



Global
Infrastructure
Hub

A G20 INITIATIVE

Infrastructure Monitor 2020

Data-Driven Insights Into
Selected G20 Infrastructure Priorities

October 2020

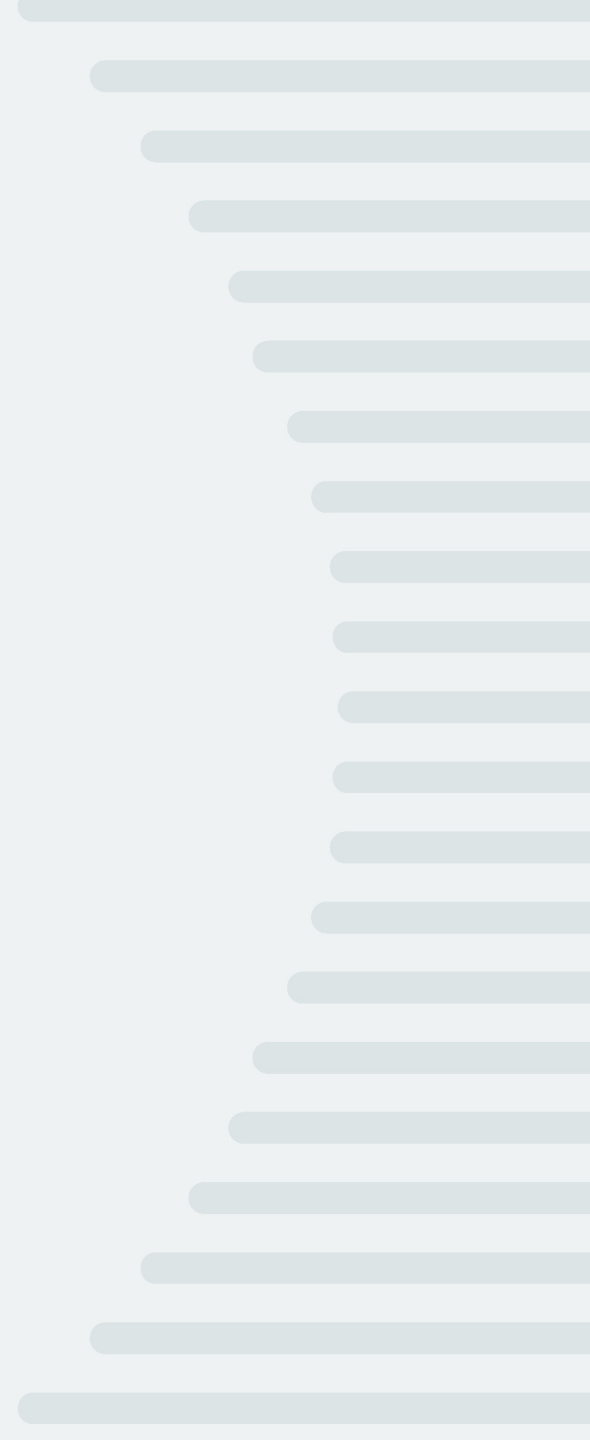
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Executive Summary

Infrastructure Monitor provides data-driven insights into selected G20 infrastructure priorities.

This 2020 edition reports on private investment in infrastructure and the performance of infrastructure investments, as a first step in monitoring progress towards G20 infrastructure priorities.



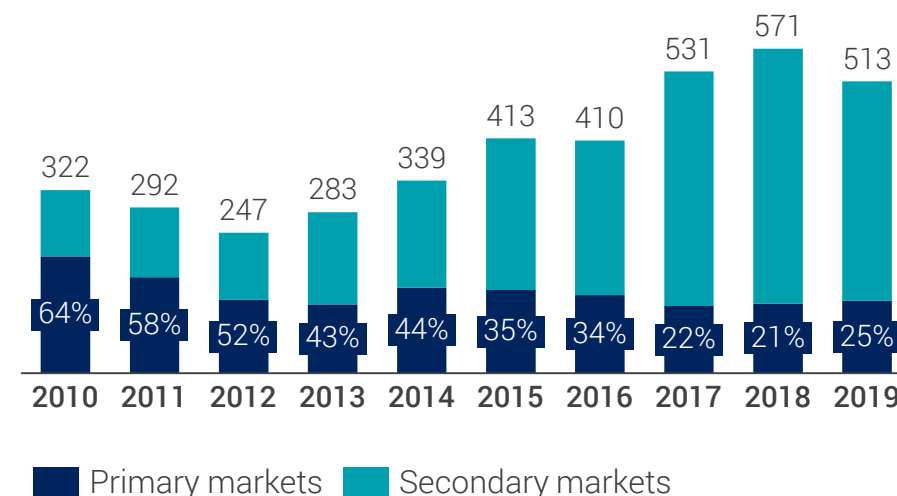
A. Private Investment in Infrastructure

Mobilising private capital is key to closing the infrastructure financing gap, which the Global Infrastructure Hub (GI Hub) [Global 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 has increased over the past decade. However, this increase has been driven by secondary market transactions (i.e. the trading of existing infrastructure assets).

Secondary market transactions accounted for 75% of all private financing in infrastructure in 2019.

Total infrastructure investment with private participation (USD bn)



Source: IJ Global and GIH calculations

A. Private Investment in Infrastructure (Cont)

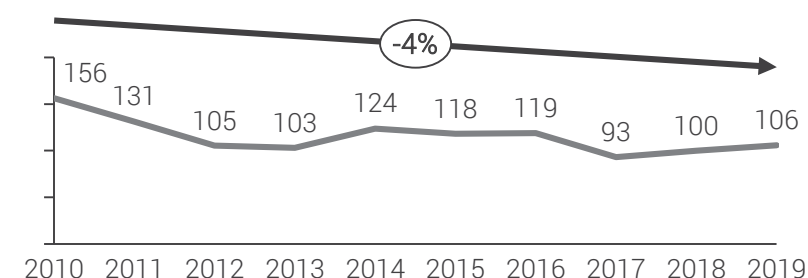
Primary market transactions (i.e. new security offerings in either greenfield or brownfield infrastructure projects) normally represent an incremental investment in infrastructure, and are a more important metric for private capital mobilisation than secondary market transactions.

Worldwide, private infrastructure investment in primary markets has been low. In 2019, it came in at US\$106 billion, about 0.13% of total global GDP. This was down from US\$156 billion in 2010, about 0.25% of global GDP.

In 2019, 77% of private infrastructure investment was in high-income countries. This suggests that the ambition of the international community to mobilise more private investment in middle- and low-income countries is not being fulfilled at a pace consistent with transformational change.

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.

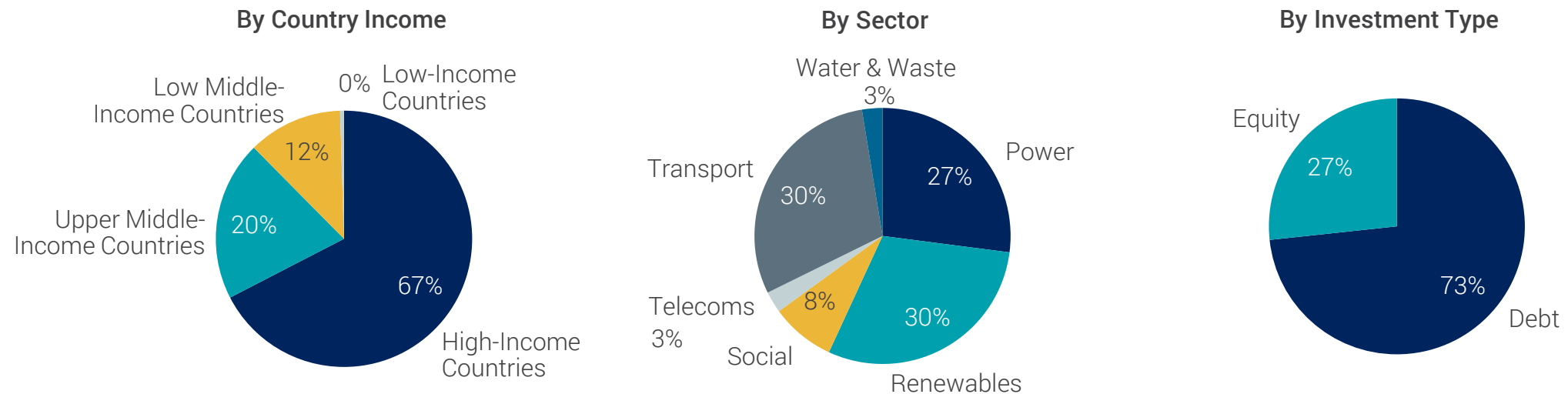
Note: Public investments involved in transactions with private participation were excluded to arrive at these estimates.

A. Private Investment in Infrastructure (Cont)

The Asia Pacific region and the renewables sector attracted the highest levels of private investment. Private investment in social infrastructure (health care, education and public facilities) declined the most, from US\$19 billion in 2010 to only US\$3 billion in 2019.

From 2010–2019, an average of 73% of private infrastructure investment globally was debt financed, and 27% was equity financed. In low-income countries, this pattern was reversed, with equity accounting for 73% of total private infrastructure financing.

Share of private infrastructure investment (average 2010–2019)



Source: IJ Global and GIH calculations

B. Infrastructure Investment Performance

A transparent record of financial performance is a key requirement in building an infrastructure asset class. This report summarises the financial performance of global infrastructure equity and debt investments, based on information available in the public domain.

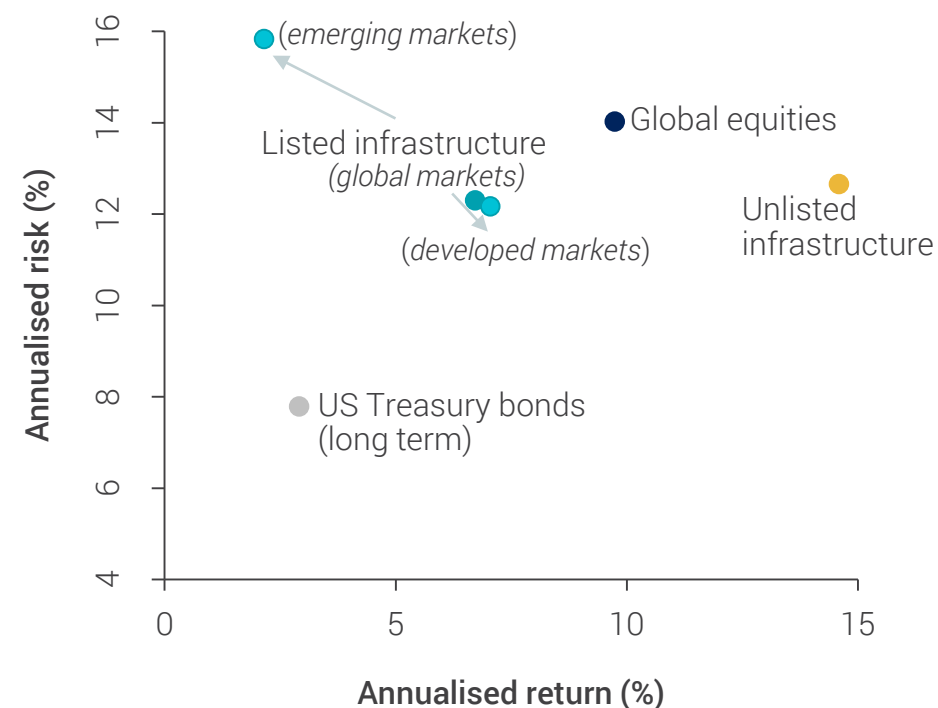
Equity Investment

Over the past 10 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 \(US T bonds\)](#)

B. Infrastructure Investment Performance (Cont)

Debt Investment

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.

The Social Infrastructure sector 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 rate 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 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 infrastructure	10	14
PPP	7	7
Non-PPP	11	15
<u>By sector</u>		
Transport	17	11
Energy	11	13
Social	1	10

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

1. Introduction

1.1 Background

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

- Mobilising private capital to invest in infrastructure, including through:
 - Risk mitigation
 - Project preparation
 - 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 (infrastructure technology) may emerge as another element of this long-term agenda.

1.2 Scope of Infrastructure Monitor

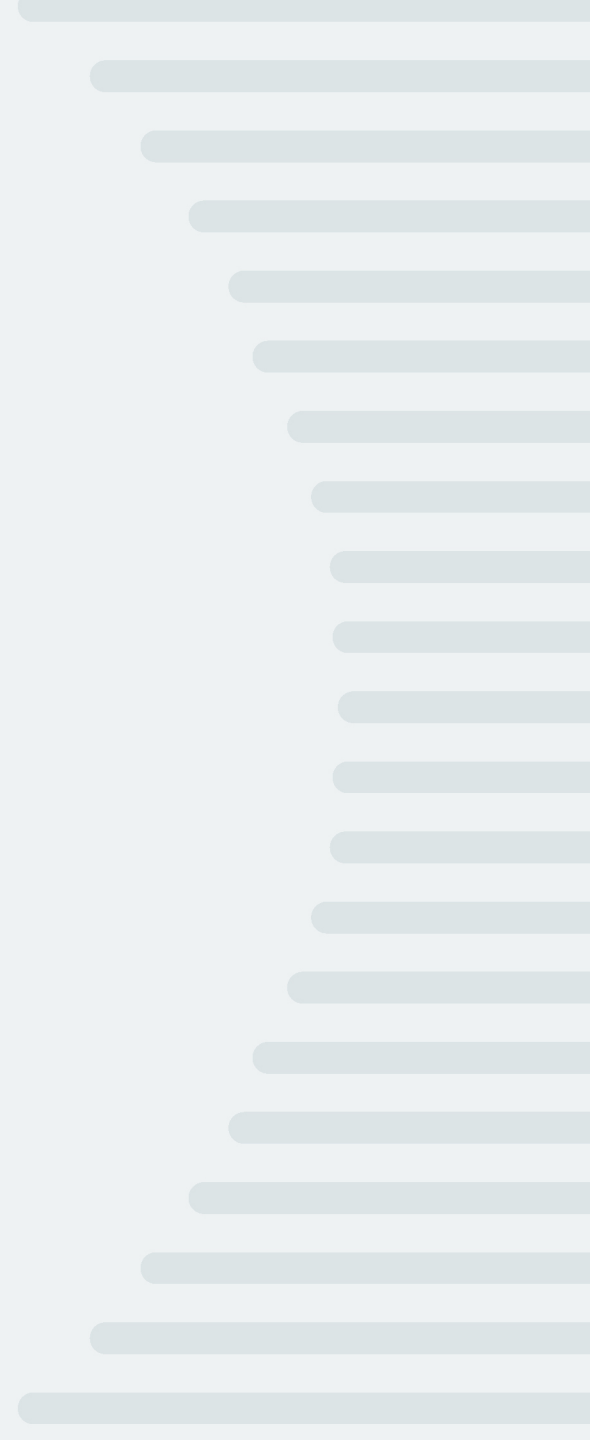
Infrastructure Monitor provides data-driven insights into G20 infrastructure priorities, supporting continuity across presidencies. With these data-driven insights, the intention is to help decisionmakers and practitioners examine systemic progress against the G20 infrastructure priorities.

This first *Infrastructure Monitor 2020* reports on two variables:

- Private investment in infrastructure
- Infrastructure investment performance.

This report studies 2010–2019, the period prior to the COVID-19 pandemic. The GI Hub continues to closely monitor the impact of the pandemic across the infrastructure landscape. Future *Monitor* reports could examine this impact and additional indicators of interest to the G20.

2. Private Investment in Infrastructure



2.0.1 Context

In 2017, the GI Hub's [Global Infrastructure Outlook](#) forecasted global infrastructure investment needs of \$94 trillion out to 2040 – \$15 trillion more than projected spending based on prevailing trends. 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 emphasis on the importance of mobilising 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 International Monetary Fund (IMF) estimated that global fiscal commitments in response to COVID-19 amounted to US\$11 trillion, and this number can be expected to grow in the near- to medium-term.

This section presents data on levels of private infrastructure investment, highlighting trends in the size and nature of private sector involvement in global infrastructure transactions. The analysis offers valuable insights into private sector participation in infrastructure but is not an exhaustive analysis of all private infrastructure deals. Data are drawn from IJ Global's transactions database, which is likely to be biased towards larger, more developed markets. Details and limitations of the data are provided on the following pages.

2.0.2 Data Source and Limitations

Data Source

Private infrastructure investment data are sourced from IJ Global's transactions database, as at July 2020.

Several other sources record levels of private infrastructure investment, including Inframation's InfraDeals, InfraPPP World, the Financial Times' fDi Markets, Bloomberg's Dealogic and the World Bank's (WB) Private Participation in Infrastructure (PPI) Database. While the WB's PPI is widely considered to be the most comprehensive data source for private infrastructure investment, it only covers transactions in low- and middle-income countries. IJ Global's is the industry's largest database of infrastructure deals covering all income groups. It captures more than 28,000 transactions in almost 200 countries.

IJ Global's database represents the best available comparable data for global private infrastructure investment. Yet, 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.

2.0.2 Data Sources and Limitations (Cont)

Definition of Private Infrastructure Investment

Private infrastructure investment is defined in this report as the private sector's share of the financial close value of infrastructure deals that involved private participation. The analyses in this report consider debt and equity transactions in the power, transportation, telecommunications, social, water and waste sectors. This report excludes:

- Transactions in oil and gas, mining and metals, and defence
- Transactions with a total deal value less than US\$1 million
- Debt transactions with maturity of less than 12 months.

Except where noted (e.g. when total investment figures are provided as context), 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. For detail on exclusions in the data, please see Appendix B.

The public and private share of investment is determined by tranche role and instrument type. Tranches financed by development banks, multilateral organisations, international financial institutions (IFIs), 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 investments.

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 is low at around US\$100 billion, and has been declining over the past decade from US\$156 billion in 2010. Primary market transactions represent new opportunities for greenfield or brownfield investment and are essential for private capital mobilisation. Although private investments through secondary markets have grown over the past decade, these do not have the same ability to mobilise capital.
2. Investment in renewables has grown and investment in social infrastructure has declined as the sectoral mix of private infrastructure investment has changed over the past decade. In middle- and low-income countries, investment in more carbon-intensive and less sustainable energy (non-renewables) has remained greater than investment in renewables.
3. Latin America and the Middle East & North Africa (MENA) have been fast-growing regions for private investment over the past decade, while Europe has seen the largest decline in private investment.
4. Investment in high-income countries has accounted for 67% of all private infrastructure investment on average over the past decade. While there has been some success in attracting investment in developing countries, progress in mobilising private capital remains below desired levels.
5. Reliance on foreign equity sponsorship is particularly high in Sub-Saharan Africa and is rising in MENA. The transaction value of private infrastructure investment in low-income countries is almost entirely denominated in foreign currencies, creating a structural foreign exchange risk for investors.

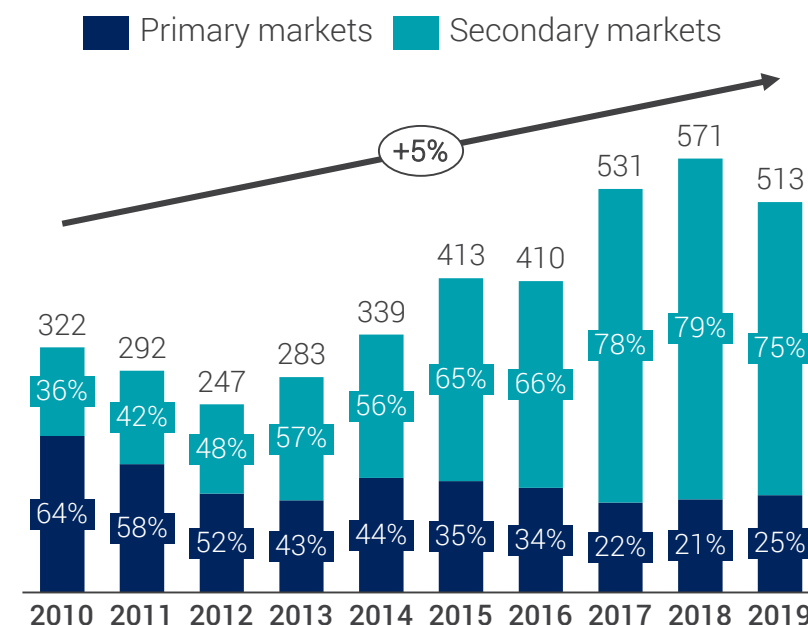
2.1 Total Infrastructure Investment with Private Participation

Total private investment in infrastructure (figures here include both primary and secondary market transactions) has increased at 5% Compounded Annual Growth Rate (CAGR) over the past decade. However, this overall increase has been driven by secondary market transactions. In 2019, only 25% of private infrastructure investment transactions occurred in primary markets, down from 64% in 2010.

Table 1: Total infrastructure investment 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



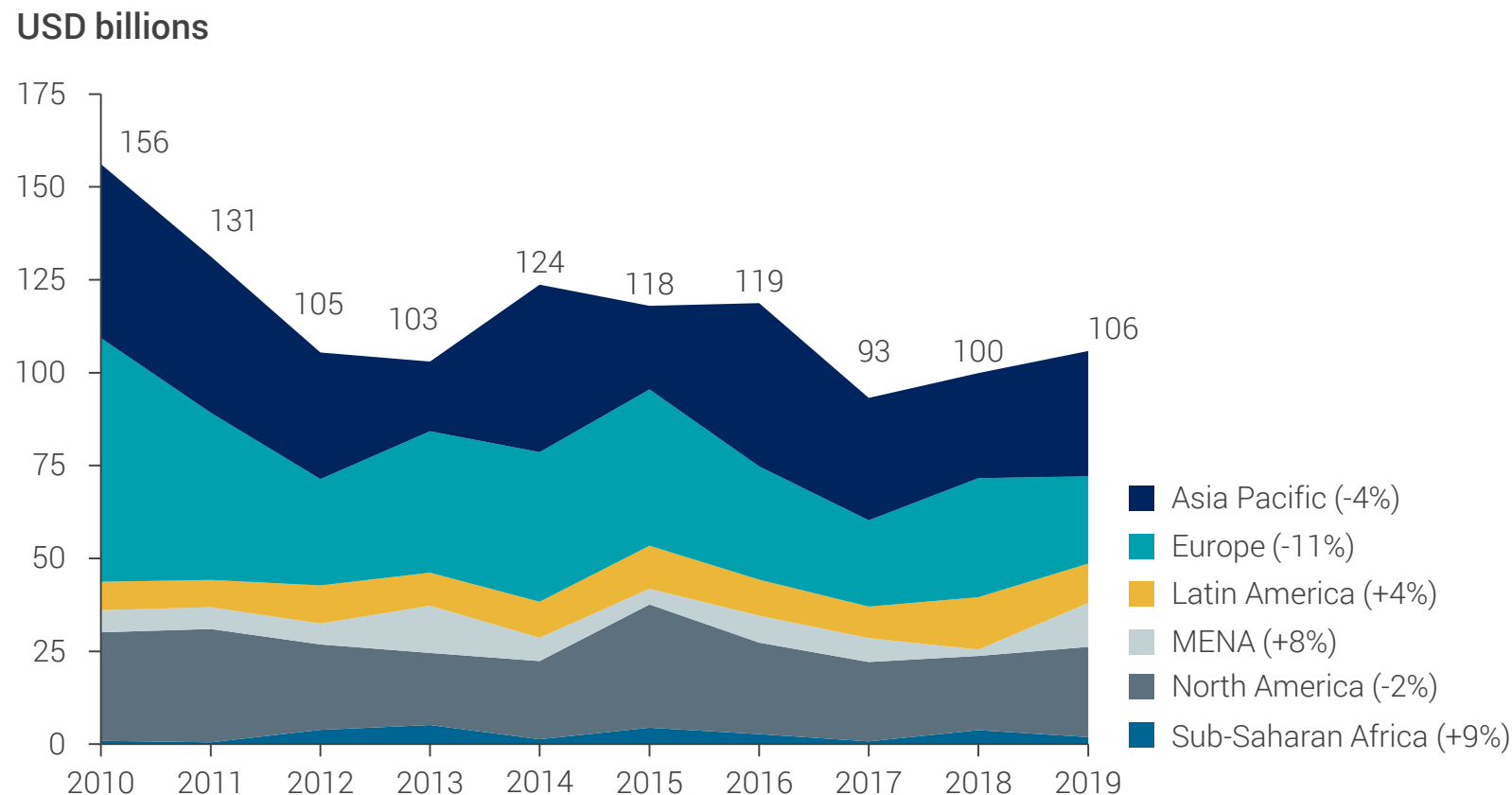
2.2 Private Infrastructure Investment by Region (2010–2019)

Except where noted, private infrastructure investment data in this report include only primary market transactions, as defined in Appendix A.

Over the past decade, private investment in infrastructure has amounted to around US\$100–150 billion annually.

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

Latin America and MENA have been fast-growing regions for private investment, while Europe has seen the largest decline.



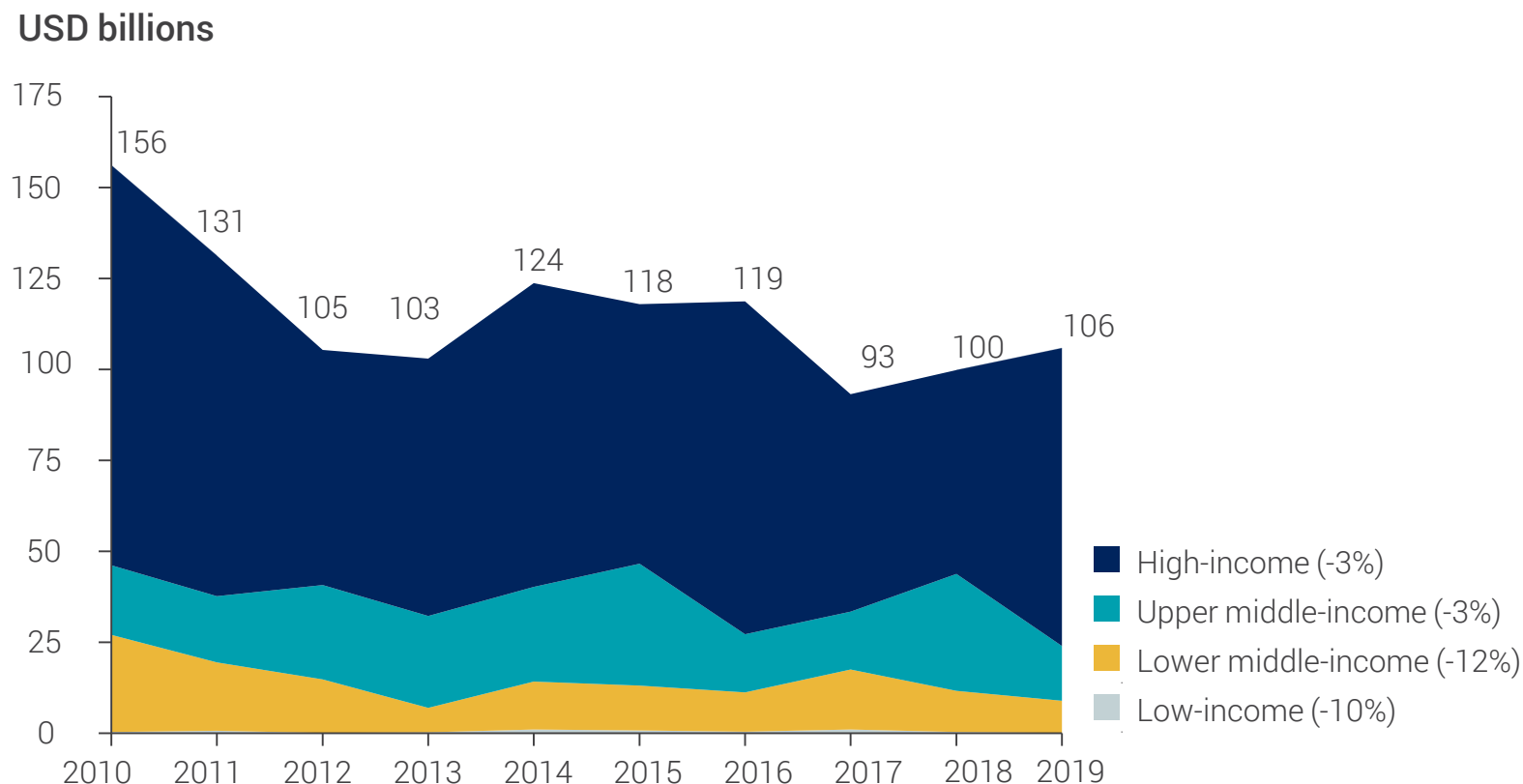
Source: IJ Global and GIH calculations
Note: CAGR growth rates for 2010–2019

2.3 Private Infrastructure Investment by Country 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 for 2010–2019

Note: For 2010–2019, countries were placed into country groupings based on 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
MENA	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

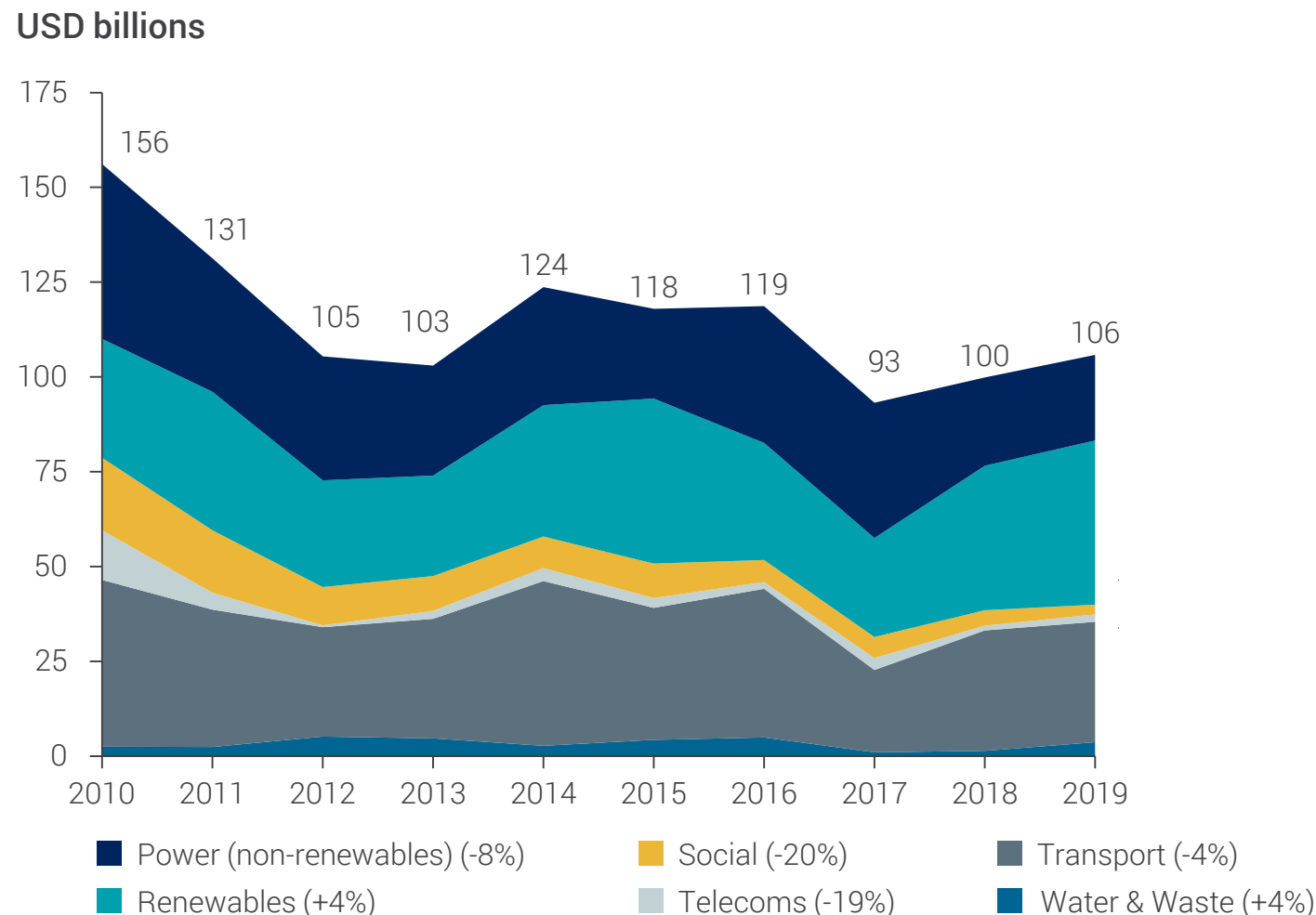
Source: IJ Global and GIH calculations

Note: World Bank Income Group classifications 2010 were used to examine trends by country income group during 2010–2019. See note at page 19.

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 US\$19 billion in 2010 to less than US\$3 billion in 2019.



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

Table 3: Private infrastructure investment by sector

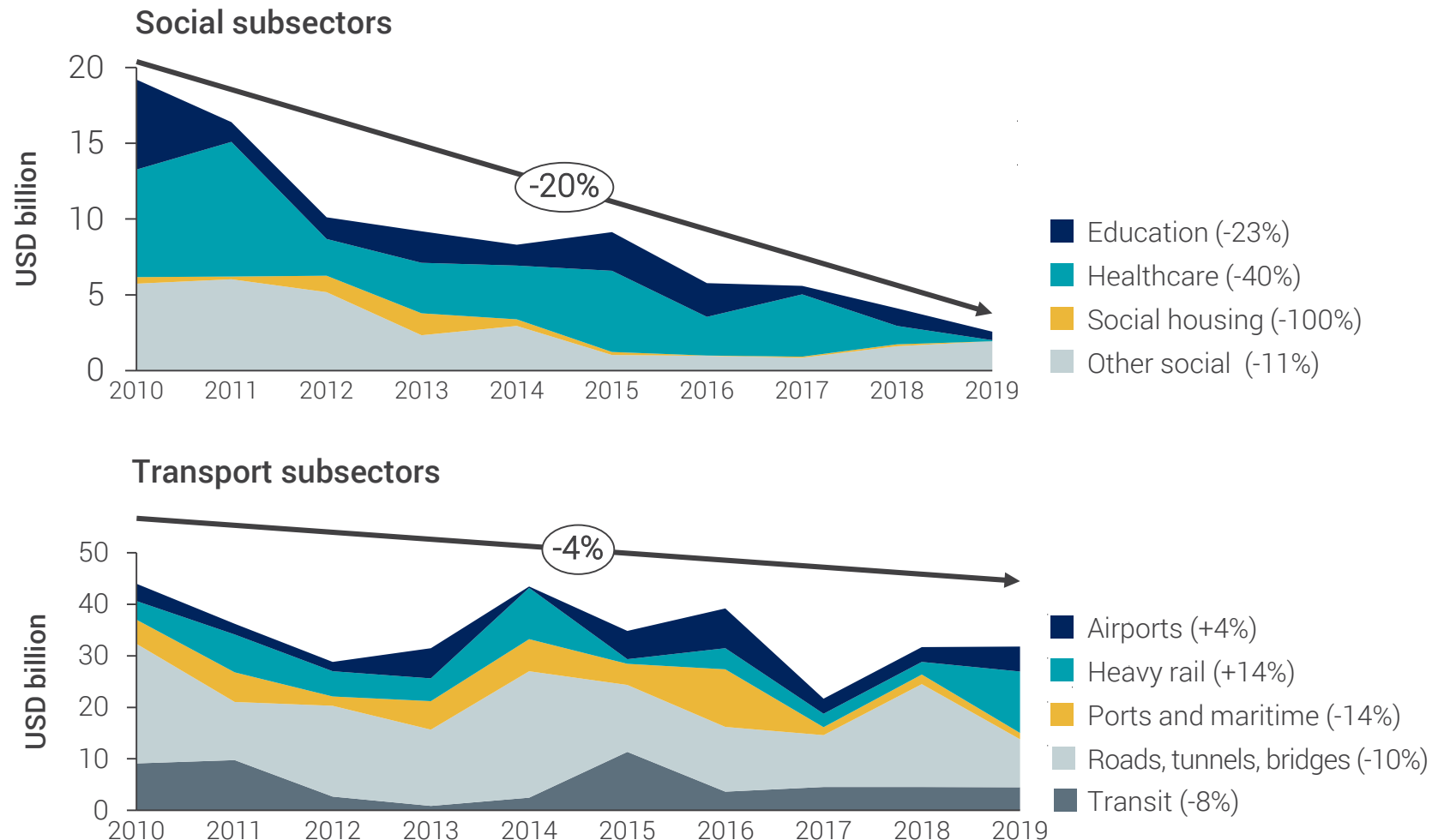
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Aggregate value (USD bn)	156.2	131.3	105.4	103.0	123.7	118.0	118.7	93.2	99.9	105.9
By sector										
Power (non-renewables)	46.1	35.2	32.7	29.0	31.1	23.6	36.1	35.7	23.3	22.6
Renewables	31.3	36.6	28.1	26.5	34.7	43.5	30.9	26.1	38.1	43.3
Social	19.2	16.4	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 in Social and Transport Subsectors

Social sector: This sector comprises subsectors of healthcare, education, social housing and others. During 2010–2019, the healthcare and social housing subsectors saw sharp declines 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 subsectors accounted for about half of private infrastructure investment in the transport sector. Investment in other transport subsectors was evenly distributed, with heavy rail being the fastest growing among these. 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 for 2010–2019

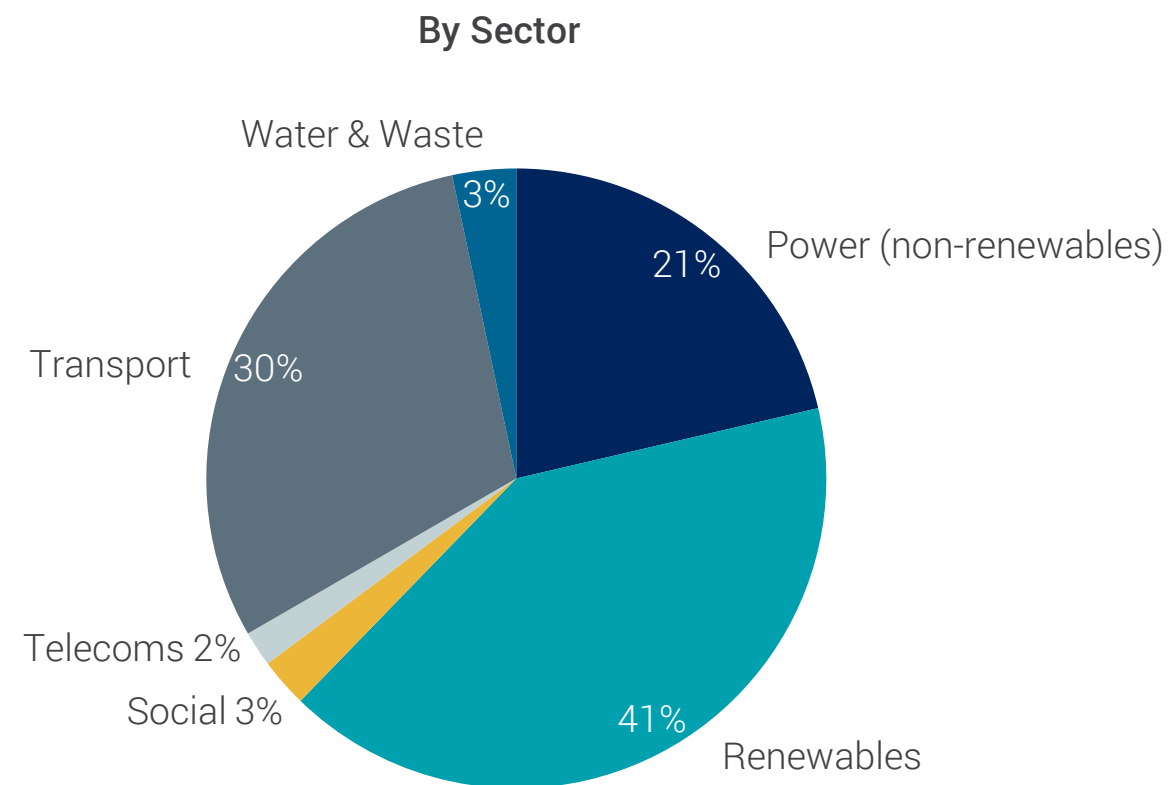
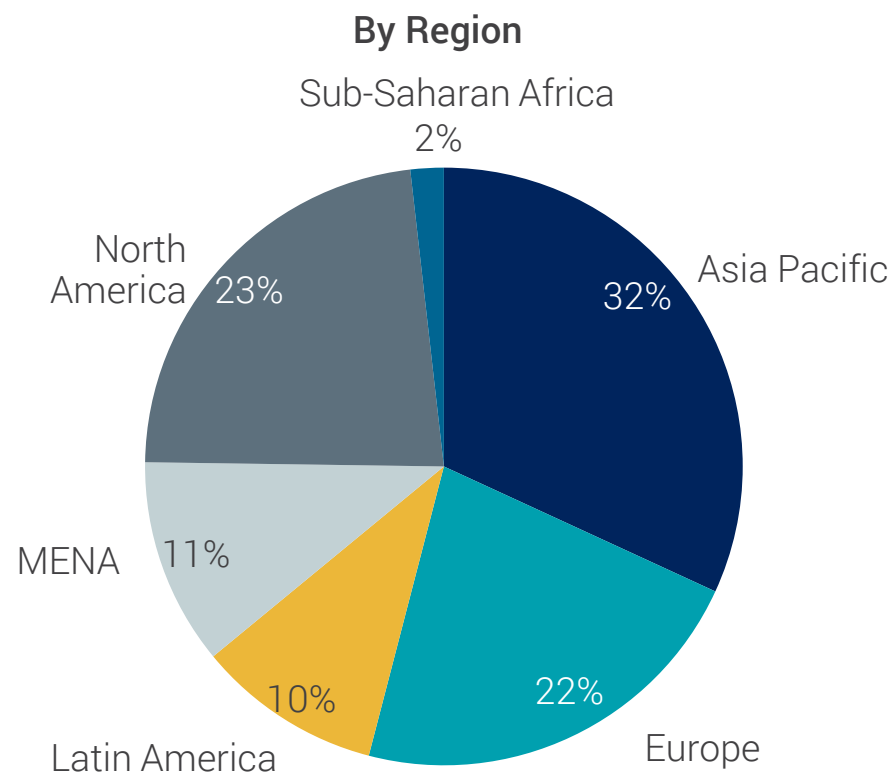
Table 4: Private infrastructure investment by subsectors

USD billions	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Social	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)

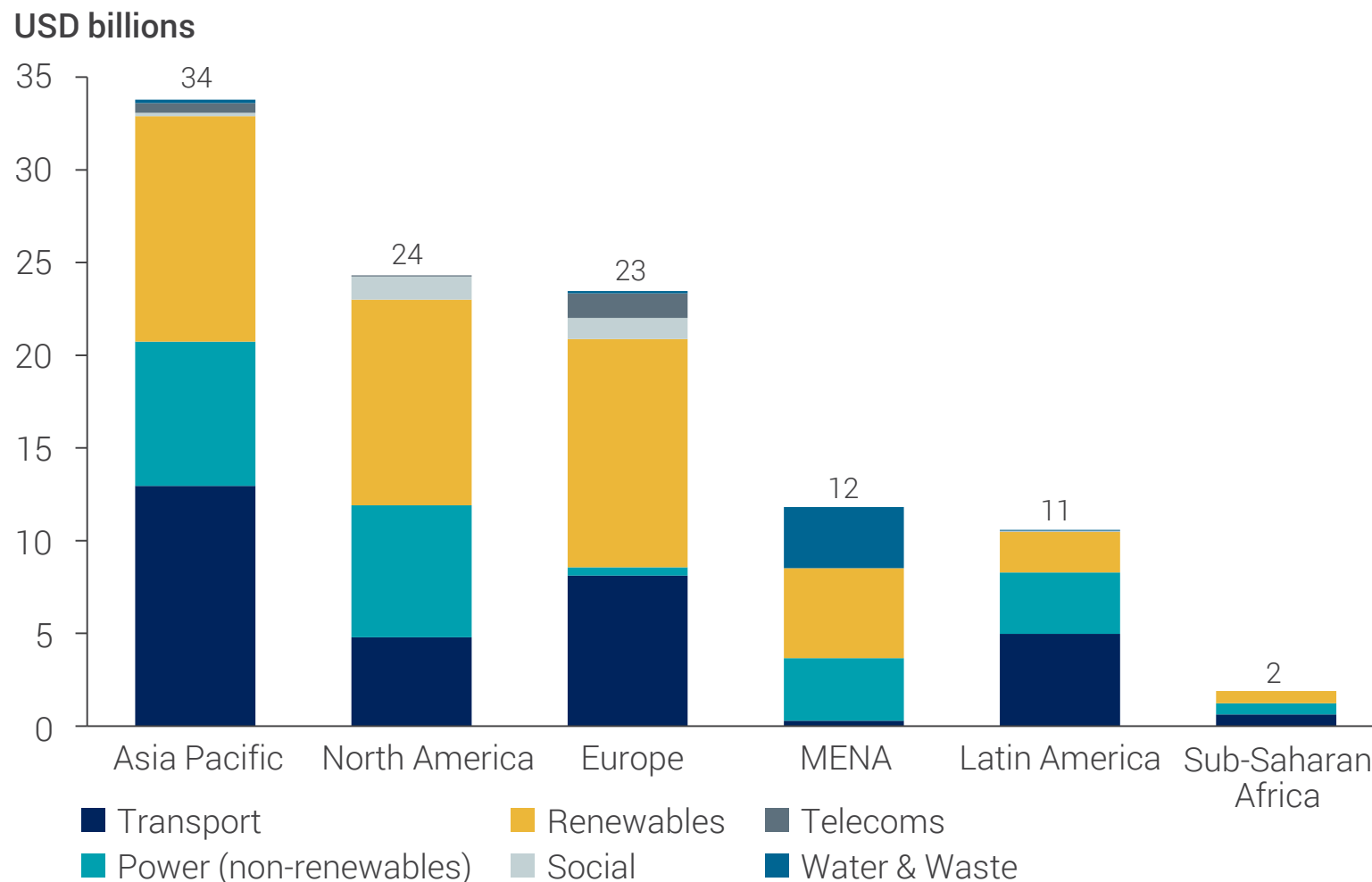
In 2019, the Asia Pacific region attracted the highest level of private investment, ahead of both Europe and North America. By sector, renewables attracted the largest amount of private investment among infrastructure sectors, followed by transport and non-renewable power.



Source: IJ Global and GIH calculations

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

Transport attracted the largest share of private infrastructure investment in the Asia Pacific region in 2019, whereas renewables attracted the most investment in both Europe and North America.

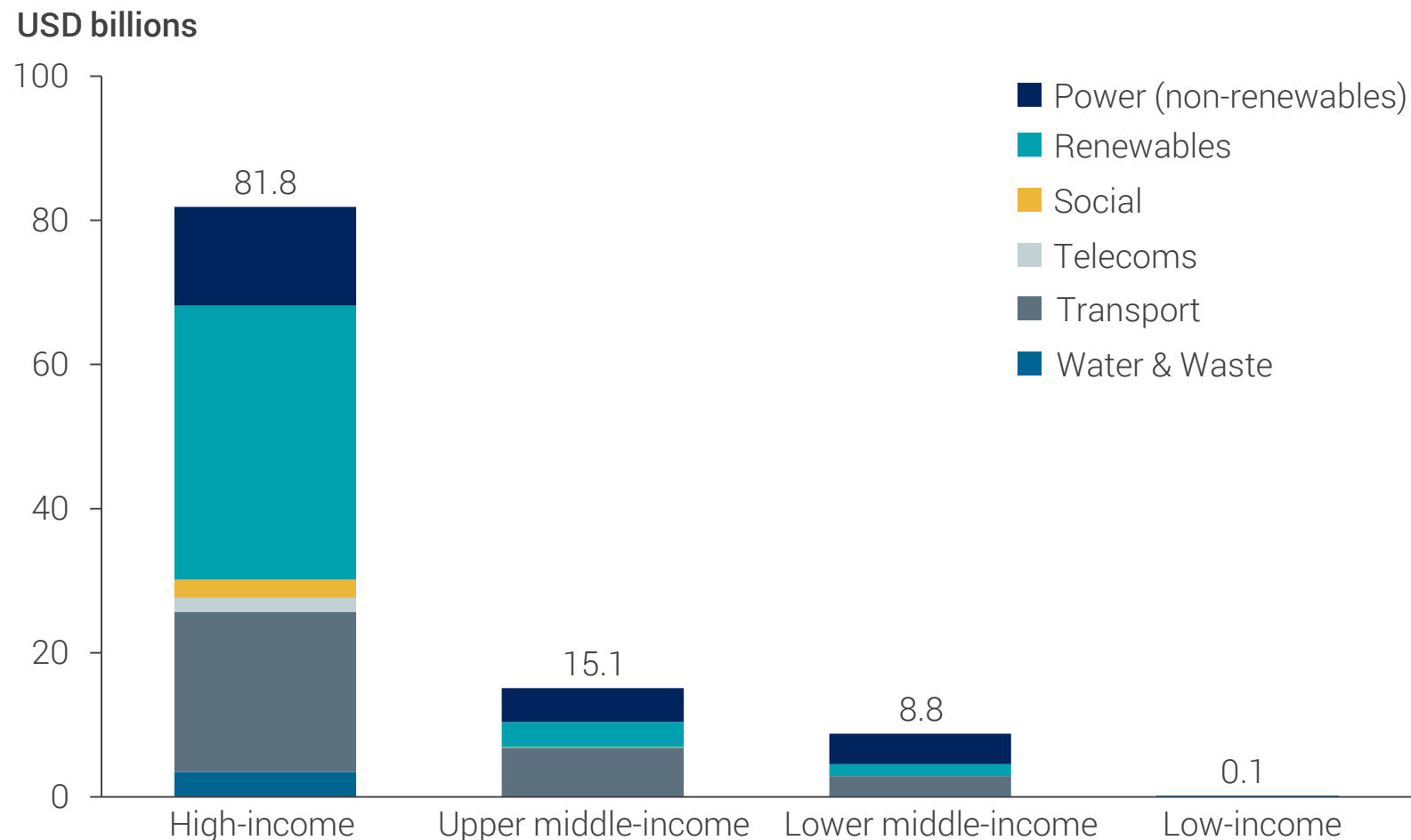


Source: IJ Global and GIH calculations

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

In 2019, private infrastructure investment in high-income countries was triple that in low-income countries, with capital invested in high-income countries accounting for 77% of all private infrastructure investment.

At these rates, the mobilisation of private investment in developing countries falls short of international ambitions, with both the scale and amount of investment falling short of what would be needed for transformation.

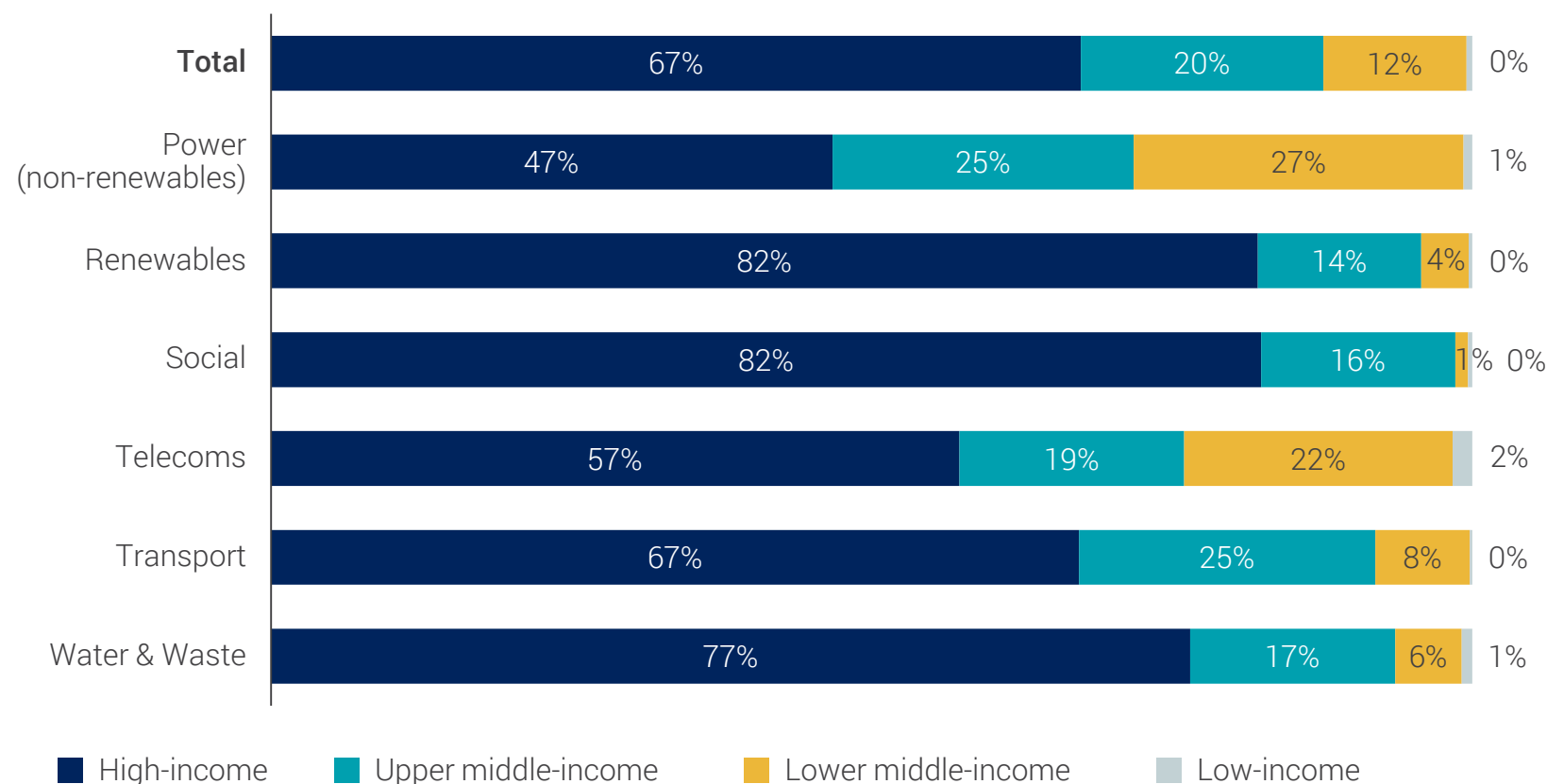


Source: IJ Global and GIH calculations Note: World Bank Income Group classifications 2020–21

2.5.4 Private Infrastructure Investment by Sector, by Country Income Group (Avg 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 the power (non-renewables) and telecoms sectors but less in the renewables, social, and water and waste sectors.



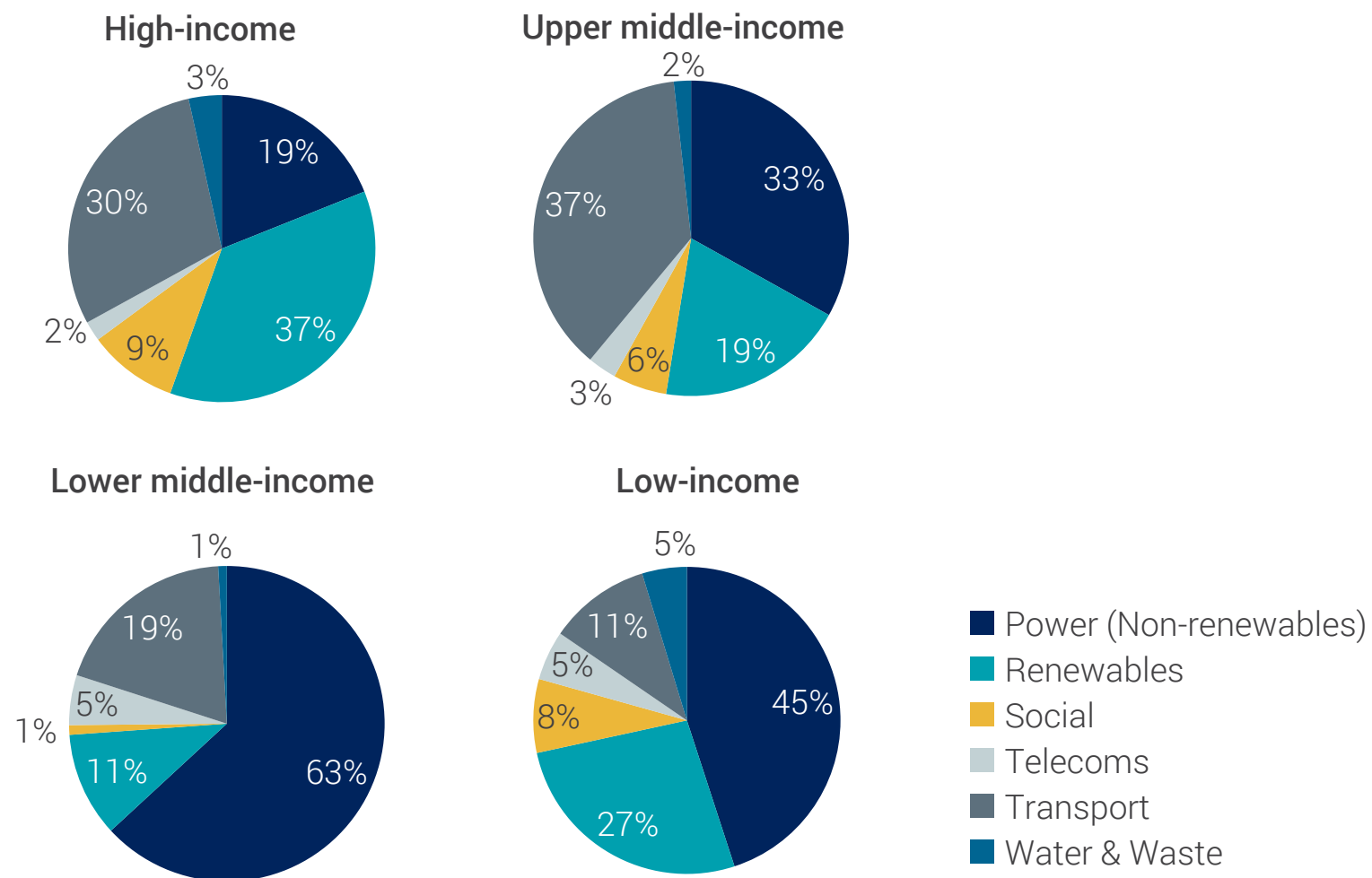
Source: IJ Global and GIH calculations

Note: World Bank Income Group classifications 2010

2.5.5 Private Infrastructure Investment by Country Income Group, by Sector (Avg 2010–2019)

Over the past decade, private infrastructure investment in more carbon-intensive and less sustainable energy (non-renewables) was greater than investment in renewables in middle- and low-income countries. A significant transformation is still required to achieve global climate and sustainable development objectives.

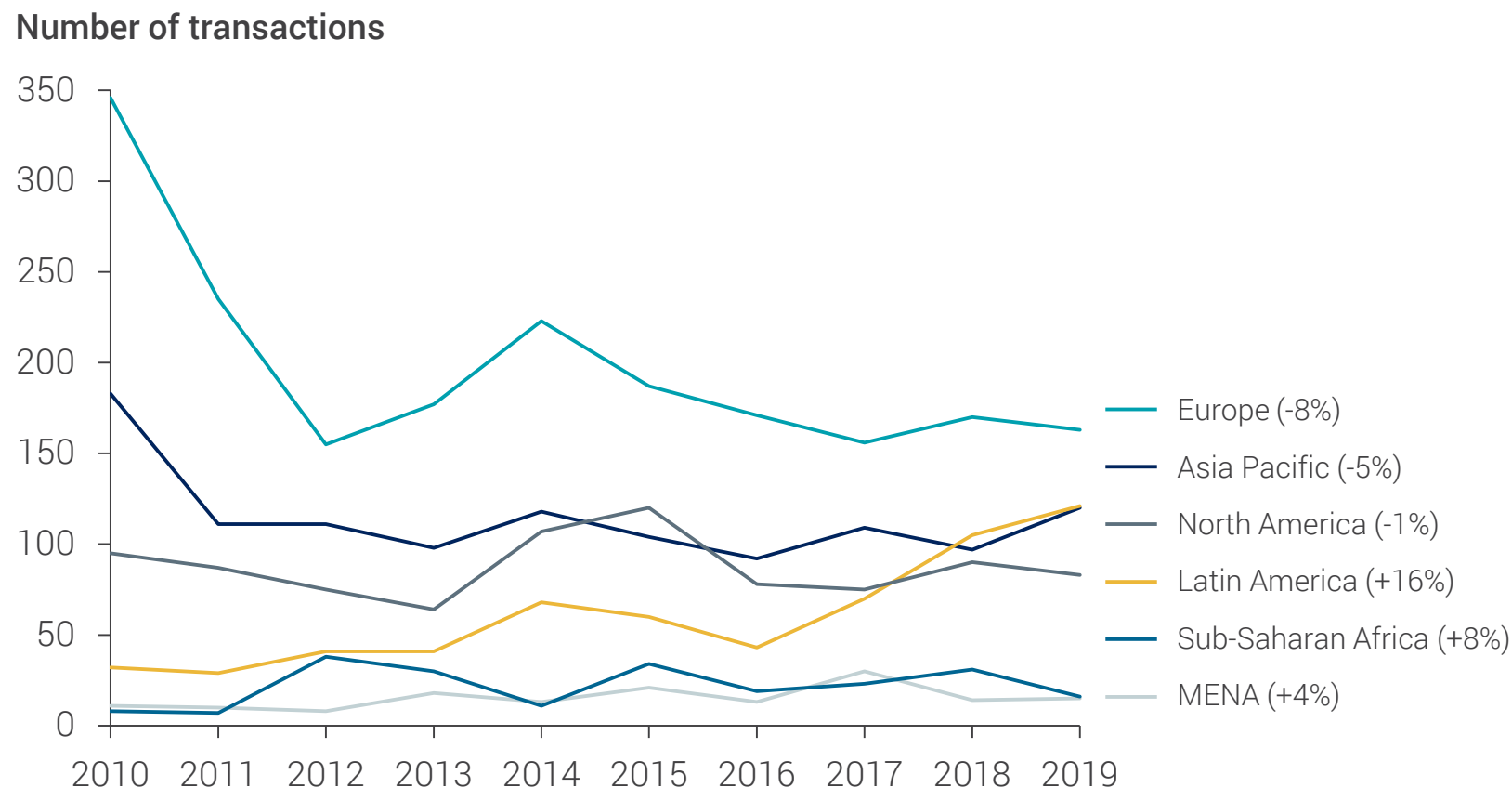
In high-income countries, private infrastructure investment in renewables has intensified. This drives the ranking of renewables as one of the top areas of global private infrastructure investment.



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. Asia Pacific has had the next largest number of transactions with private participation.

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



Source: IJ Global and GIH calculations

Note: CAGR growth rates 2010–2019

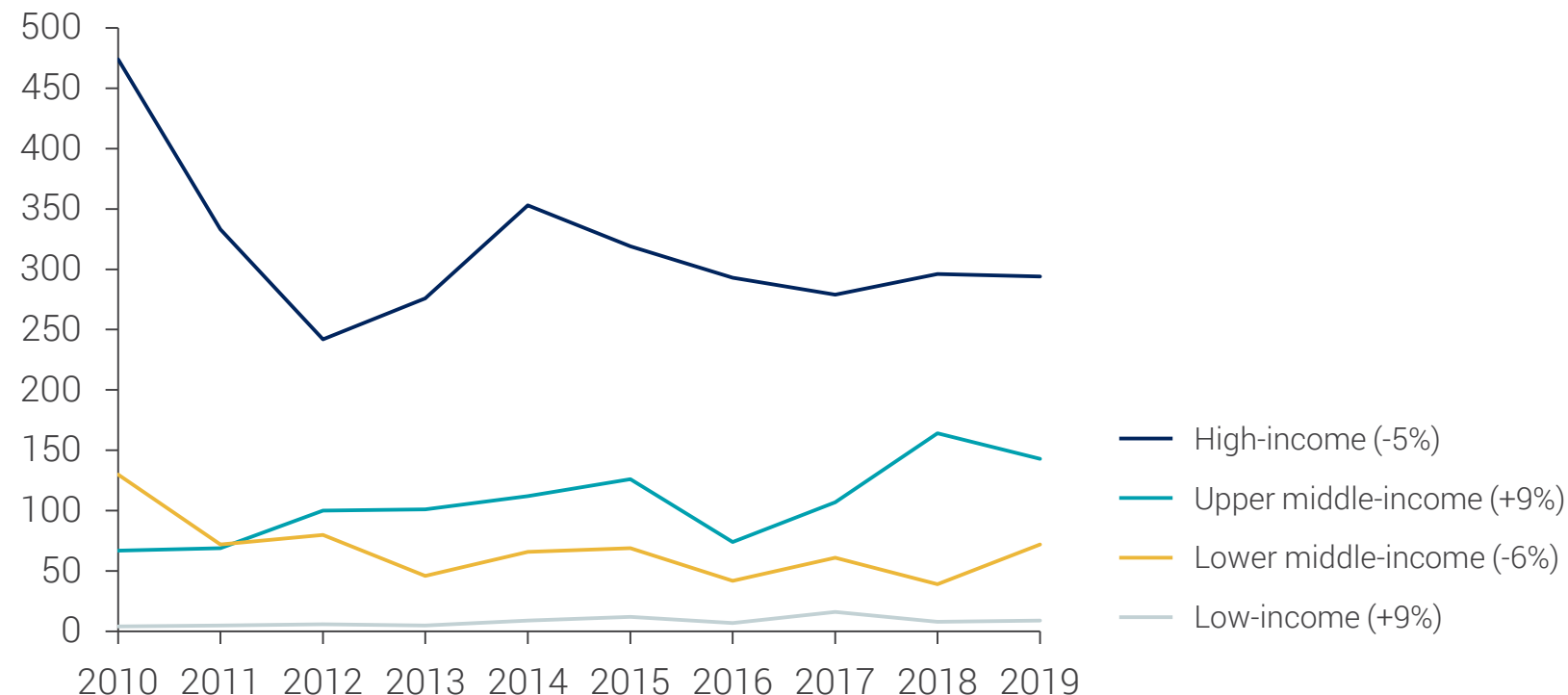
2.6.2 Number of Private Infrastructure Investment Transactions by Country Income Group (2010–2019)

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

During 2010–2019, the share of transactions in high-income countries declined from 70% to 57%, and the share in 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.

Number of transactions

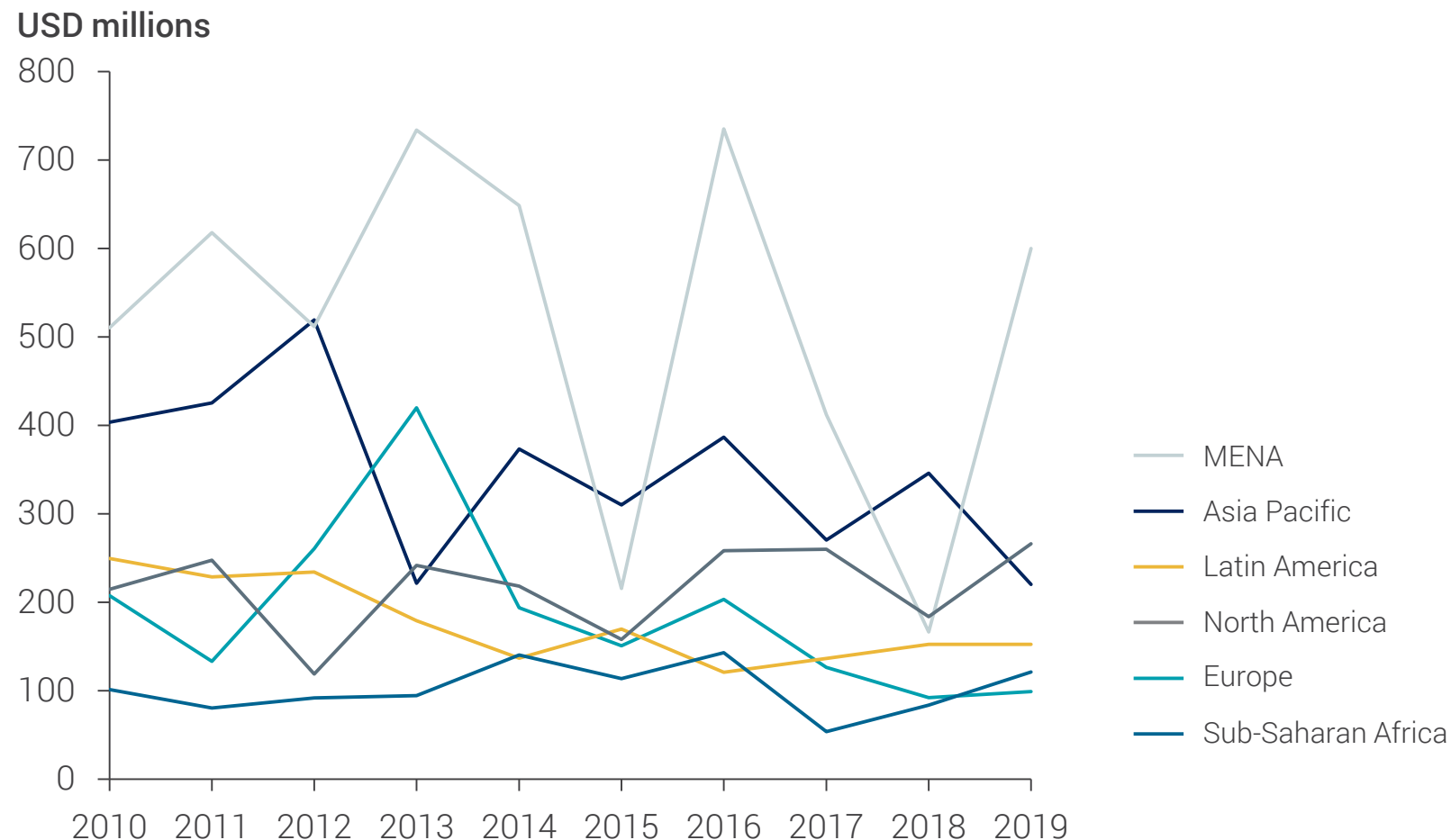


Source: IJ Global and GIH calculations
Note: CAGR growth rates 2010–2019

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, transaction value tends to be relatively small compared to other regions.

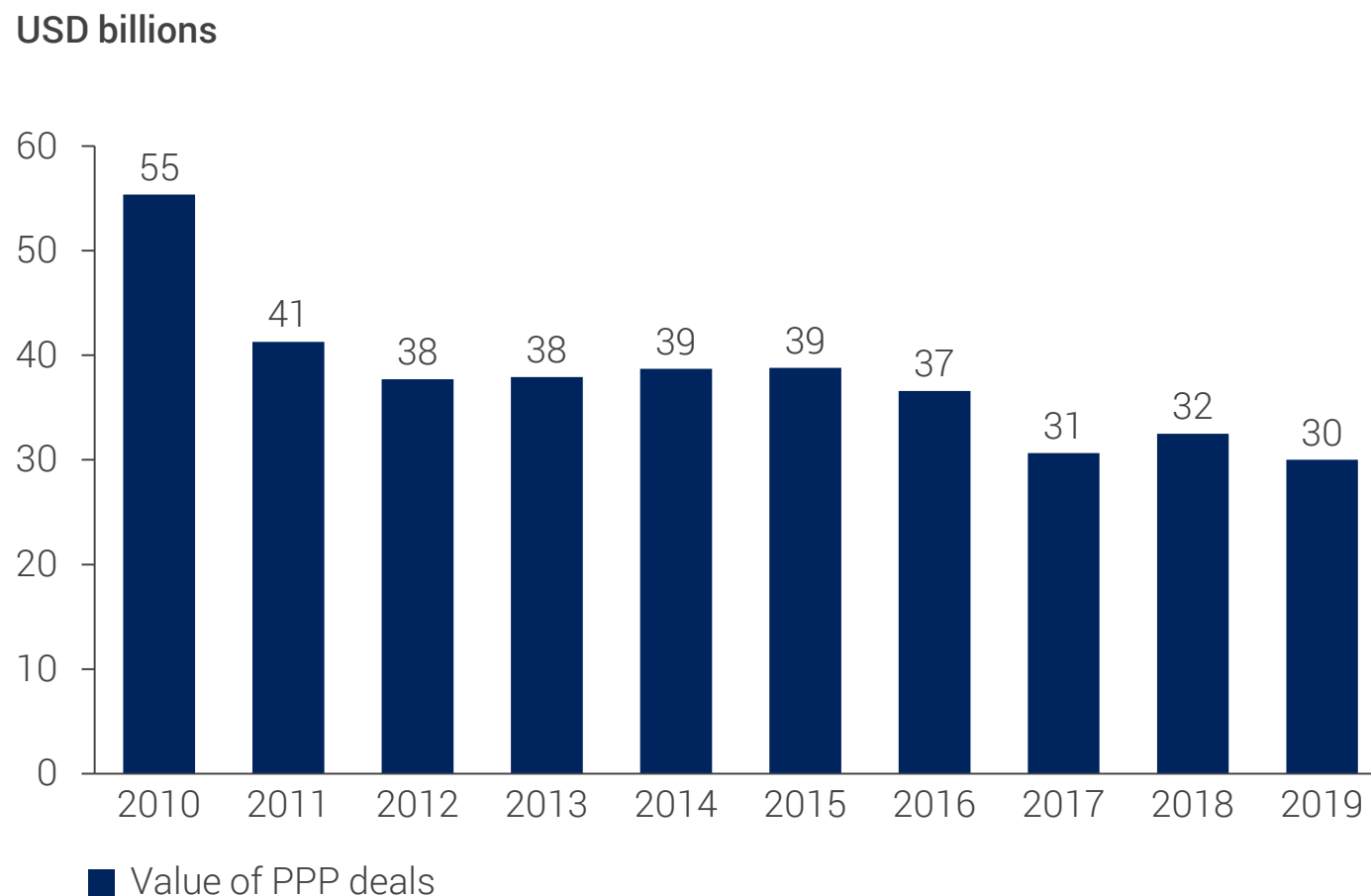


Source: IJ Global and GIH calculations

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

Over the past decade, private participation in public-private partnerships (PPPs) has gradually declined from \$US55 billion in 2010 to \$US30 billion in 2019, or from 36% to 28% as a share of total private infrastructure investment.

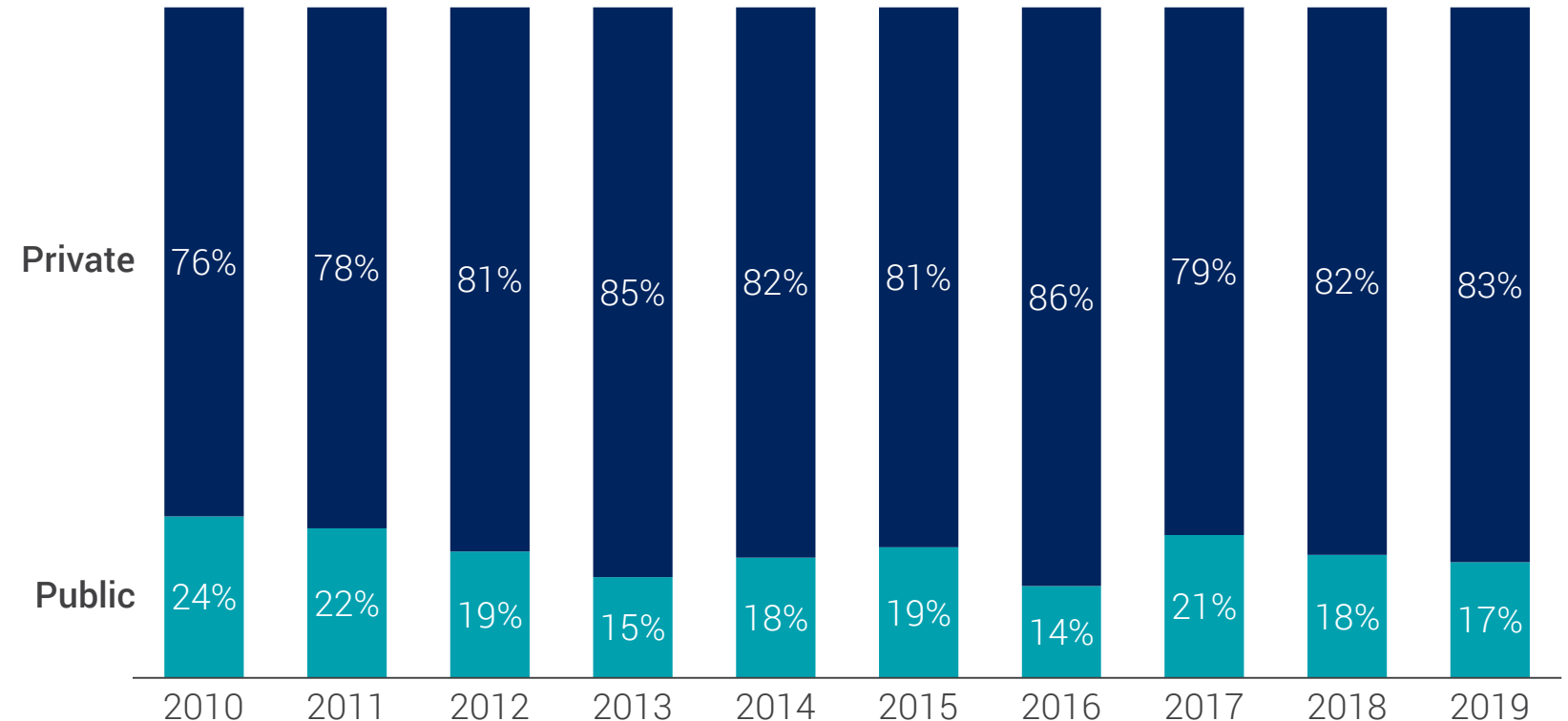
On average, PPP deals account for the smallest share of private investment in MENA. Europe and Latin America have the highest share of investment in PPPs.



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

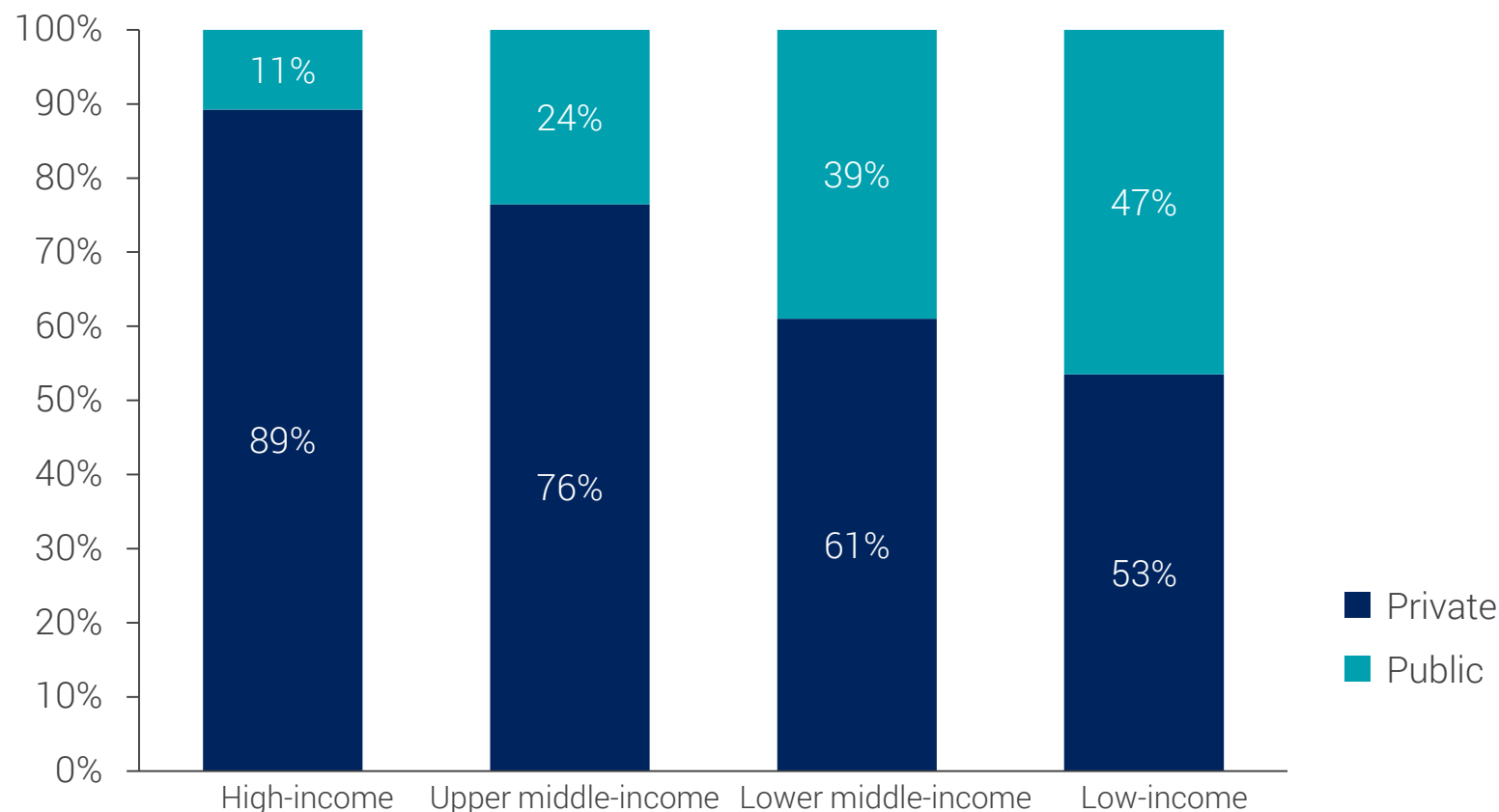


Source: IJ Global and GIH calculations

2.9.2 Share of Private and Public in Infrastructure Investments with Private Participation, by Country Income Group (Avg 2010–2019)

Among 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 for establishing a strong enabling environment for infrastructure investment.

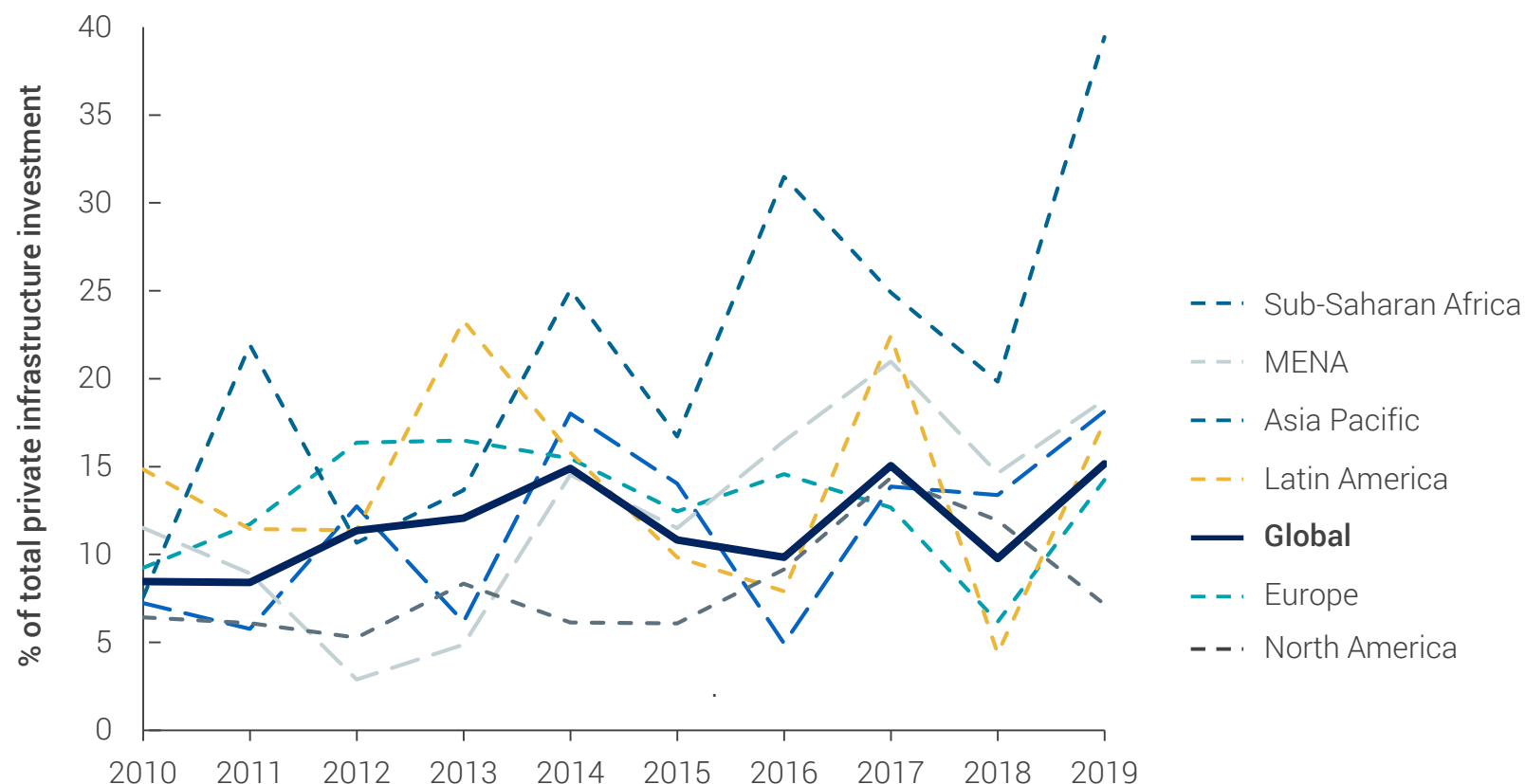


Source: IJ Global and GIH calculations
Note: World Bank Income Group classifications 2010

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 about US\$13 billion per year on average.

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.



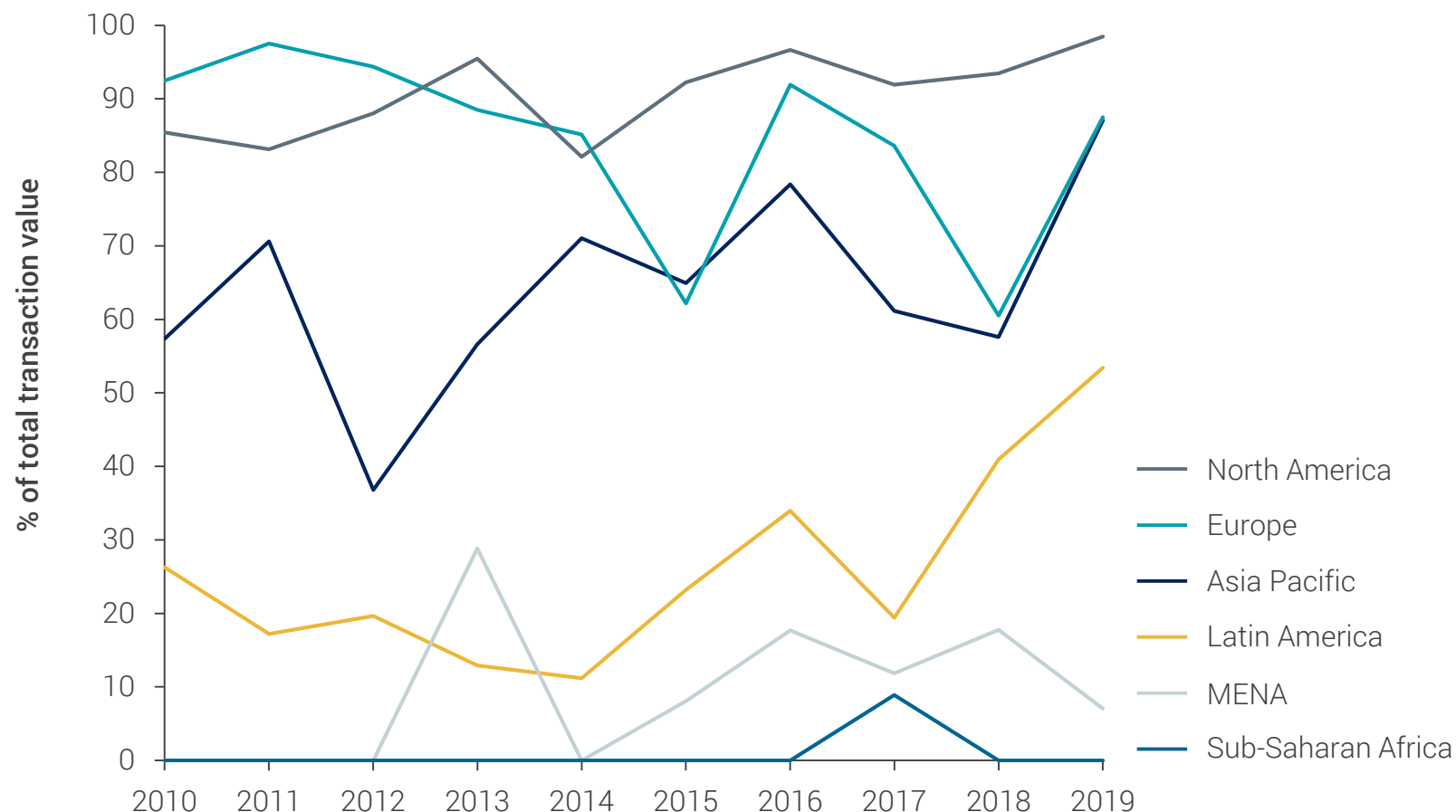
Source: IJ Global and GIH calculations

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 undertaken largely in local currencies.

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

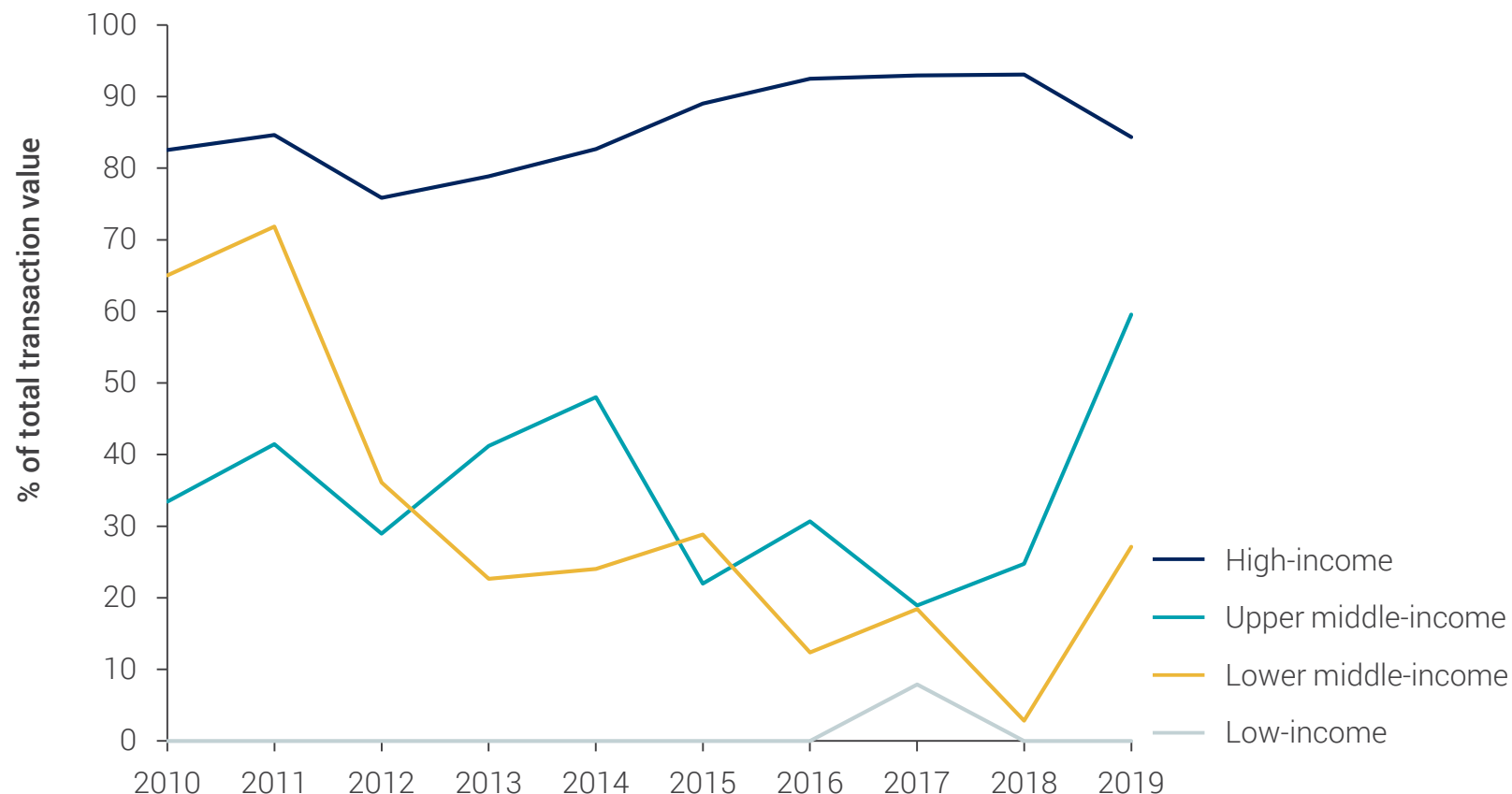


2.11.2 Local Currency Component in Private Infrastructure Investment, by Country Income Group

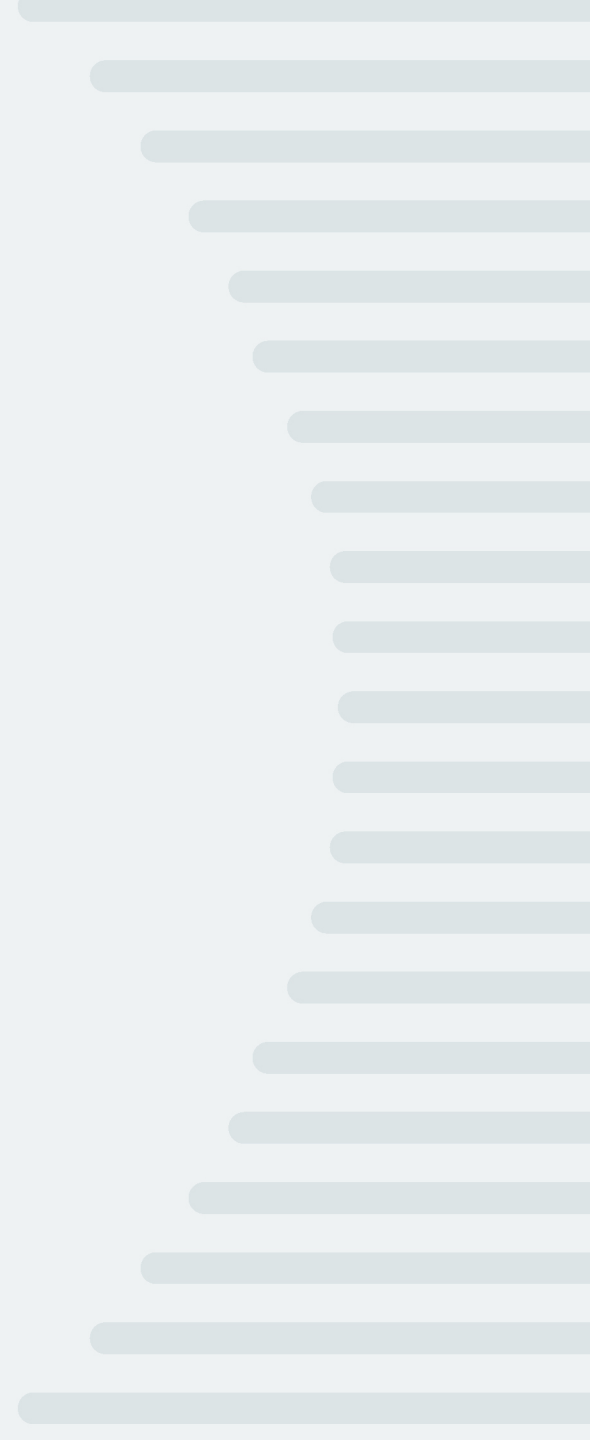
In low-income countries, private infrastructure transactions were entirely structured in foreign currencies during 2010–2019 (except in 2017), creating a structural foreign exchange risk.

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 consistently had about 80–90% of transaction value held in local currency.



3. Infrastructure Investment Performance



3.0.1 Context

This section examines the performance track record of infrastructure investment, 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

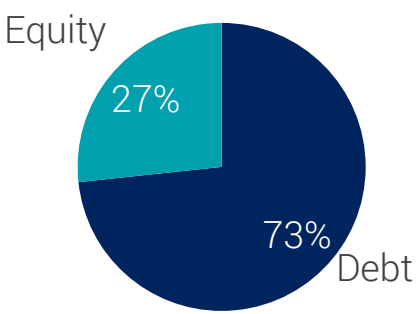
(USD billions)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Equity	37.9	29.6	28.1	32.6	36.0	36.9	31.8	24.7	22.9	26.6
Debt	118.3	101.7	77.3	70.4	87.6	81.1	86.9	68.5	77.0	79.3

Source: IJ Global and GIH calculations

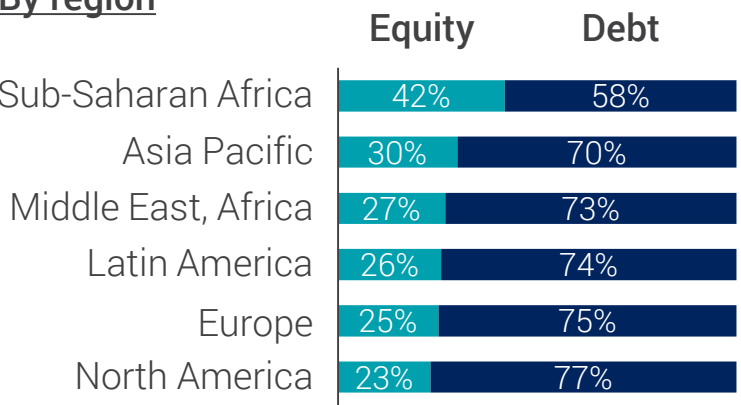
3.0.2 Context (Cont)

The snapshots below show 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 transport and water and waste infrastructure sectors.

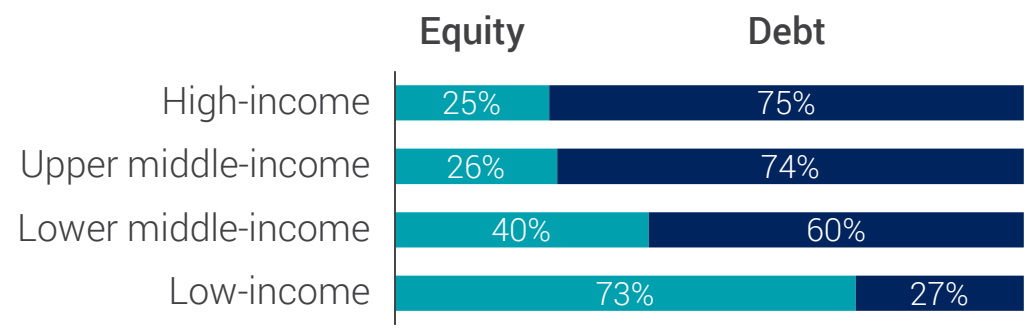
Global average



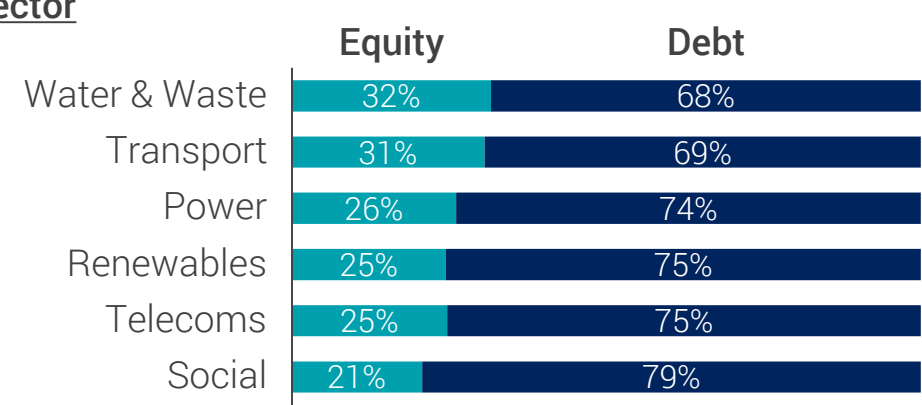
By region



By country income group



By sector



Source: IJ Global and GIH calculations

3.0.3 Data Sources

Known Data Sources

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

Debt Investment

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

3.0.3 Data Sources (Cont)

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 three 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, and awareness among investors of the track record of infrastructure investment is also important. The following sections of this report summarise records of financial performance of global infrastructure equity and debt investments, based on information available in the public domain.

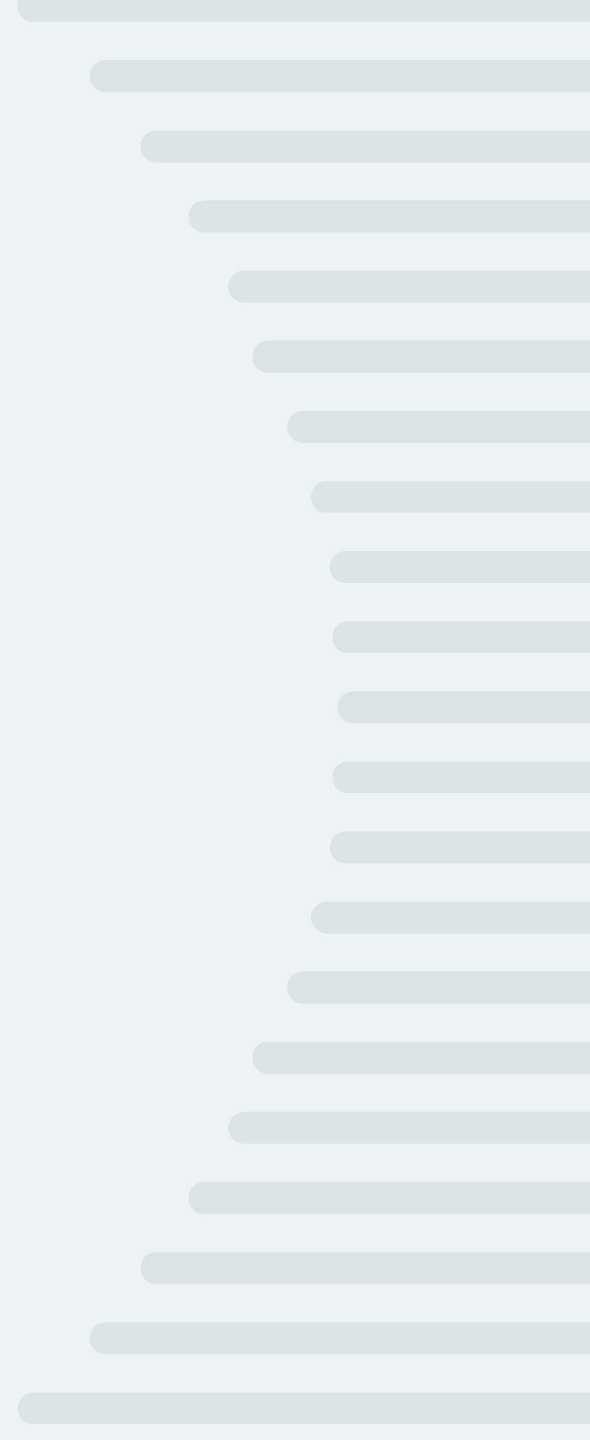
Equity: Over the past 10 years, publicly listed infrastructure equities have on average provided lower returns (6.7% p.a.) than global equities (9.7% p.a.), but with lower risk and a lower price relative to fundamentals. This suggests that investors tend to treat infrastructure equities as value stocks. 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 evaluated based 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. MENA has experienced the lowest default rates and highest recoveries in infrastructure debt.

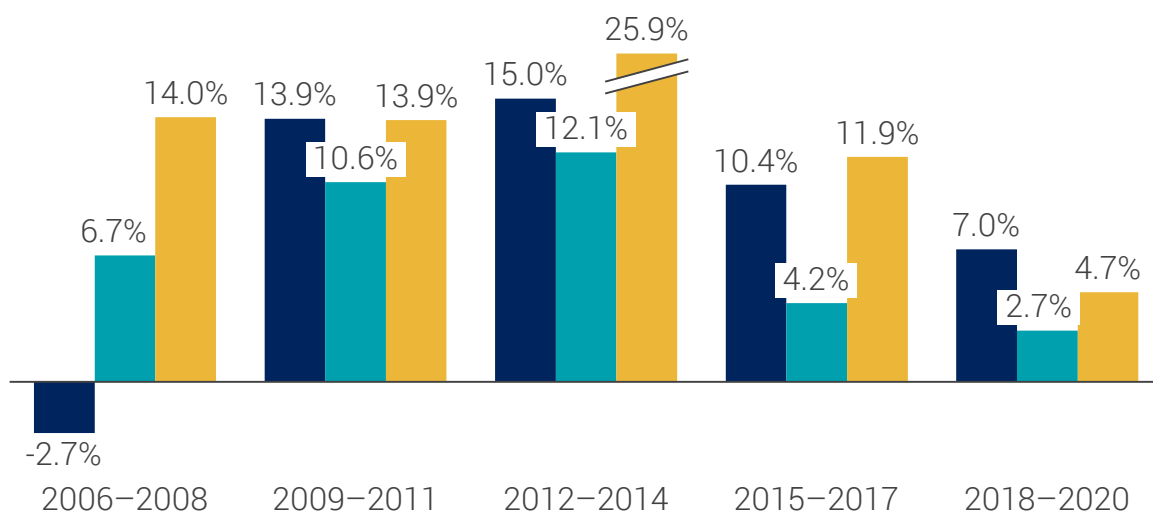
3.1 Infrastructure Equity Performance



3.1.1 Annual Total Return

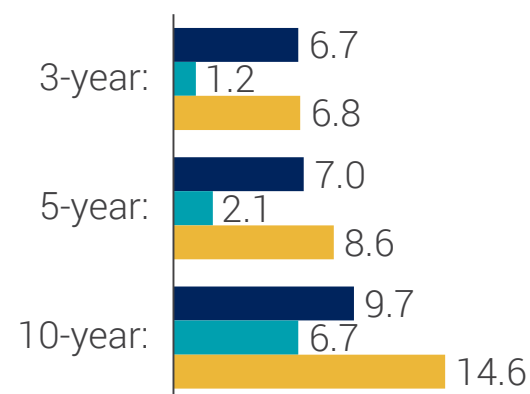
Over the past decade, listed infrastructure equities have returned 6.7% annually compared to 9.7% for a broader basket of listed global equities (hereafter 'global equities'). Unlisted infrastructure equities outperformed global equities, with a 14.6% annual return.

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



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

Annualised return (%)



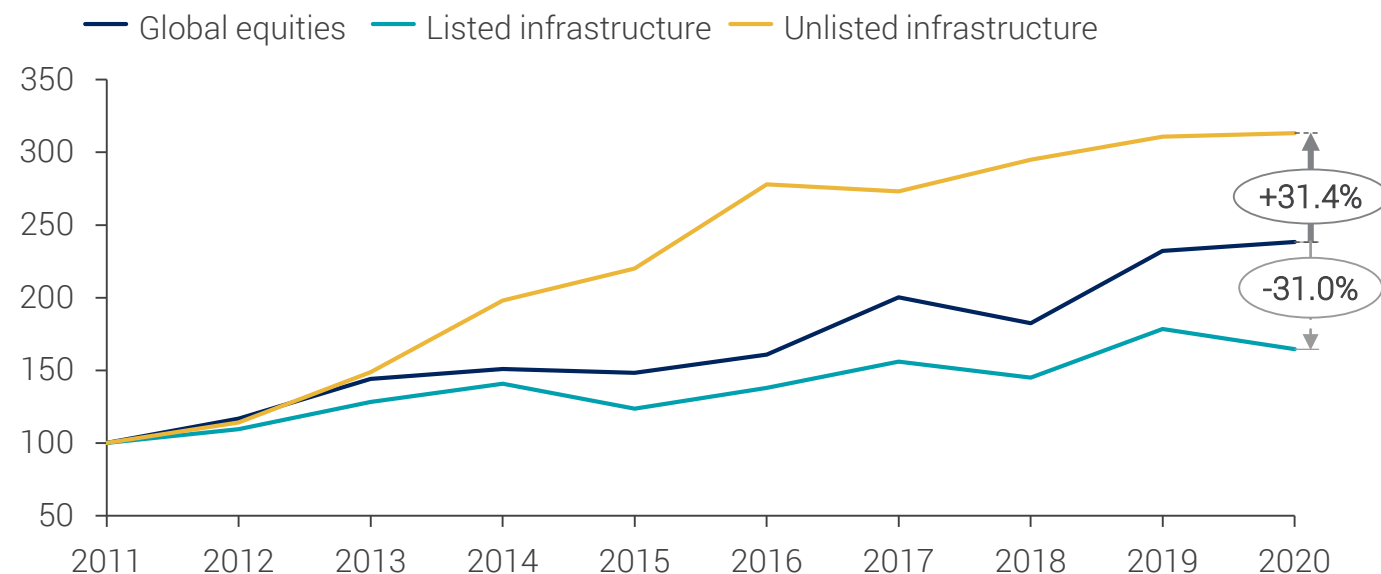
Source: [MSCI Gross Returns](#), [EDHECinfra](#), as at June 2020

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

3.1.1 Annual Total Return (Cont)

During 2011–2020, listed infrastructure equities provided lower average return than global equities but with less volatility. Unlisted infrastructure outperformed global equities consistently, providing higher average return with less volatility.

Gross returns annual performance, at 30 June year end (USD)



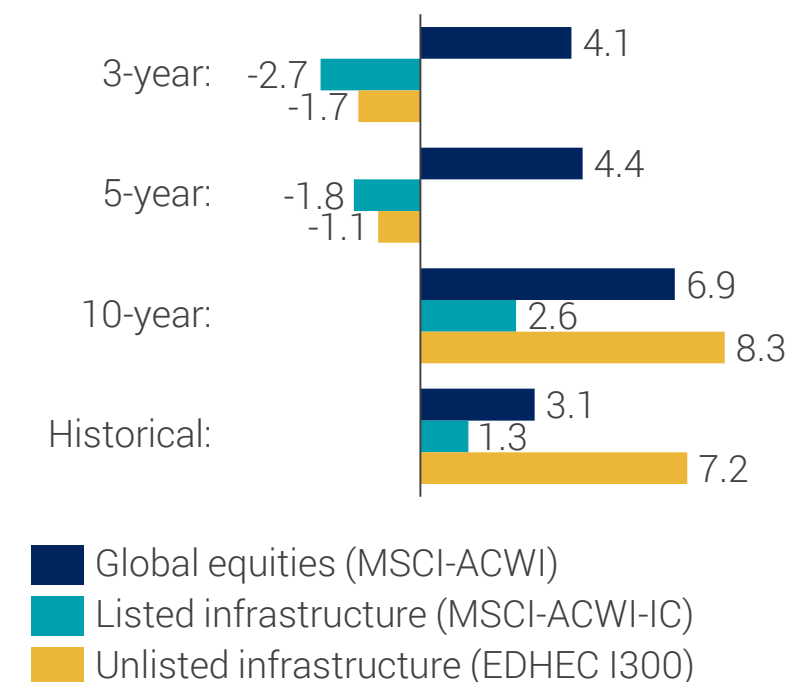
Infrastructure equities closely follow the cyclicity of the market and have not experienced the same 2020Q2 recovery as did the broader basket of global equities.

Source: [MSCI Gross Returns](#), [EDHECinfra](#), as at June 2020

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 (%)



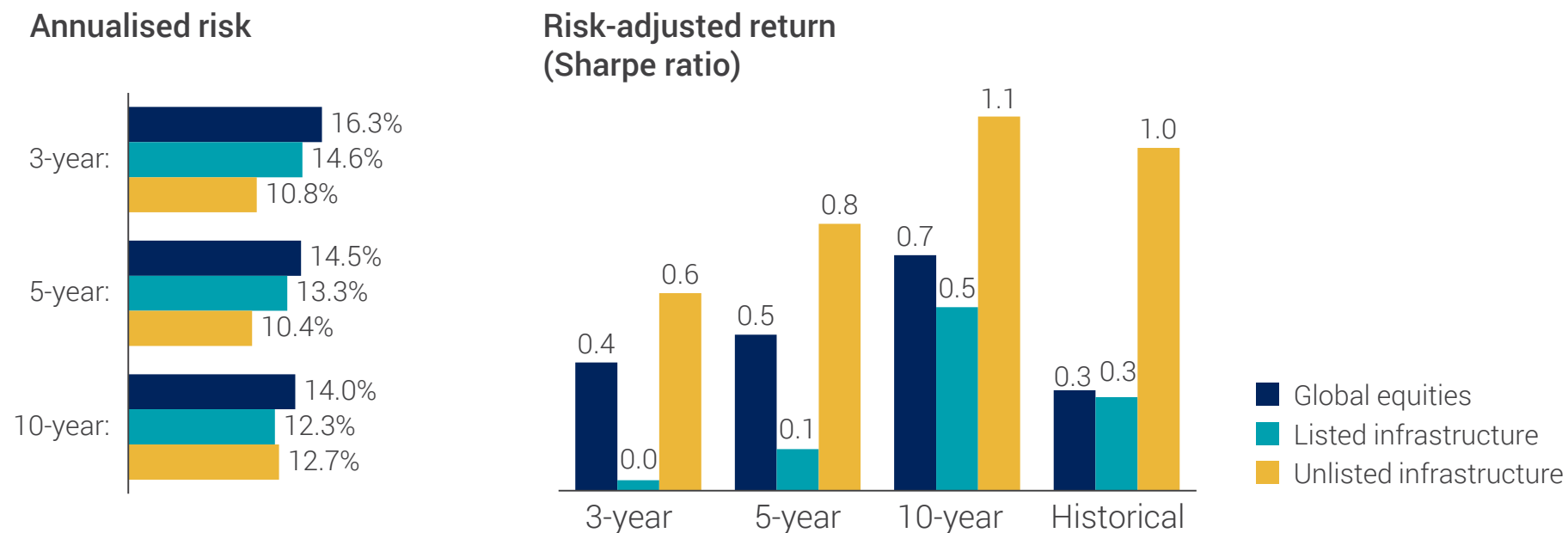
Fundamentals (30 June 2020)

	Global equities	Listed infrastructure	Unlisted Infrastructure
Dividend yield (%)	2.2	4.1	8.5
Price/earnings	19.9	17.4	-
Price/earnings forward	19.2	15.7	-
Price/book value*	2.3	1.8	1.3

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

3.1.3 Risk

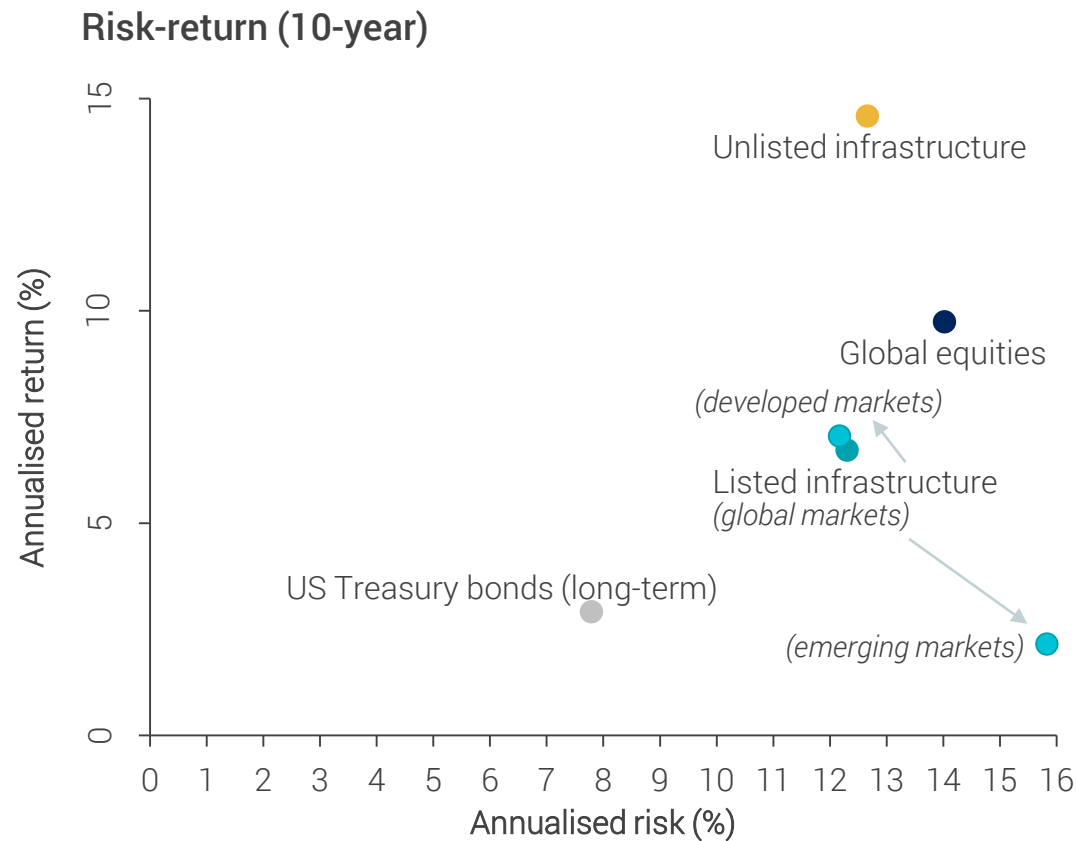
Listed and unlisted infrastructure equities have been less volatile than global equities. Unlisted infrastructure equities have provided the highest risk-adjusted return.



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 markets due to variations in key risk factors.



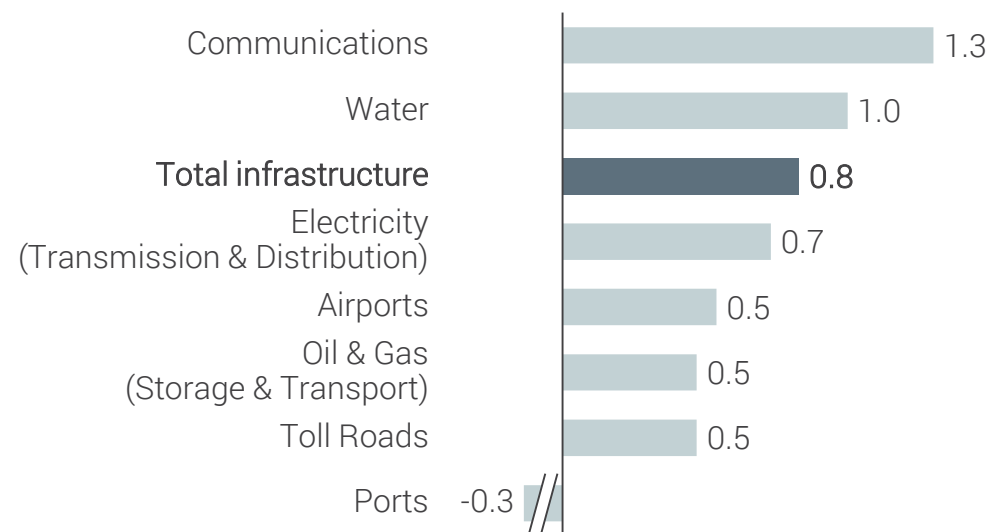
Source: [MSCI Gross Returns](#), [EDHECinfra](#), [Damodaran NYU \(US T bonds\)](#)

3.1.4 Risk-Return (Cont)

Investment performance of infrastructure equities differs among sectors due to variations in key risk factors.

Listed infrastructure

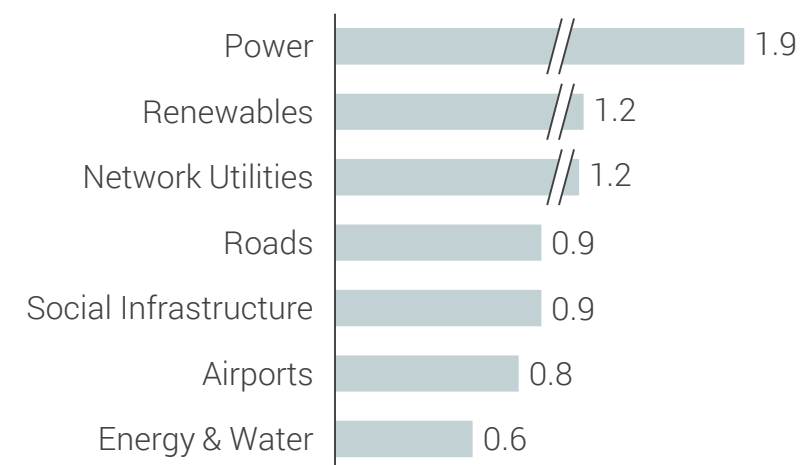
Annualised risk-adjusted return (10-year), by infrastructure sector



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

Unlisted infrastructure

Sharpe ratio (10-year), by infrastructure sector

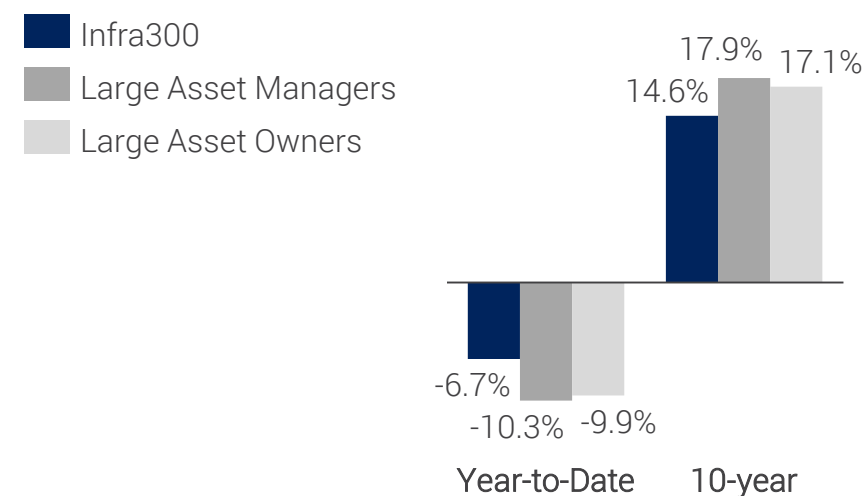
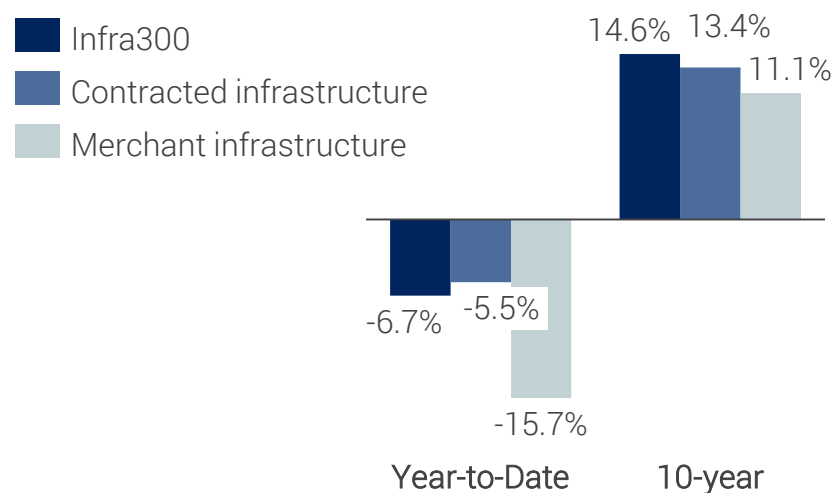


Source: EDHECInfra

3.1.5 Impact of COVID-19 on Unlisted Equities

Due to COVID-19, merchant infrastructure and larger investors (top 20) have experienced declines in returns that are larger than the Infra300 benchmark for unlisted infrastructure equity.

Annual Total Return

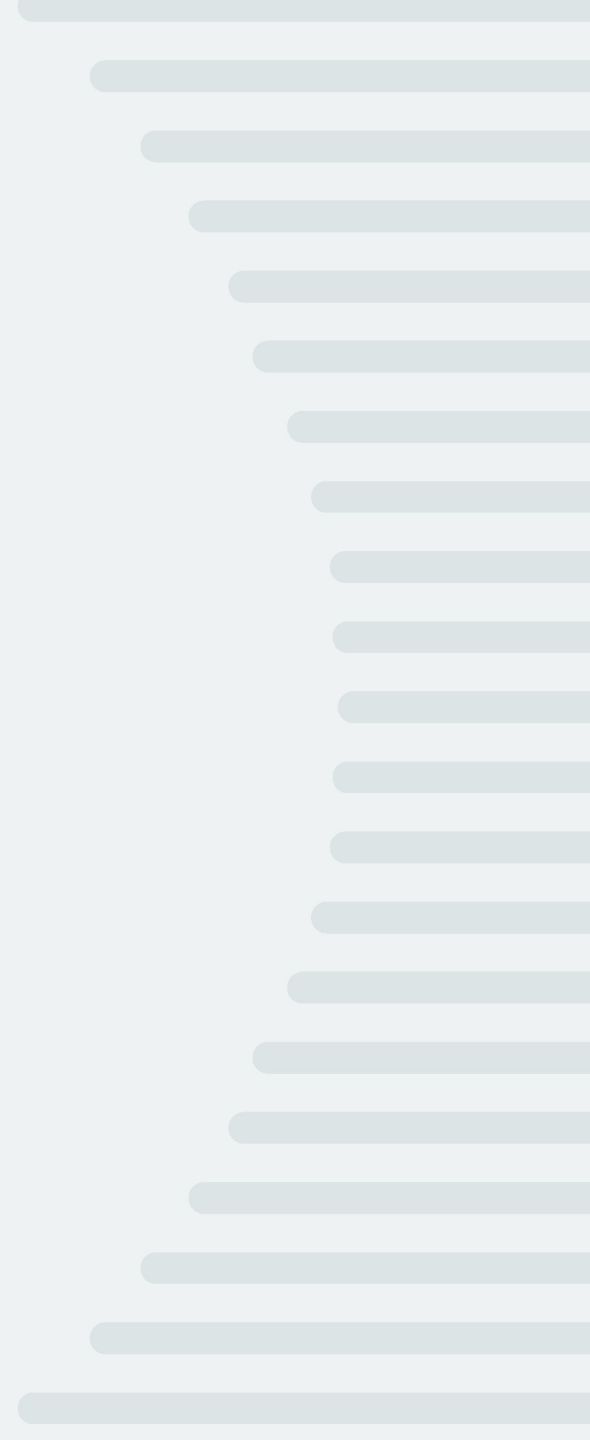


Source: EDHEC*Infra*. Estimated as of Q2 2020

According to EDHEC*Infra* (June 2020), COVID-19 has impacted total returns 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 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 to 2018.

A total of 7,047 (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.

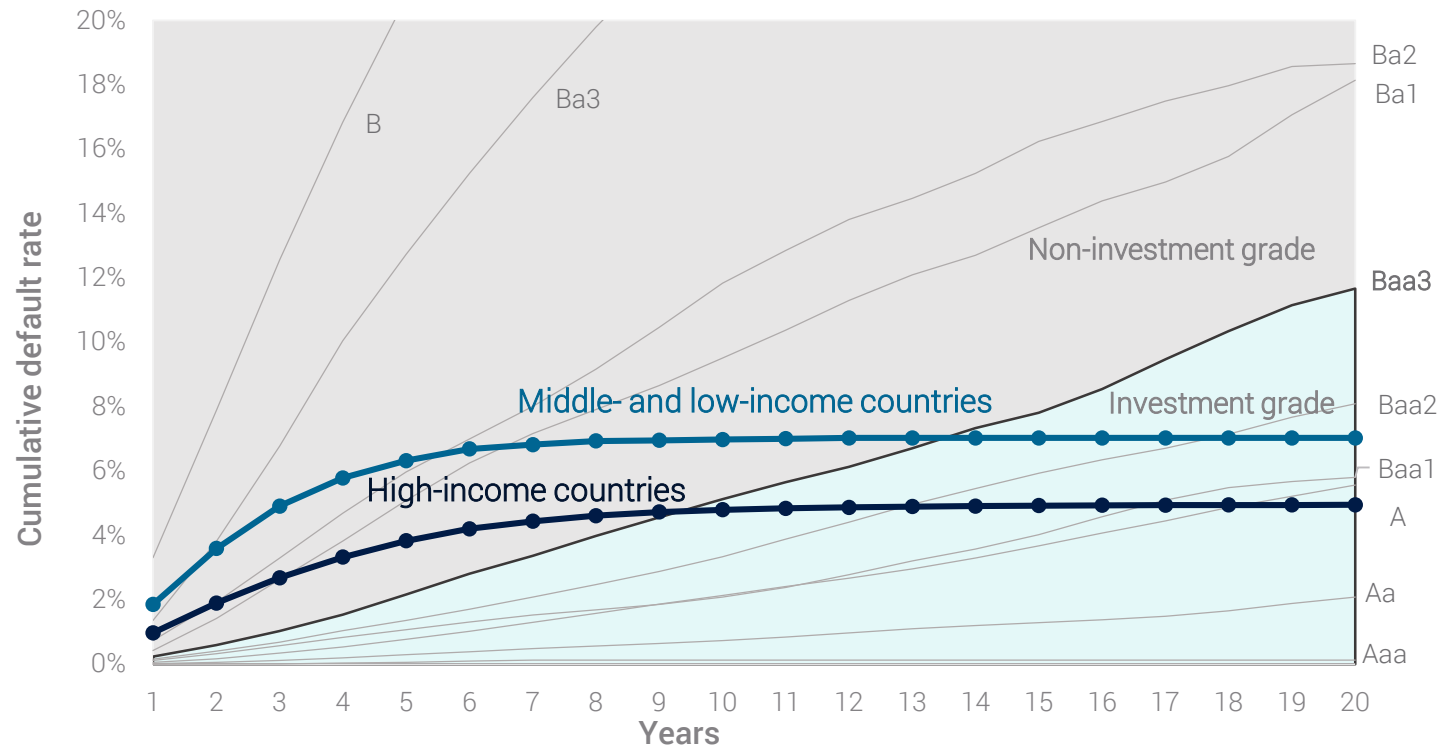
The consortium data set represents 63% of all global project finance loans originated between 1983 and 2018.

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 stabilises 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.

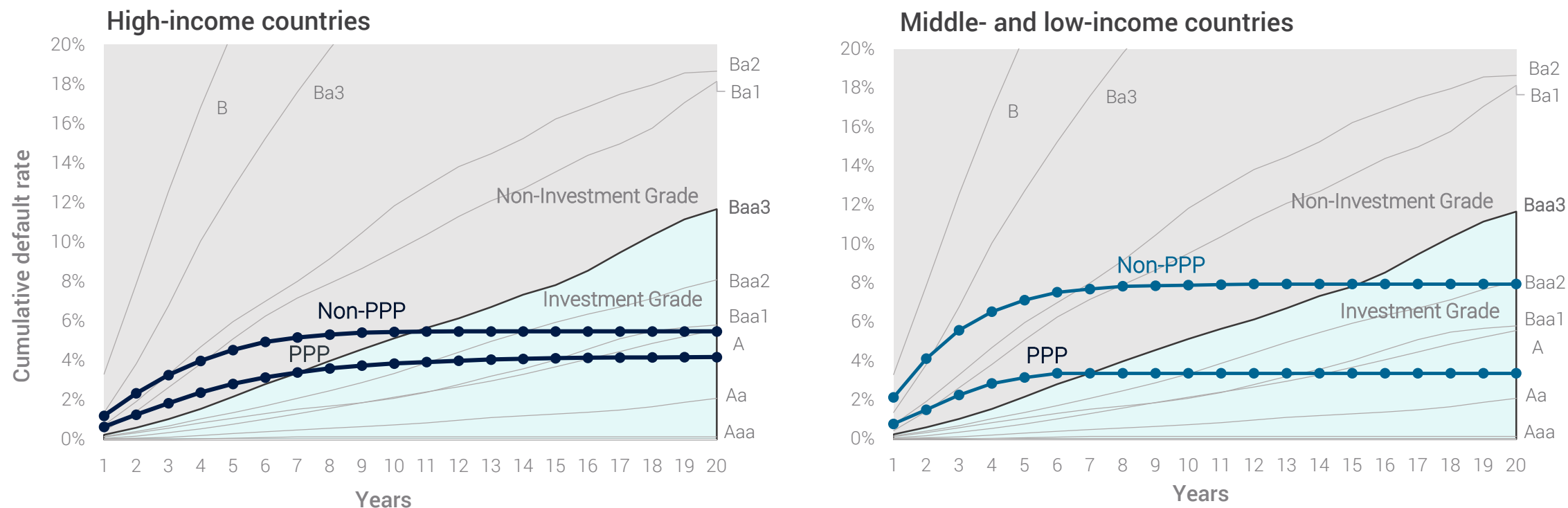


For this and the following slides, the chart background shows the cumulative default rates associated with different Moody's credit ratings, including the Baa3 (BBB-) frontier between investment and non-investment grade.

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

3.2.2 Infrastructure Debt Cumulative Default Rates for PPPs, by Country Income

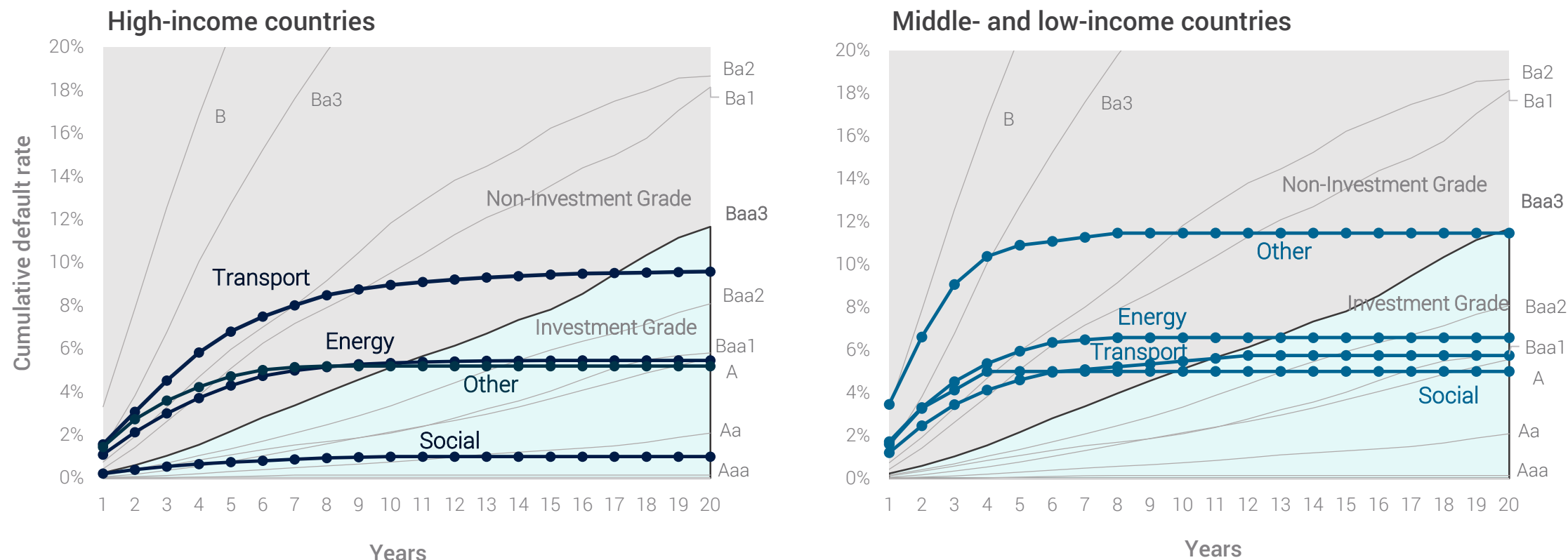
Infrastructure debt PPPs perform better than non-PPPs, reaching investment grade performance four years faster in high-income countries and nine years faster in middle- and low-income countries.



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.

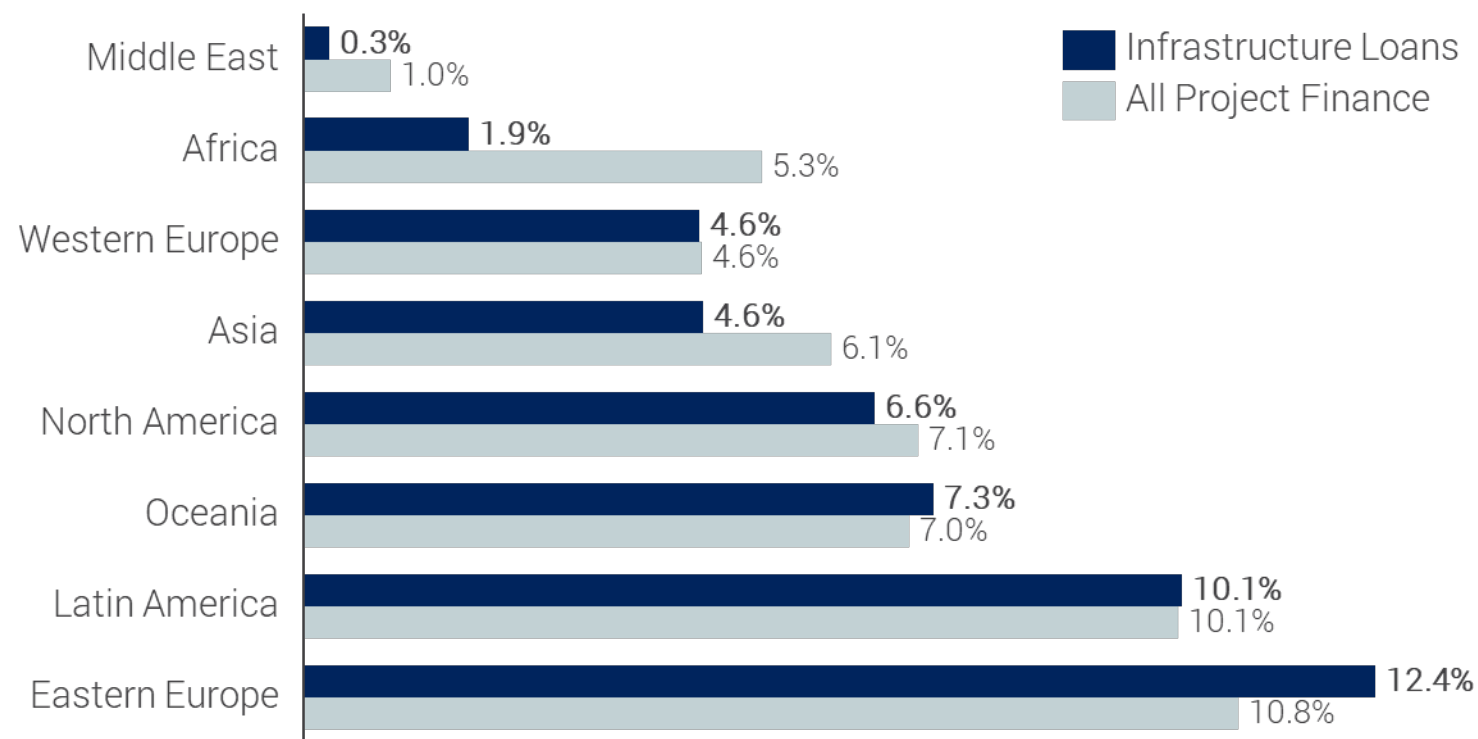


Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

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

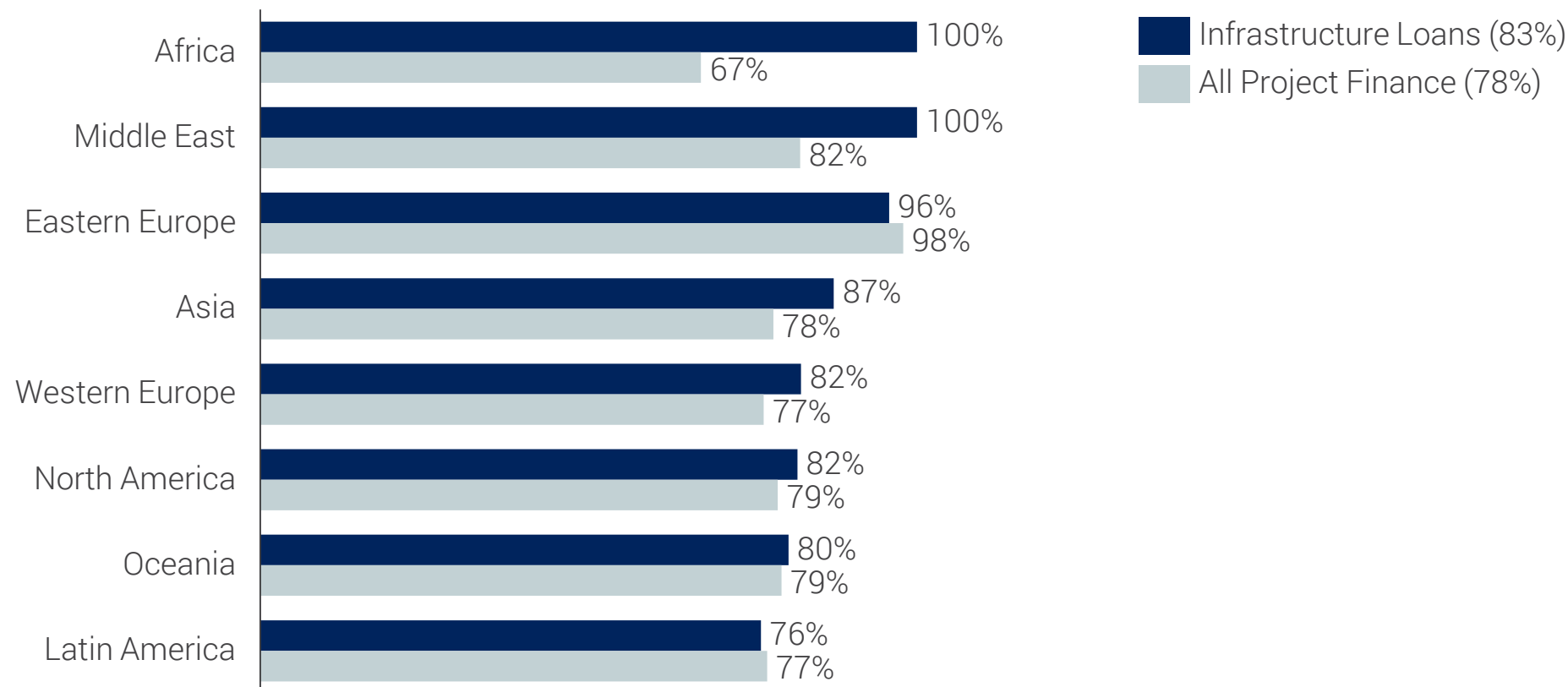
The Middle East and Africa have experienced the lowest default rates in infrastructure debt.



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.

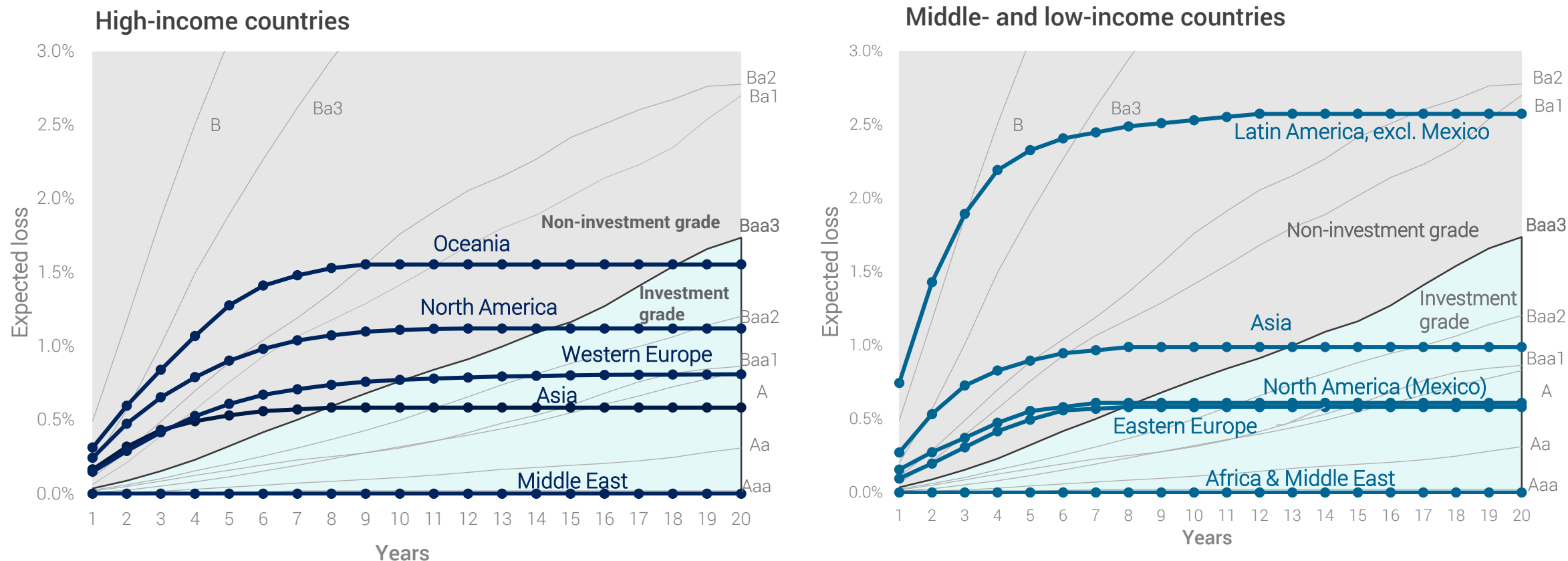


Source: Moody's Analytics 2020: [Examining Infrastructure as an Asset Class](#)

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

3.2.6 Infrastructure Debt Expected Loss, by Region

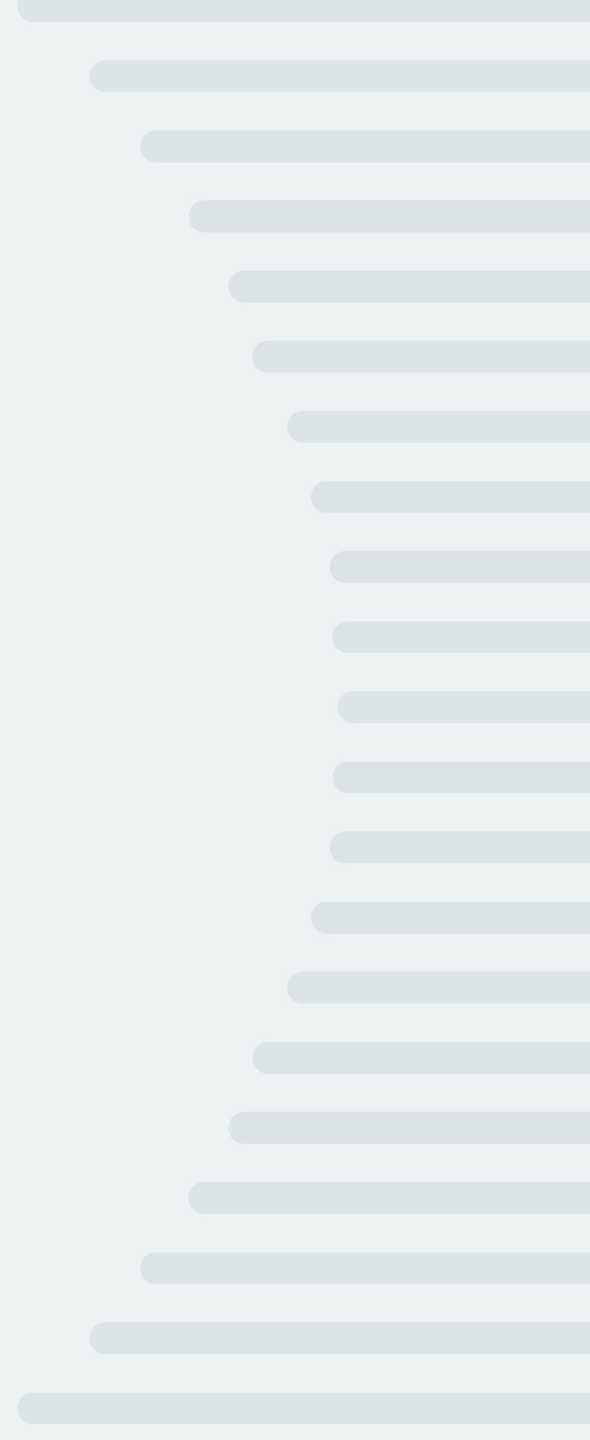
Based on the default and recovery data noted previously, Africa and the Middle East have the lowest expected loss rates on infrastructure debt.



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

Note: If a region appears on both charts, the data reflect 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 Investment in Infrastructure

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

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 privatisation.

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 is based on its classification by the Data Consortium and involves some subjectivity.

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

Appendix A: Glossary (Cont)

Infrastructure Investment Performance

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

Cumulative default rate: Weighted average of the marginal default rates, which are the ratios 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.

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.

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.

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

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

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 industry's largest database of infrastructure deals covering all income groups. It captures more than 28,000 transactions in almost 200 countries. It covers all known transactions across the globe, as 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 transaction 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 was 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.

Appendix B: Methodology for Private Investment in Infrastructure (Cont)

Using the World Bank's Income Group Classification 2010, the country level data were aggregated to arrive at country income group level data. The 2010 Classification was used to avoid 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. The oil and gas, mining and metals, and defense sectors were excluded. Due to some differences between GI Hub and IJ Global definitions of infrastructure sectors, the subsector level data were used and mapped to match GI Hub's definition of infrastructure sectors. For example, the waste subsector was excluded from the social sector and aggregated in the water and waste sector.

For multi-sector transactions, the transaction value was split equally among the sectors. The values 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-organisations
- 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

While IJ Global also manages data collection for the World Bank's PPI Database, the operation is run independently from IJ Global's Transactions Database. Due to methodological differences, there are transactions that may be eligible for inclusion in the PPI Database, but not in IJ Global's, and vice versa. The most notable differences that may explain discrepancies between the WB's PPI Database and Infrastructure Monitor are:

1. WB PPI typically reports the total investment value of infrastructure deals with private participation (i.e. both the private and public shares of the transaction). Private infrastructure investment in the GI Hub's Infrastructure Monitor reports only the private share.
2. WB PPI focuses solely on low-and middle-income countries, while IJ Global covers all income groups, including high-income countries. Due to the WB's specialisation, the PPI dataset tends to have greater coverage of deals in low-and middle-income countries. This is particularly noticeable in the case of China, which is largely due to greater domestic market intelligence. In 2019, the WB PPI reported 142 projects in China, almost all of which were sponsored by domestic entities. This compares with only 4 transactions recorded in IJ Global (as at July 2020), only one of which was a primary market transaction. There were an additional 9 transactions classified as public sector finance in IJ Global.
3. WB PPI excludes investment in captive infrastructure (i.e infrastructure reserved for the private use of firms). Captive infrastructure is included in both IJ Global and Infrastructure Monitor.
4. WB PPI excludes investments in social infrastructure, which are included in both IJ Global and Infrastructure Monitor.
5. Additional facilities are included in WB PPI, but are excluded from private infrastructure investment reported in Infrastructure Monitor.
 - Note that WB PPI excludes secondary transactions, such as refinancing, acquisitions between private parties, portfolio financing, and securitisation, which are included in the IJ Global database. While these types of transactions are not included in our headline estimates of private infrastructure investment, they are included in our secondary market investment figures.

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