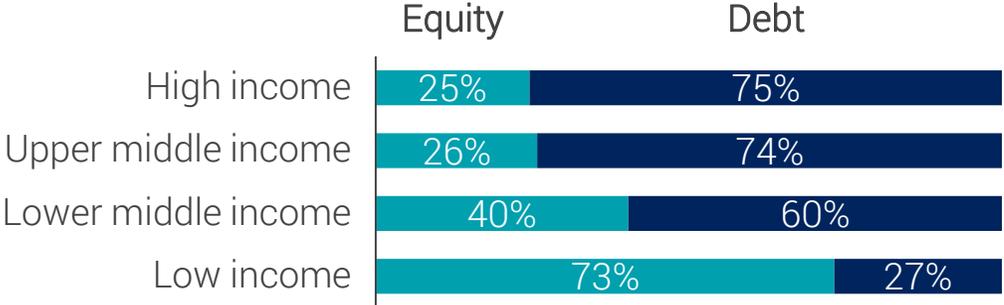
3.0.2 Total Private Infrastructure Investment by Equity and Debt (2010-2019)

On a relative basis, equity financing was higher in lower middle- and low-income country groups, and the regions of Asia Pacific and Sub-Saharan Africa. Equity financing was relatively higher in the water and waste, and transport infrastructure sectors.

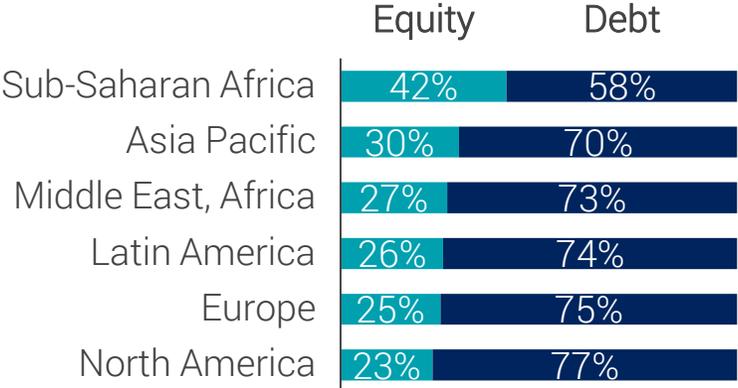
Global Average



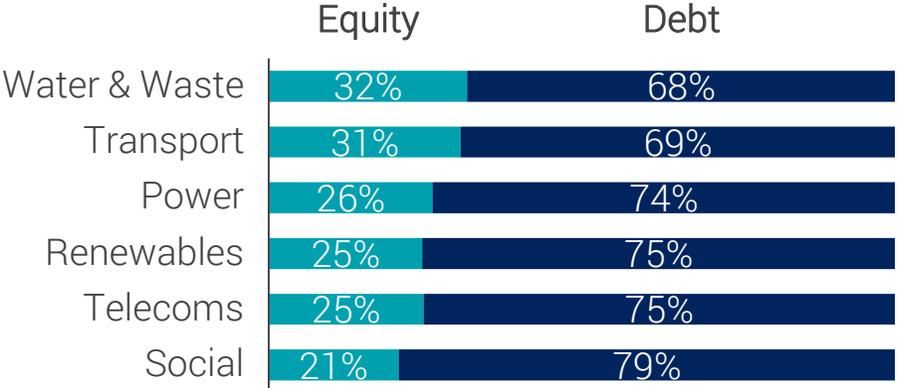
By Country Income Group



By Region



By Sector



3.0.3 Data Sources

KNOWN DATA SOURCES

3.1 EQUITY INVESTMENT

Listed Infrastructure

- Morgan Stanley Capital International All Country World Index Infrastructure Capped Index (MSCI ACWI-IC)
- Dow Jones Brookfield Global Infrastructure Composite Index (DJBGIC)
- S&P Global Infrastructure Index (S&PGI)
- FTSE Global Core Infrastructure 50-50 Index (FTSEGCI)

Unlisted Infrastructure

- EDHEC*infra* Infra300 Equity Index (EDHEC I300)
- Preqin Pro

3.2 DEBT INVESTMENT

- Moody's Infrastructure and Project Finance Bank Loans
- S&P Infrastructure Default, Transition and Recovery
- Global Emerging Markets Risk Database (GEMs)

DATA SOURCES USED

MSCI ALL COUNTRY WORLD INDEX INFRASTRUCTURE CAPPED INDEX

Global opportunity set of companies that are owners or operators of infrastructure assets, selected from MSCI ACWI, the parent index, which covers mid and large cap securities across 23 Developed Markets and 26 Emerging Markets, for five infrastructure sectors:

- Telecommunications (1/3rd weight)
- Utilities (1/3rd weight)
- Energy, Transport, Social (1/3rd weight)

EDHEC/INFRA INFRA 300 EQUITY INDEX

Unlisted infrastructure companies (often private equity funds) - a sample of 300 companies representing 6,000 firms in 22 countries across all infrastructure sectors.

MOODY'S INFRASTRUCTURE AND PROJECT FINANCE BANK LOANS

Comprehensive data on infrastructure debt default and recovery of over 7,000 projects around the world, collected through a consortium of investors.

* MSCI ACWI-IC's constituents cover five infrastructure sectors with capped weights across the largest number of countries including both developed and emerging markets, and are selected from a well-defined global benchmark index (the MSCI All Country World Index). The MSCI index is used for this analysis as S&PGI only covers 3 sectors, DJBGIC does not have a corresponding benchmark, and FTSEGCI covers a much wider range of related sectors including travel, tourism and business support services.

3.0.4 Key Findings

A transparent record of financial performance is a key requirement in building an infrastructure asset class, however, not all stakeholder communities may be fully aware of the track record of infrastructure investment around the world. This report lays out the record of financial performance available in the public domain for infrastructure equity and debt investments on a global basis.

Equity: Over the past ten years, publicly listed infrastructure equities have on average provided lower returns (6.7% p.a.) than global equities (9.7% p.a.), but with lower risk and a lower price relative to fundamentals suggesting that investors tend to treat infrastructure equities as value stocks. Emerging markets listed infrastructure equity returns (2.2% p.a.) have underperformed global equity benchmarks and experienced higher volatility.

Unlisted infrastructure equities, generally offered through private placements, outperform listed global equities, both in terms of higher returns (14.6% p.a.) and lower risk.

Debt: Infrastructure debt performance is focused on default and recovery rates, given the greater clarity around fixed income yields. Infrastructure default risk slows considerably after an initial period (i.e., the construction phase), in contrast to other asset classes which typically experience a steady rise in default over time. Infrastructure loans on average perform like an investment grade security by year 10 in high-income countries and by year 14 in middle- and low-income countries, and even faster in PPPs.

Social infrastructure has experienced lower default rates than other infrastructure sectors. The Middle East and Africa have experienced the lowest default rates and highest recoveries in infrastructure debt.

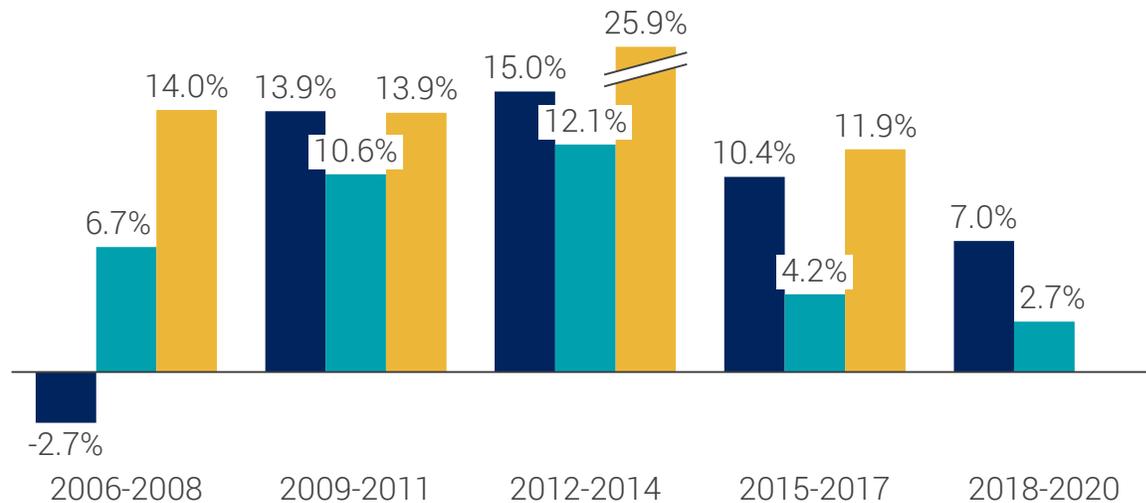
3.1 Infrastructure Equity Performance

3.1.1 Annual Total Return

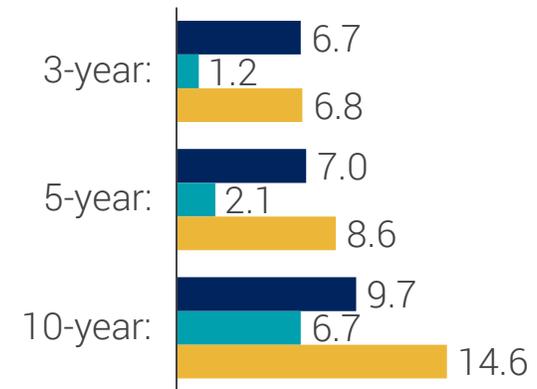
Over the past decade, listed infrastructure equities have returned 6.7% annually compared to 9.7% for a broader basket of listed global equities. Unlisted infrastructure equities outperformed global equities with a 14.6% annual return.

■ Global equities (MSCI ACWI)
 ■ Listed infrastructure (MSCI ACWI IC)
 ■ Unlisted infrastructure (EDHEC I300)

Annual return (3-year average, June 2006-June 2020)



Annualized return (%)



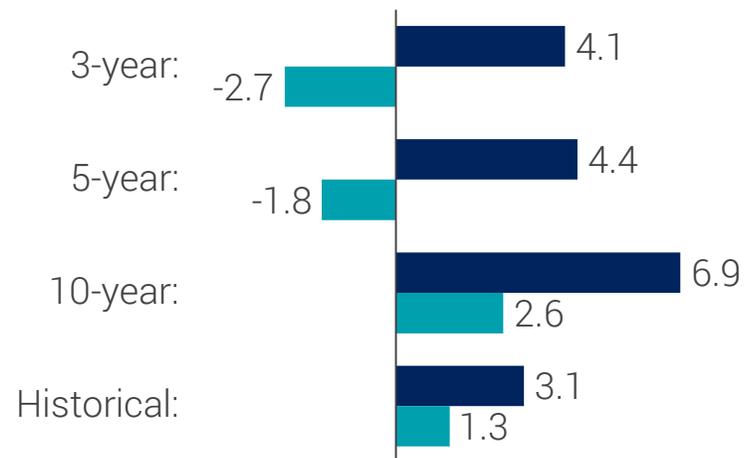
Source: [MSCI Gross Returns](#), [EDHECinfra](#) (EDHEC I300 data is publicly available only up to 2017)

Annualized return is a geometric average of annual total return (price returns + dividends assumed to be reinvested excluding withholding tax, fees). Historical annualized returns were estimated since December 1998 for global and listed equities, and since inception for unlisted equities.

3.1.2 Price Returns and Fundamentals

Relative to global equities, listed infrastructure equities have provided lower price returns but higher dividend yields. Valuation fundamentals are lower for infrastructure equities relative to the average for global equities, suggesting that investors tend to look at infrastructure equities as value stocks.

Price return, excluding dividends (%)



■ Global equities (MSCI-ACWI)
■ Listed infrastructure (MSCI-ACWI-IC)

Fundamentals (June 30, 2020)

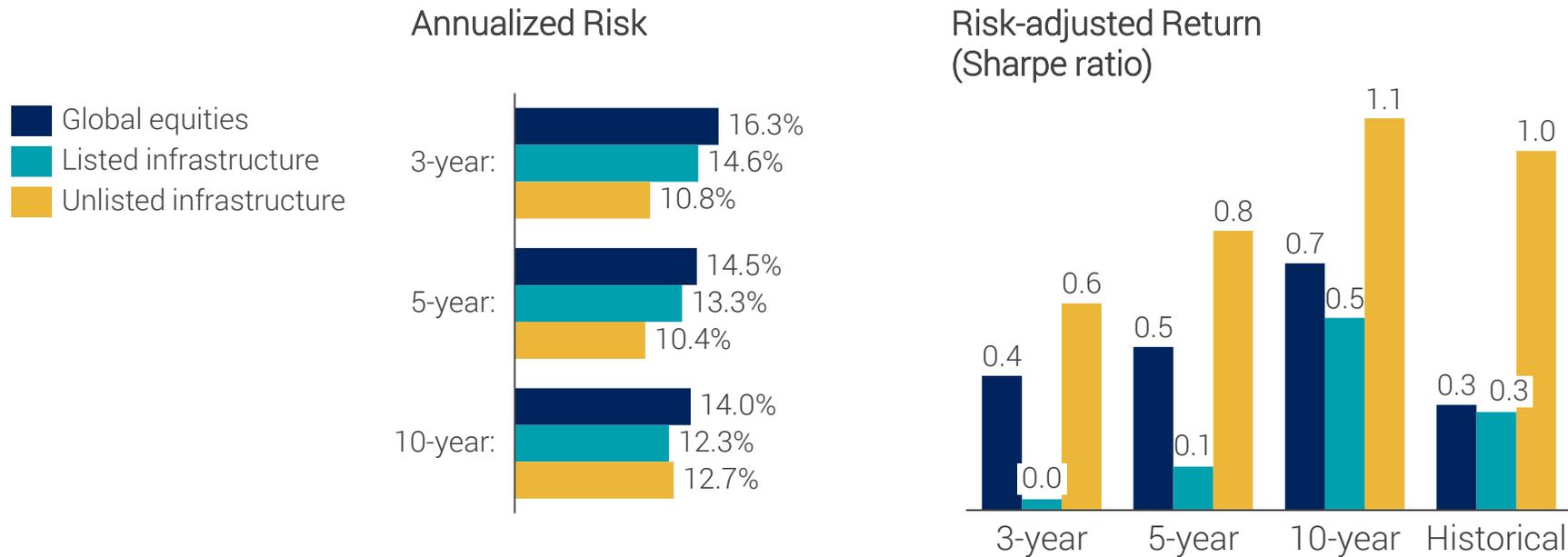
	Global Equities	Listed Infrastructure
Dividend Yield (%)	2.2	4.1
Price/Earnings	19.9	17.4
Price/Earnings Forward	19.2	15.7
Price/Book Value*	2.3	1.8

*For unlisted infrastructure, price/book value is 1.3

Source: [MSCI Gross Returns](#), [MSCI Price Returns](#), [EDHECinfra](#)

3.1.3 Risk

Listed and unlisted infrastructure equities have been less volatile than global equities. Unlisted infrastructure equities have provided the highest risk-adjusted return.

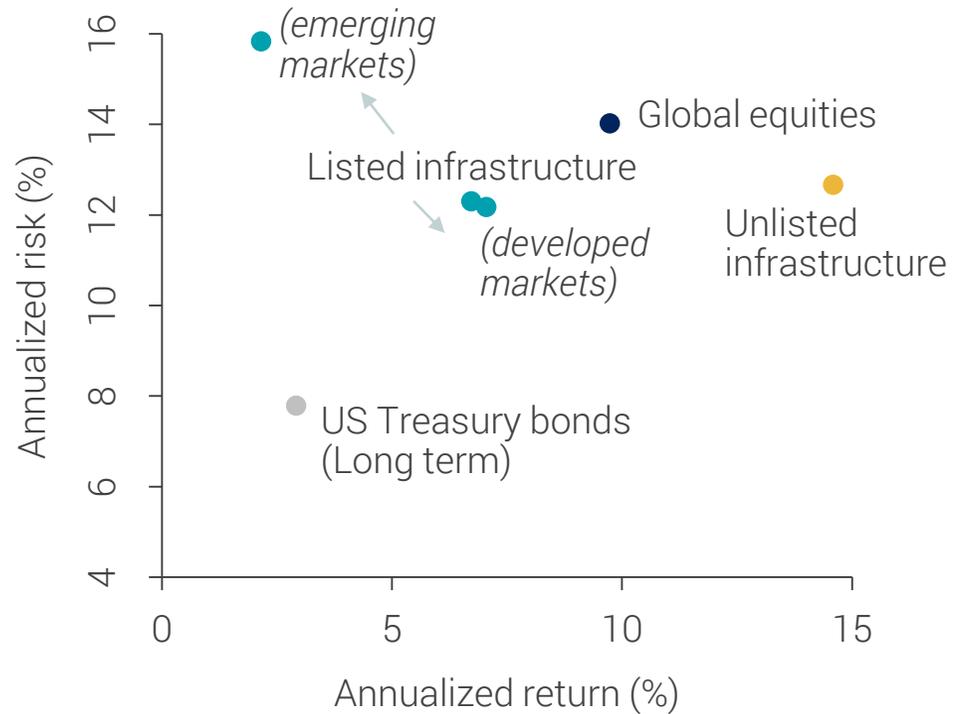


Source: [MSCI Gross Returns](#), [EDHECinfra](#) (EDHEC I300 data is publicly available only up to 2017)

3.1.4 Risk-Return

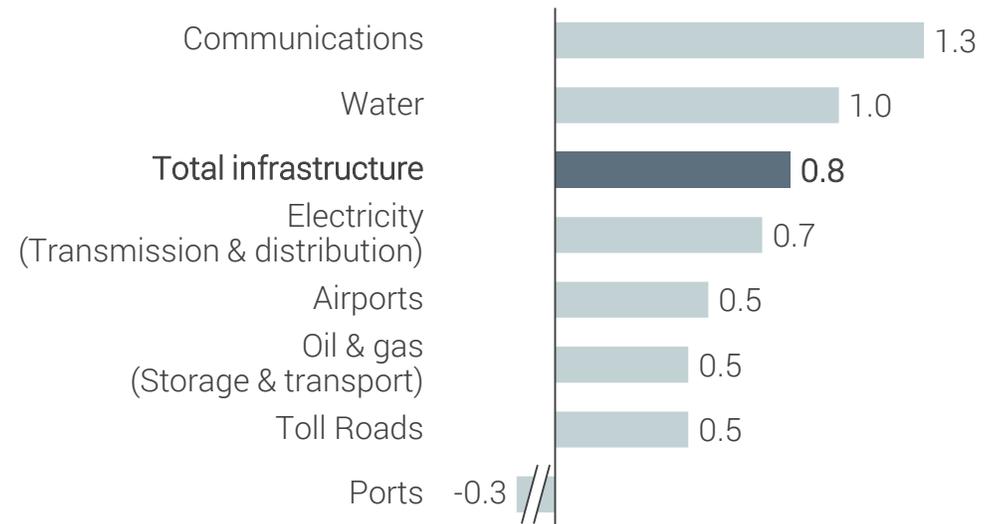
Infrastructure equities have an attractive risk-return profile providing a competitive alternative to other investment options. Investment performance of infrastructure equities differs between sectors and markets due to variations in key risk factors.

Risk-return (10-year)



Source: [MSCI Gross Returns](#), [EDHECinfra](#), [Damodaran NYU \(US T bonds\)](#)

Annualized risk-adjusted return (10-year), by infrastructure sector



Source: [Dow Jones Brookfield Infrastructure Indices](#) Factsheets as of July 31, 2020
 Note: Sector indices are not published by MSCI

According to EDHEC*Infra* (June 2020), COVID-19 has impacted valuations as follows:

- Airports : -10.6%
- Roads: -16.6%
- Ports: -20.9%
- All infra sectors: -8.0%

3.2 Infrastructure Debt Performance

3.2.0 Moody's Infrastructure and Project Finance Bank Loans

Infrastructure debt performance is drawn from the 2020 reports of the Moody's Analytics Data Alliance Project Finance Consortium, notably [Examining Infrastructure as an Asset Class](#).

Over 120 global institutions – including commercial banks, insurance companies, asset managers and other institutional investors – have participated in the consortium, providing confidential default and recovery information on a total of 8,583 project loans, including 587 project loan defaults and 298 ultimate recoveries, that originated from 1983-2018.

7,047, or 82%, of the project finance loans are in the infrastructure sector. Of the infrastructure loans, 5,909 are in high-income countries with 335 defaults and 1,138 are in middle- and low-income countries with 107 defaults.

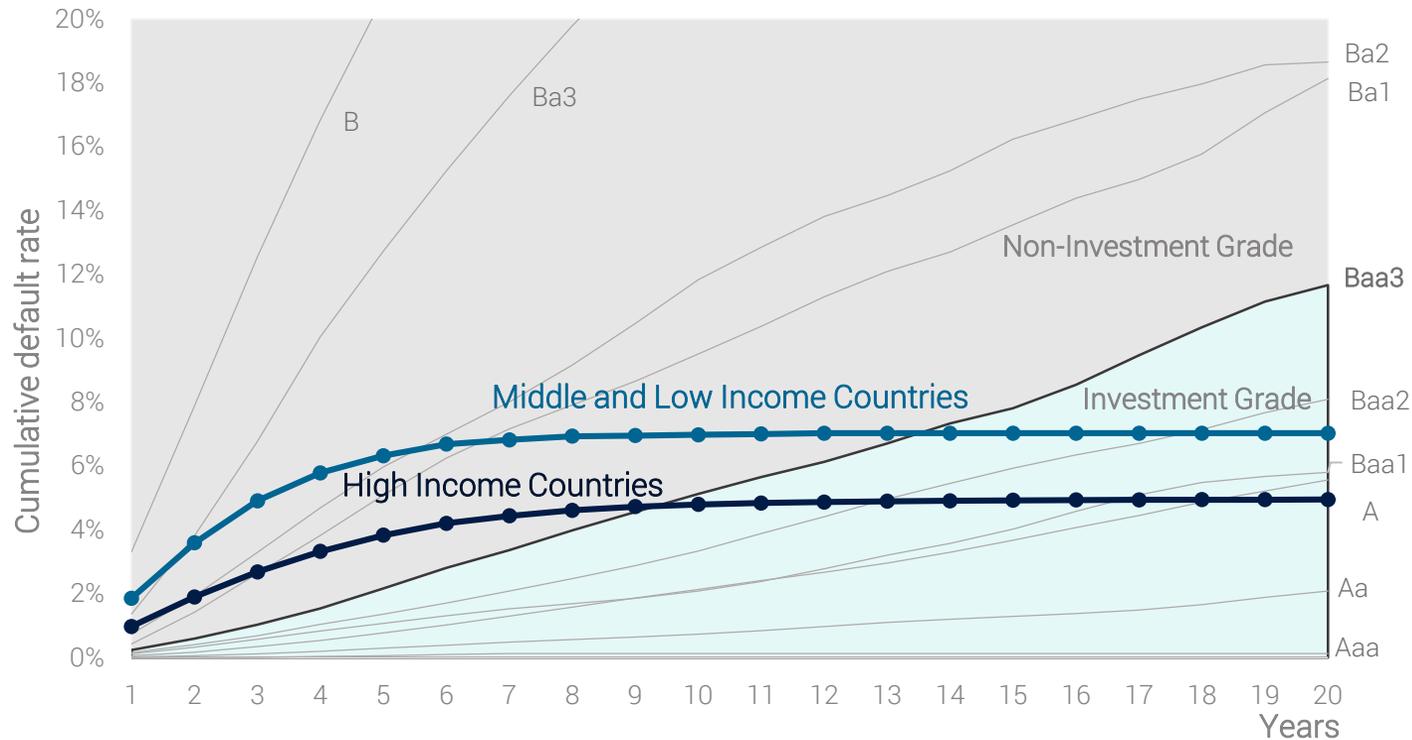
The consortium data set represents 63% of all global project finance loans originated between 1983 and 2018.

Country income groups are based on the World Bank Group's classification of countries as high-income, middle-income or low-income from 1995 to 2018.

Infrastructure Loans	7,047
By country income	
High income	5,909
• PPP	1,718
Middle and low income	1,138
• PPP	215
By sector	
Social	1,006
Transport	1,114
Energy	4,159
Other	768
By region	
Africa	234
Asia	447
Eastern Europe	112
Latin America	363
Middle East	226
North America	1,989
Oceania	352
Western Europe	3,324

3.2.1 Infrastructure Debt Cumulative Default Rates by Country Income

Infrastructure debt is, as expected, higher risk during the initial construction period. Following construction, infrastructure debt stabilizes and performs at investment grade on average by year 10 in high-income countries and year 14 in middle- and low-income countries. Over 20 years, infrastructure has a cumulative default rate of 5.3% for high-income countries and 7.0% for middle- and low-income countries. By comparison, the lowest credit rating for an investment grade security has a cumulative default rate of 11.7% over 20 years.

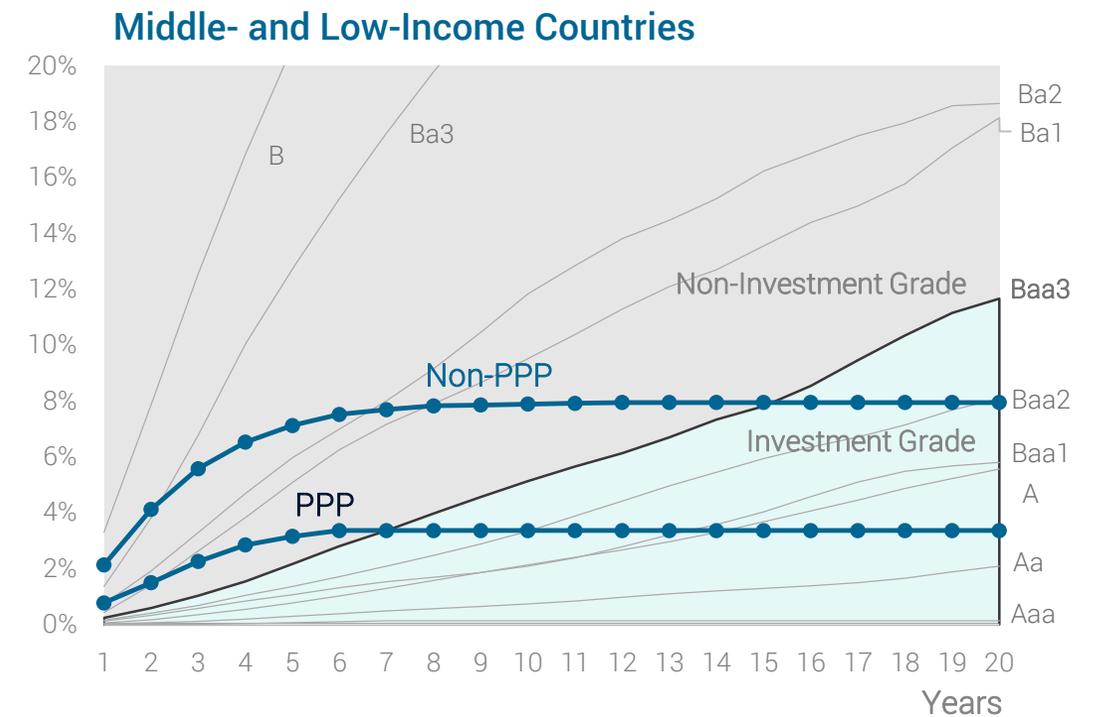
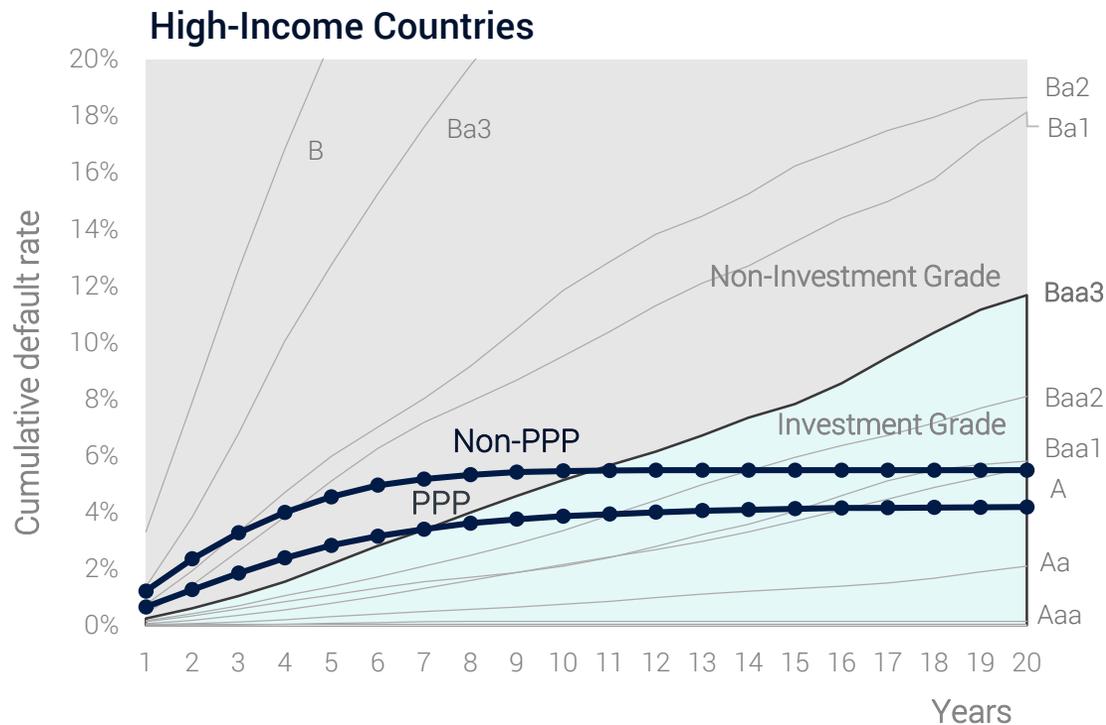


For this and following slides, the chart background shows the cumulative default rates associated with different Moody's credit ratings, including the Baa3 (BBB-) frontier between investment and non-investment grade.

Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

3.2.2 Infrastructure Debt Cumulative Default Rates for PPPs by Country Income

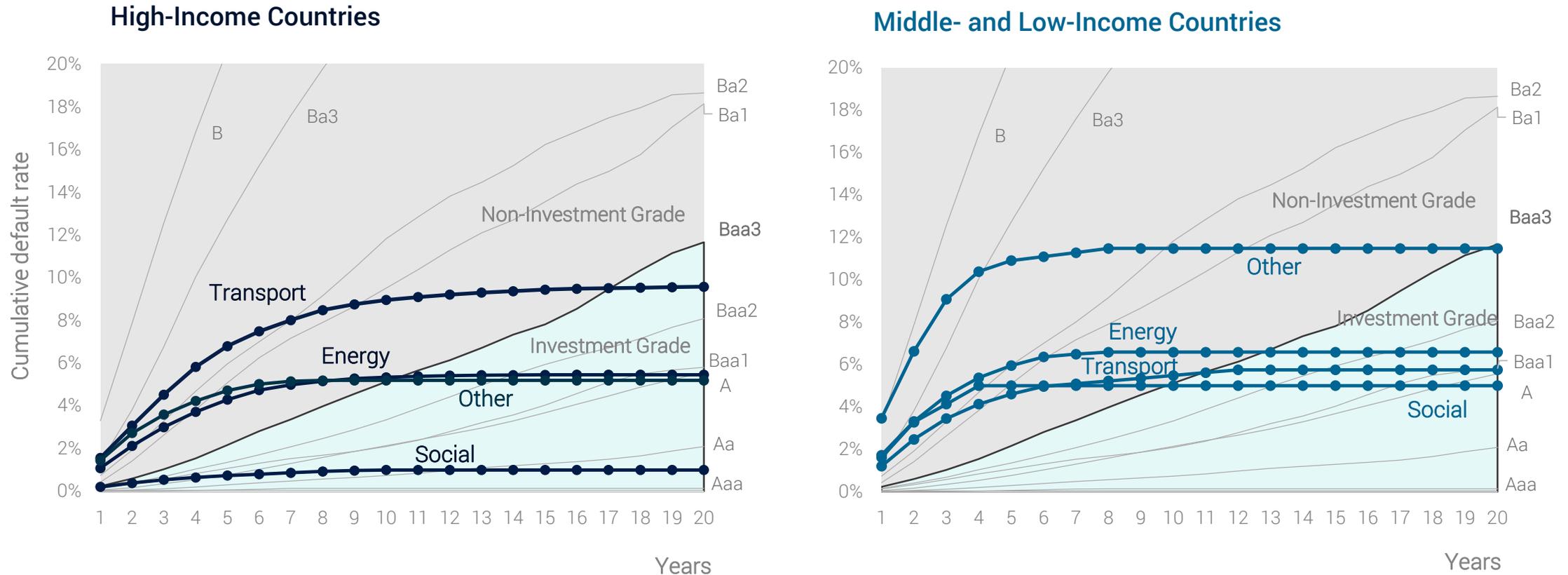
Infrastructure debt PPPs perform better than non-PPPs, reaching investment grade performance 4 years faster in high-income countries and 9 years faster in middle- and low-income countries.



Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

3.2.3 Infrastructure Debt Cumulative Default Rates by Sector

Infrastructure debt performance varies by sector. Social infrastructure is the sector with the lowest default rate in both country income groups.

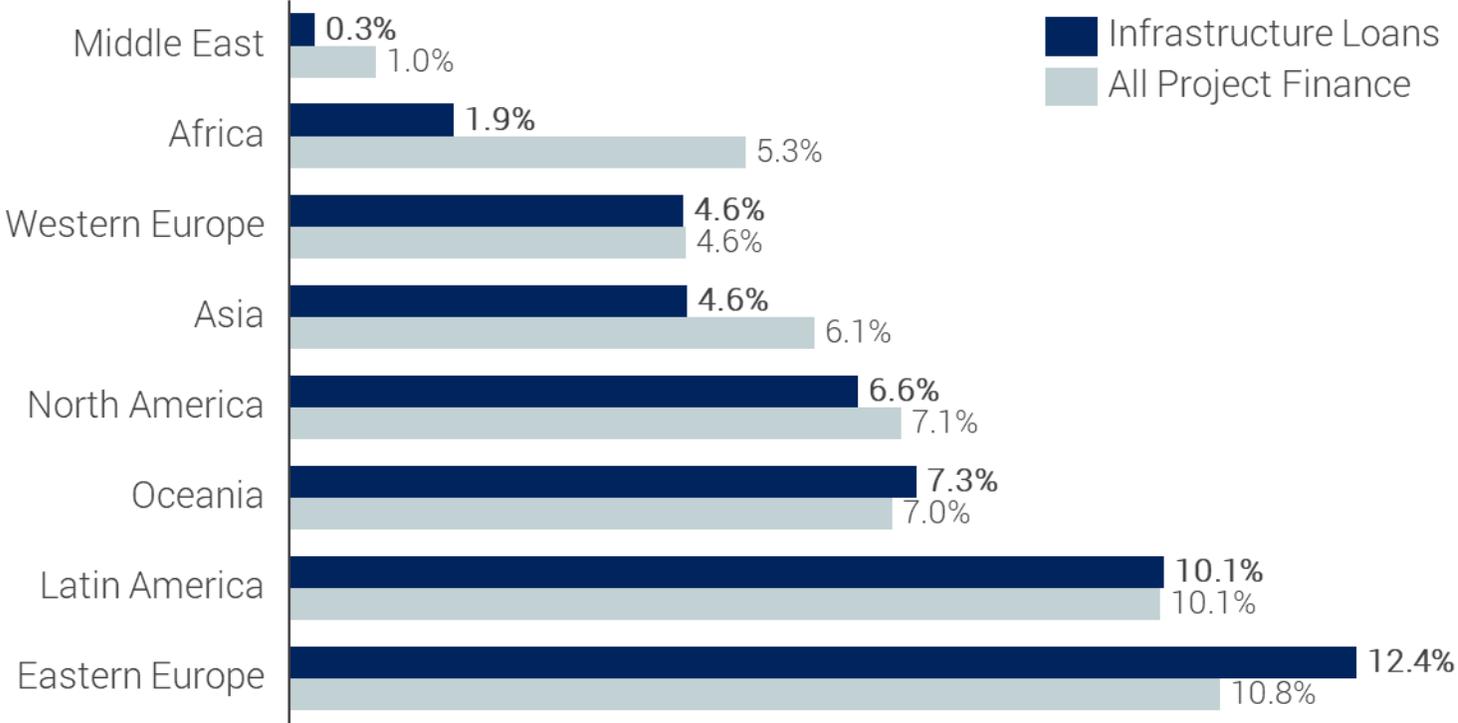


Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

Note: High-income countries project loans by sector: 939 for transport, 3,411 for energy, 973 for social, and 586 for others; Middle- and Low-income countries project loans by sector: 175 for transport, 748 for energy, 33 for social, 182 for others. Others refer to media and telecom, and water and waste sectors.

3.2.4 Infrastructure Debt Cumulative 10-Year Default Rate by Region

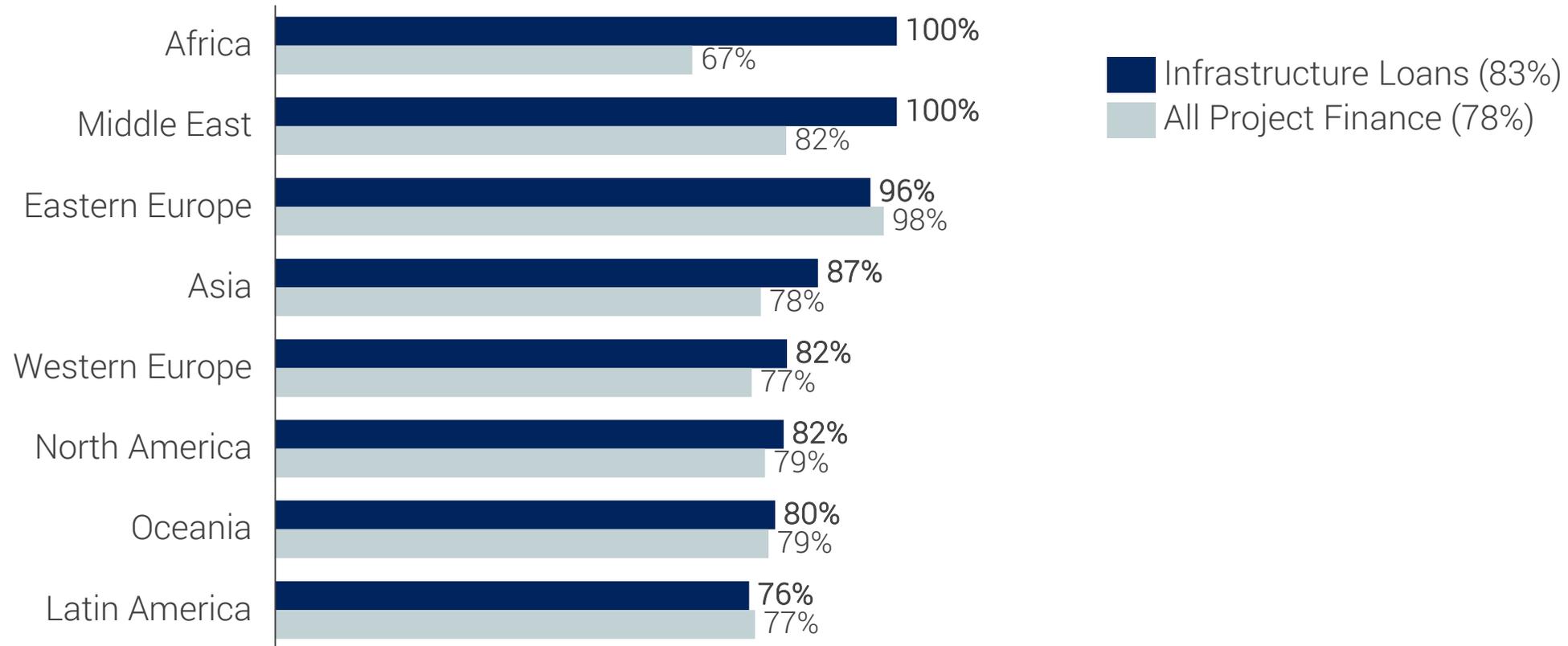
The Middle East and Africa have experienced the lowest default rates in infrastructure debt.



Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

3.2.5 Infrastructure Debt Ultimate Recovery Rate by Region

Recovery rates are higher for infrastructure loans than for all project finance loans. For infrastructure loans, Africa and the Middle East have 100% recovery rates on the 8 of 460 loans that went into default.

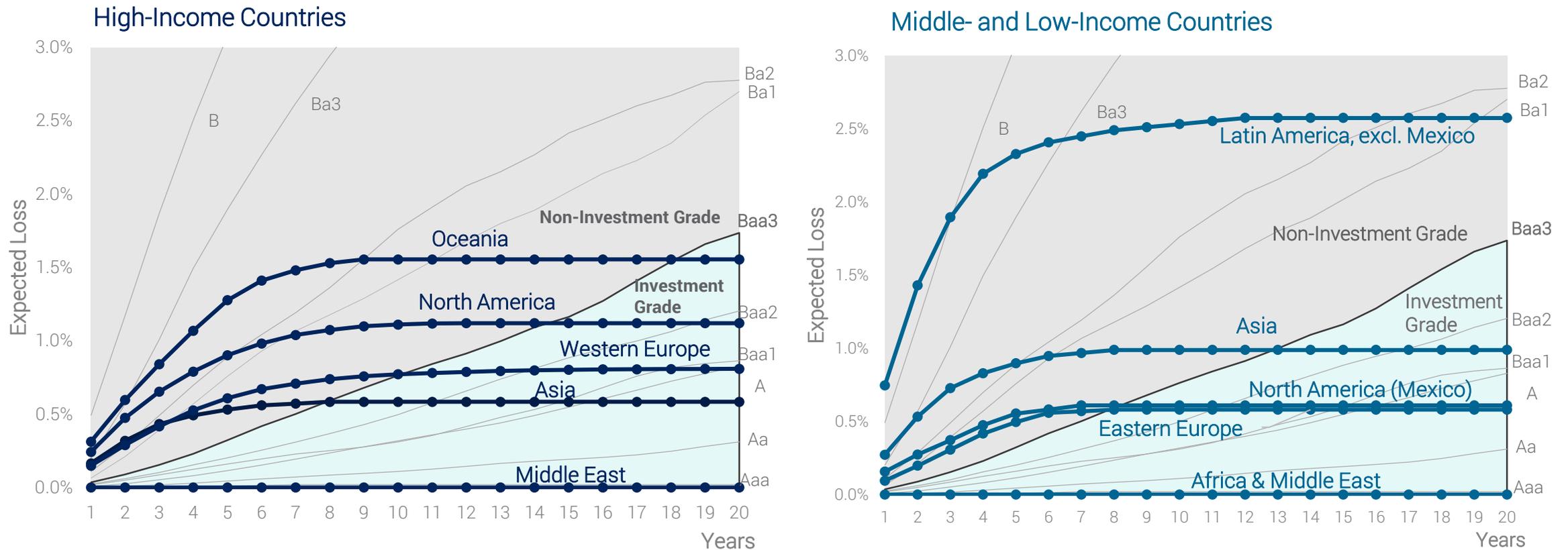


Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

Note: Ultimate recovery refers to a default on credit obligations for which recoveries have been realized following emergence from default.

3.2.6 Infrastructure Debt Expected Loss by Region

Based on the default and recovery data noted previously, Africa and the Middle East have the lowest expected loss rates on infrastructure debt.



Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

Note: if a region appears on both charts, the data reflects performance of countries from that region in that income group (e.g. North America in Middle- and Low-Income Countries accounts for Mexico). Regions are not shown in the charts above if the total project count is less than 20 for the region in that income group (e.g., Africa is not shown on High-Income Countries).

Appendices

Appendix A: Glossary

Private infrastructure investment: Private sector's share of the financial close value of deals with private participation in the infrastructure sectors - power, transportation, telecommunications, social, water and waste - that are concluded in primary markets. It includes both debt and equity transactions.

Primary market: Transaction types as defined by IJ Global as either primary financing or privatization.

Secondary market: Transaction types as defined by IJ Global as either asset or company acquisitions, additional facility, refinancing, design-build or securitization.

PPP infrastructure deals: As per IJ Global's definition, deals that contain at least the following attributes: (i) procurement conducted by a public sector procuring authority or other government body, (ii) private partner that is at least majority owned, (iii) some element of commercial debt financing, (iv) responsibility for arranging financing to lie with the private partner, (v) little or no responsibility for the public partner to service debt, and (vi) usually a concession period. As per Moody's definition, a public sector procurement structured as a public-private partnership. There exists no standard definition of what constitutes a PPP. A PPP is often defined as a long-term contractual agreement between a public sector governmental entity and a private developer to design, build, finance, operate and/or maintain an infrastructure asset for a specific period. The classification of a project as a PPP project in this addendum is based on its classification by the Data Consortium and involves some subjectivity.

Foreign equity sponsorship: The value of equity provided by foreign investors. An investor was designated as foreign if the company headquarters differed to the transaction region.

Equity investment: money that is invested in a company by purchasing shares of that company. Listed infrastructure equities are publicly traded on a stock exchange. Unlisted infrastructure equities are generally offered through private placements made by the project company signatory of the project or concession agreement.

Annual total return: share price appreciation and income from regular cash distributions (cash dividend payments or capital repayments) reinvested on the ex-date of such distributions, without consideration for withholding taxes.

Infrastructure debt: as per Moody's Analytics Data Alliance Project Finance Consortium dataset, project finance loans to infrastructure subindustries within the social, transport, water and waste, media and telecoms, oil and gas, and power sectors.

Cumulative default rate: weighted average of the marginal default rates, which are the ratio of the number of project defaults in a specific time period to the number of projects exposed to the risk of default at the beginning of that time period.

Ultimate recovery: A default on credit obligations for which recoveries have been realized following emergence from default

Sharpe Ratio: Ratio of excess returns to the standard deviation of returns, where excess returns is total returns minus risk-free return

Appendix B: Methodology for Private Investment in Infrastructure

This appendix describes the data source and estimation methodology used to compute the metrics for 'Private Investment in Infrastructure' in Section 2.

Data source: [IJ Global](#) is the largest database of infrastructure deals capturing more than 28,000 transactions across the globe. It covers all known transactions across the globe accessed through a wide range of primary and secondary sources including client submissions, journalists and third-party sources such as news and media releases. The database is updated regularly. Estimates in this report are based on the database published in July 2020.

Estimation methodology: the private sector share of the financial close value of deals with private participation has been estimated by applying a number of filters to IJ Global's transactions data. Tranches that were financed by development banks, multilaterals, international financial institutions, public finance institutions and state lenders were classified as public and removed from the total transaction value. Any participant providing IFI government support were also classified as public. Our headline estimates cover only primary market transactions and exclude secondary market transactions.

The data on number of deals and average value of deals are a derivative of this exercise. The value of PPP deals is also a subset of estimates for private investment and was derived using IJ Global's classification of PPPs.

Using the World Bank's Income Group Classification 2010, the country level data was aggregated to arrive at country income group level data. The 2010 Classification was used to avoid self-selection bias in examining trends by country income group during 2010-2019. Over time, countries with higher income growth graduate to a higher income group category. Countries with faster income growth typically have higher infrastructure investment levels.

Further, the total financial close value was disaggregated into infrastructure sectors using IJ Global's sector filters. Oil and gas, mining and defense sectors were excluded. Due to some differences between GI Hub's and IJ Global's definition of infrastructure sectors, the sub-sector level data was used and mapped to match GI Hub's definition of infrastructure sectors. For example, the waste sub-sector was excluded from social sector and aggregated in water and waste sector.

For multi-sector transactions, the transaction value was split equally among the sectors. The value of multi-country transactions were also split equally.

Exclusions

The following are excluded from the IJ Global transactions database:

- Internecine transactions between a parent company and its affiliates
- offtake or supply agreements in and of themselves
- service or O&M contracts in and of themselves
- an amendment to existing debt facility or facilities
- intracompany re-organizations
- sectors other than the above-mentioned
- lenders that are not MLAs and participate in a transaction at syndication
- machinery or equipment financing
- IPOs
- stock-for-stock mergers
- Joint Venture agreements
- trade finance
- carbon transactions
- salt mines
- aviation financing
- equipment leasing
- real estate projects

Comparison with World Bank Private Participation in Infrastructure (PPI) Database

The World Bank's PPI Database records the total investment value of infrastructure deals in low-and middle-income countries with private participation, i.e., both the private and public shares of the transaction, in both primary and secondary markets. The GI Hub's Infrastructure Monitor reports private infrastructure investment as the private share only of primary market transactions. The PPI database excludes investments in social infrastructure. These methodological differences can be used to reconcile the Monitor data to that of the PPI database.

Appendix C: Data Tables on Private Investment in Infrastructure

SUBJECT TO LICENCING DISCUSSIONS

For detailed country level data tables, visit [Infrastructure Monitor's digital database](#)

Disclaimer

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