INFRASTRUCTURE MONITOR 2024

Global trends in private investment in infrastructure



PPIAF Global Infrastructure Hub

WORLD BANK GROUP

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About

The Infrastructure Monitor report covers global trends in private investment in infrastructure to inform investors, policy-makers and other practitioners.

The objective is to deliver global insights on global infrastructure trends across key topics such as investment volumes, performance, blended finance, and ESG drivers, facilitating the monitoring of private infrastructure investment and its performance. These insights aim to support policymakers, investors, and other stakeholders in developing sustainable, resilient, and inclusive infrastructure while fostering effective partnerships with the private sector.

Acknowledging the significant infrastructure data gap — with notable variations in coverage, quality across countries and income groups, and differences in the availability of regional breakdowns — our approach leverages the best available aggregated data from leading infrastructure databases to generate market insights while also providing context on its limitations.

2025 will be the fifth version of the report, the first under the World Bank.









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About PPIAF

PPIAF helps developing country governments strengthen policy, regulations, and institutions that enable sustainable infrastructure with private sector participation. As part of these efforts, PPIAF promotes knowledge transfer by capturing lessons while funding research and tools; builds capacity to scale infrastructure delivery; and assists subnational entities in accessing financing without sovereign guarantees. Donor-supported and housed within the World Bank, PPIAF's work helps generate hundreds of millions of dollars in infrastructure investment. While many initiatives focus on structuring and financing infrastructure projects with private participation, PPIAF sets the stage to make this possible. (http://www.ppiaf.org).

Abbreviations

Abbreviation	Description
BID	Benchmarking Infrastructure Development
CDR	Cumulative default rate
CPI	Consumer price index
DEI	Diversity, Equity, and Inclusion
DFI	Development finance institution
EAP	East Asia and Pacific
ECA	Export credit agency
ECA	Europe and Central Asia
EMDEs	Emerging markets and developing economies
ESG	Environmental, Social, and Governance
G20	Group of 20
GDP	Gross domestic product
GEMs	Global Emerging Markets Risk Database
GHG	Greenhouse gas emissions
HICs	High-income countries
IRR	Internal rate of return
LAC	Latin America and the Caribbean

Abbreviation	Description
LMICs	Low- and middle-income countries
MDB	Multilateral development bank
MENA	Middle East and North Africa
NA	North America
NGO	Non-government organization
P/E	Price-to-earnings ratio
PCM	Private sector mobilization
PDF	Project development fund
PPA	Power purchase agreement
PPF	Project preparation fund
PPI	Private Participation in Infrastructure
PPP	Public-private partnership
SDG	Sustainable Development Goals
SOE	State-owned enterprise
SSA	Sub-Saharan Africa
WACC	Weighted average cost of capital

Glossary

Term	Definition
Acquisition	Infrastructure asset and corporate acquisition refers to the purchase of existing infrastructure assets or companies that own and operate them. This is typically done by investors, infrastructure funds, or strategic buyers looking to gain ownership, control, or returns from operating infrastructure.
Additional financing	Additional financing refers to supplemental funding provided to an existing infrastructure project that has already received an initial round of financing but requires more capital to continue or complete implementation.
Annual total return	Share price appreciation and income from regular cash distributions (cash dividend payments or capital repayments) that are reinvested on the intended date, without considering withholding taxes.
Availability-based payment	Availability-based payments are a type of payment mechanism used in infrastructure projects — especially public-private partnerships (PPPs) — where the private operator is paid by the government or public authority based on the availability and performance of the infrastructure, rather than usage or demand.
Blended finance	The use of catalytic capital from public or philanthropic sources to increase private sector investment in sustainable development. It is a structuring approach that allows public, private, and philanthropic to work together to address the investment barriers while achieving their own objectives.
Blended finance infrastructure fund	Funds in which investors from public and private sectors pool money to partner and support infrastructure projects.
Brownfield	A brownfield project refers to the redevelopment, upgrading, or expansion of an existing infrastructure. An existing asset or structure that requires improvements, repairs, or expansion. The asset or structure is usually partially operational and may already be generating income.
Corporate finance	A type of finance that deals with the capital structure of a corporation, including its funding and the actions that management takes to increase the value of the company. The lender looks at the creditworthiness of the corporation including all the projects run by the company as opposed to project finance that focuses on a single project.
Cross-border guarantee	A cross-border guarantee is a financial commitment provided by a guarantor (typically a bank, financial institution, or government entity) in one country to cover the obligations or liabilities of a borrower or project located in another country.

Term	Definition
Cumulative default rates	The weighted average marginal default rates (hazard rates) for all cohorts. The marginal default rate (hazard rate) is the ratio of the number of project defaults in a specific time period divided by the number of projects exposed to the risk of default at the beginning of that time period. For the purposes of this study, marginal default rates were calculated on a monthly basis. A default is assumed to take place on the date S&P Global Ratings revised the rating to 'D', which could occur when a payment on the issue is missed, a distressed exchange offer is completed, or the issuer filed for or was forced into bankruptcy. When an issue defaults, it is not uncommon for S&P Global Ratings to subsequently withdraw the 'D' rating.
Cumulative private infrastructure capital	The total investment value of all the financial assets in a fund's portfolio plus the fund's dry powder.
Dividend yield	Dividend refers to the share of a company's profit paid to shareholders. Dividend yield is the ratio of dividends paid out each year, relative to its stock price.
Dry powder	Capital committed by investors that is available to fund managers but has not yet been invested or allocated (capital committed is the sum of unallocated capital and portfolio returns, minus any disbursements to investors).
Equity investment	Money that is invested in a company by purchasing shares.
Expected loss	A function of the probability of default and ultimate recovery rates to indicate the creditworthiness of debt obligations.
Financial close	Transaction stage where all financing documentation has been signed, all conditions precedent have been satisfied or waived, and initial drawdown is contractually possible.
Fund	An infrastructure fund is a type of investment vehicle that pools capital from investors to invest in infrastructure assets.
Green investment	Since there is no agreed global definition of a green project – for this report – it has been defined as either investment in renewables or investment financed with a sustainable financing instrument.

Term	Definition
Green unlisted equity investment	The scope in this analysis covers investments in solar and wind projects worldwide to provide a unique view of the renewable energy sector.
Green unlisted infrastructure debt	The scope in this analysis covers outstanding senior debt of the constituents of the infraGreen Equity index which tracks over 100 investments in solar and wind projects worldwide and provides a unique view of the renewable energy sector's performance.
Greenfield	A greenfield infrastructure project refers to the construction of new infrastructure. An asset or structure that does not currently exist and needs to be designed and constructed. Investors fund the building of the infrastructure asset as well as the maintenance once the asset has been designed and built and is operational.
Investment grade	Debt that is believed to have a lower risk of default and thus receives higher ratings by the credit rating agencies as Baa3 or higher (by Moody's) or BBB- or higher (by S&P and Fitch).
Investment time horizon	Length of time for which money is held as an investment until investors need the money back.
Investment value	The market value of the portfolio (including mark-to-market gains from investments in infrastructure assets).
Listed equity investment	Investment in shares of a company that are traded on a stock exchange. The shares are issued to the public through an initial public offering (IPO).
Non-availability-based projects	Projects that do not have an availability-based revenue scheme. Such projects are subject to demand risk and/or price risk.
Non-financial corporates	Includes all the corporates excluding those operating in the financial sector.
Non-revenue-resilient infrastructure	Includes unregulated corporate infrastructure i.e., unregulated electric and gas and unregulated water and waste utilities, transportation infrastructure corporates, and project finance other than availability-based PPPs

Term	Definition
Primary markets	Infrastructure primary markets refer to the initial phase where capital is raised to finance new infrastructure projects. This is where investors, lenders, or public entities provide funding directly for the development or construction of infrastructure assets—such as roads, power plants, water systems, or ports.
Private infrastructure capital invested by funds	Capital invested is estimated using the 'capital called up' data series, which refers to capital committed by private investors that has been called up for investment.
Private infrastructure capital raised by funds	Aggregate capital raised by funds with a commitment to invest in the infrastructure asset class.
Private infrastructure fund	Funds in which private investors pool money to invest in infrastructure projects to achieve their risk-return targets.
Private infrastructure investment	Investment made by the private sector in infrastructure projects in primary markets (financed by private and public financiers). Investment values represent commitments made at the financial close of investment and not executed investment. It includes both debt and equity transactions.
Project finance	A method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is usually for large, complex, and expensive installations. This can include power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunication infrastructure. Project finance can include financing the construction of a new capital installation, or refinancing an existing installation, with or without improvements. In project finance transactions, the lender is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output. This includes the electricity sold by a power plant. The borrower is usually an SPV that is not permitted to perform any function other than developing, owning, and operating the installation. The consequence is that repayment depends primarily on the project's cash flow and on the collateral value of the project's assets. In contrast, if repayment of the exposure depends primarily on a well-established, diversified, credit-worthy, and contractually obligated end user for repayment, it is considered a secured exposure to that end user.
Project preparation/ development funds	Funds created to identify and prepare a pipeline of infrastructure projects.
Public-Private Partnership	An infrastructure Public-Private Partnership (PPP) is a long-term contractual arrangement between a public authority and a private sector entity for the development, financing, construction, operation, and/or maintenance of infrastructure assets or services.

Term	Definition
Refinancing	Refinancing refers to the process of replacing an existing loan or financial structure with a new one, usually to improve the terms of borrowing—such as lowering interest rates, extending repayment periods, or adjusting risk allocation.
Regulated power	This group encompasses electric and gas utility companies that are influenced to a large degree by regulation. It includes investor-owned and commercially oriented government-owned companies that are engaged in the production, transmission, distribution and/or sale of electricity and/or natural gas, including vertically integrated utilities and local gas-distribution companies. This group also includes companies that are primarily engaged in the transmission and/or distribution of electricity and/or natural gas in markets where these services are separated from supply and generation activities. They are monopoly providers of essential services and their activities and rates/tariffs are supervised by a regulator.
Revenue-resilient infrastructure	Includes availability-based payments Public Private Partnership (PPPs) and regulated corporate infrastructure including regulated electric and gas industry, and regulated water utilities
Risk premium	The excess return investors expect to earn from their investments in addition to the prevailing risk-free return.
Scope 1 emissions	Scope 1 emissions, also known as direct emissions, are defined as emissions from sources that are owned or controlled by the organization. This might include, for example, natural gas combusted in a boiler at a company's head office. Scope 1 emissions physically occur in assets owned or controlled by the reporting company.
Scope 2 emissions	Scope 2 emissions, also known as indirect emissions, are emissions from purchased electricity, heat, steam or cooling consumed by the company, but generated elsewhere.
Scope 3 emissions	Scope 3 emissions, or other indirect emissions, are emissions that occur as a consequence of the operations of the organization but are not directly owned or controlled by that organization.
Secondary markets	Infrastructure secondary markets refer to the buying and selling of existing infrastructure assets or stakes in infrastructure projects after the initial financing and development phase (i.e., after the project is built or operational).
Securitization	Transaction in which a pool of assets is collateralised into one vehicle of loan products for sale.

Term	Definition
Senior secured debt	Debt that is backed by collateral and has priority in repayment.
Senior unsecured debt	Debt that a company owes that takes priority over other debts and is not backed by collateral.
Subordinated debt	Debt that is paid after all other debts are repaid in the event of a borrower default.
Trading price recovery	Recovery of trading prices on an issuer's bonds 30 days after its initial missed payment or bankruptcy filing. Such prices provide a useful and early indicator of ultimate recovery, especially in cases of bankruptcy, where it may take years for debt holders to know how much will ultimately be recovered.
Ultimate recovery	Recoveries following emergence from default. Emergence from default occurs after any of the following events: Repayment of overdue interest; Restructuring with no subsequent default; Restructuring with the lender out of the deal e.g. by repayment of the defaulted loan with no participation in a restructured debt facility; Material restructuring; Liquidation.
Unlisted equity investment	Investment in shares of a company that are not traded on a public stock exchange and are privately held by a limited number of investors.
Unlisted infrastructure debt	Debt associated with infrastructure assets that are not listed on a stock exchange.
Volatility	The extent of fluctuation in the value of an investment over a given period.
Weighted average cost of capital	It represents the average cost paid to finance assets. It measures the average cost of a company's sources of capital (debt and equity) weighted by the proportion of each source in the total capital.

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Executive summary



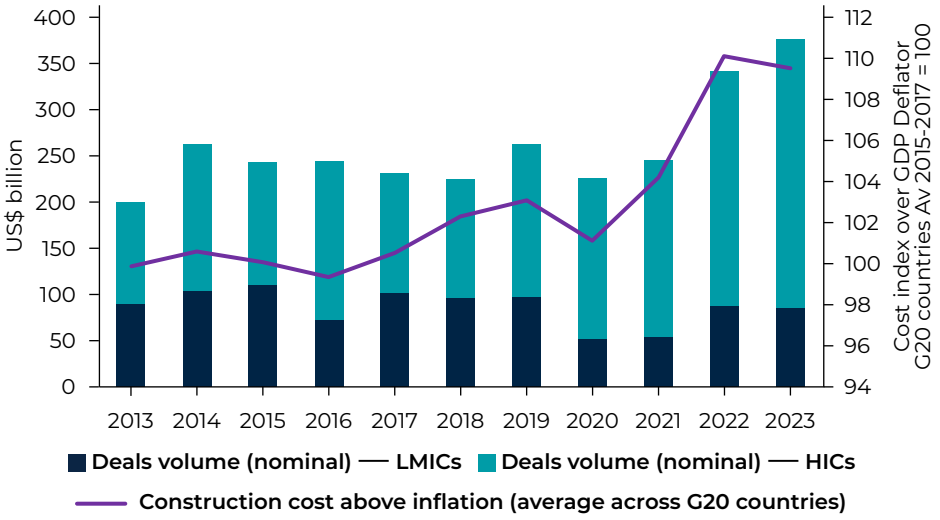
Greenfield investment continues to rebound in developed markets, while growth in emerging markets lags

Global private investment in infrastructure projects in primary markets rose notably in nominal terms in 2023, increasing by 10 percent. The majority of this growth took place in developed markets, while low- and middle-income countries (LMICs) experienced a slight decline.

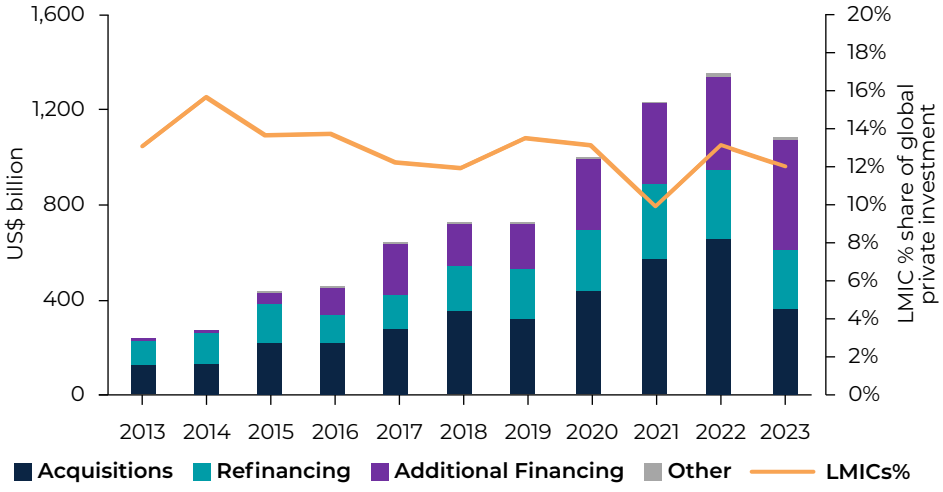
This marks a continuation of strong post-pandemic growth, with investment levels significantly higher than the five-year average (2018-2022). However, infrastructure delivery costs have increased significantly in the meantime — potentially 10 percent above inflation based on the construction cost index across G20 countries — necessitating a cautious interpretation of the trend especially for greenfield projects.

Meanwhile, secondary market investments declined by 17 percent in 2023, largely due to reduced acquisition activity, a reflection of the impact of higher interest rates on asset valuations. The share of LMIC countries for secondary market continued to decrease slightly and only represented around 12 percent of the global volumes. Preliminary data for 2024 indicates some significant rebound for secondary activities as many central banks globally initiated interest rate cuts, driven by declining inflationary pressures.

Private investment in infrastructure projects in primary markets
(US$ billion, all countries)



Private investment in infrastructure projects in secondary markets
(US$ billion, all countries)



Source for volumes: Authors' analysis based on Realfin data, PPI database and IMF Outlook
Source for construction cost index: Data from G20 agencies – see Chapter 1 for detailed sources
Note: Throughout this report, private investment in infrastructure projects refers to private sector investment in infrastructure projects in primary markets (financed by private and public financiers) including greenfield and brownfield infrastructure, as well as privatizations, unless otherwise specified. Investment values represent commitments made at the financial close of investment and not executed investment. 'Acquisitions' includes corporate and asset acquisitions, and 'Other' includes transactions such as securitizations. The data does not capture the entirety of corporate investment and therefore represents a subset of total private sector investment.

Chapter 1 of this report provides detailed data by market

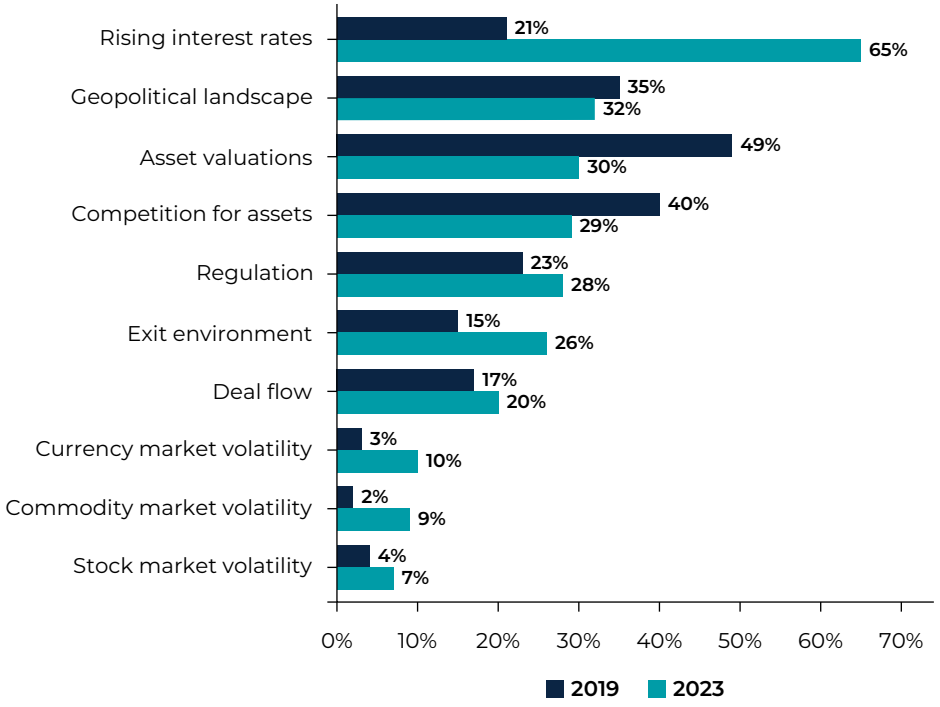
Rising interest rates weigh on acquisitions and fundraising

Investor sentiment surveys also highlighted rising interest rates as the primary challenge in generating attractive returns and this has tempered return expectations across most infrastructure fund types.

Consequently, infrastructure fundraising also faced significant challenges in 2023, with total capital raised dropping to $94.9 billion, nearly half of 2022 levels. While the decline stabilized in 2024, fundraising remained subdued, reaching $70.5 billion by Q3.

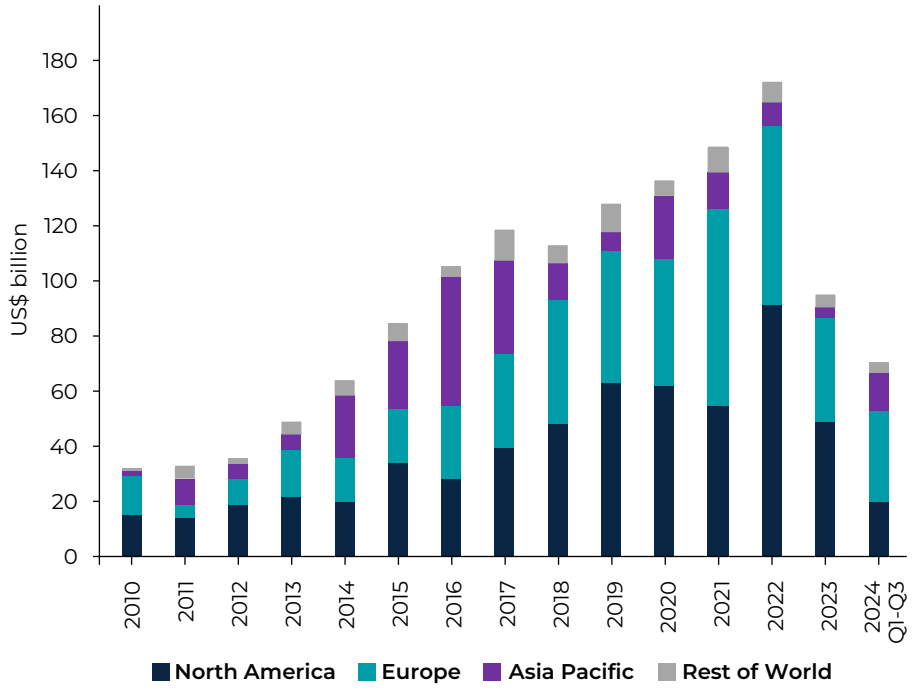
Despite these challenges, investment from infrastructure funds – still stocked with significant dry powder — is expected to remain relatively resilient compared to other asset classes. Between 2016 and 2022, infrastructure funds yielded an average return of 11.3 percent, with only a slight projected decline to 10.9 percent over 2022-2028. This is in contrast to steeper declines forecasted for private equity and venture capital, thereby improving the relative attractiveness of infrastructure funds for equity investors.

Top challenges for return generation for the infrastructure asset class (% of surveyed investors, 2019 and 2023)



Source: Preqin Investor Survey, Global Infrastructure Report 2024

Annual capital raised by funds for the infrastructure asset class by region, 2010-2024 (US$ billion)



Source: Preqin Global Infrastructure Report 2025

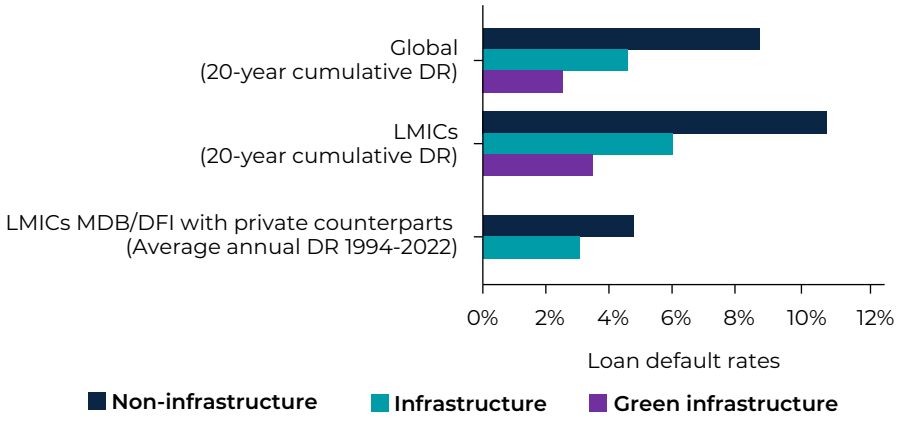
Chapter 2 of this report provides detailed data on infrastructure fund raising and investors' sentiment

Infrastructure demonstrates resilience amid macroeconomic uncertainty

Despite evolving market conditions and differences across markets, private infrastructure financing has maintained a stable debt-to-equity ratio over the past decade, with debt financing comprising 77 percent of total investment in 2023. Infrastructure debt remains attractive to investors due to its reliable cash flows and historically lower default rates compared to non-financial corporate debt — a trend consistent across countries of all income levels. Even in non-investment-grade categories, infrastructure debt demonstrates stronger credit performance and higher recovery rates upon default than non-infrastructure debt. This bodes well for investors as they still prefer low-risk strategies for infrastructure investment.

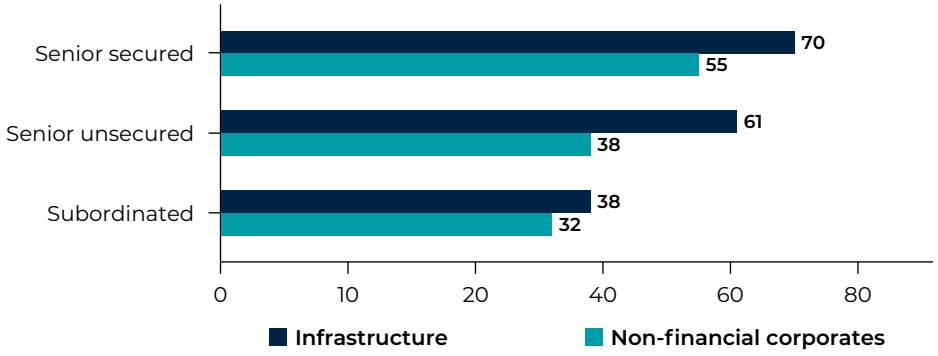
The presence of contractual provisions and revenue resilience further enhances infrastructure debt stability. Revenue-resilient infrastructure is defined to include availability-based payments Public Private Partnership (PPPs) and regulated corporate infrastructure including regulated electric and gas industry, and regulated water utilities, according to Moody's. Between 1995 and 2023, revenue-resilient infrastructure loans had a five-year cumulative default rate (CDR) of just 0.7 percent, compared to 5.4 percent for non-revenue-resilient infrastructure debt. Availability-based public-private partnerships (PPPs) and regulated utilities exhibited particularly low default rates, reinforcing the importance of well-structured financing models. Those schemes can indeed reduce project risks and the likelihood of default by ensuring predictable cash flows, but they can also impose significant fiscal commitments on governments (for example, renegotiation or bailout, contingent liabilities, exchange rate and inflation risk compensation, underperforming assets or projects, etc.). While this is true for LMICs as well, there is scope to strengthen the contractual and regulatory arrangements to further lower the default rates.

Loans default rates (DR): Infrastructure vs non-infrastructure



This graph illustrates the materially lower DR for infrastructure than non-infrastructure across leading data sources (Moody's, S&P, and GEMs)
Note: Metrics from Moody's and GEMS differ slightly and cannot be compared directly

Average trading price recovery rates for rated infrastructure corporate and project finance debt securities by debt seniority and asset class (%, 1983-2023)



Source: Moody's (2023a), Moody's (2023b).
Note: Estimates for trading price recovery rates are based on 1,146 rated corporate infrastructure and project finance debt securities that originated from 1983-2023.

Chapter 3 of this report provides detailed data on infrastructure financial performance across equity (listed and unlisted) and debt markets

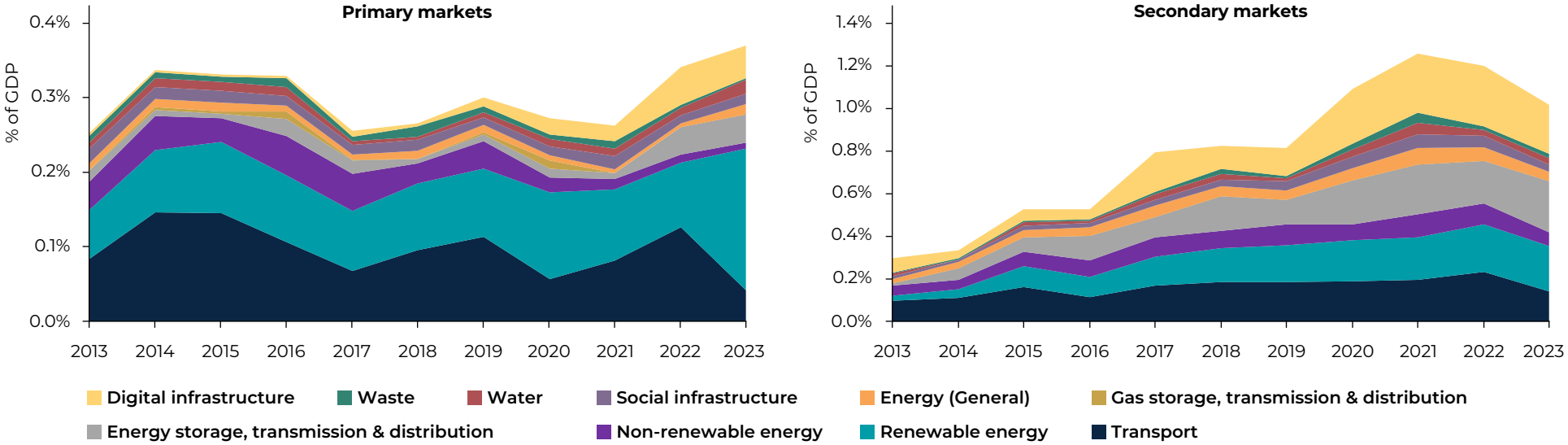
Policy and incentive changes set to influence investor strategies and sector priorities

Since 2013, renewable energy and transport have consistently dominated primary market infrastructure investment, together accounting for two-thirds of total activity. Digital infrastructure has emerged more recently as a key sector, driven by Covid-related stimulus and the rapid pace of digital transformation. In 2022, transport briefly surpassed renewables, largely due to several large-scale transactions in North America. However, renewable energy rebounded strongly in 2023, with investment more than doubling and reclaiming its leading position. Within the renewables space, private investment in hydrogen projects surged by over 400 percent, spurred by targeted policy incentives — though solar and wind continue to represent the bulk of activity.

Digital infrastructure, along with energy storage, transmission, and distribution, accounts for a significantly larger share of secondary market transactions, as corporates continue to invest in expanding and upgrading their networks.

Trends in LMICs generally mirror global patterns across both primary and secondary markets, though with a greater emphasis on transport and a smaller share of digital infrastructure compared to high-income countries (HICs).

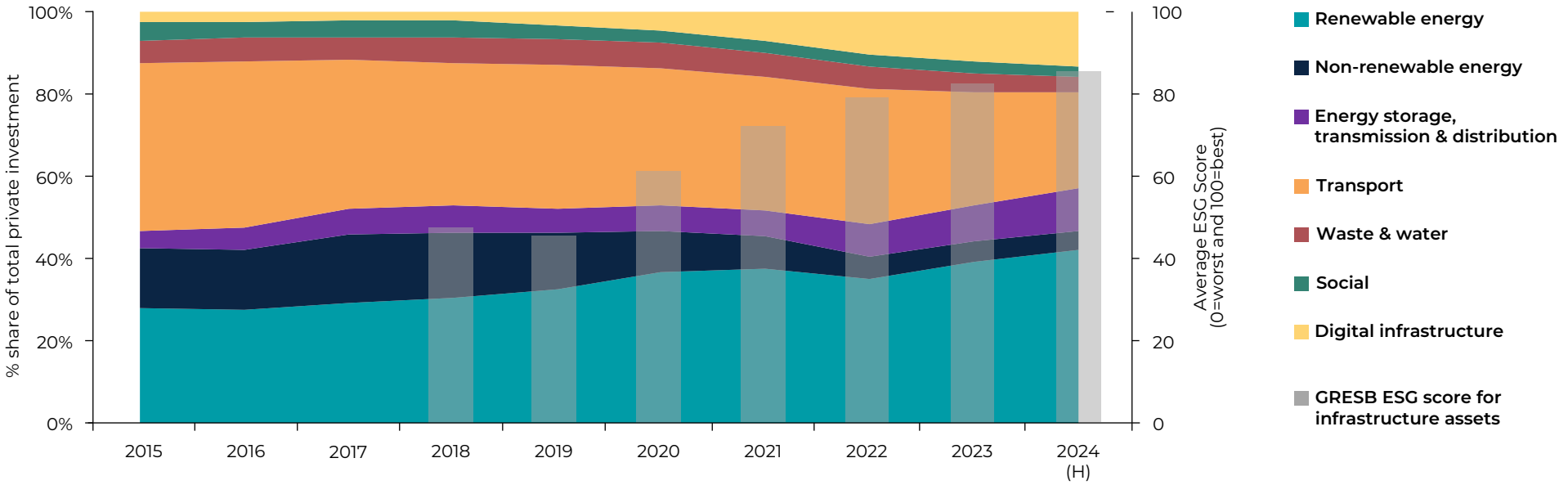
Private investment in infrastructure projects in primary and secondary markets by sector
(% of GDP, all countries)



Source: Authors' analysis based on Realfin data.

As shown in the two graphs above, infrastructure investments classified as green — whether through direct renewable energy projects or sustainability-linked financing — have grown steadily over the past decade, in particular for primary market activity for which it now represents half of the volumes. This upward trend reflects broader shifts in policy, with many governments committing to carbon neutrality and tightening ESG disclosure requirements. In response, asset managers are increasingly integrating sustainability and climate risk considerations into their investment decisions. The graph below illustrates both the sectoral evolution of primary market investments and the rise in ESG scores across a large global sample of infrastructure assets.

Private investment in infrastructure projects in primary markets by sector – 3 year moving average



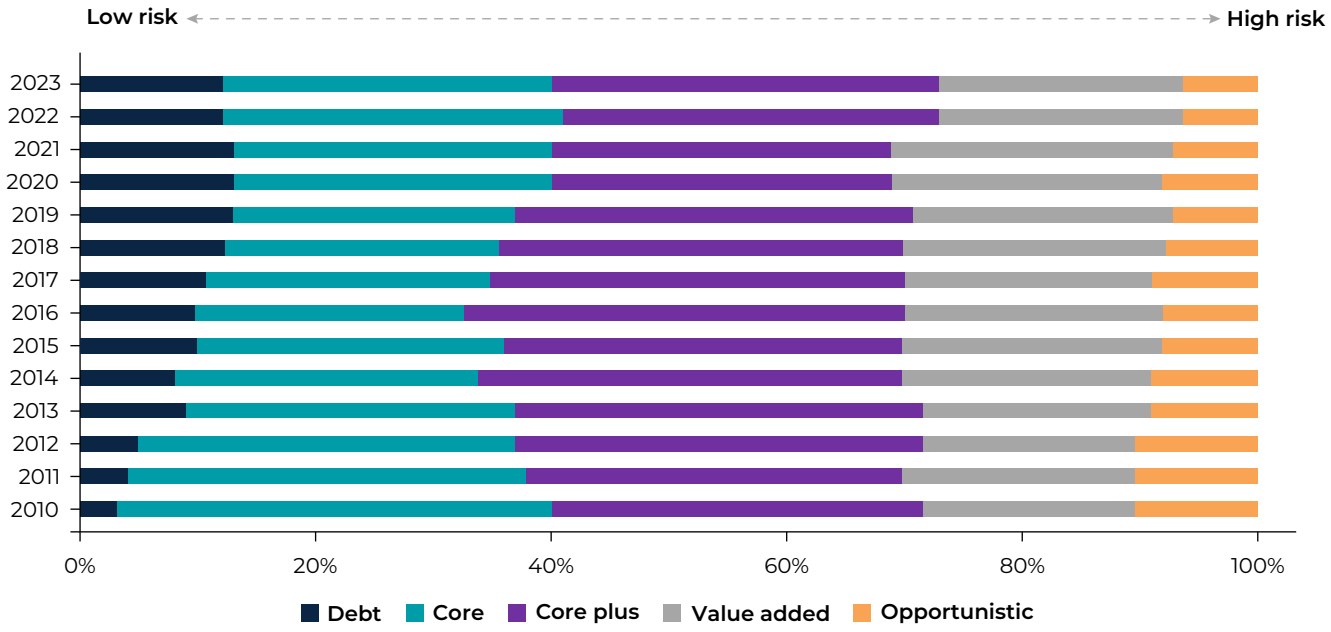
Source: Authors' analysis based on RealFin and GRESB Infrastructure Asset Assessment. GRESB data covers 720 assets across 81 countries. Data for the GRESB Infrastructure Asset Assessment is provided and self-reported on a voluntary, opt-in basis. Resultingly, the analysis is not totally representative of the state of ESG for infrastructure assets across the world. In 2024, 88 percent of the participating assets in the assessment came from high-income countries.
Notes: While ESG Scores have been subject to some methodological changes and changing component weights over time, they are still comparable across years.

Chapter 4 of this report provides ESG and climate-alignment metrics at the asset-level data

Despite this momentum for new sectors and financing instruments, private infrastructure investors remain focused on opportunities that offer long-term predictability. Infrastructure funds allocate over 70 percent of capital to low-risk strategies (debt, core, and core-plus investments), while higher-risk opportunistic strategies have declined from 10 percent in 2010 to 6 percent in 2023.

Higher-risk strategies have not consistently delivered higher returns, with increased volatility outweighing potential gains. Aligning with government policies, managing the risk of stranded assets, and leveraging incentives are therefore likely to be crucial for driving growth in these and other emerging sectors — at least until they achieve financial sustainability on their own.

Value of infrastructure assets managed by funds by risk strategy
(% in total value)



Source: Preqin (2024b)

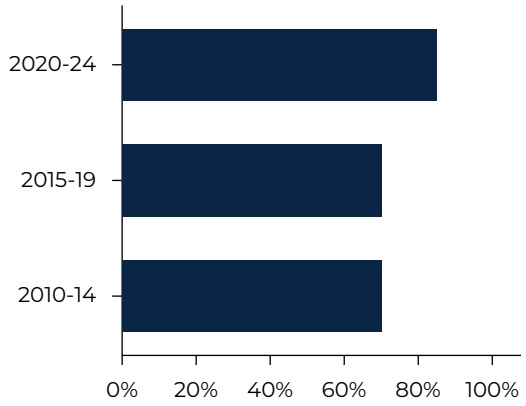
Shifting market conditions and policies widen investment gaps

Among markets, a growing divergence in investment levels between HICs and LMICs continued in 2023. HICs saw a 15 percent increase in infrastructure investment in primary markets, compared to a small decline in LMICs.

Beyond primary markets, high-income volumes have also increased significantly faster than in LMICs — in particular across secondary markets – and overall LMICs represent less than 20 percent of the overall volumes compared to 30 percent a decade ago. And while investment in LMIC markets rose, it was driven by an increasing concentration of investment in the largest LMIC markets — China, India, Brazil, Mexico, Turkiye and Indonesia — whose collective share of private investment rose from 66 percent (2013-2019) to 71 percent (2021-2024) in primary and secondary markets.

Fundraising also remains heavily concentrated in North America and Europe, in part due to strong investment incentives in developed markets, particularly for energy transition initiatives. In contrast secondary market activity was more impacted in HICs than in LMICs as the increase in interest rates in these markets was proportionally less dramatic.

Share of North America and Europe in private capital raised through infrastructure funds (%)

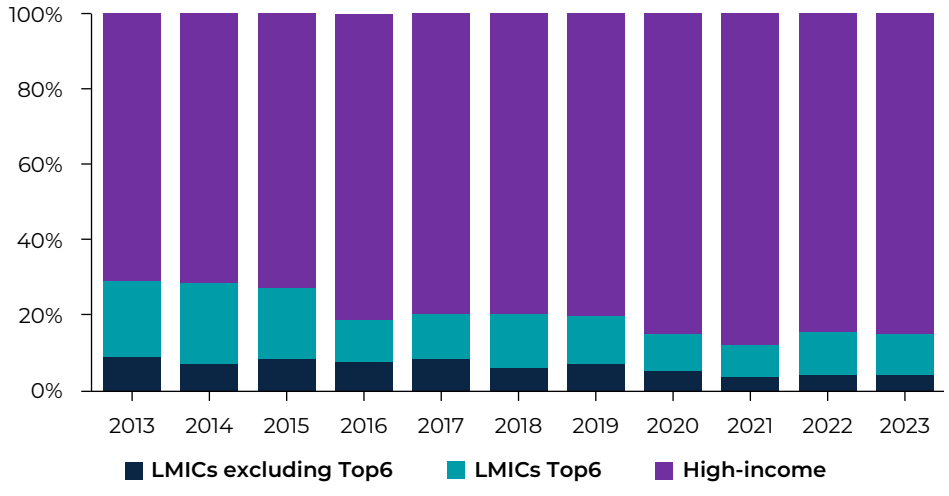


Source: Preqin Global Infrastructure Report 2025

Private investment in infrastructure projects in primary markets by income group
(% total private investment, HICs and LMICs)



Private investment in infrastructure projects in primary and secondary markets by income group
(% total private investment, HICs and LMICs)



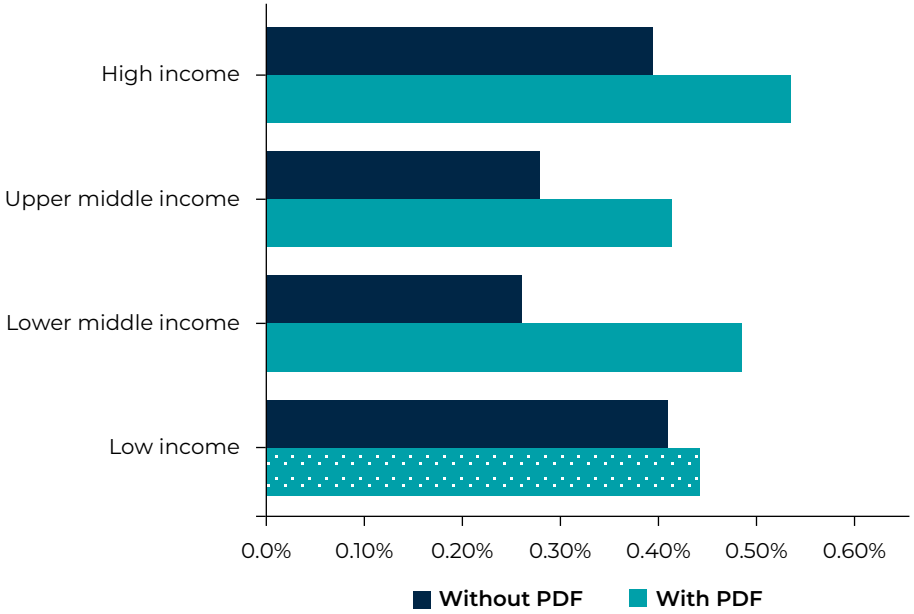
Source: Authors' analysis based on Realfin data | Note: The top 6 LMICs are Brazil, China, India, Indonesia, Mexico and Turkiye

Strengthening regulatory frameworks is critical to accelerating investment in emerging markets

To address investment gaps in emerging markets, strengthening regulatory frameworks remains essential for attracting private capital. New data from the World Bank's Benchmarking Infrastructure Development study shows that each improvement in regulatory frameworks can increase investment by approximately $500 million.

The availability of Project Development Funds (PDFs) is also positively associated with private capital mobilization although PDFs appear less impactful in low-income countries where the pre-conditions for mobilizing private investment are not sufficient.

Private investment with and without Project Development Funds (PDF) (% of GDP, 2020-2022)



Source: World Bank BID and RealFin
Note: The sample size for Low income and With PDF is too small to be representative

Regulatory PPP reforms associated with almost US$488 million increase in infrastructure PPP investments*



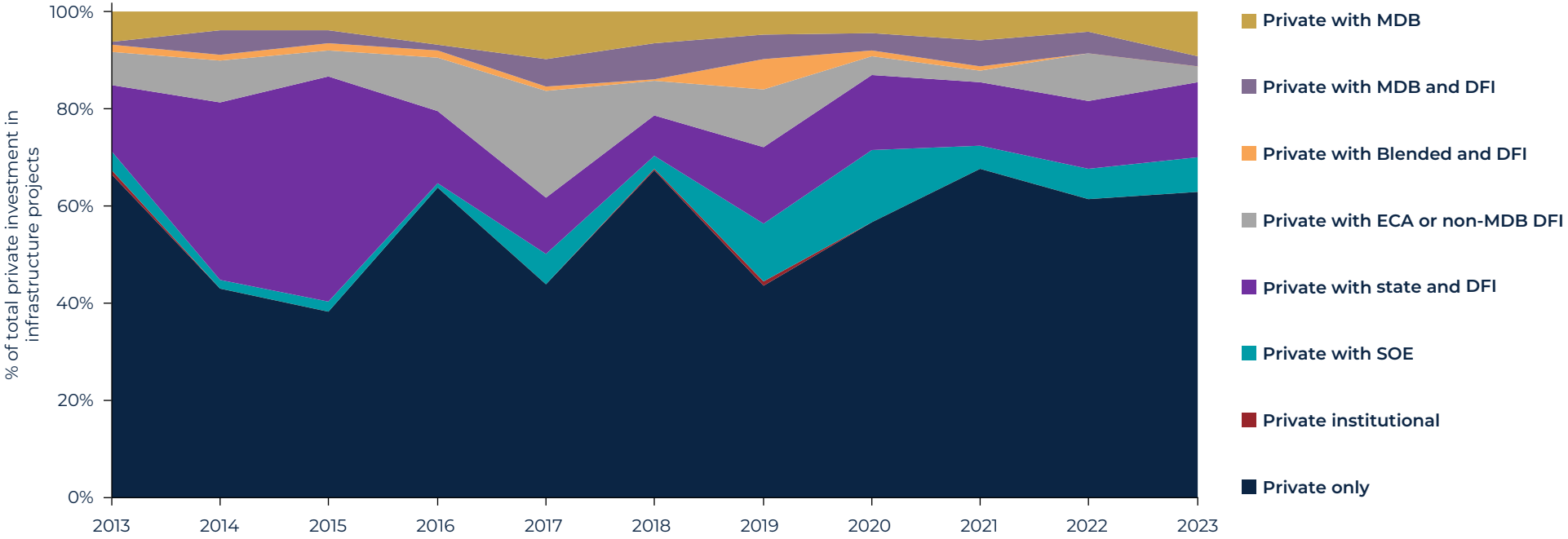
Note: *The correlation was determined using data from the average country in the sample, which has a gross domestic product (GDP) per capita of US$4,000, spanning the years 1990 to 2019.

Development institutions remain key to mobilizing private capital in emerging markets

In 2023, whilst 63 percent of total private investment was solely financed by private investors in primary markets in LMICs, much of the remaining investment was underpinned by development institutions such as multilateral development banks (MDBs) and development finance institutions (DFIs). Development institutions formed part of the financier mix for 30 percent of total private investment i.e., they provided co-financing, in addition to other private investors. However, directly, development institutions only provided financing for 10 percent of total private investment in LMICs, highlighting their degree of involvement and pivotal role in mobilizing private capital into infrastructure markets, particularly in LMICs.

More generally MDBs and DFIs remain critical in catalyzing private investment – especially in lower-income and smaller markets. In middle-income markets, it gives way to government own funding and a larger commercial financing stack. In 2023 infrastructure-related total private mobilization by MDBs/DFIs was particularly effective across all emerging markets with a 23 percent increase in 2023 compared to 2022 according to the 2023 Joint Report: Mobilization of Private Finance by MDBs and DFIs.

Financing of private investment in infrastructure projects in primary markets by financier mix
(% of total private investment in infrastructure projects, LMICs)



Source: Authors' analysis based on Realfin data
Note: Includes only transactions for which financier details are available. Financier type data was only available for 80 percent of total private investment from 2013-2023. 'Development institutions' for the purpose of this analysis includes MDBs, DFIs, and blended DFIs.

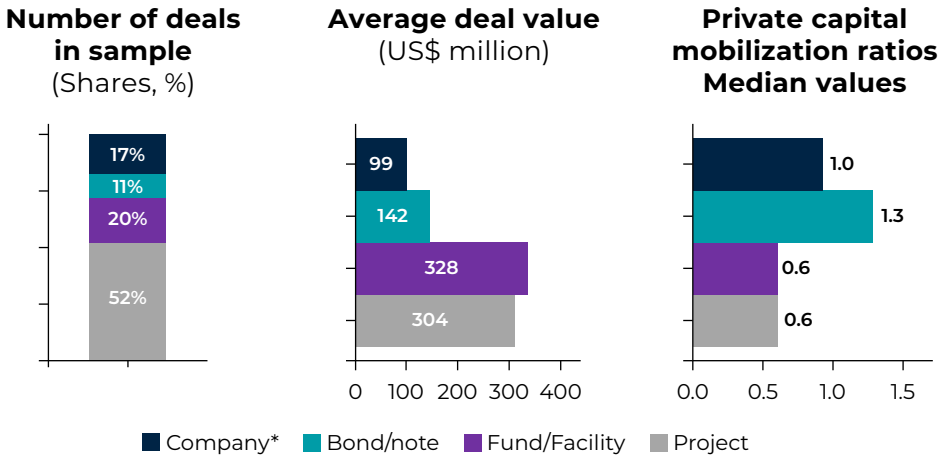
Guarantees and blended finance offer targeted solutions to bridge investment gaps

Within the approaches developed by DFIs, blended finance and guarantees offer targeted solutions to bridge market gaps. While definitions and data on blended finance remain difficult to gather consistently, evidence gathered for this report underscores its potential to attract private investment through the strategic use of public and philanthropic capital. While private capital mobilization ratios vary widely across income levels, regions, and sectors, approximately 20 percent of infrastructure deals mobilized more than $2 of private capital for every $1 of non-private capital, underscoring the potential for scaling successful approaches.

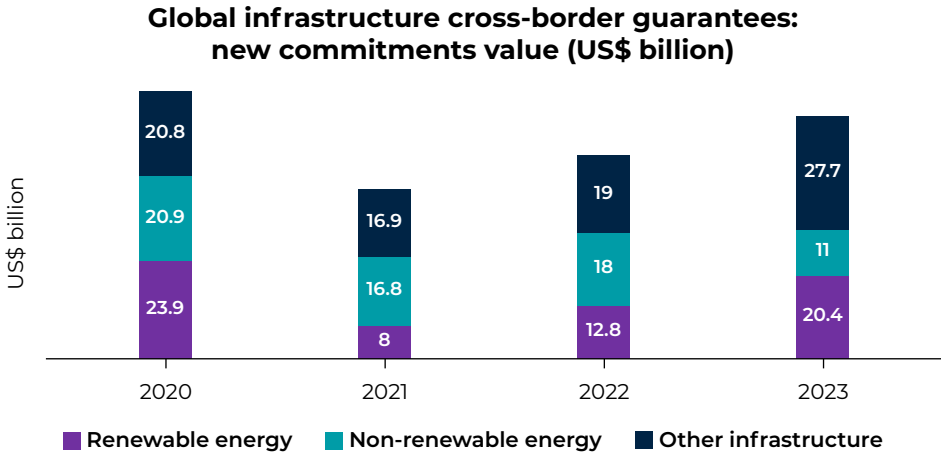
As innovative approaches continue to be deployed, data and examination of high-performing deals will provide valuable insights to refine and enhance blended finance strategies in infrastructure. For example, while projects comprised the majority of blended finance transactions, bonds and corporate investments exhibited higher leverage ratios, demonstrating greater private capital mobilization potential.

To address shortcomings within the regulatory environment and other local risks, guarantees appeared to be particularly effective for private capital mobilization - increasing the share of commercial debt by covering some default risk. Evidence gathered a large sample of blended finance deals showed that those backed by guarantees had 80 percent private commercial debt participation, compared to 42 percent for non-guaranteed deals and that their coverage remains critical in lower-income countries.

However, since the COVID-19 pandemic, the availability of cross-border guarantees for infrastructure deals has barely recovered while financing and delivery costs have increased significantly.



Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which data was available.



Source: International Union of Credit and Investment Insurance Industry Reports, 2020-2024
Note: Data by sector includes medium and long-term, political risk, and other cross-border guarantees. Other Cross-Border guarantees are included in the estimates because of their strategic shift towards long-term solutions and the overall greater support through non-traditional products.

Chapter 5 of this report provides detailed data on blended finance and the use of cross-border guarantees

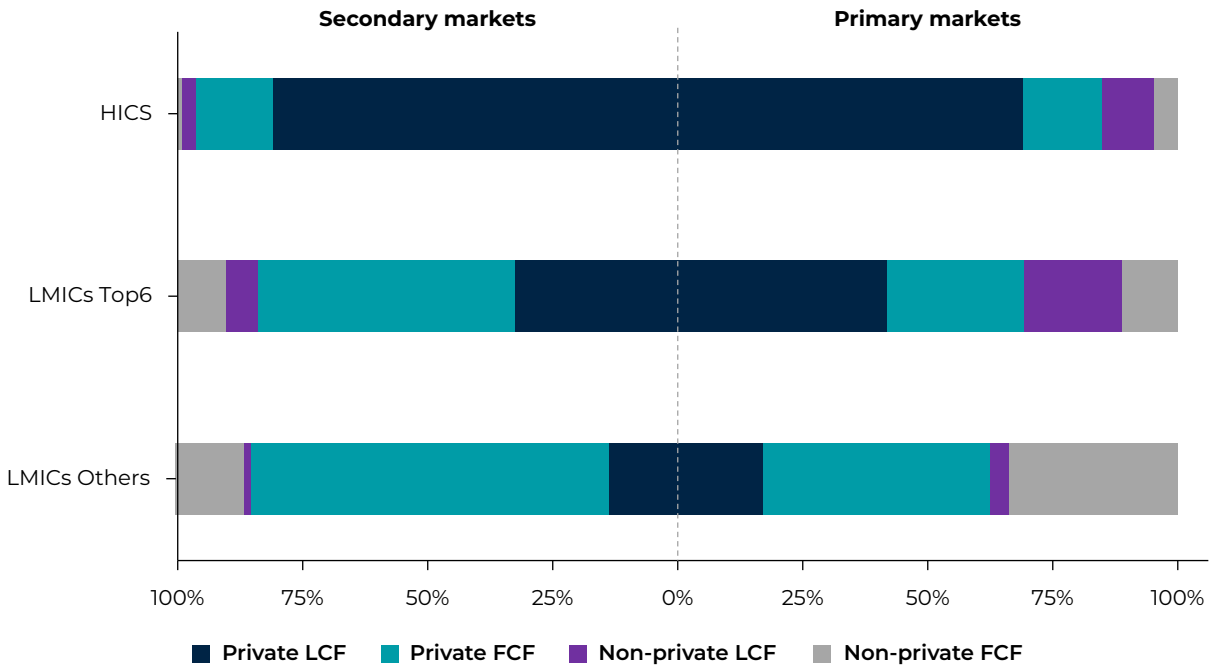
Opportunities to expand local currency financing and capital markets beyond major LMICs

In 2023 in LMICs, 37 percent of financing for private investment in infrastructure projects in primary markets is local currency financing – a 16 percentage point decrease from 2022 when more than half of financing was conducted in local currency. Local currency financing can protect against foreign exchange volatility, strengthen local markets, and attract local investors.

The top 6 LMICs have however a much greater proportion of local currency financing (LCF) when measured up against other LMICs and closer to HICs ratios, from both private and non-private financing sources – 61 percent of investment, compared to 21 percent.

Other LMICs rely more heavily on financing from non-private sources, with more of the investment coming from financiers like development institutions, who tend to provide finance in foreign currencies (FCF).

Local currency financing of private investment in infrastructure projects in primary markets by financier source
(% of total private investment, 2019-2023 average, LMICs)



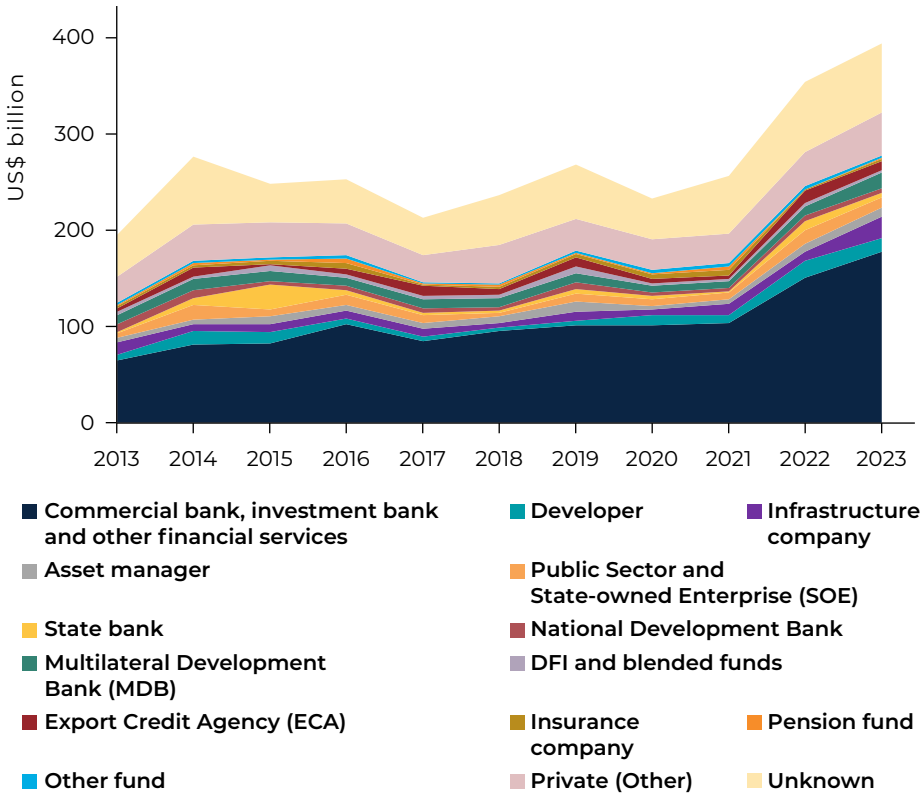
Source: Authors' analysis based on Realfin data.
Note: Includes only transactions for which transaction currency and financier details are available. Currency data was only available for 64 percent of private investment in LMICs – with 75 percent of the financier types known within these. The top 6 LMICs are Brazil, China, India, Indonesia, Mexico and Turkiye.

Another opportunity for emerging markets is leveraging capital markets. Banks and loans remain the leading financier and main financing instrument for infrastructure projects in primary markets.

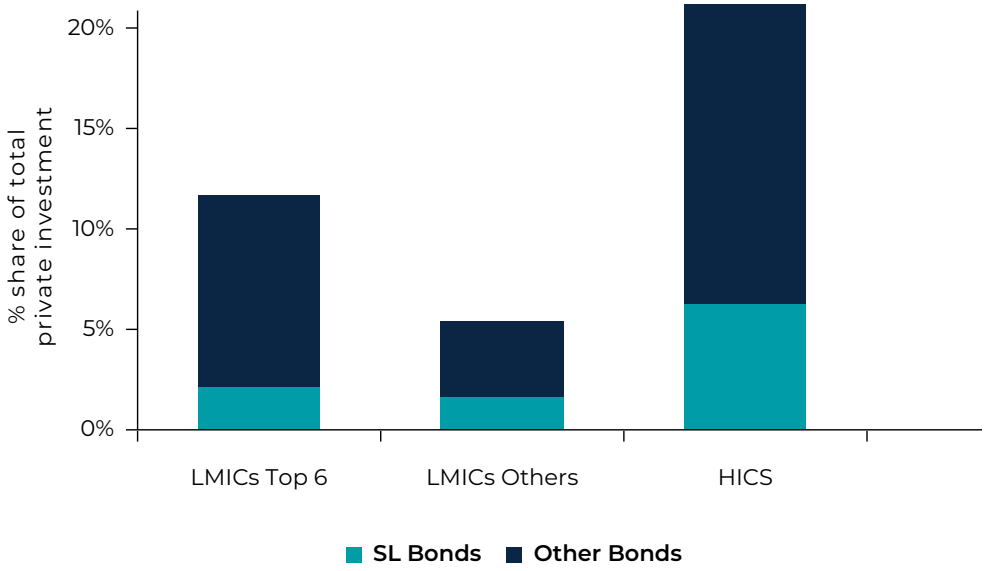
In recent years, as traditional sources such as concessional finance and government budgets face constraints, there also has been a growing shift toward leveraging domestic and international capital markets to mobilize long-term funding at scale. Emerging market governments and infrastructure developers are increasingly turning to instruments such as green, sustainability-linked, and project bonds to attract institutional investors seeking stable, long-duration assets. This potential is however still mostly captured in the large LMICs markets.

Financing of private investment in infrastructure projects in primary markets

By financier type (US$ billion, all countries)



By tranche type (% share of total private investment, 2019-2023)



Source: Authors' analysis based on Realfin data.

The top 6 LMICs are Brazil, China, India, Indonesia, Mexico and Turkiye.
SL bonds refer to both green bonds and sustainability-linked bonds.

Conclusion and report structure

Private investment in infrastructure has encountered considerable volatility — particularly in fundraising and secondary markets — while primary market investment has continued to rebound from the impacts of COVID-19, supported by substantial incentives in developed markets. The increased dominance of renewables and digital infrastructure demonstrated how sectoral priorities for investors respond quickly to government policy priorities and disclosure requirements with ESG considerations playing an increasingly central role. At the same time, secondary market activity has faced headwinds from higher interest rates and shown how overall economic conditions can impact investors appetite in the infrastructure asset class.

Recent macroeconomic shifts, particularly interest rate hikes, are reshaping return expectations, but infrastructure investment has demonstrated resilience. Investors prefer infrastructure for its lower risk and volatility in returns than non-financial corporates. Infrastructure debt continues to exhibit lower default rates and higher recovery rates than non-financial corporate debt. This bodes well for investors especially during the current economic environment characterized by high uncertainty and increased investors' risk aversion.

For markets in which the risks remain high and especially smaller markets, the involvement of MDBs and DFIs and Government remain critical. Data also shows that blended finance and guarantees can be effective tools for mobilizing private capital in such markets. Going forward, closing the investment gap between HICs and LMICs will require targeted policy interventions, regulatory strengthening, and innovative financing solutions to unlock greater private sector participation in sustainable infrastructure development.

The full report offers deeper insights and is structured across the following chapters:

- Chapter 1: Private investment in infrastructure
- Chapter 2: Infrastructure funds
- Chapter 3: Financial performance of infrastructure investment
- Chapter 4: Environmental, Social, and Governance (ESG) factors in infrastructure
- Chapter 5: Blended finance and guarantees in infrastructure

Private investment in infrastructure



INTRODUCTION

This section presents data and analyses related to levels of private investment in infrastructure. Unless otherwise stated, the analyses refers to private sector investment in primary market projects financed by public as well as private financiers, including greenfield projects (new projects on undeveloped sites), brownfield projects (construction on previously developed sites, such as upgrades), and investment via the privatization of public sector assets. Compared to previous years' reports, and for select insights, the analyses has been extended to investment in secondary markets and additional financing.

Similar to Monitor 2023, the analyses draw on a project-by-project dataset developed in partnership with Realfin, which has a more comprehensive coverage of transactions. Additionally, the new dataset also incorporates supplementary information from The World Bank's Private Participation in Infrastructure (PPI) database, which focuses on private participation in infrastructure project in low- and middle-income countries.

With this additional coverage, the consolidated dataset represents the most comprehensive global dataset on project-based private investment in infrastructure. However, it is important to note that (a) project-by-project validation of the 40,000+ transactions in the dataset was not possible, and discrepancies may exist, and (b) it remains incomplete—meaning the figures presented in this section likely underestimate the true levels of global private investment in infrastructure.

Note the following:

- The dataset focuses on project-based private investment and does not capture most corporate private investment in infrastructure, which may represent a significant portion of private investment in some infrastructure sectors. For example, balance sheet financing is estimated to account for 70 percent of total private investment in renewable energy.
- Coverage of green, sustainable, and sustainability-linked bonds is limited, particularly as use-of-proceeds (intended and actual) are typically not reported and difficult to identify as either primary or secondary investment.

The estimates in this report are best interpreted as indicative of the broad trends in the size and nature of private infrastructure investment.

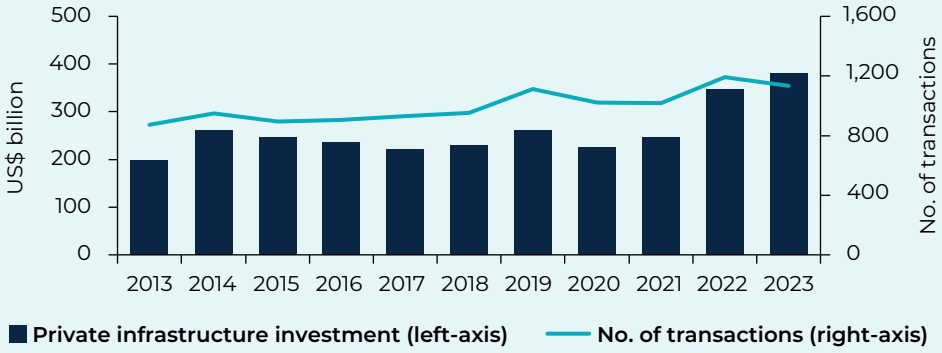
OVERVIEW

Private investment in infrastructure projects in primary markets continued their post-pandemic rise in 2023, while secondary market activity slowed amid rising interest rates.

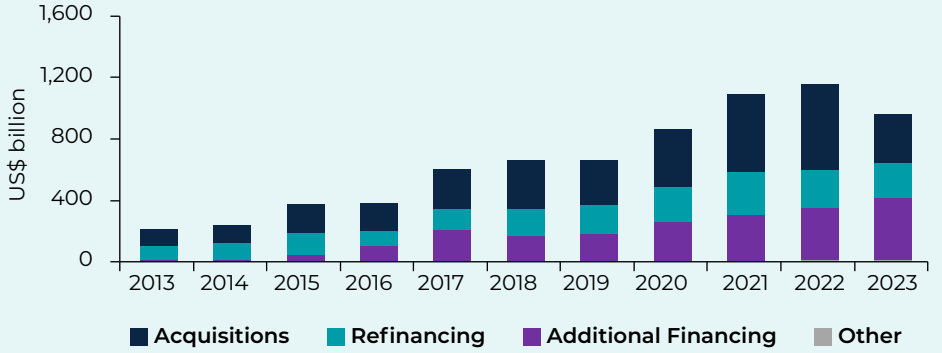
In 2023, global private investment in infrastructure projects in primary markets increased by 10 percent, continuing its post-pandemic rise to be 46 percent higher than its five-year average (2018-2022). This followed an eight-year period of stagnation prior to 2022. Regionally, the Middle East and North Africa (MENA) region saw notably strong investment growth in 2023, while the level of investment in North America remained at a decade-high. However, infrastructure delivery costs have increased significantly in the meantime — around 10 percent above inflation — necessitating a cautious interpretation of the trend, especially for greenfield projects.

In contrast, global private investment in infrastructure projects in secondary markets decreased by 17 percent in 2023, driven by a decline in acquisitions, although it remained higher than pre-pandemic levels in 2019. The overall decline in secondary market activity is likely to reflect higher interest rates and investors moving away from secondary markets, once seen as a safe haven amid heightened global uncertainty during the pandemic.

Private investment in infrastructure projects in primary markets
(US$ billion, and number of transactions, all countries)



Private investment in infrastructure projects in secondary markets
(US$ billion, all countries)



Source: Authors' analysis based on Realfin data.
Note: Throughout this report, private investment in infrastructure projects refers to private sector investment in infrastructure projects in primary markets (financed by private and public financiers) including greenfield and brownfield infrastructure, as well as privatizations, unless otherwise specified. Investment values represent commitments made at the financial close of investment and not executed investment. 'Acquisitions' includes corporate and asset acquisitions, and 'Other' includes transactions such as securitizations.

OVERVIEW

However, growth in primary markets was uneven and likely insufficient to close the infrastructure gap – especially in emerging economies.

In 2023, private investment in infrastructure projects in primary markets increased by 15 percent in high-income countries (HICs) and fell by 2 percent in low- and middle-income countries (LMICs). Levels of investment in LMICs remain below 2019 levels and represent under a quarter of total global investment. This disparity is also evident on a share of GDP basis, with the gap between HICs and LMICs further widening in 2023.

There are also disparities within LMICs, with an increasing share of primary and secondary investment concentrated in the largest LMIC markets – China, India, Brazil, Mexico, Indonesia and Turkiye. These markets also see a higher proportion of local currency financing compared to other LMICs and are also more likely to have projects financed solely by private investors. Development institutions, such as MDBs and DFIs, play a critical role in LMICs and are directly involved as a co-financier in 30 percent of total private investment in these markets.

The current pace of increase – especially in emerging markets — remains inadequate to meet the estimated doubling of infrastructure investment required to bridge the infrastructure gap and does not fully realize the potential of private capital to complement public funding.

Private investment in infrastructure projects in primary markets by income group
(% total private investment, HICs and LMICs)



Source: Authors' analysis based on Realfin data.

OVERVIEW

Investment continues to be dominated by renewables and transport, although digital infrastructure is emerging as a rapidly growing sector.

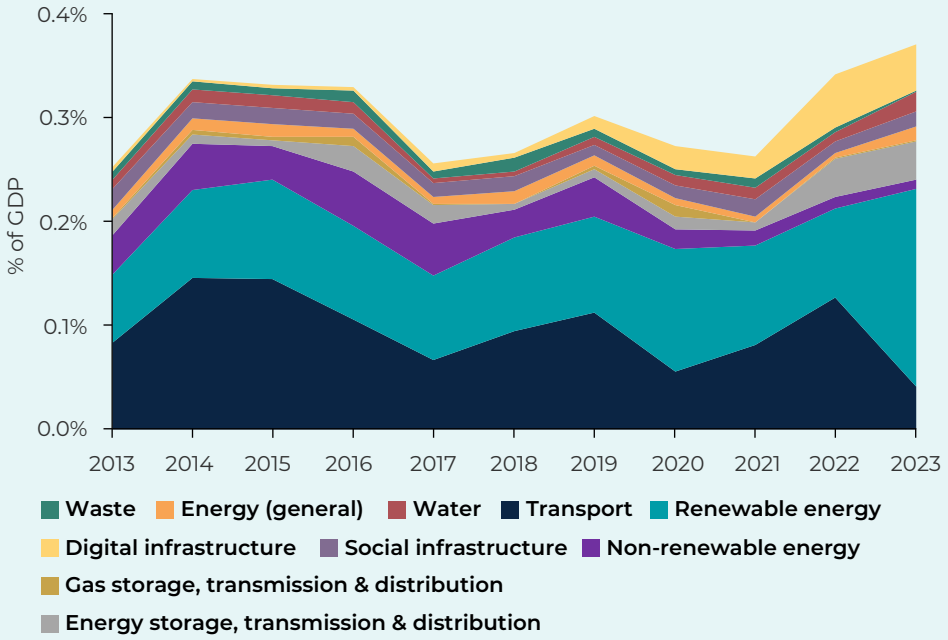
Renewable energy and transport have consistently dominated private investment in infrastructure projects, together accounting for an average two-thirds of total investment since 2013. While transport led in 2022, renewables regained the lead in 2023, with investment more than doubling due to a surge in hydrogen and continued growth in wind and solar which remained the most prevalent technologies.

Green investment (either renewables or investment financed with a sustainable financing instrument) has been rising for the past 10 years and now accounts for a record 62 percent of total private investment.

At the same time, as digital connectivity accelerates worldwide, digital infrastructure has emerged as a top-performing sector with record growth over the past three years.

Despite evolving sectoral preferences over the past decade, private infrastructure financing has maintained a stable debt-to-equity ratio, with debt financing comprising 78 percent of total investment in 2023.

Private investment in infrastructure projects in primary markets by sector
(% of GDP, all countries)

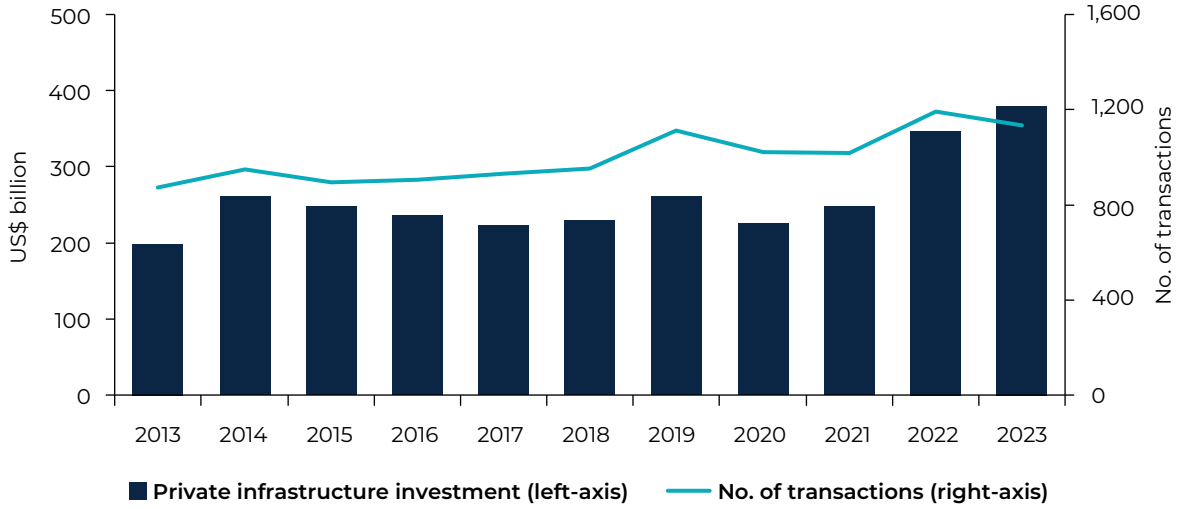


Source: Authors' analysis based on Realfin data.

In 2023, private investment in infrastructure projects in primary markets continue to rise post-pandemic.

- In 2023, global private investment in infrastructure projects in primary markets increased by 10 percent to US$380 billion. Investment continues to sit well over pre-pandemic levels after an eight-year period of stagnation prior to 2022, being 45 percent higher in value than the past five-year average (2018-2022).
- Post-pandemic, the data shows a second period of significant growth, indicating a promising recovery, and suggesting an upward trend in investment. However, there is still insufficient years' data to confirm a lasting shift in this trend.
- The number of transactions decreased slightly in 2023 by 5 percent to reach 1,100 transactions, but the average transaction size increased to approximately US$0.35 billion.

Private investment in infrastructure projects in primary markets
(US$ billion, and number of transactions, all countries)

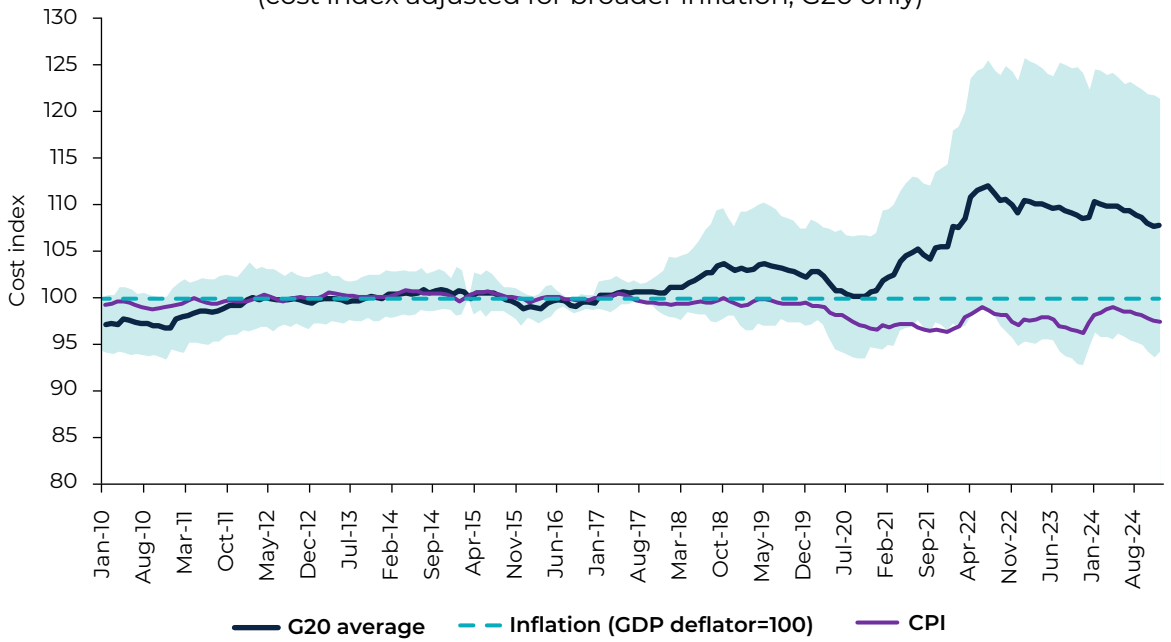


Source: Authors' analysis based on Realfin data.
Note: Throughout this report, private investment in infrastructure projects refers to private sector investment in infrastructure projects in primary markets (financed by private and public financiers) including greenfield and brownfield infrastructure, as well as privatizations, unless otherwise specified. Investment values represent commitments made at the financial close of investment and not executed investment.

However, infrastructure delivery costs have increased significantly in the meantime, necessitating a cautious interpretation of the trend, especially for greenfield projects.

- Infrastructure delivery costs have gone up significantly since mid 2021. They are now, on average, 10 percent higher than pre-COVID levels, based on the infrastructure cost analysis for G20 countries after adjustment for inflation.
- Global data and surveys also show that all areas of infrastructure costs – material costs, labor costs, shipping costs, and financial costs, spiked in 2022 with rapid global inflation.
- Furthermore, container costs exerted short-term pressures in 2021 and 2022, and while these pressures reduced in 2023, infrastructure delivery costs continued to rise. Thus, container costs appear less likely to have had a long-term impact.
- Financial costs remain the top factor elevating infrastructure delivery costs, thus limiting construction activity. In 2024, the negative pressures of financial costs showed signs of relief.
- Material costs and a shortage of labor or skills could also be key drivers of the long-term increase in infrastructure delivery costs.

G20 infrastructure construction cost indexes
(cost index adjusted for broader inflation, G20 only)



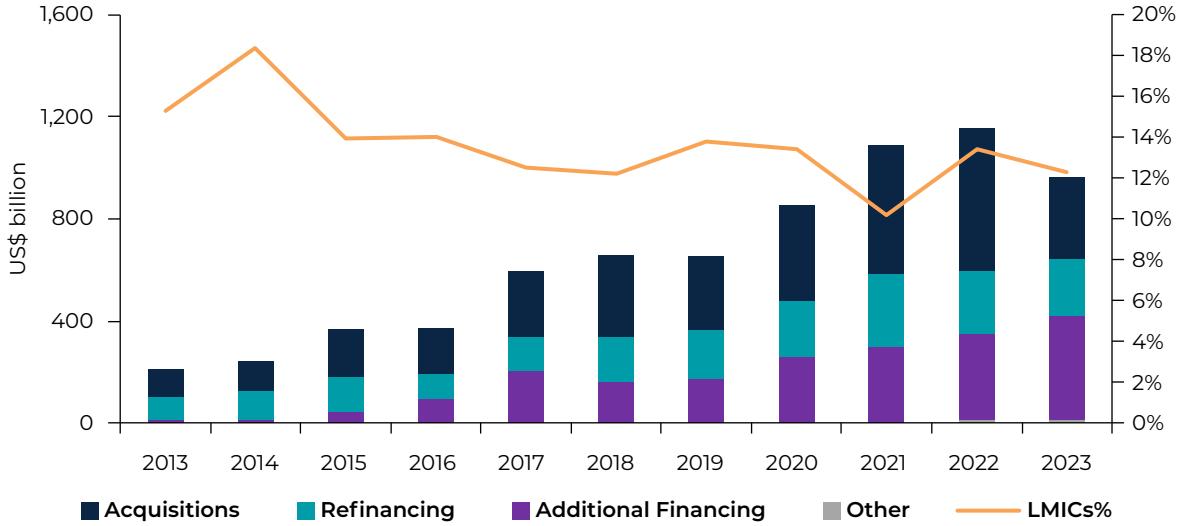
Sources: Author's estimates based on construction cost indices data from G20 members' statistical units (infrastructure-specific or general construction when not available), CPI and GDP deflator from IMF.

The G20 members are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkiye, the U.K. and the U.S., as well as the European Union, represented by the rotating council presidency and the European Central Bank.

The secondary market for infrastructure declined in 2023, largely driven by a downturn in acquisitions amid rising interest rates.

- In 2023, global private investment in infrastructure projects in secondary markets decreased by 17 percent to US$960 billion. The decline was largely driven by a decrease in acquisitions, which saw a 43 percent decrease to US$320 billion.
- Nevertheless, secondary private investment in infrastructure projects remain well over pre-pandemic levels (2019) and almost quadruple the value recorded when data collection began (2013).
- The overall decline in secondary market activity is likely reflective of the impact of higher interest rates and investors moving away from secondary markets, after having been drawn to their safe haven amid heightened global uncertainty during the pandemic.
- Meanwhile, additional financing saw a 21 percent increase to US$407 billion, representing 42 percent of total secondary private investment in infrastructure (the highest since 2013). Refinancing fell in 2023 by 10 percent.

Private investment in infrastructure projects in secondary markets
(US$ billion, all countries)

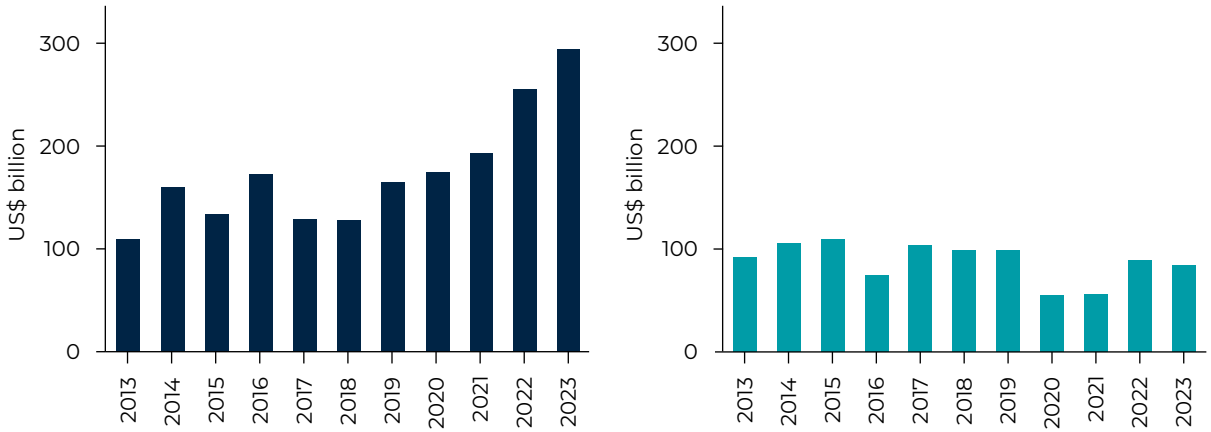


Source: Authors' analysis based on Realfin data.
Note: 'Acquisitions' includes corporate and asset acquisitions

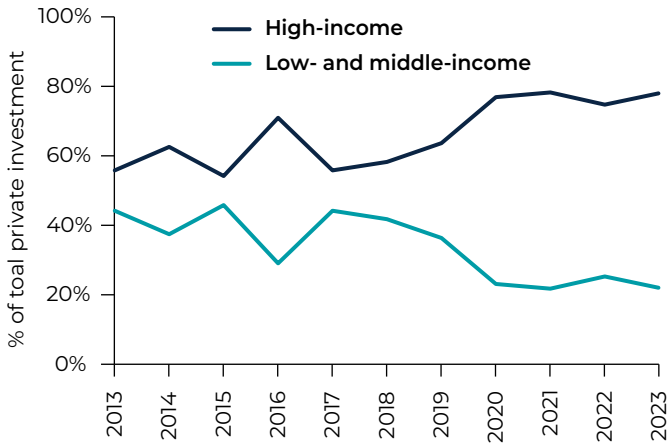
Although private infrastructure investment grew in high-income countries, low- and middle-income countries remain below 2019 levels, representing under a quarter of investment.

- In 2023, private investment in infrastructure projects in primary markets increased by 16 percent in high-income countries (HICs), whereas investment in low- and middle-income countries (LMICs) fell marginally by 2 percent. As a result, private investment in LMICs remain below pre-pandemic levels (2019).
- The gap between HICs and LMICs has notably widened since 2017, as LMICs account for only 22 percent of global primary investment in 2023.
- On a GDP basis, this disparity is also evident. In 2023, the gap between HICs and LMICs further widened, with HICs having invested 0.4 percent of GDP in infrastructure projects in the private sector, whereas LMICs invested 0.2 percent of GDP.
- LMICs are even further underrepresented in secondary markets, making up only 12 percent of global secondary investment, a value which has been gradually declining since 2013.

Private investment in infrastructure projects in primary markets by income group
(US$ billion, HICs and LMICs)



Private investment in infrastructure projects in primary markets by income group
(% total private investment, HICs and LMICs)



Source: Authors' analysis based on Realfin data.
Note: As the PPI database only covers economic infrastructure sectors, the LMICs values presented here are slightly greater than PPI values as Monitor also covers social infrastructure.

Private investment in infrastructure increased significantly in the Middle East and North Africa region, whilst investment in North America remained at a decade-high level.

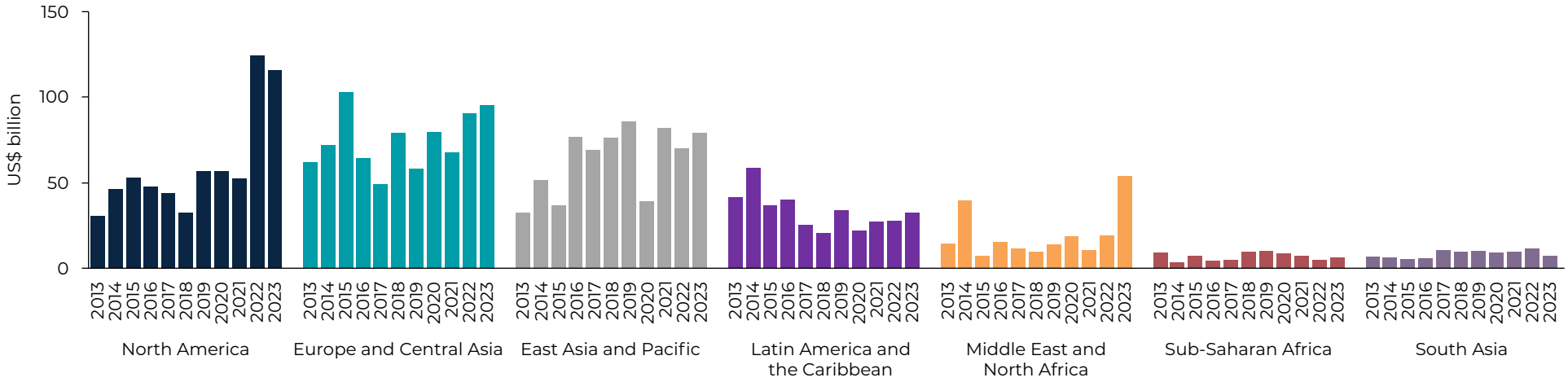
- 2023 saw an increase in private investment in infrastructure projects in primary markets across all regions, except in South Asia and North America (NA), with the latter region maintaining similar levels to 2022.
- The increase in investment in infrastructure projects was largely driven by growth in East Asia and Pacific (EAP), and the Middle East and North Africa (MENA). The MENA region alone accounted for more than three-quarters of this growth, increasing by almost threefold in 2023.
- For a second year in a row, private investment in infrastructure projects has remained particularly strong in NA. This was underpinned by the successful financial closure of large-scale renewable project SunZia Wind Farm and Transmission Line.
- Europe and Central Asia (ECA), and Latin America and the Caribbean (LAC) recorded modest growth in 2023, increasing by 6 percent and 16 percent, respectively. Private infrastructure investment grew by 33 percent in Sub-Saharan Africa (SSA), albeit from a low baseline.



Detailed analysis and project data for primary market investment in emerging economies is available in the World Bank PPI database and report.

ppi.worldbank.org/en/ppi

Private investment in infrastructure projects in primary markets by region
(US$ billion, all countries)

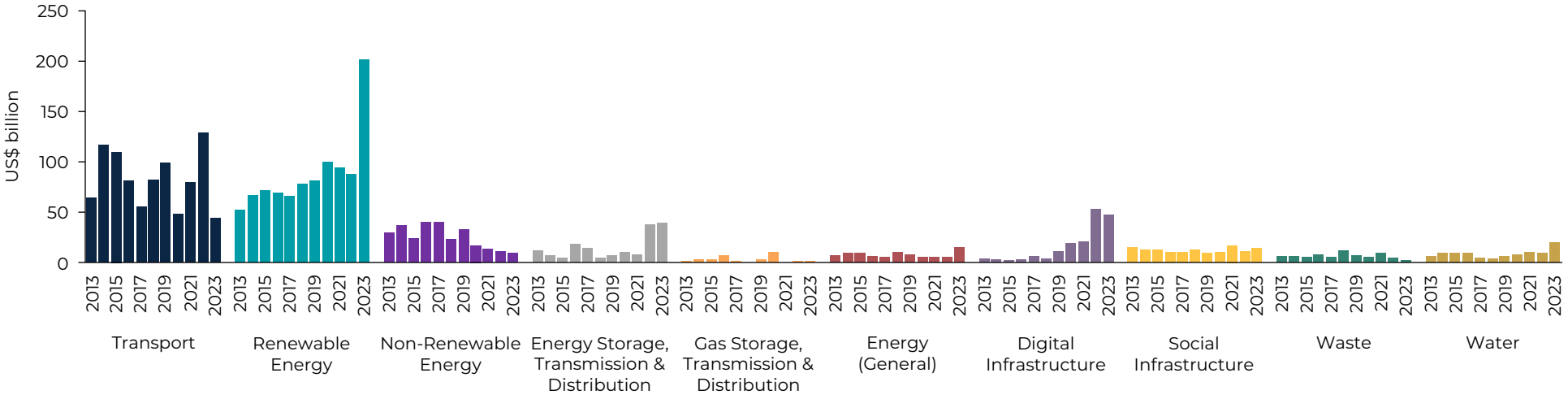


Source: Authors' analysis based on Realfin data.

Global infrastructure private investment continues to be dominated by renewables and transport, while digital infrastructure and energy transmission & storage had record growth over the last three years.

- Transport and renewable energy continue to dominate private investment in infrastructure projects, with both sectors combined accounting for almost two-thirds of investment on average since 2013.
- Although investment in transport overtook renewables in 2022, renewables has reclaimed its lead position and skyrocketed to more than double in 2023. This was accompanied by a drastic decline in transport investment, which fell by almost two-thirds, experiencing an all-time low since data collection commenced. Notably, SSA was the only region to lower its level of renewables investment in this period. Encouragingly, private investment in non-renewables is on its fourth consecutive year of decline and fell further by 19 percent in 2023.
- Having experienced continuous growth for the last 5 years, and a considerable boost in 2022 underpinned by activity in North America, digital infrastructure has sustained its growth in 2023. The region alone contributes to 50 percent of digital private investment.
- As observed in past years, social infrastructure, waste, and water attract the lowest levels of private investment.

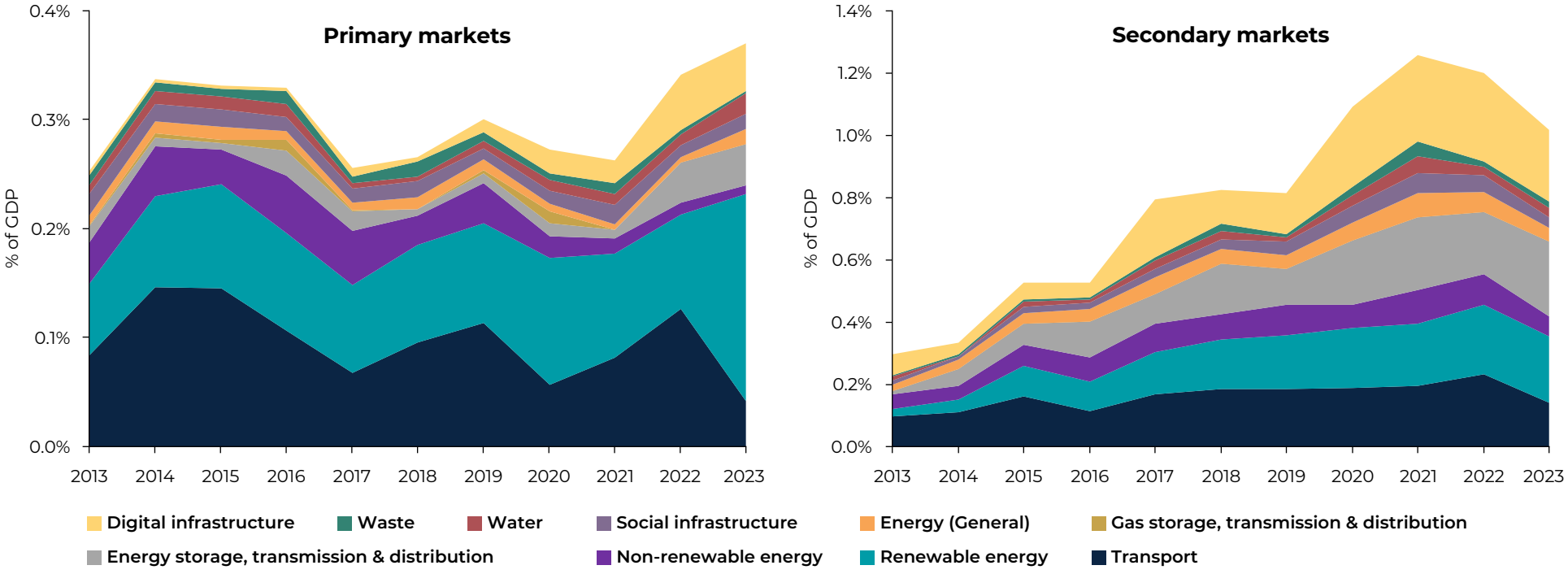
Private investment in infrastructure projects in primary markets by sector
(US$ billion, all countries)



Source: Authors' analysis based on Realfin data.

As a proportion of GDP, private infrastructure investment in primary markets has recovered post-pandemic. As digital connectivity accelerates worldwide, digital infrastructure emerges as a top performing sector in both primary and secondary markets.

Private investment in infrastructure projects in primary and secondary markets by sector
(% of GDP, all countries)

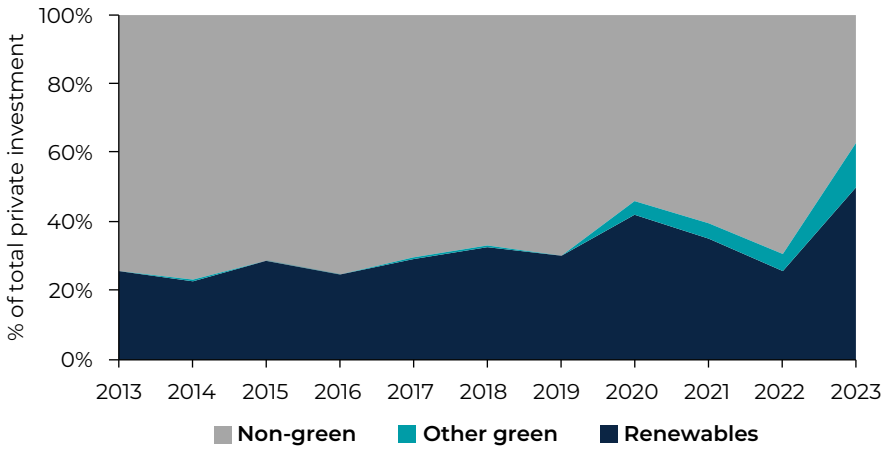


Source: Authors' analysis based on Realfin data.

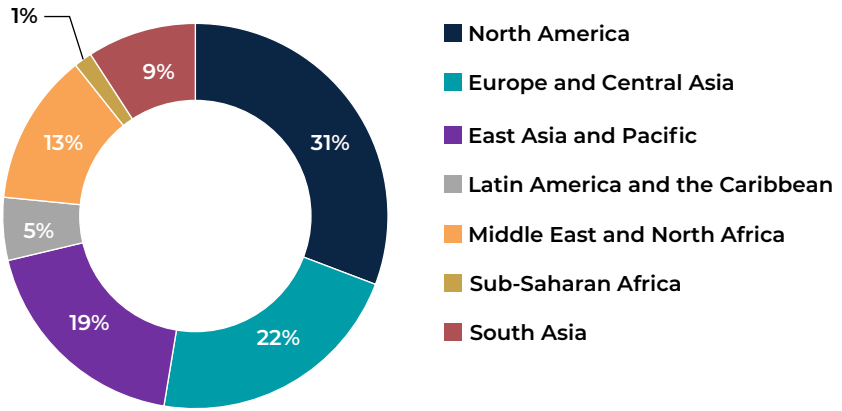
In 2023, more than half of private investment in infrastructure projects was green investment* – mostly renewables but also incorporating other sectors.

- Green investment encompasses investment in renewables, and other infrastructure projects for which green or sustainability-linked financing instruments have been used. In line with the transition towards net zero, green private investment has been rising for the past 10 years. The share of green investment has also increased over time, with the exception of a dip experienced during the pandemic. In 2023, green investment rose significantly by 131 percent to an all-time high, accounting for 62 percent of total private investment.
- While green investment is comprised mostly of renewable energy generation projects, there was considerable green growth in sectors outside of renewables ('other green'), particularly digital infrastructure. Investment in 'other green' projects has noticeably grown in the past four years, occupying an increasingly larger share in total investment (13 percent in 2023) – signaling that other infrastructure sectors are scaling up the transition of their infrastructure.
- Overall, HICs represent 74 percent of green investment in infrastructure, although they also represent the majority (63 percent) of non-green investment.
- On a regional basis, NA and ECA had the greatest share of total green investment in 2023, at 31 percent and 22 percent, respectively. However, the NA region's share has decreased by more than 10 percentage points since 2022 (when the region accounted for 43 percent of green investment), making way for growth in other regions such as EAP and MENA.

Green and non-green private investment in infrastructure projects in primary markets
(% of total private investment, all countries)



Green private investment in infrastructure projects in primary markets by region
(% of total green investment, all countries, 2023)

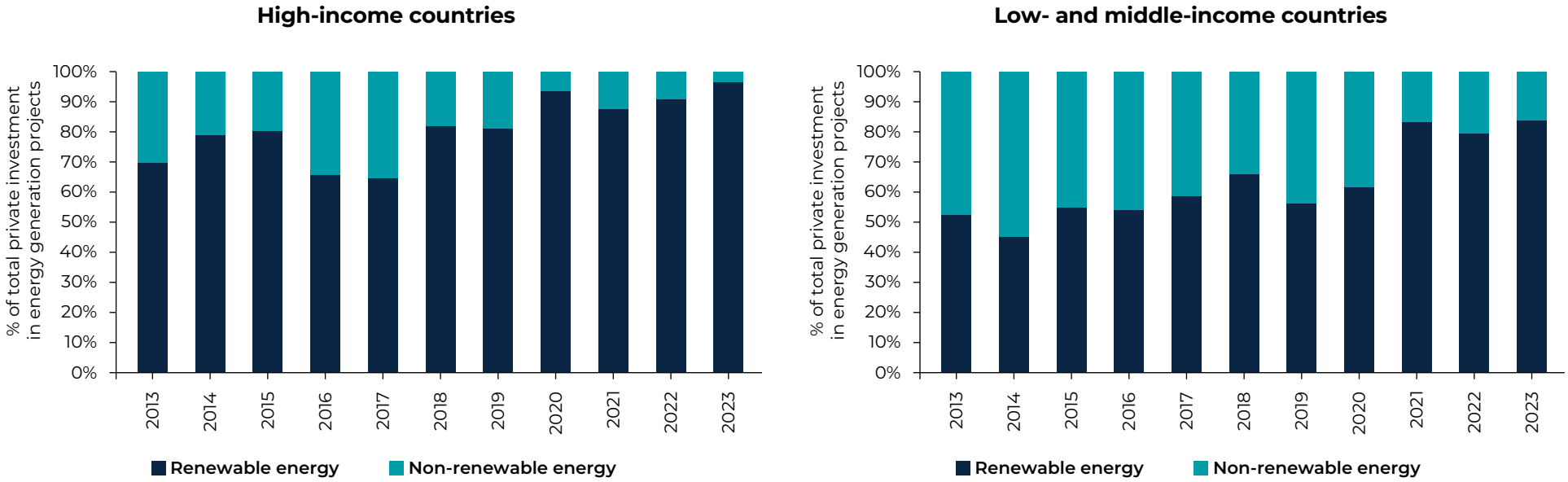


Source: Authors' analysis based on Realfin data.
*Other green includes projects for which green or sustainability-linked financing instruments were used.

The share of renewables within energy generation continues to increase significantly.

- In 2023, renewables represent 96 percent and 84 percent of private investment in energy generation projects, for HICs, and LMICs, respectively. Globally, this is equivalent to 93 percent of all private investment in energy generation being clean energy.
- The trend away from non-renewables has continued, with renewables investment almost quintupling for HICs since 2013, when renewables represented 70 percent of energy generation.
- Promisingly, LMICs continue to catch up, with renewables investment having grown by almost 250 percent since 2013, when renewables represented just more than half of energy generation investment (53 percent).
- As a proportion of GDP, HICs and LMICs are investing comparably in renewable energy projects, at 0.23 percent and 0.16 percent of GDP. For LMICs, this is more than double the level invested in 2022.

Private investment in renewable and non-renewable energy generation projects in primary markets by income group
(% of total energy generation private investment, HICs and LMICs)

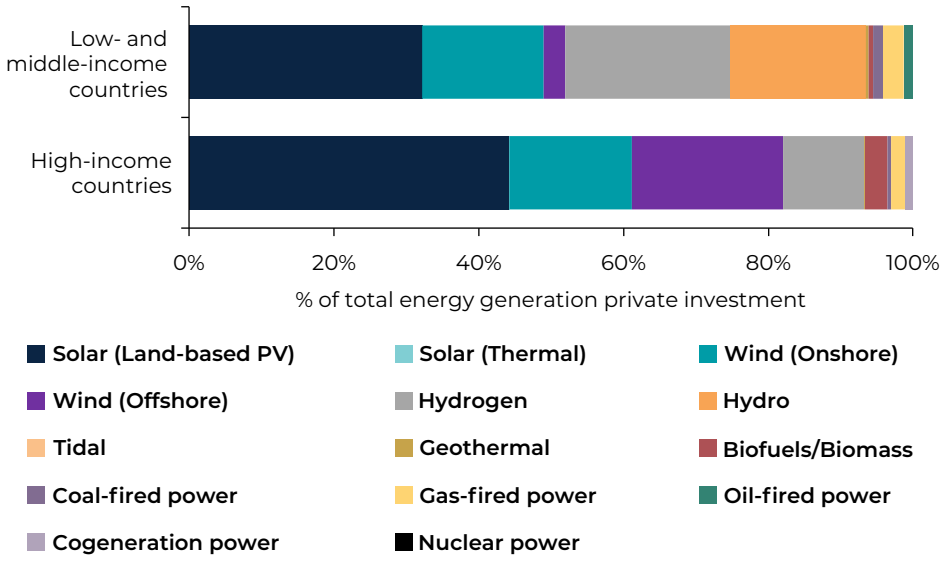


Source: Authors' analysis based on Realfin data.

Hydrogen projects boomed in 2023, although more established technologies such as solar and wind are still the most prevalent.

- In 2023, more than three-quarters of all private investment in energy generation is concentrated in solar and wind (42 percent and 34 percent of total energy generation investment, respectively). However, in the last 3 years, solar has replaced wind as the renewable with the largest share of investment, likely due to the falling cost of solar technology.
- LMICs have a notably higher share of energy generation investment in renewables such as hydrogen and hydropower. However, they also have a larger share of fossil fuel generation such as coal, gas and oil.

Private investment in energy generation projects in primary markets by income group and subsector
(% of total energy generation private investment, HICs and LMICs, 2023)



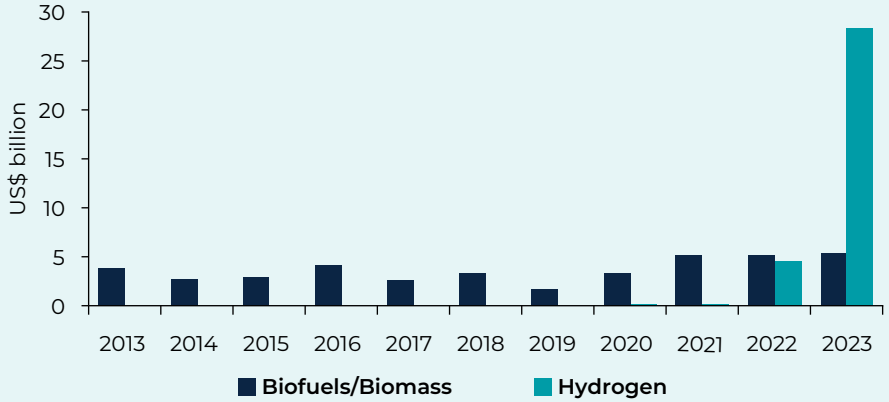
Source: Authors' analysis based on Realfin data.

Fuel production

Private investment in hydrogen projects jumped exponentially in 2023 (growing by over sixfold) representing 14 percent of total energy generation investment. This boom was driven by projects in EAP and MENA, regions which had previously only invested modestly (or not at all, in the case of MENA) in hydrogen. More than a third of hydrogen investment (35 percent) is from LMICs .

In contrast, investment in alternative fuels such as biofuels and biomass have been rising steadily over time, making up for 3 percent of total energy generation investment, mostly from the EAP region.

Private investment in alternative fuel projects in primary markets
(US$ billion, all countries)

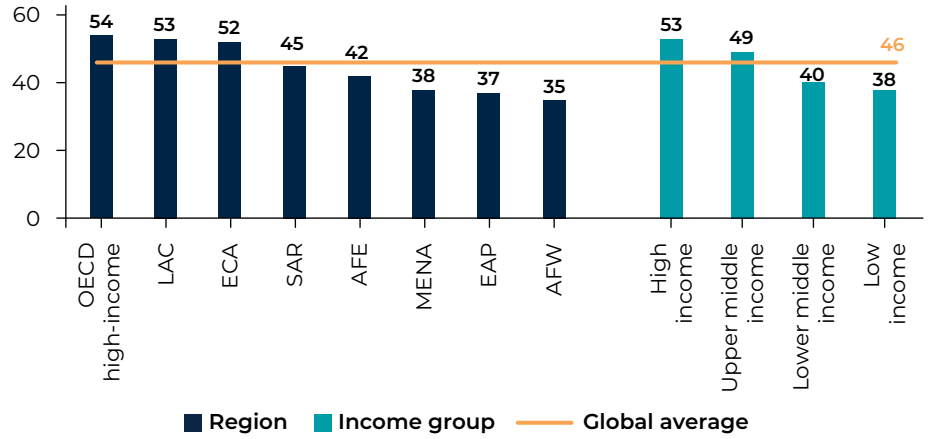


Progress in improving the enabling environment has been steady but project preparation remains the area with more room for improvement.

Appropriate and effective regulatory frameworks and institutional capacity remain crucial for ensuring that investments in infrastructure are made strategically and efficiently. A supportive regulatory framework also reduces the costs and risks of carrying out individual projects. It provides the private sector and foreign investors with a more predictable, stable, and safe environment to invest in infrastructure, which is particularly relevant for emerging markets and developing economies.

The World Bank Benchmarking Infrastructure Development provides insights into the regulatory quality of preparing, procuring, and managing PPP infrastructure projects in 140 economies. Based on this data, countries have significantly strengthened their PPP regulatory frameworks, with 60 economies passing reforms between June 2019 and June 2022. Most changes have been seen in the MENA region. As such, PPP preparation remains an area with further room for improvement.

Preparation of PPPs by region and income group
(Average score 1-100, N=140)



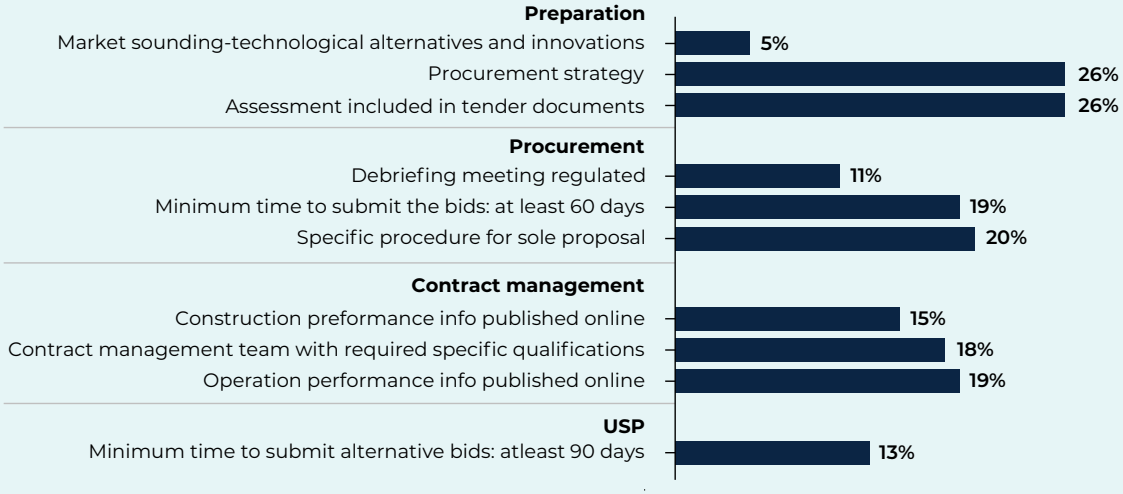
Source: *Benchmarking Infrastructure Development (BID), 2024.*

Public-Private Partnerships Data

Detailed data (including 100+ indicators) on enabling environment by country is available on the Benchmarking Infrastructure Development online tool and report.



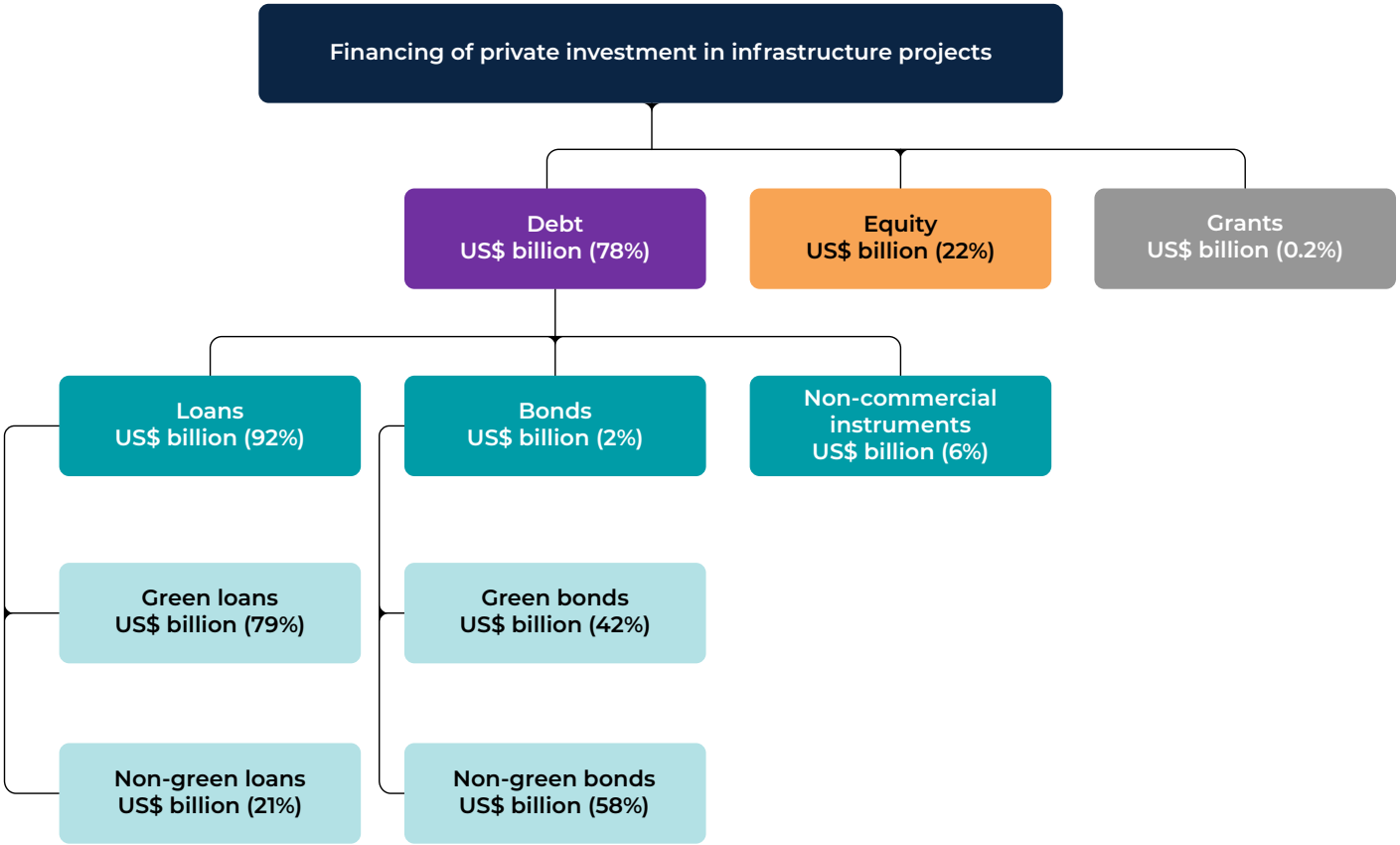
Lowest adoption of good international practices by score area (%, N=140)



Source: *Benchmarking Infrastructure Development (BID), 2024.*

Private investment in infrastructure projects continues to be primarily debt-financed.

Financing of private investment in infrastructure projects in primary markets by financing instrument
(US$ billion and % of total private investment, all countries, 2023)



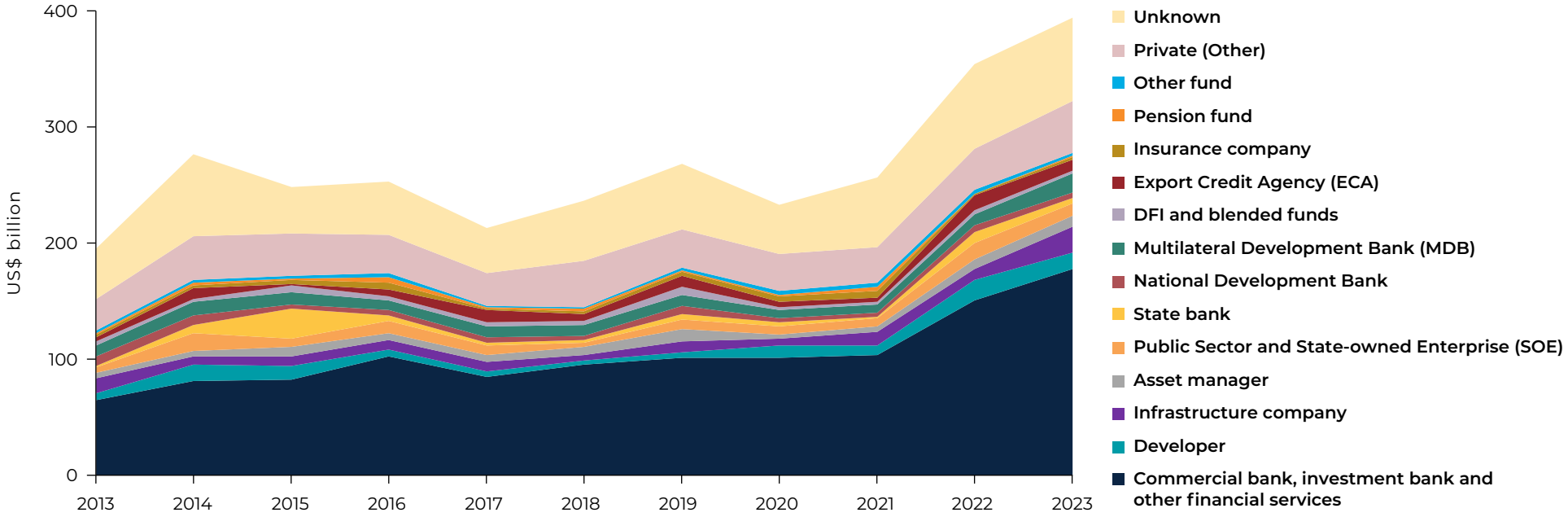
- In 2023, debt remains the lead financing instrument for infrastructure projects in primary markets (78 percent debt), a proportion which has remained largely unchanged since data collection began. Within debt financing, the use of loans remains dominant.
- The amount of debt provided by financiers in 2023 increased by 12 percent. In comparison, the amount of equity provided by financiers in 2023 increased by 22 percent.

Source: Authors' analysis based on Realfin data.
Note: Includes only transactions for which instrument details are available. In this analysis, sustainability-linked and blue bonds are included in the green bonds category.

Over the past 10 years, commercial banks have steadily ramped up their roles as financiers, having provided almost half of the financing for private infrastructure investment since 2020.

- Financial service institutions – mostly commercial banks – continue to finance the majority of private investment in infrastructure projects in primary markets, across all income groups. In 2023, they accounted for 45 percent of total private investment, a share which has been gradually rising since 2013 (when they provided only 33 percent of financing). As a result, other financier types have experienced a marginal decline in their share of total financing over the past decade.
- The public sector, together with SOEs and state banks, contributed 4 percent of total financing in 2023 – a 3 percent decrease from 2022. Understandably, governments of HICs have greater capacity to invest, something that is also reflected in the data at the national, sub-national and local levels.

Financing of private investment in infrastructure projects in primary markets by financier type
(US$ billion, all countries)

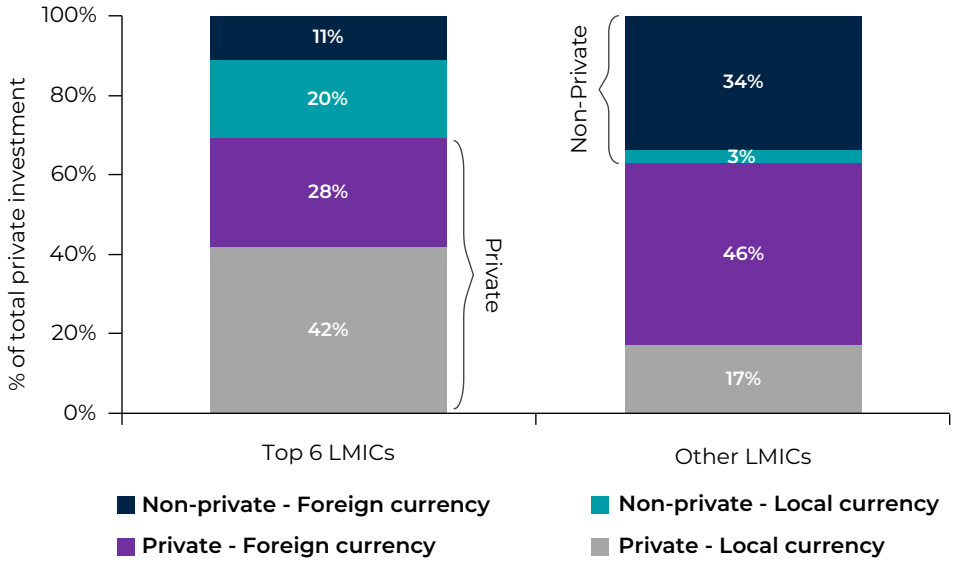


Source: Authors' analysis based on Realfin data.
Note: Includes only transactions for which financier details are available. Financier type data was only available for 80 percent of total private investment from 2013-2023.

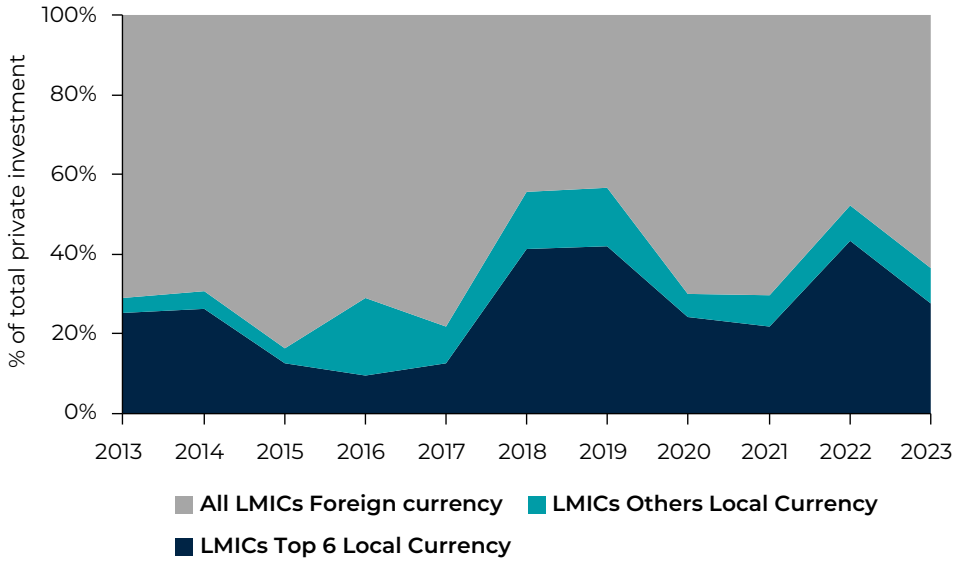
Local currency financing represents only a third of financing in LMICs and is mainly limited to large markets which are increasingly occupying a larger share.

- Local currency financing can protect against foreign exchange volatility, strengthen local markets, and attract local investors. In 2023 in LMICs, 37% of financing for private investment in infrastructure projects in primary markets is local currency financing — a 16 percentage point decrease from 2022 when more than half of financing was conducted in local currency and slightly below the 2019-2023 average of 43%.
- In 2023, approximately 75% of local currency financing occurred in the top 6 LMIC markets. The top 6 LMICs have a much greater proportion of local financing when measured up against other LMICs, from both private and non-private financing sources — 61% of investment in the 2019-2023 period, compared to 21%. Other LMICs rely more heavily on financing from non-private sources, with 37% of their total investment coming from financiers like development institutions, who tend to provide finance in foreign currencies.

Local currency financing of private investment in infrastructure projects in primary markets by financier source
(% of total private investment, 2019-2023 average, LMICs)



Local currency financing of private investment in infrastructure projects in primary markets
(% of total private investment, LMICs)

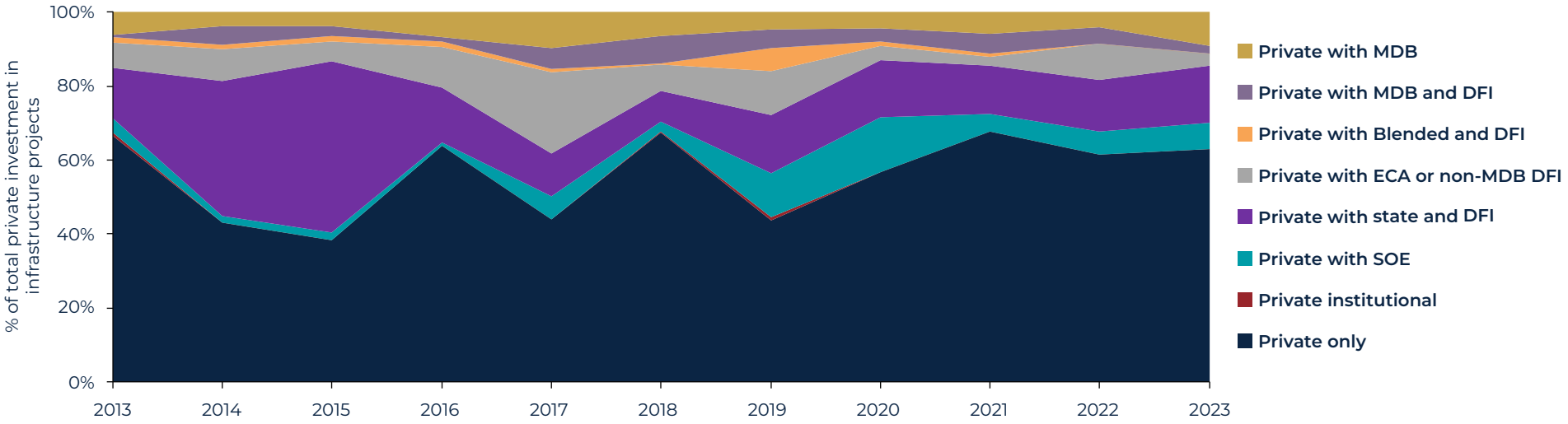


Source: Authors' analysis based on Realfin data.
Note: Includes only transactions for which transaction currency and financier details are available. Currency data was only available for 64 percent of private investment in LMICs - with 75 percent of the financier types known within these. The top 6 LMICs are Brazil, China, India, Indonesia, Mexico and Turkiye.

In emerging markets, development institutions continue to play a pivotal role in mobilizing private capital, by co-financing infrastructure projects alongside other private investors.

- An infrastructure deal or transaction often draws financing from multiple sources, with a mix of financiers and financier types coming together to finance a single infrastructure project.
- In 2023, whilst 63 percent of total private investment was solely financed by private investors in primary markets in LMICs , much of the remaining investment was underpinned by development institutions such as MDBs and DFIs. Development institutions formed part of the financier mix for 30 percent of total private investment, that is, they provided co-financing, in addition to other private investors. However, directly, development institutions only provided financing for 10 percent of total private investment in LMICs, highlighting their degree of involvement and pivotal role in mobilizing private capital into infrastructure markets, particularly in LMICs.
- SOEs also formed part of the financier mix for 7 percent of total private investment in LMICs. Most notably, their involvement was heightened during the pandemic period, peaking in 2020.

Financing of private investment in infrastructure projects in primary markets by financier mix
(% of total private investment in infrastructure projects, LMICs)



Source: Authors' analysis based on Realfin data.
Note: Includes only transactions for which financier details are available. Financier type data was only available for 80 percent of total private investment from 2013-2023. 'Development institutions' for the purpose of this analysis includes MDBs, DFIs, and blended DFIs.



Infrastructure funds

OVERVIEW

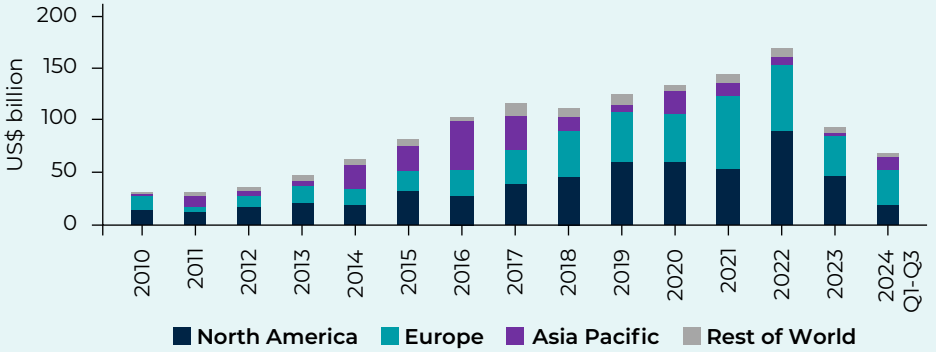
Trends in new capital raising

Annual capital raised by private infrastructure funds increased from US$31.9 billion in 2010 to US$172.4 billion in 2022. An unprecedented decline occurred in 2023 when the annual capital raised was US$94.9 billion, almost half of the 2022 level. Investor surveys note rising interest rates were the leading driver of this decline. In 2024, the fundraising remained subdued with US$70.5 billion raised by Q3 2024. North America and Europe dominate, capturing 82 percent of capital raised during 2020-2024, driven by energy/climate transition initiatives and investor preference for stable markets. Asia-Pacific, especially India, attracts private financing in emerging markets.

Globally, the value of infrastructure assets being managed by private funds increased from US$180 billion in 2010 to nearly US$1400 billion in Q1 2024. Dry powder, that is, available but not yet invested capital, was almost consistently increasing since 2010 from US$68 billion to US$374 billion in 2023. However, dry power as a share of the total value of infrastructure assets under management abruptly declined from around 40 percent during 2010-2017 to around 34 percent during 2018-2020, influenced by reduced fundraising and increased infrastructure investments in developed markets.

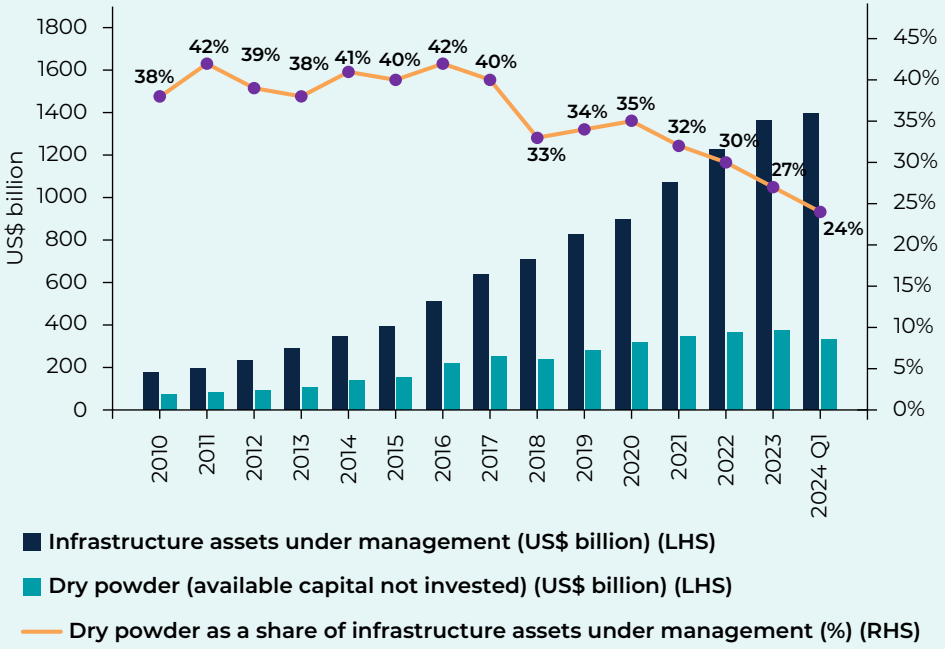
Since the Covid-19 pandemic in 2020, there has been a secular decline in this dry powder share, which reached its lowest level of 24% in 2024Q1.

Annual capital raised by funds for the infrastructure asset class by region, 2010-2024



Source: Preqin (2025).

Value of infrastructure assets managed by funds, 2010-2024



Source: Preqin (2025).

OVERVIEW

Driving factors for investors

- Private investors choose infrastructure for portfolio diversification and risk reduction, favoring lower-risk strategies. Higher-risk strategies do not necessarily yield higher returns.
- Geopolitical conflicts and rising interest rates are key challenges for generating returns. Rising interest rates are expected to reduce returns for most funds except private debt funds.
- Renewable energy dominates private infrastructure fund investments, increasing its share in energy capital raised from 20 percent in 2010 to 80 percent in 2023. For ESG metrics, private infrastructure funds have more stringent reporting requirements than other funds.

Blended and preparation funds

- Blended finance funds: Nearly 90 percent of the blended finance infrastructure funds had a climate focus with more than half of the funds specifically focusing on renewable energy.
- Project preparation funds: These are positively associated with increasing private capital mobilization. Challenges include scale, limited resources, increased costs due to new sustainability and technology requirements, and high coordination costs.

Risk-return profile of private infrastructure funds launched during 2010-2020 by risk strategy

Risk strategy (low to high)	Median net Internal Rate of Return (IRR) (%) (1)	Standard deviation of IRRs (%) (2)	Ratio (1) / (2)
Debt	8%	7%	1.13
Core	12%	10%	1.19
Core-Plus	10%	13%	0.76
Value added	12%	15%	0.77
Opportunistic	8%	15%	0.56

Source: Preqin (2024b).

Definitions

In infrastructure financing, funds are a popular instrument for pooling capital from different investors

In infrastructure financing, funds are becoming an increasingly popular investment product among both public and private investors. They are pooled investment vehicles that mobilize capital from public and private investors for a clearly defined purpose.

Infrastructure funds are used to channel public savings, a blend of public and private savings, and/or private savings to achieve scale to meet large financing needs of infrastructure projects, while offering due diligence and diversification to investors. They operate in a less stringent regulatory environment offering more flexibility in the use of capital.

For a comprehensive overview, the following types of infrastructure funds are assessed in this section:

Downstream (Profit-oriented)

Upstream (Project development)

Types	Scope
Private infrastructure funds	Funds in which private investors pool money to invest in infrastructure projects to achieve their risk-return targets
Blended finance infrastructure funds	Funds in which investors from public and private sectors pool money to partner and support infrastructure projects
Project preparation/ development funds	Funds created to identify and prepare a pipeline of infrastructure projects

In addition, strategic government-led infrastructure funds are initiated by public sector entities with material financial support and active oversight to meet policy priorities. Over time, these funds may leverage larger shares of private capital or transfer management to an independent public authority or a dedicated private manager (Divakaran,S; Halland,H; Lorenzato,; Rose,G; Sarmiento-S, Sebastian P [2022]).

What is a fund?

A fund is an investment product that accumulates savings from different investors and invests in opportunities that align with the purpose defined during its creation.

Benefits of funds for private investors:

- Due diligence and screening of investment opportunities
- Diversification of investment
- Achieve scale
- Less stringent regulatory environment

Trends in new capital raising

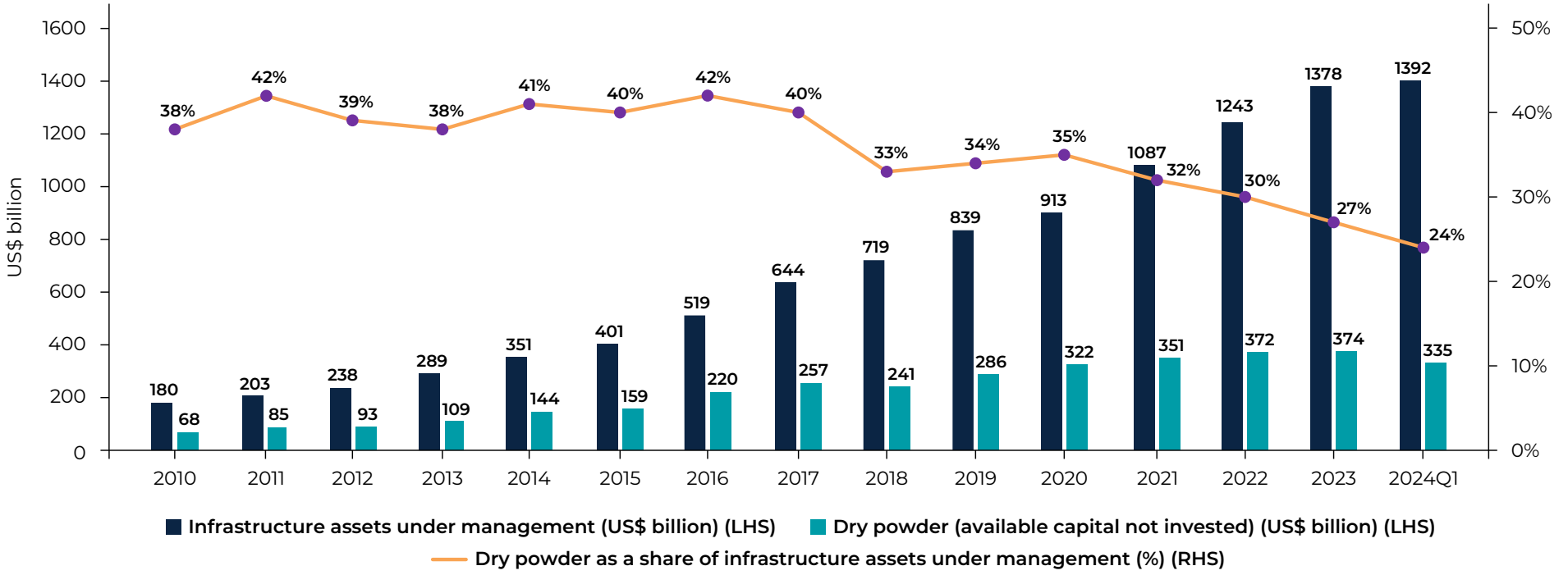


Dry powder (available but uninvested capital) had a secular declining trend in recent years, reaching its lowest level in 2024

Globally, the value of infrastructure assets being managed by private funds increased from US$180 billion in 2010 to nearly US$1400 billion in Q1 2024.

The total value of assets being managed includes dry powder i.e., available but not yet invested capital. The dry powder was almost consistently increasing since 2010 from US$ 68 billion to US$ 374 billion in 2023. However, dry power as a share of the total value of infrastructure assets under management abruptly declined from around 40% during 2010-2017 to around 34% during 2018-2020. Since the Covid-19 pandemic in 2020, there has been a secular decline in this dry powder share, which reached its lowest level of 24% in 2024Q1. This is partly due to the decline in annual fundraising levels and partly due to the renewed focus on infrastructure development in North America and Europe.

Value of infrastructure assets managed by funds, 2010-2024



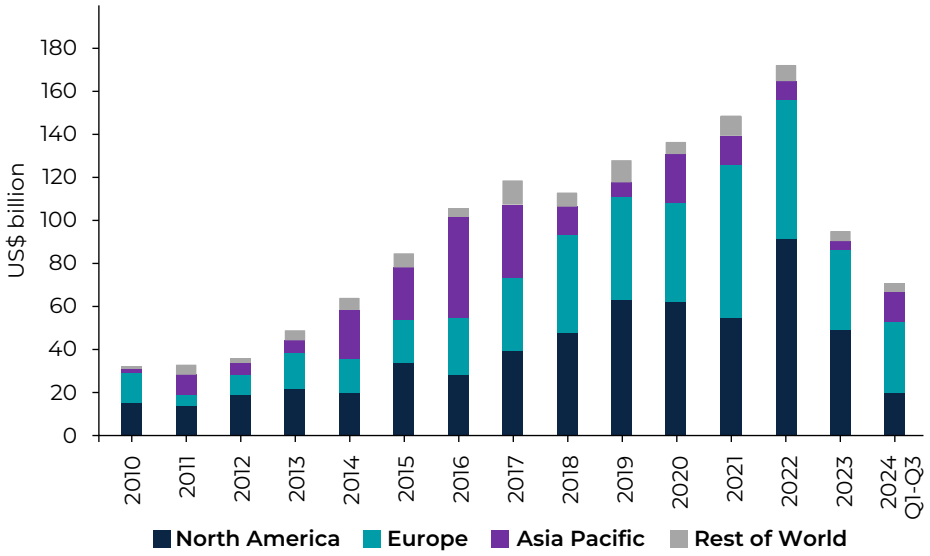
Source: Preqin (2025).

Annual capital raised by private infrastructure funds showed an increasing trend before falling sharply in 2023 and remained subdued in 2024. The dominant share of North America and Europe further increased.

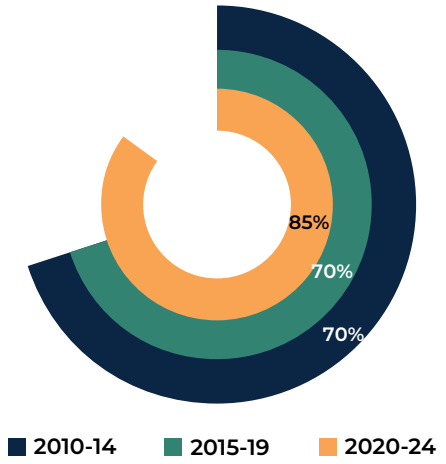
Annual capital raised by private infrastructure funds increased from US$31.9 billion in 2010 to US$172.4 billion in 2022. It increased consistently in most years during this time. An unprecedented decline occurred in 2023 when the annual capital raised was US$94.9 billion, almost half of the 2022 level. Investor surveys note that rising interest rates were the leading driver of this decline. In 2024, the fundraising remained subdued with US$70.5 billion raised by Q3 2024.

North America and Europe attract most of the private capital held by infrastructure funds, and their share has been increasing over time. During the polycrisis period of 2020-2024, the share increased to 85 percent from 70 percent during 2010-2019. The renewed emphasis on infrastructure development, particularly to accelerate energy/climate transition in developed markets, coupled with the preference of investors for these markets, especially during the uncertainty of the polycrisis period, drove this trend. In emerging markets, the Asia Pacific region attracts infrastructure financing from private infrastructure funds, especially in India (Preqin, 2024).

Annual capital raised by funds for the infrastructure asset class by region, 2010-2024 (US$ billion)



Share of North America and Europe in private capital raised through infrastructure funds (%)



Source: Preqin (2025).

Driving factors for funds investors



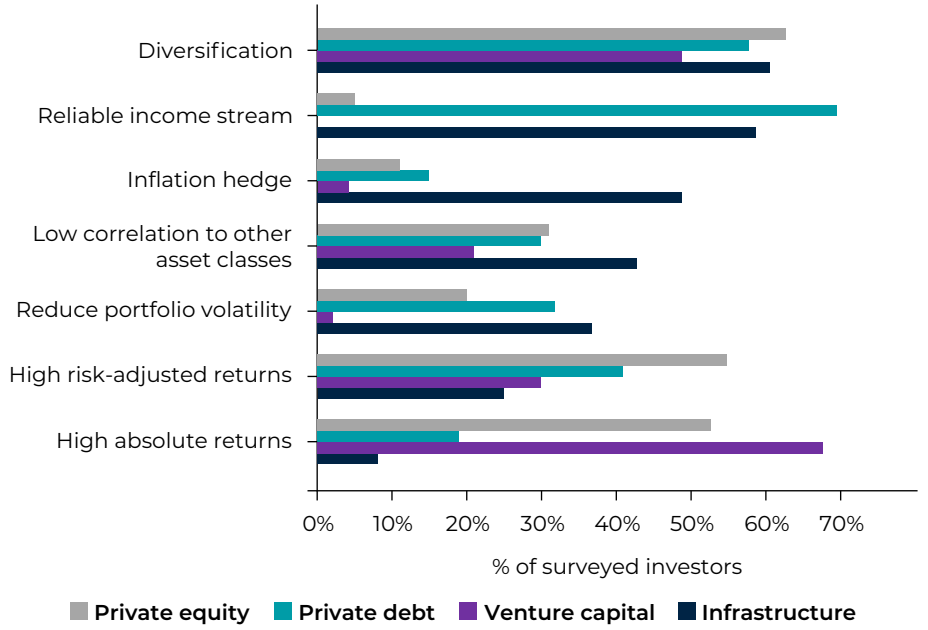
Private investors choose to invest in infrastructure as an asset class to diversify and reduce risk of their investment portfolio

Lower risk through more reliable income stream of the infrastructure asset class is its most attractive feature for private investors. The specific factors highly rated by private investors driving this feature are inflation hedge, low correlation to other asset classes, and usefulness in reducing overall investment portfolio volatility. All asset classes enable diversification of investment portfolio for private investors. Private investors allocate money to infrastructure funds to reduce the overall risk of their investments while diversifying their investment. An average global listed infrastructure equity provided higher dividend yield and lower volatility than an average global listed equity. Thus, the infrastructure asset class is more likely to attract risk-averse investors.

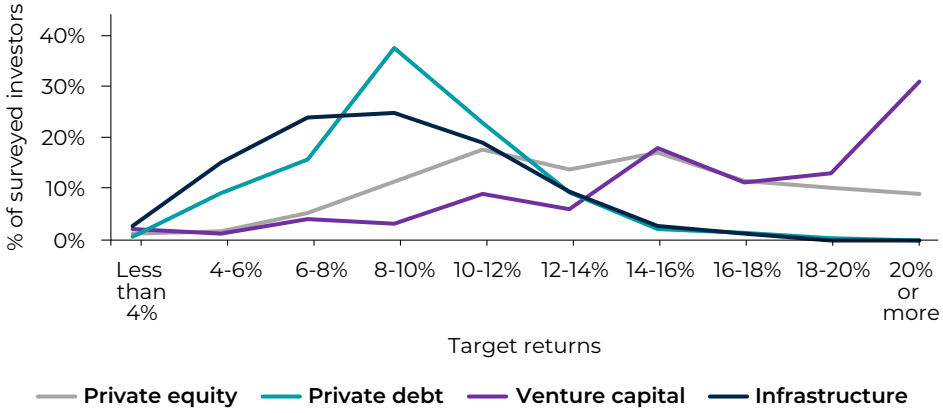
Private investors rate high returns or risk-adjusted returns as the least attractive feature of the infrastructure asset class. Private investors with high return targets go for venture capital or private equity, depending on their risk-taking appetite. Overall, private equity ranks the best for providing high risk-adjusted returns explaining its overall popularity and highest share in the total value of private capital managed by funds. While data showed that historical returns (over 25 years) were high for listed infrastructure equities, other listed equities provided higher return in the preceding decade, except during the last three years preceding October 2024.

An institutional investor survey revealed that the recent interest rate hikes have led to lower targets for return from infrastructure than even private debt (Preqin, 2024). While infrastructure operates in monopoly-like market structure that, in principle, can provide the highest profitability levels, social, political and regulatory factors keep a strong check on profitability levels through pricing regulation to enable lower prices for the essential infrastructure services. The recent high inflation and affordability crisis generated pressure for low prices, while higher interest rates increased financing costs, thereby reducing return targets.

Factors driving private investors by asset class
(% of surveyed investors)



Institutional investors: Target returns distribution by asset type (%)

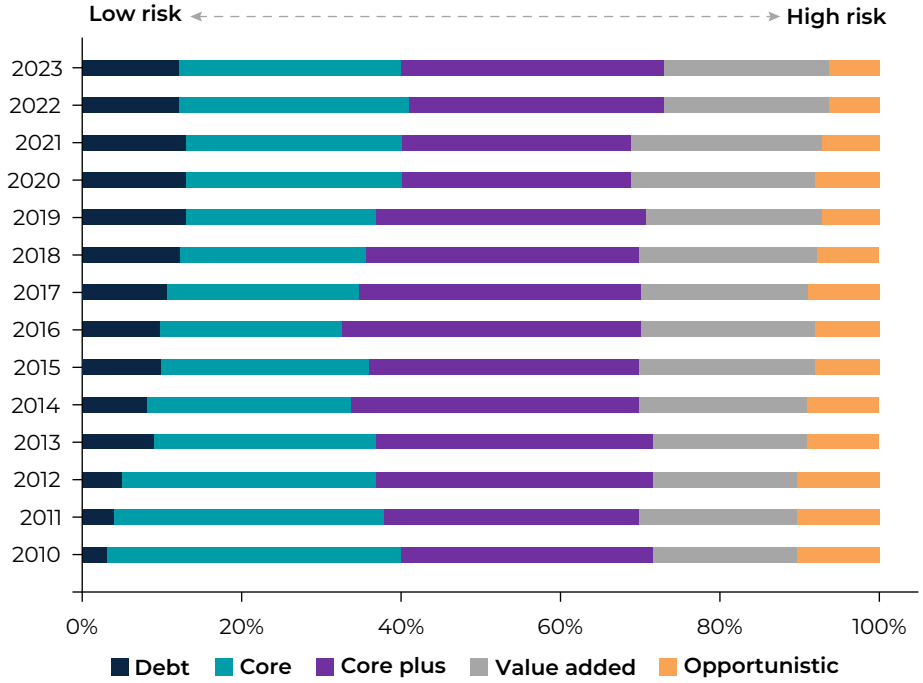


Source: Preqin (2024b, 2024c).
Note: Expectations vary by type of investor. Institutional investors may be more invested in infrastructure debt of developed markets for which returns declined.

Lower risk strategies are preferred by private infrastructure funds, higher risk strategies do not necessarily provide higher returns

Private infrastructure funds allocate most of their capital to investment strategies with lower risk. Over 60 percent of the capital was invested as equity targeting core and core plus strategies. Core strategies have no operational risk and core+ strategies are similar to core strategies, but are more correlated to economic cycle. While the share of debt strategy, the lowest risk strategy has grown from 3 percent in 2010 to 12 percent in 2023, the share of opportunistic strategy, the highest risk strategy focused on capital growth, has reduced from 10 percent in 2010 to 6 percent in 2023. The return earned by the funds does not grow if the fund adopts a higher risk investment strategy. In fact, the higher risk strategies had greater volatility in returns for similar or lower returns.

Value of infrastructure assets managed by funds by risk strategy
(% in total value)



Source: Preqin (2024b).

Risk-return profile of private infrastructure funds launched during 2010-2020 by risk strategy

Risk strategy (low to high)	Median net Internal Rate of Return (IRR) (%) (1)	Standard deviation of IRRs (%) (2)	Ratio (1) / (2)
Debt	8%	7%	1.13
Core	12%	10%	1.19
Core-Plus	10%	13%	0.76
Value added	12%	15%	0.77
Opportunistic	8%	15%	0.56

Source: Preqin (2024b).

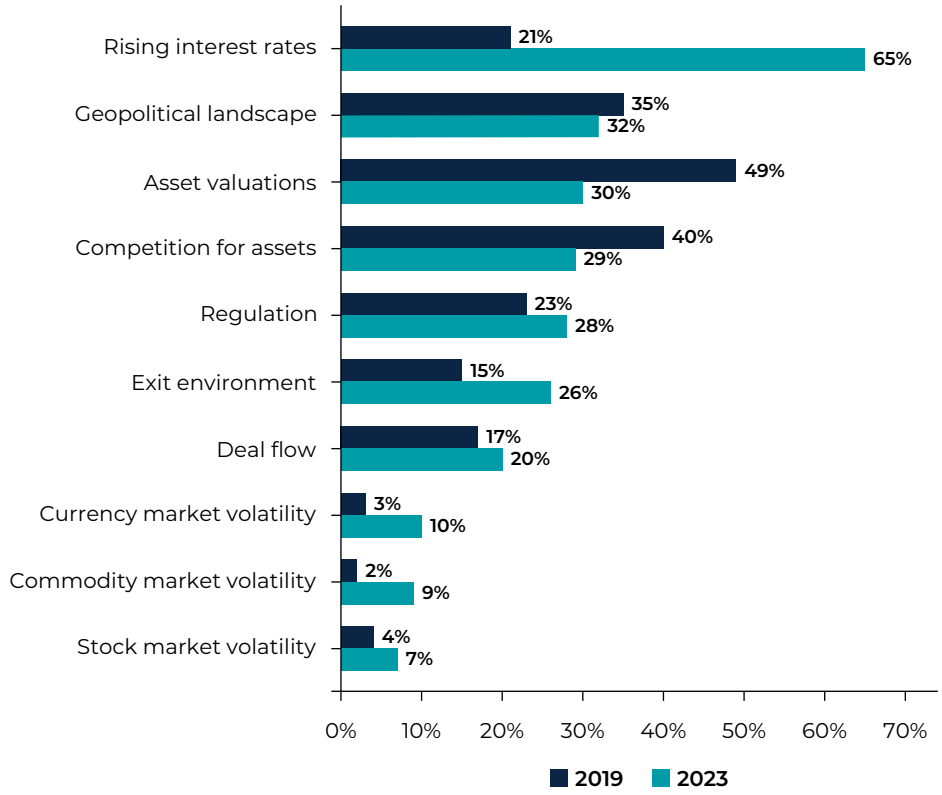
Rising interest rates and geopolitical conflicts are currently the top challenges for generating returns through infrastructure investment

Infrastructure projects have been financed through a large share of debt financing (60-80 percent), which helped in increasing returns during the low-interest rate environment. In 2023, rising interest rates was the top challenge in generating attractive returns through investment in infrastructure, selected by 65 percent of the investors surveyed by Preqin, up from being the fifth most concerning challenge in 2019. The other top five challenges in 2019 as well as 2023 were geopolitical landscapes, asset valuations, competition for assets, and regulation.

Rising geopolitical conflicts and policy uncertainty are increasing the demand for political risk guarantees while making them more expensive. The market structure and competition in infrastructure business, and revenue or pricing of infrastructure services depend on the rules chosen by sector and pricing regulations. As infrastructure assets are not frequently traded and its financial statements are not easy to constantly monitor, the accuracy and recency of infrastructure asset valuations are compromised. The competition for assets is a key challenge because some infrastructure assets are characterized by extremely low risk due to their critical nature, strong government support, revenue resilience and low transition risk.

With the high uncertainty in economic environment driven by inflation and price fluctuations, the challenges of exit environment, and volatility in currency, commodity and stock markets have also intensified.

Top challenges for return generation for the infrastructure asset class
(% of surveyed investors, 2019 and 2023)



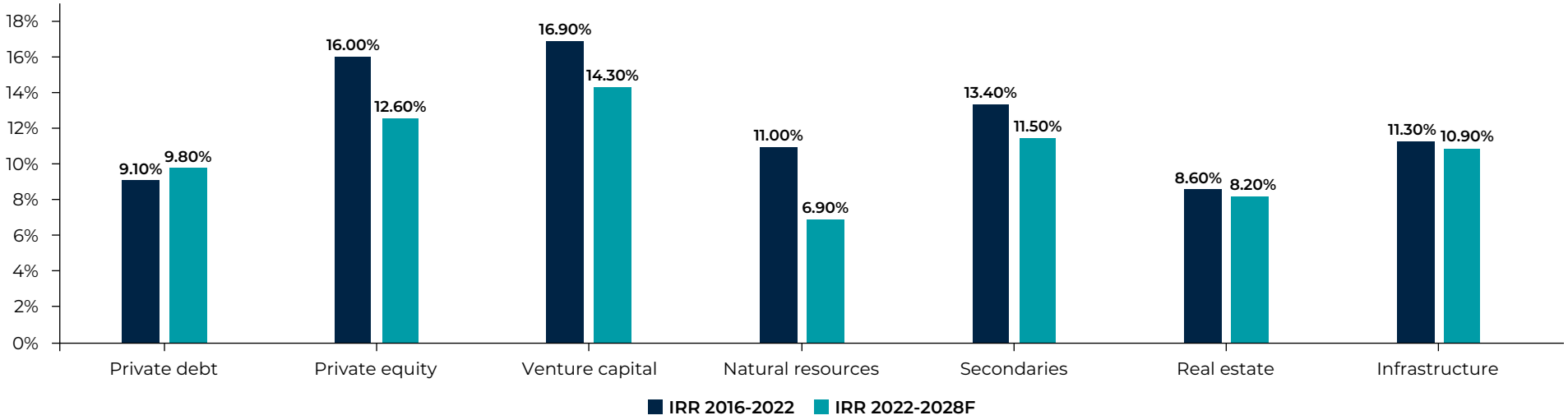
Source: Preqin (2024a).

High-interest rate regime is indeed expected to reduce returns earned by all types of funds except private debt funds. Infrastructure is relatively less impacted, but private equity and venture capital still provide more competitive returns.

Private investors dedicate their pooled savings through funds to different asset classes in view of the expected returns. In global funds' market, the funds targeting private equity held the largest share estimated at 30 percent in 2024. Venture capital grew the fastest at 17 percent. The infrastructure asset class also witnessed fast annual average growth rates in the value of private capital accumulated by funds at 16 percent compared to 11 percent growth across all asset classes during 2010-2024. The share of the infrastructure asset class in total value of private capital managed by funds increased from 4 percent in 2010 to an estimated 6 percent in 2024.

Funds targeting private equity and venture capital earned the highest returns during 2016-2022, which explains why private equity held the largest share in the total value of private capital managed by funds, and venture capital experienced the highest growth. Following the sharp interest rate hikes in 2022, returns are forecasted to fall for all asset class, except private debt, which is providing higher returns. Infrastructure is expected to experience relatively limited decline in returns during 2022-2028 compared to 2016-2022, that is, 11.3 percent to 10.9 percent, compared to private equity (16 percent to 12.6 percent) and venture capital (16.9 percent to 14.3 percent). It improves relative competitiveness of infrastructure in attracting private capital through funds. Notwithstanding, private equity and venture capital are still expected to provide higher returns to private investors than infrastructure.

Annual return (Internal Rate of Return (IRR)) earned by funds by asset class
(% 2016-2022 and 2022-2028F)



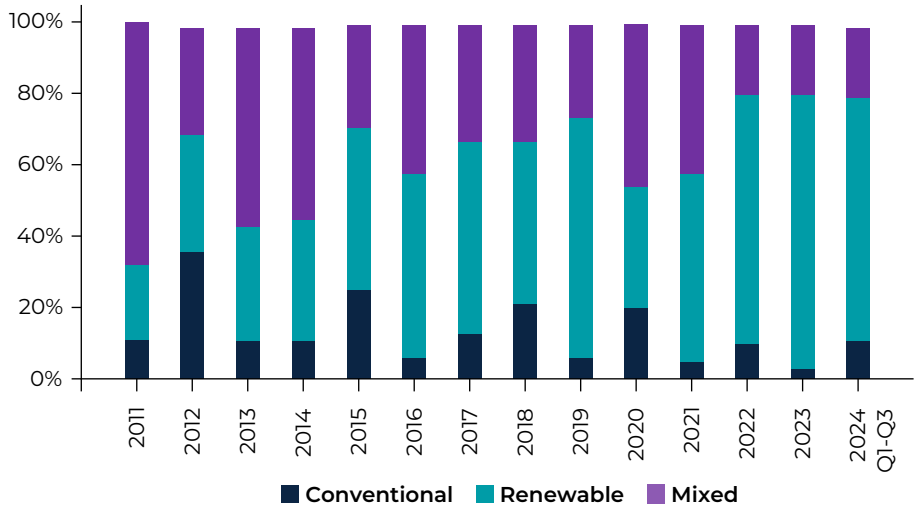
Source: Preqin (2024a).

Energy transition is driving the fundraising of private infrastructure funds

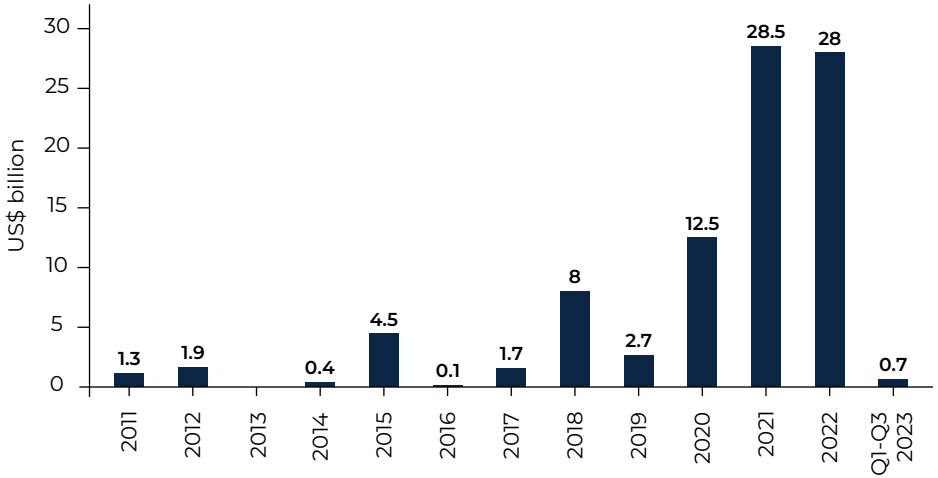
The share of renewable energy sector in the aggregate capital raised by private infrastructure funds for the energy sector increased from nearly 20 percent in 2010 to about 70 percent to 80 percent in recent years.

In 2020s, the exposure to energy storage saw a massive jump. The capital raised with exposure to energy storage in 2021 and 2022 was over US$28 billion, while it was mostly US$1-2 billion in the decade preceding 2020.

Aggregate capital raised by private infrastructure funds for the energy generation sector by subsector (%)



Aggregate capital raised by private infrastructure funds with exposure to energy storage
(US$ billion)



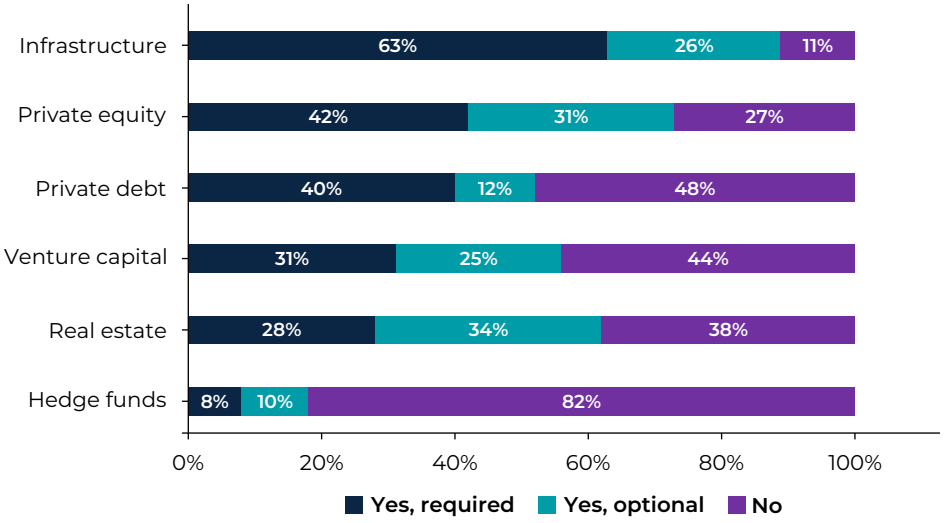
Source: Preqin (2025).

Private funds for infrastructure also have the strongest reporting requirements on ESG metrics

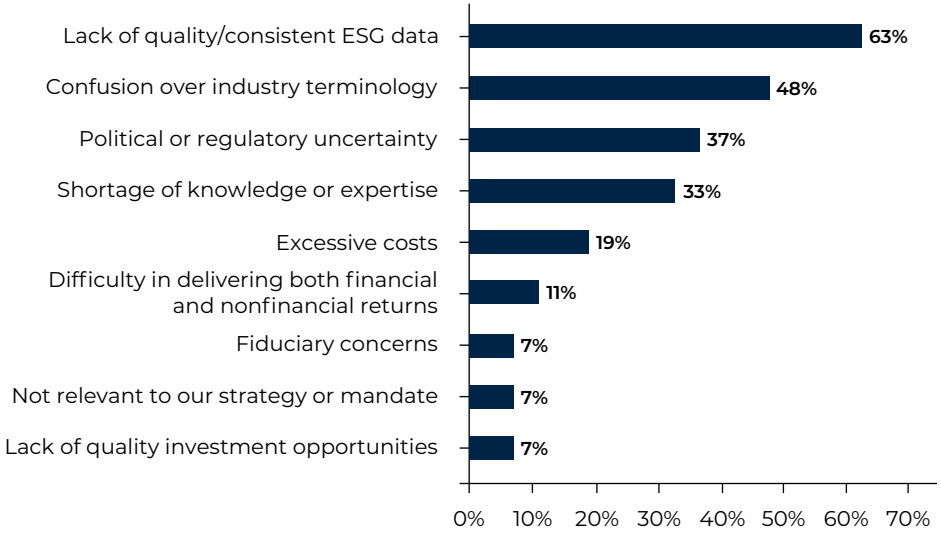
Among private funds, the funds with a mandate to invest in infrastructure are the most stringent in their ESG reporting requirements: 63 percent of private infrastructure funds require their portfolio companies to report on ESG metrics, compared to about 40 percent of private debt or equity funds, 30 percent of venture capital and real estate funds, and less than 10 percent of hedge funds.

Infrastructure fund managers note that the lack of quality/consistent ESG data and confusion over industry terminology are the most pertinent challenges in implementing ESG policy. Nearly one-third of the fund managers note that political or regulatory uncertainty and shortage of knowledge or expertise as a challenge. In contrast, only 19 percent of the managers identify excessive cost as the main challenge and only 11 percent identify difficulty in delivering both financing and non-financial returns as the main challenge.

ESG reporting requirements by type of private fund



Infrastructure funds: Main challenges in implementing ESG policy
(% of infrastructure fund managers)



Source: Preqin (2024b).

Primary driver of private capital investment in infrastructure over the next 10 years

Transitioning to decarbonized energy generation – 82 percent of the surveyed investors

Blended and preparation funds

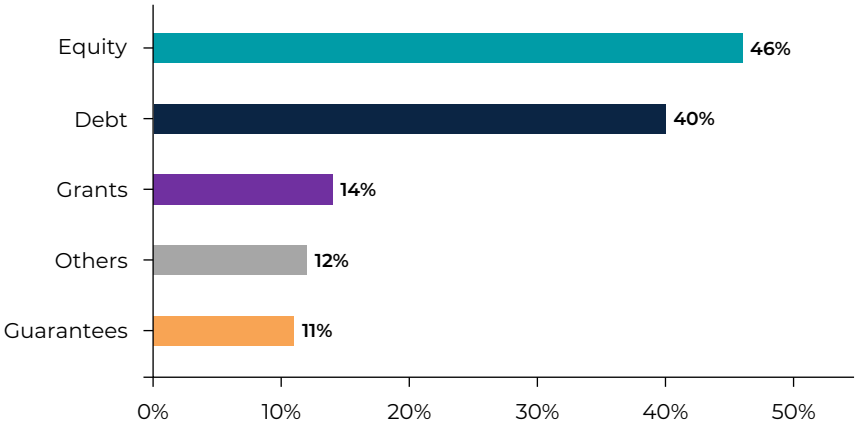


Most blended finance infrastructure funds provide debt or equity financing and focus on renewable energy and other climate-aligned infrastructure projects

Blended finance infrastructure funds mainly provide debt or equity financing for infrastructure projects. Of the blended finance infrastructure funds analyzed, 46 percent financed infrastructure projects through equity and 40 percent provided debt. Some are also providing grants (14 percent), guarantees (11 percent) or other non-traditional forms of financing (12 percent) including mezzanine, venture capital, government subsidy or capital markets development schemes.

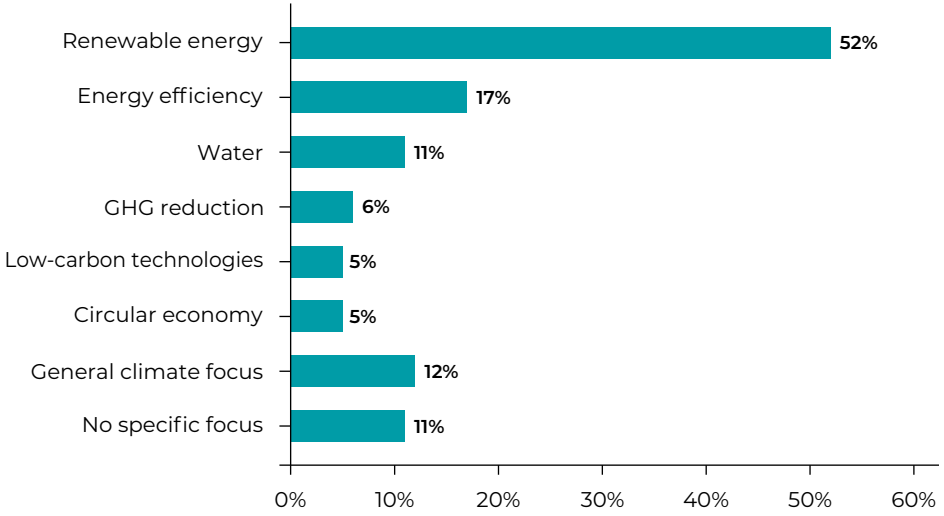
Nearly 90 percent of the blended finance infrastructure funds had a climate focus with more than half of the funds specifically focusing on renewable energy. Other specific priority focus areas are energy efficiency, water security or resilience, Green House Gas (GHG) emissions reduction, low-carbon technologies, and circular economy.

Blended finance infrastructure funds: type of finance offered
(% of funds)



Others include mezzanine, government schemes, capital markets development schemes, venture capital.

Blended finance infrastructure funds: focus areas
(% of funds)



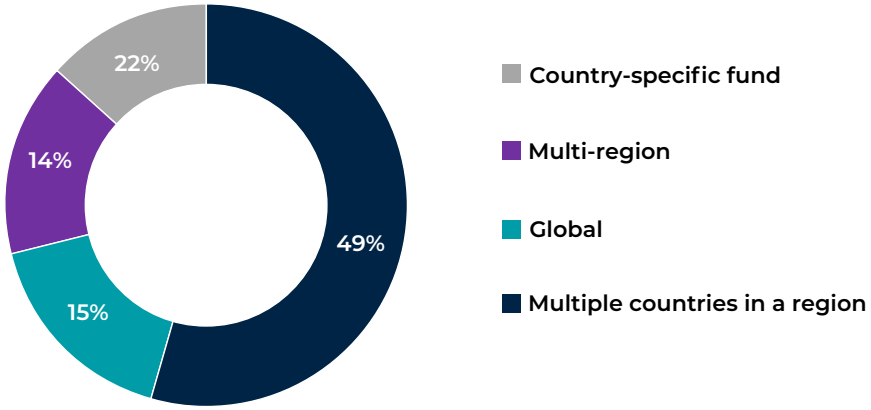
Source: Authors' analysis based on Convergence historical deals database.
Note: The analysis is based on 81 blended finance infrastructure funds/facilities for which data was available.

Creation of blended finance infrastructure funds calls for guarantees and heavily relies on debt especially in low-income countries. Funds targeting multiple countries rely more on equity financing

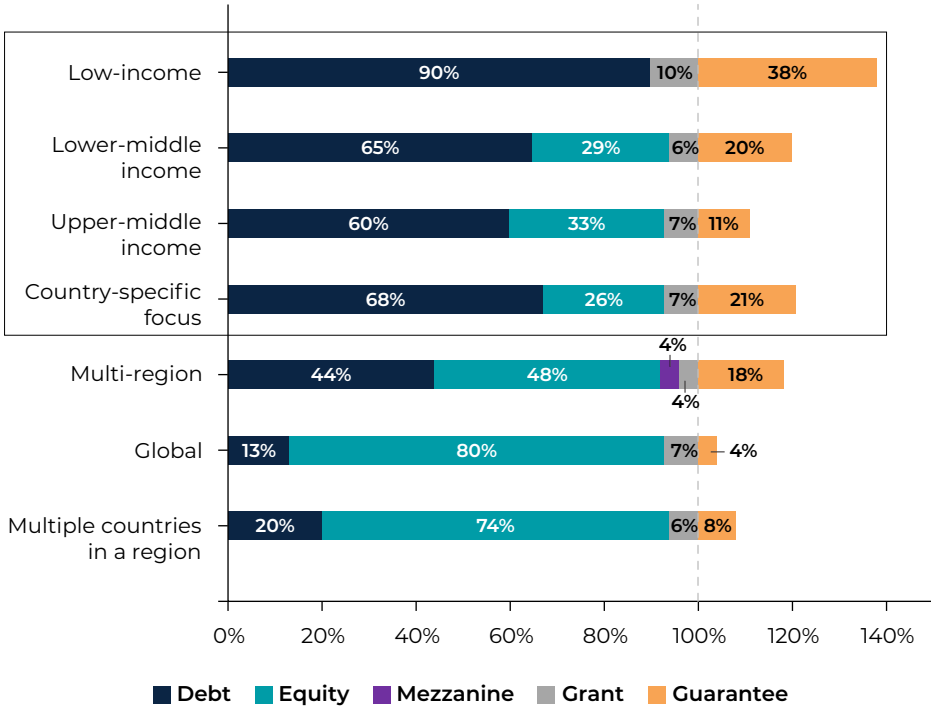
Blended finance infrastructure funds often target multiple countries, especially when pooling capital from international investors for infrastructure projects in Emerging Markets and Developing Economies (EMDEs).

While these global funds are mainly focused on providing equity, country-specific funds are formed through a higher share of debt. The share of debt and the need for guarantees are significantly higher for countries with lower income.

Blended finance infrastructure funds: Geographical focus
(% of funds)



Financing used for creation of blended finance infrastructure funds by financing type and geographical focus (% of total financing)

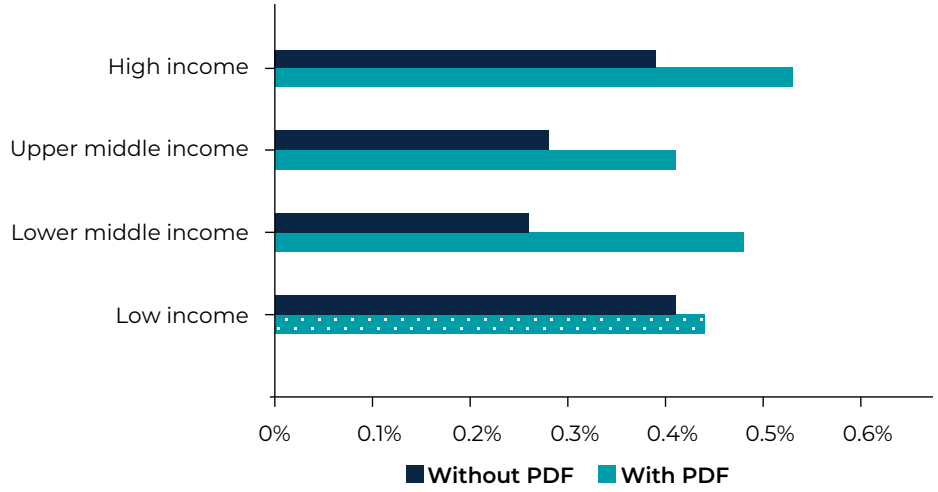


Source: Authors' analysis based on Convergence historical deals database.
Note: The analysis is based on 81 blended finance infrastructure funds/facilities for which data was available.

Project Development Funds (PDFs) can be critical to create pipelines

Recent Benchmarking Infrastructure Development data shows that the availability of Project Development Funds is positively associated with private capital mobilization. By country income groups, PDFs are less impactful in low-income countries where the pre-conditions for mobilizing private investment are not sufficient.

Private investment with and without Project Development Fund (PDF) (% of GDP, 2020-2022)



Source: World Bank (2024).
Note: The sample size for Low income and With PDF is too small to be representative.

Project Preparation Funds (PPFs) provide technical and financial support to develop a pipeline of infrastructure projects

Infrastructure project preparation costs up to 10 percent of the total project costs. Project preparation funds are created to provide technical and financial support. Majority of these funds provide support in the form of grants. Some funds also offer technical support for successfully completing different stages of the process.

The technical and financial resources are currently spread across these funds, thereby increasing coordination costs. Interviews with infrastructure project preparation facilities reveal that new requirements related to sustainability, regulation, inclusion and technology, among others, have increased the project preparation costs in recent years.

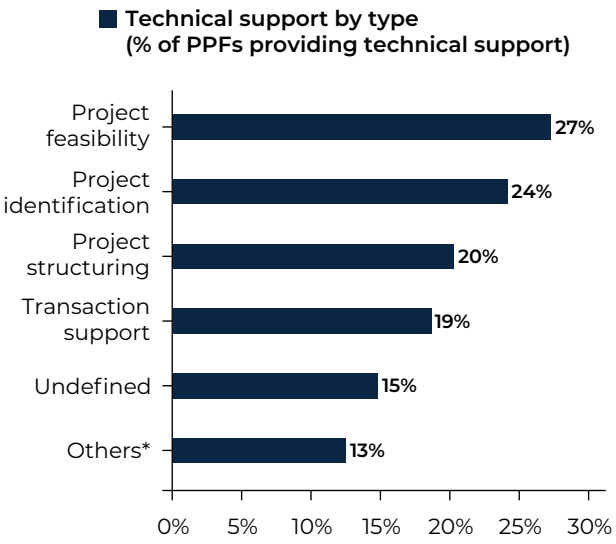
The limited technical and financial resources for project preparation translates into limited availability of bankable and investment-ready projects.

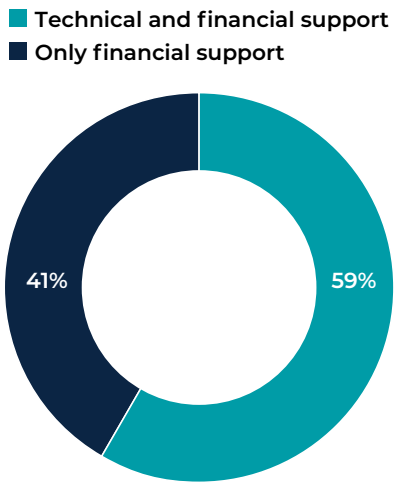
Project preparation costs can average up to 10 percent of the project cost
(% of total project cost)

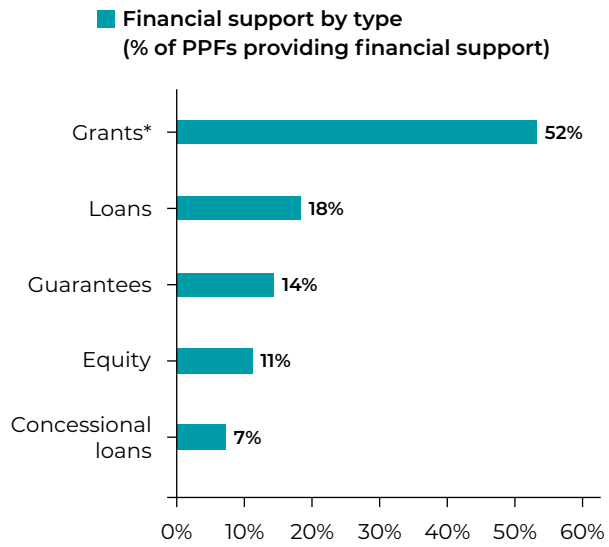


Source: PPIAF-GIH (2021).

Scope of PPF support for projectpreparation (% of total)







* Capacity building, networking arrangements, legal support.

* Very few grants include some contingencies.

Source: PPIAF-GI Hub calculations based on information published by the sample PPFs. | Note: Results add over 100% because PPFs provide more than one type of technical and financial support

Financial performance of infrastructure investment

Based on EDHECInfra, GEMs, FTW GLIO, Moody's, MSCI, and S&P data



Decoding investment drivers: Financial performance metrics

Chapter structure

This section dives deeper into the financial performance of investments in infrastructure to analyze attractiveness of the investments for private investors and present benchmarks for developing a bankable pipeline of infrastructure projects to mobilize private capital.

An in-depth analysis of the financial performance of infrastructure investment by type of financial product – debt and equity – is covered in this section:

- **Infrastructure equity performance** analyzes financial performance metrics for infrastructure equity investments in listed and unlisted equity markets based on leading market data and benchmarks published by EDHECInfra, Global Listed Infrastructure Organization (GLIO), and MSCI. The section includes a deep-dive on Listed Infrastructure Equities performance.
- **Infrastructure debt performance** analyzes financial performance metrics for infrastructure debt investments based on leading market data and benchmarks. In particular, the performance of loans given by private financial institutions is presented based on Moody's and S&P datasets, and the loans given by Multilateral Development Banks and Development Finance Institutions (MDBs/DFIs) is presented through the Global Emerging Markets Risk database (GEMs). This section also draws from EDHECInfra data on the performance of senior debt securities issued by global infrastructure corporates and project companies

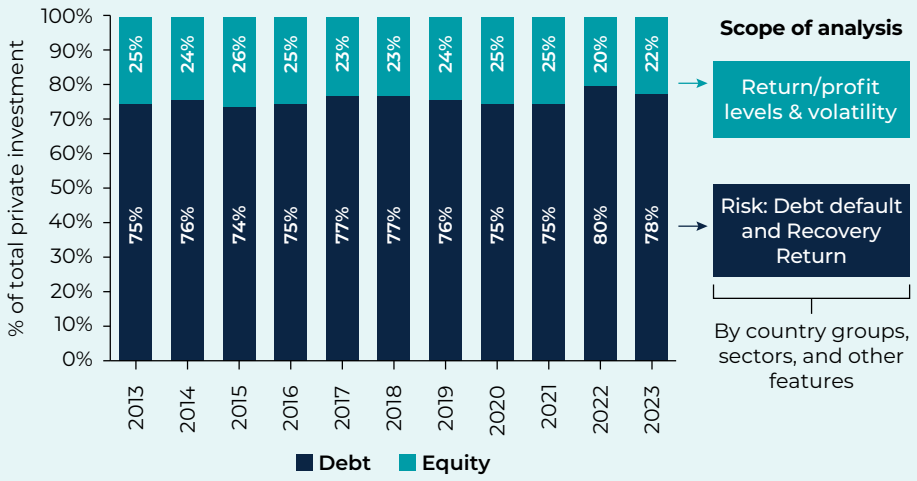
The financial performance of infrastructure funds and cross-border guarantees are covered in Sections 2 and 5 of the report, respectively.

The role of debt and equity in infrastructure finance

Infrastructure investments have high debt-to-equity ratio (~80:20). Backed by large physical assets and stable revenue streams, infrastructure investments mobilize high share of debt to finance infrastructure projects. The investments with higher risk have relatively higher share of equity by sector and region, for example, waste sector projects and Sub-Saharan Africa's projects. Higher risk infrastructure projects seek support from guarantees to increase the share of debt because debt is cheaper than equity.

Equity investors seek to maximize return within the limits of their risk-taking appetite. Hence, the attractiveness of any investment opportunity depends on its risk-return profile. As debt instruments have pre-determined return, debt investors seek timely repayment of debt without default and strong likelihood of recovering investment in case of default, measured through default and recovery rates.

Private investment in infrastructure projects by financial product



Source: Authors analysis based on Realfin and PPI data.

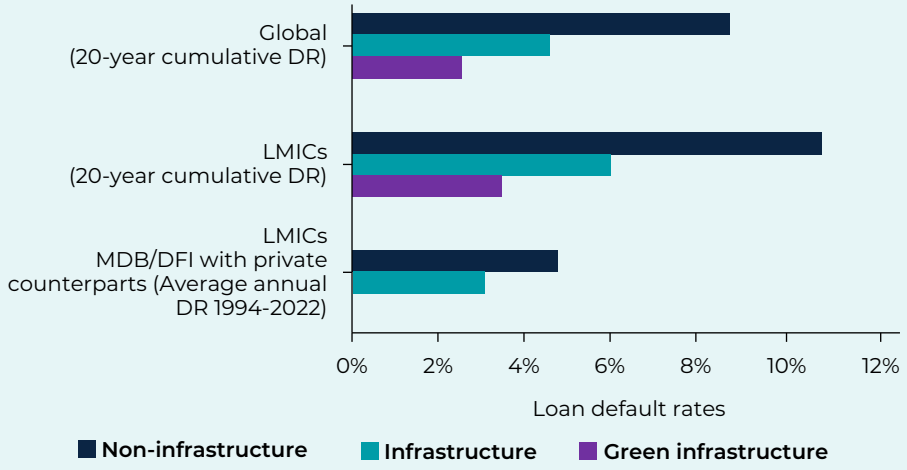
OVERVIEW

Overview of key findings

Leading financial performance data on infrastructure debt points to its superior performance, on average, than non-infrastructure debt in the long run. Globally, credit risk metrics – average long-term default, recovery upon default rates, expected loss, and credit ratings - were more attractive for infrastructure loans than non-financial corporate loans. This was true across country income groups. The presence of MDBs/DFIs materially strengthened the performance in low- and middle-income countries (LMICs). When infrastructure debt was rated, 80 percent had investment-grade rating, double relative to 40 percent for the rated non-financial corporate debt, but it remains challenging for infrastructure projects to secure ratings in the first place due to their complex structuring.

Infrastructure debt performance can be enhanced through contractual or regulatory provisions that strengthen revenue-resilience. Between 1995 and 2023, revenue-resilient infrastructure loans had a five-year cumulative default rate (CDR) of just 0.7 percent, compared to 5.4 percent for non-revenue-resilient infrastructure debt. Revenue-resilient infrastructure is defined to include availability-based payments Public Private Partnership (PPPs) and regulated corporate infrastructure including regulated electric and gas industry, and regulated water utilities, according to Moody's. Availability-based PPPs and regulated utilities exhibited particularly low default rates, reinforcing the importance of well-structured financing models.

Loans default rates (DR): Infrastructure vs non-infrastructure



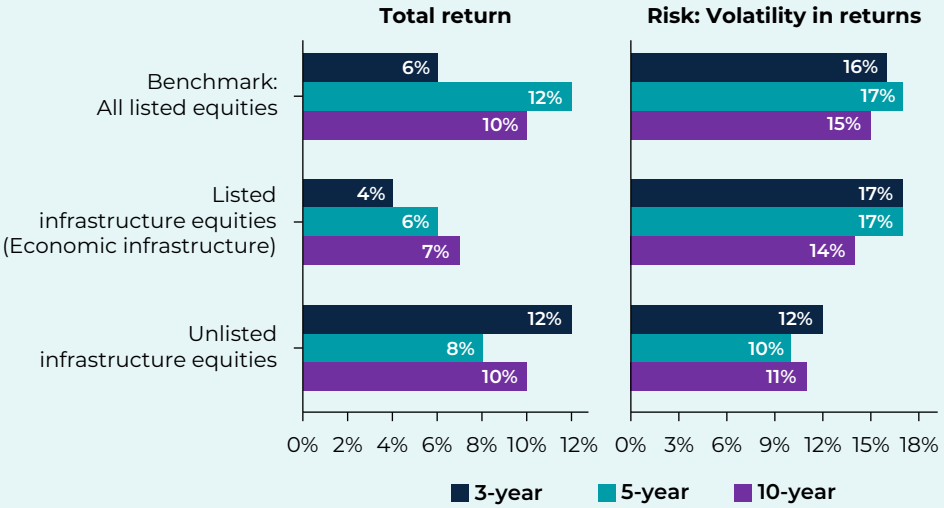
Source: Moody's and GEMs.
Note: Metrics from Moody's and GEMS differ slightly and cannot be compared directly. This graph illustrates the materially lower DR for infrastructure than non-infrastructure across leading data sources (Moody's, S&P, and GEMs). For further details on these data sources, see the Appendix.

OVERVIEW

Low volatility in returns is the most attractive feature of infrastructure investments for private investors. As infrastructure assets provide essential services like electricity, water, transport and communication connectivity, revenue streams are more stable than that for non-infrastructure assets. This enables infrastructure equities to deliver positive returns with lower volatility in the long run.

Multiple crises during 2020-2024 affected all equities including infrastructure equities. Sharp interest rate hikes and high equity risk premia were the key explanatory factors for the decline in net value of infrastructure equities. These factors adversely impacted all equities. Unlisted infrastructure equities provided higher returns (12 percent) at lower volatility (12 percent) than other equities. The complex nature of infrastructure development allows private investors to earn a premium from infrastructure equity investments in unlisted markets. Provision and scaling of infrastructure equities in listed markets is limited by factors including the illiquid nature and the lack of complete, accurate and timely disclosure of financial data for infrastructure assets. Returns on non-infrastructure listed equities are driven by growth sectors such as technology and digital companies.

Equity risk-return: Infrastructure vs non-infrastructure



Source: MSCI, GLIO and EDHECInfra.
Note: By definition, the data represents markets with significant infrastructure activity and availability of data. For further details on these data sources, see the Appendix.

Infrastructure equity performance

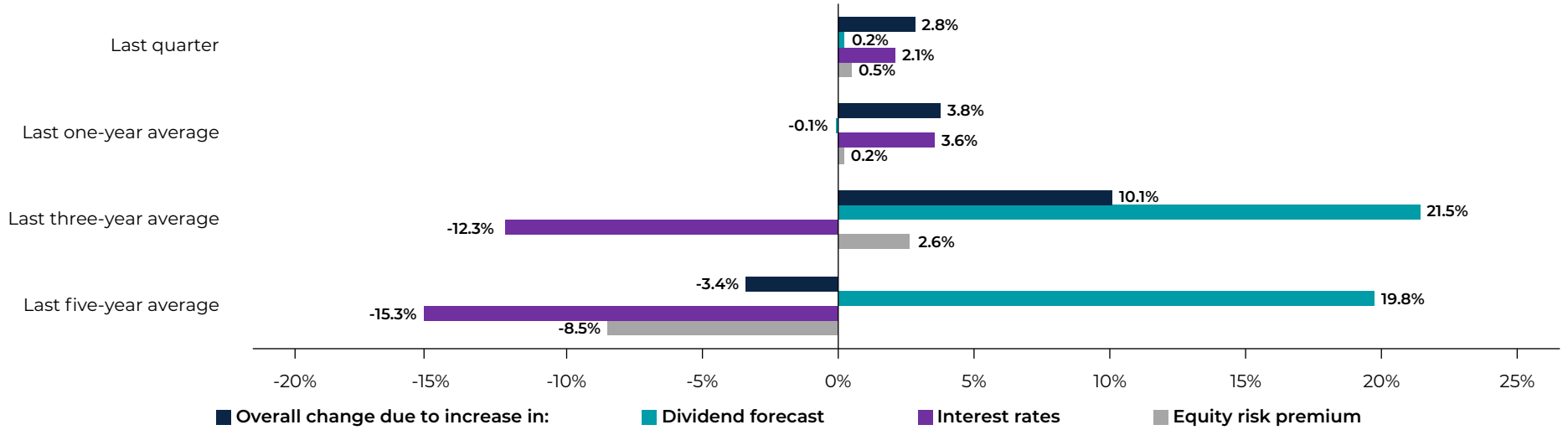


Sharp interest rate hikes and high equity risk premia were the key explanatory factors for the decline in value of global infrastructure equities over 2019-2024. The negative pressures from both factors seem to have concluded in 2024

The net value of an infrastructure equity can be estimated using the discounted dividend model widely used in equity markets, in which (i) increase in dividend forecasts positively impact the value, and (ii) increase in discount factor – a combination of risk premia and interest rates – negatively impacts valuations.

Over the five years preceding October 2024, sharp increases in interest rate and increase in risk premia were the key factors driving the decline of 3.4 percent in value. Over the last three years, the sharp increases in interest rate was the key explanatory factor for the decline in the value. The relative role of risk premia in negatively impacting the value reduced with recovery from the Covid-19 pandemic, while the relative role of interest rate increased due to sharp hikes in developed markets that account for majority of the global infrastructure equity investments. The negative impact of these factors was countered by increases in dividend forecasts. However, dividend forecasts played a subdued role last year likely due to the pressures on profitability due to higher costs of delivering infrastructure. In the last year, some reduction in interest rates was the main factor contributing to slight improvement in the value.

Average increase in net asset value of global infrastructure equities by factor and time period



Source: EDHECInfra (2024). Data as of 31 October 2024.
Note: The estimates were derived using the discounted dividend model equation which defines net asset value as the ratio of dividend forecasts and discount factor (combination of interest rates and risk premium). EDHECInfra data is based on a representative sample of 27 countries that exhibit sizable level of activity that could be measured including Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, Finland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, New Zealand, Poland, Portugal, Russia, Singapore, Slovakia, Sweden, United States of America, Brazil, Chile, Malaysia, Philippines.

Both risk premia and cost of debt spiked in recent years, which increased the cost of equity and overall financing costs

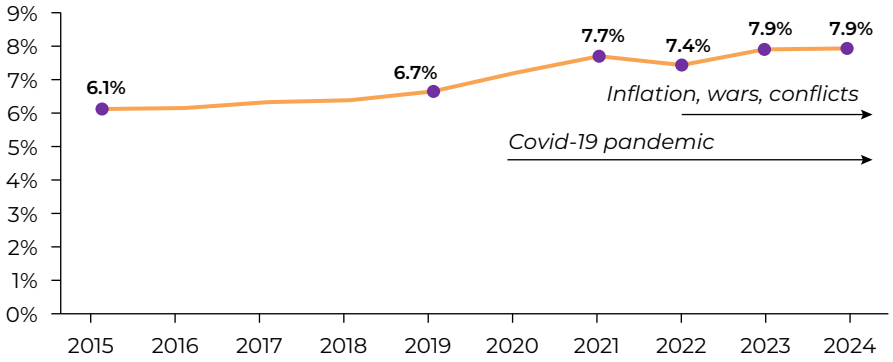
Since the onset of crisis period in 2020 with the Covid-19 pandemic, the risk premia for infrastructure equities has been above 7 percent. In 2023 and 2024, the average risk premium was 7.9 percent which was last observed in 2011. The risk premium reached its lowest level in 2015 at 6.1 percent. The multiple shocks since 2022 including geopolitical conflicts, rapid inflation, and sharp interest rate hikes, and other post-Covid effects, have contributed to elevated risk premia.

Historically, spikes in risk premia for infrastructure equities has coincided with crisis-like situations. For instance, the risk premia spiked to 11.6 percent in 2001 during the dot-com bubble crisis and again to 9.6 percent in 2008-2009 during the global financial crisis.

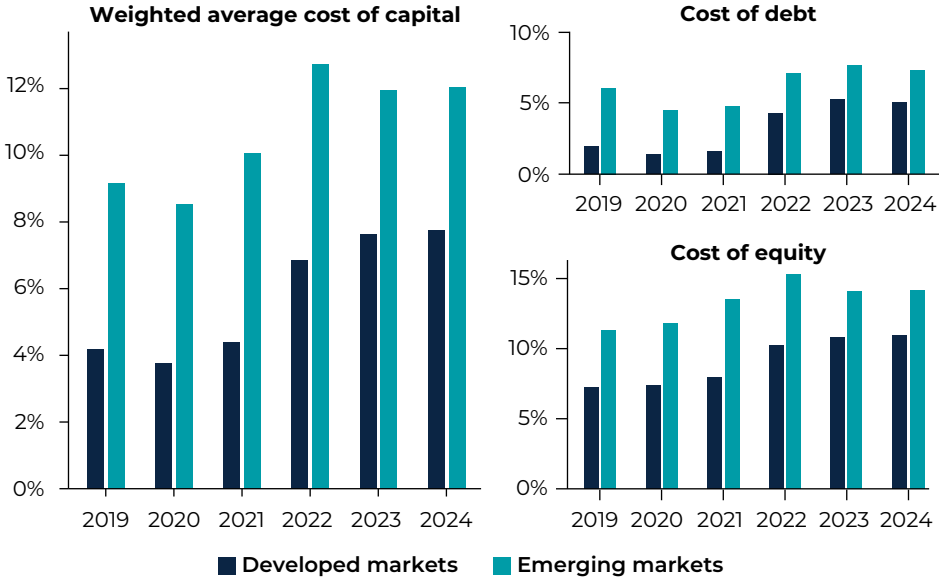
The weighted average cost of capital (WACC) depends on the cost of debt, cost of equity, and the ratio of debt to equity. For infrastructure, it doubled from nearly 4 percent in 2019 to 8 percent in 2024 in developed markets, and from nearly 9 percent to 12 percent in emerging markets.

This was driven by the increase in debt cost in developed markets from 1.9 percent in 2019 and 1.6 percent in 2021 to 5.0 percent in 2024, much sharper than that in emerging markets from 6.1 percent in 2019 to 7.4 percent in 2024. The cost of equity depends on cost of debt and risk premia. Risk premia increased more for emerging markets while cost of debt increased more for developed markets. Thus, the cost of equity increased from 7.2 percent in 2019 to 10.9 percent in 2024 in developed markets, and it increased from 11.3 percent to 14.2 percent in emerging markets during the same time period. In emerging markets, more equity than debt was likely used due to their higher risk, further contributing to increase in cost of capital as equity is more costly.

Risk premium of unlisted infrastructure equities (%)



Cost of Capital by market and year:

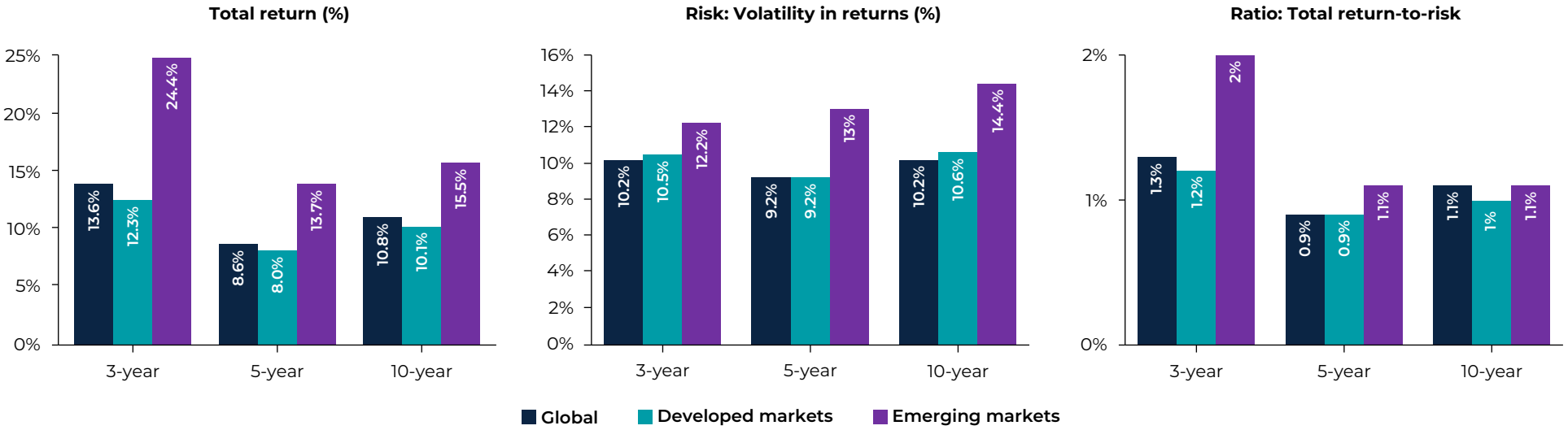


Source: EDHECInfra (2024). Data as of 31 October 2024.
Note: EDHECInfra data is based on a representative sample of 27 countries that exhibit sizable level of activity that could be measured including Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, Finland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, New Zealand, Poland, Portugal, Russia, Singapore, Slovakia, Sweden, United States of America, Brazil, Chile, Malaysia, Philippines.

In recent years, emerging markets provided more attractive returns to risk ratio on infrastructure equities than developed markets

During the high-interest rate regime in developed markets during the three years preceding October 2024, the return on unlisted infrastructure equities across markets also increased. The global annual total return on unlisted infrastructure equities increased from 10.8 percent over the past ten years to 13.6 percent over the past three years. While the increasing trend was seen in both developed and emerging markets, the increased in return was 10.1 percent to 12.3 percent in developed markets, and 15.5 percent to 24.4 percent in emerging markets, during the same time period, as of 31 October 2024. The volatility in returns provided by unlisted infrastructure equities remained the same globally and in developed markets, while it reduced in emerging markets. With the high interest-rate regime in developed markets, investors are able to secure higher and safer returns in developed markets. It seems that investors are willing to take less risk and require higher returns in emerging markets than they did previously. It is more evident through an analysis of trends in the ratio of total return to volatility. The ratio increased from 1.0 over the last ten years to 1.2 over last three years in developed markets, while it increased from 1.1 to 2.0 during the same time period in emerging markets. As affordability remains a global challenge due to elevated inflation, constrained government finances, and subdued economic growth prospects, this indicates that it was more challenging to ensure competitive returns for new infrastructure projects to attract global private capital.

Unlisted infrastructure equities: Return and risk by market and investment time horizon



Source: EDHECInfra (2024). Data as of 31 October 2024.
Note: EDHECInfra data is based on a representative sample of 27 countries that exhibit sizable level of activity that could be measured including Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, Finland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, New Zealand, Poland, Portugal, Russia, Singapore, Slovakia, Sweden, United States of America, Brazil, Chile, Malaysia, Philippines.

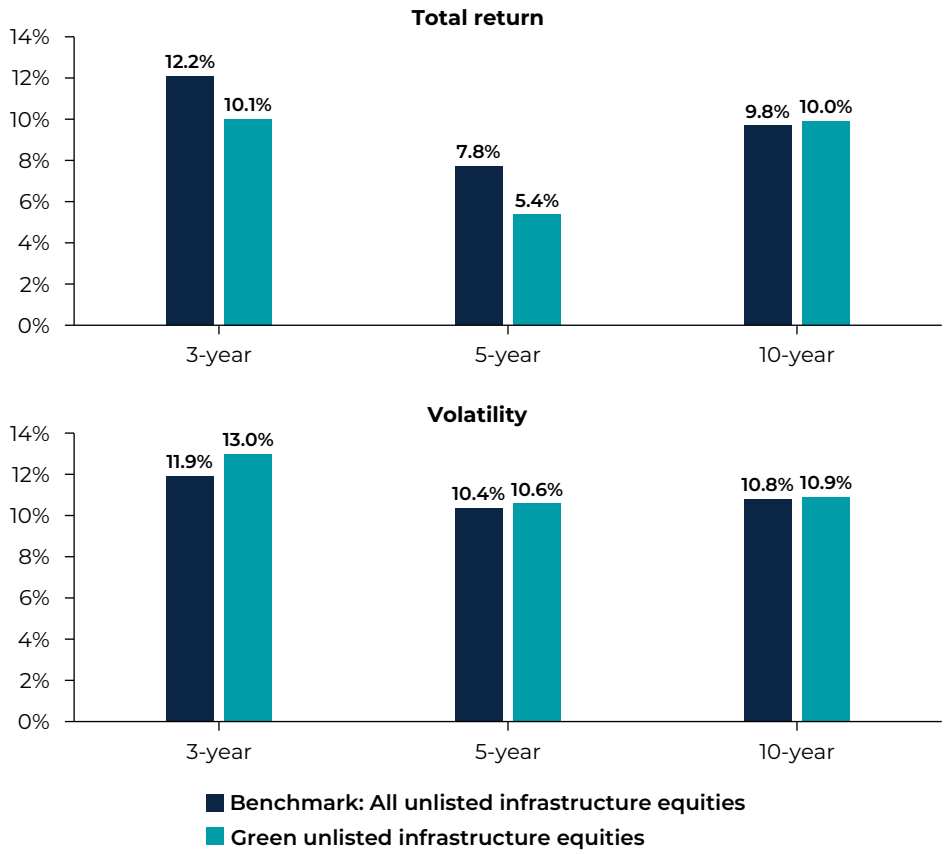
Over the previous decade, the return and volatility in return on green unlisted infrastructure equities were similar to all infrastructure equities but worsened in recent years

The average return on green unlisted infrastructure equities was attractive at 10.0 percent over the decade preceding October 2024, similar to that for all infrastructure equities at 9.8 percent. The volatility was also similar at 10.9 percent and 10.8 percent respectively over the decade. Note: the green unlisted infrastructure equities mainly illustrate the performance of renewable energy infrastructure, which attracts the largest share of private investment in infrastructure.

Over the five years preceding October 2024 plagued by multiple crisis, the 5-year return on green unlisted infrastructure equities reduced to 5.4 percent from its 10-year return level of 10.0 percent: a much sharper decline than the decline for all infrastructure equities to 7.8 percent from the 10-year return level of 9.8 percent. The returns declined due to multiple crisis that hit the economy in the last five years. Market consultations suggest that the sharper decline for green infrastructure equities was driven by transition risk to green economy and resulting competition for the limited renewable assets.

Over the three years preceding October 2024, the return on green unlisted infrastructure equities nearly doubled to 10.1 percent from the 5-year return of 5.4 percent. The return on all unlisted infrastructure equities also increased from 7.8 percent to 12.2 percent. However, green unlisted infrastructure equities witnessed an increase in volatility in returns to 13.0 percent from the 5-year level of 10.6 percent, higher than the increase in volatility to 11.9 percent from the 5-year level of 10.4 percent for all unlisted infrastructure equities.

Green unlisted infrastructure equities: Return and risk by investment time horizon (%)



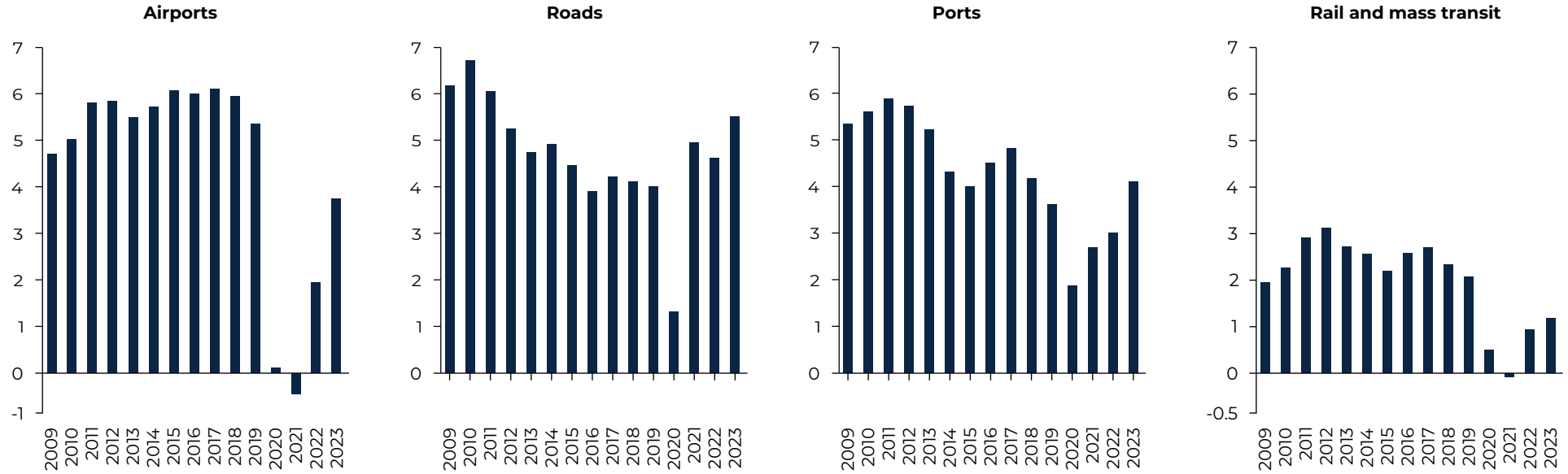
Source: EDHECInfra (2024). Data as of 31 October 2024.
Note: Green unlisted infrastructure equities is measured by the EDHECInfra InfraGreen Index that reflects the performance of unlisted companies in the renewable energy sector. EDHECInfra data is based on a representative sample of 27 countries that exhibit sizable level of activity that could be measured including Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, Finland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, New Zealand, Poland, Portugal, Russia, Singapore, Slovakia, Sweden, United States of America, Brazil, Chile, Malaysia, Philippines.

In transport sector, return on capital only for roads exceeded pre-pandemic levels. Return on capital for airports was most negatively affected by the pandemic but also showed strong recovery.

Transport sector experienced decline in traffic during the lockdowns introduced in 2020 to prevent the spread of Covid-19 virus but have been recovering from the setback in the following years. As expected, airports were the worst affected and registered nearly zero or even negative returns in 2020 and 2021.

As multiple other crisis hit the world following the Covid-19 pandemic, capital investments faced significantly higher cost of capital due to sharp interest rate hikes and higher uncertainty related to material costs and inflation (see chapter 1 for more details on delivery cost trend over time), weakened availability of labor following the pandemic, and high credit spreads due to elevated risk. However, the pent-up travel demand outweighed affordability risks for most transportation assets, which fueled increase in return on capital every year (S&P, 2024b). Only the roads sector reached returns on capital levels above the pre-pandemic level by 2022. Roads benefitted from inflation-linked tariffs and recovery in traffic growth. Ports also registered a strong recovery for return on capital employed to the pre-pandemic level, but trade tensions and geopolitical conflicts have been putting downward pressures on volume. However, the strong pricing power supported the recovery for return on capital employed. Rail and mass transit had relatively lower recovery for the return on capital employed due to modest passenger growth, increase in operating costs, and price controls to support user affordability.

Global return on capital employed by transport subsectors (%, 2009-2023)



Source: S&P (2024c).

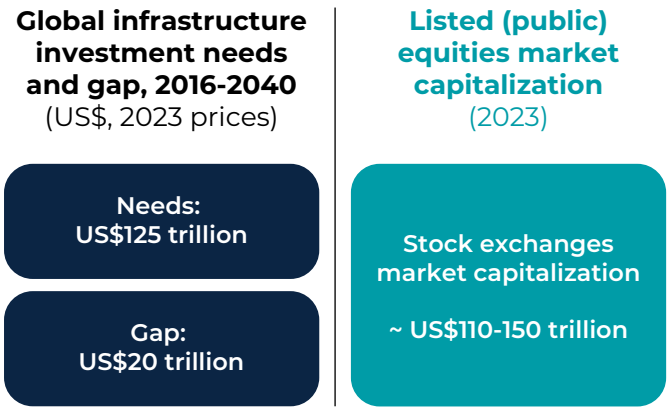
Globally, listed equity markets can potentially play a significant role in closing infrastructure financing gap. The current potential widely varies by country.

The global stock exchanges where listed equities are traded were estimated to reach a market capitalization of about US$110-150 trillion in 2023: a sizeable size relative to the infrastructure investment gap of US$20 trillion estimated for the time period 2016-2040. Investors prefer to trade in listed equities markets for their liquidity and transparency depending on the scale and depth of the national stock exchange and the quality of national regulators, which widely varies by country.

According to the World Bank's Global Finance Development Database, the stock market traded value to GDP was greater than 1 percent for only 46 countries (names outlined in the bar graph below). By developing listed equity markets for infrastructure, the liquidity risk inherent in infrastructure investment can be mitigated. The large size of infrastructure investment make the concentration risk of investing in infrastructure a major concern for private investors.

Listed equity markets have high standards of transparency and require frequent and consistent reporting to ensure reliability of stock price valuations and fully disclose information to a wide range of investors. Well-developed listed equity markets for the infrastructure asset class can make it more amenable for private investors by enabling creation of diversified infrastructure investment products. However, the scaling of listed infrastructure equities is limited not only by the maturity of national listed equity markets but also by key barriers unique to infrastructure as an asset class including the lack of complete, accurate and timely disclosure of financial data needed by the investors, lack of standard taxonomy and data metrics, the lack of data collection by national regulators and supervisors, difficult access to credit ratings, long-term illiquidity, complex contracts and risk mitigation.

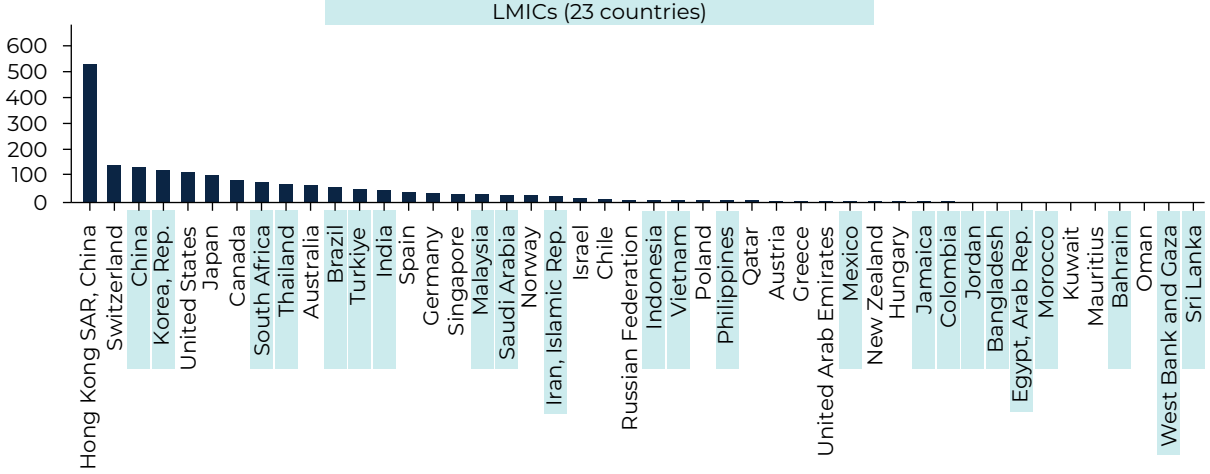
Global listed equity markets: Financing scale in context of infrastructure needs



Source: GI Hub (2017), Mobilist (2024), OECD (2024), Statista (2024).

Stock market traded value (% of GDP, 2019)

For 46 countries with a value of greater than 1%



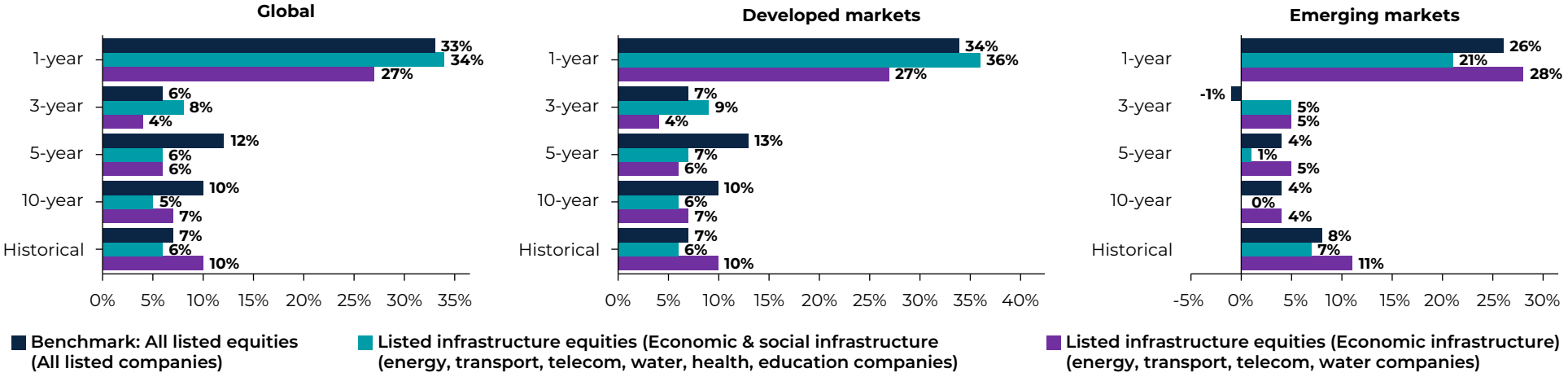
Source: World Bank (2022a). Global Financial Development Database, September 2022 Version.

While listed economic infrastructure equities have historically offered strong long-term returns, other equities outperformed them over the past decade, significantly reversing the previous performance gap.

Globally, listed equities of economic infrastructure (energy, transport, telecommunications and water) companies provided higher average annual return over the past 25 years of 10-11 percent than the return of 7-8 percent provided by all listed equities across markets. In the 3-years preceding October 2024, the return dropped to 4 percent in developed markets coinciding with their high-interest rate regime. Before 2020, the strong macroeconomic environment in developed markets enabled high returns in equity markets. Emerging markets consistently provided positive return of 4-5 percent for economic infrastructure companies across varying time periods in the preceding decade.

While historically economic infrastructure sectors provided higher returns than social infrastructure sectors, the return on social infrastructure listed equities become equally or more competitive across markets during the recent 5-years mostly representing the multiple crisis period since the onset of Covid-19 pandemic. In 2024, all infrastructure sectors show strong signs of recovery. In both developed and emerging markets, listed equities including infrastructure equities registered more than 20 percent annual average growth rate during the 1-year preceding October 2024.

Listed equity markets: Gross annual average returns by investment time horizon (US$ %, as of October-end 2024)



Source: FTW GLIO (2024a), MSCI (2024a, 2024b, 2024c). Data as of 31 October 2024.
Benchmark: All listed equities is measured by the MSCI All Country World Index. Listed infrastructure equities (economic & social infrastructure) is measured by the MSCI ACWI Infrastructure Capped Index. Historical data starts from 31 December 1998.
Listed infrastructure equities (Economic infrastructure) is measured by the FTW GLIO Infrastructure Index which excludes social infrastructure, oil and gas storage and transportation and other companies. Historical data starts from 31 December 1999.
Note: MSCI data is based on 47 countries: 23 Developed Markets (DM) and 24 Emerging Markets (EM). DM countries include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the UK and the US. EM countries include: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Kuwait, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, Taiwan, Thailand, Turkiye and United Arab Emirates.
FTW GLIO data is based on 38 countries including Australia, Austria, Belgium, Brazil, Canada, Chile, China, Columbia, Czech Rep, Denmark, France, Germany, Greece, Hong Kong, India, Indonesia, Israel, Italy, Japan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Philippines, Poland, Portugal, Saudi Arabia, Singapore, Spain, Switzerland, Taiwan, Thailand, Turkiye, UAE, United Kingdom, United States.

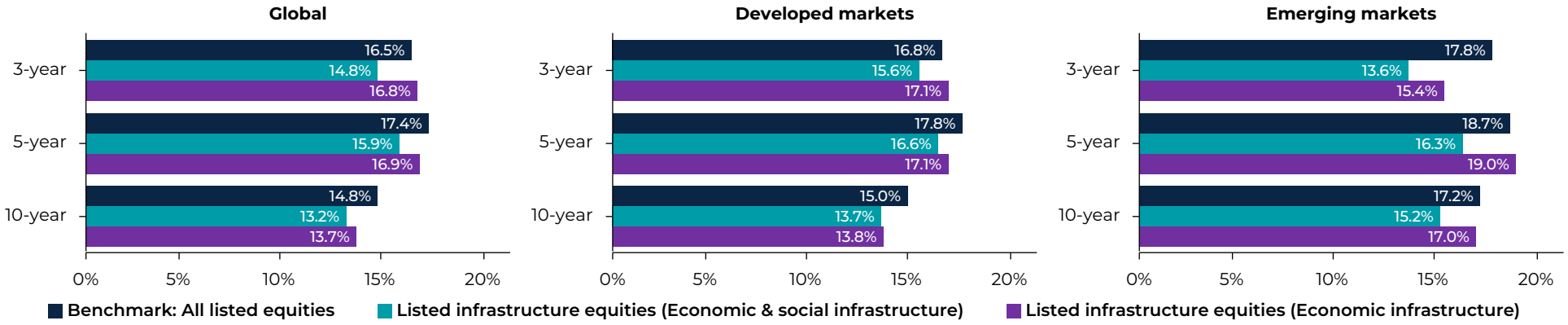
Listed infrastructure equities mostly had lower volatility than other listed equities. In recent years, listed infrastructure equities in emerging markets had lower volatility than developed markets unlike the preceding decade

Across different investment time horizons, listed infrastructure equities had lower volatility in returns than an average listed equity.

The volatility for all listed equities including listed infrastructure equities was lower over the last three years than the last five years preceding October 2024, suggesting that volatility declined with global recovery from the Covid-19 pandemic. In the last three years, the volatility for listed infrastructure equities in emerging markets reached lower levels (13.6 percent to 15.4 percent) than the levels in developed markets (15.6 percent to 17.1 percent). Prior to that, the volatility in emerging markets had been higher than developed markets. In particular, the volatility levels over ten years in developed markets (13.7 percent to 13.8 percent) were much lower than emerging markets (15.2 percent to 17.0 percent).

The volatility of returns for listed infrastructure equities in social infrastructure sectors appear to be lower than that for economic infrastructure sectors across markets and investment time horizons.

Listed equity markets: Volatility in returns by investment time horizon (US$ %, as of October-end 2024)
Measured by annualized standard deviation of monthly gross returns



Source: FTW GLIO (2024a), MSCI (2024a, 2024b, 2024c). Data as of 31 October 2024.
Benchmark: All listed equities is measured by the MSCI All Country World Index. Listed infrastructure equities (economic & social infrastructure) is measured by the MSCI ACWI Infrastructure Capped Index. Historical data starts from 31 December 1998.
Listed infrastructure equities (Economic infrastructure) is measured by the FTW GLIO Infrastructure Index which excludes social infrastructure, oil and gas storage and transportation and other companies. Historical data starts from 31 December 1999.
Note: MSCI data is based on 47 countries: 23 Developed Markets (DM) and 24 Emerging Markets (EM). DM countries include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the UK and the US. EM countries include: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Kuwait, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, Taiwan, Thailand, Turkiye and United Arab Emirates.
FTW GLIO data is based on 38 countries including Australia, Austria, Belgium, Brazil, Canada, Chile, China, Columbia, Czech Rep, Denmark, France, Germany, Greece, Hong Kong, India, Indonesia, Israel, Italy, Japan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Philippines, Poland, Portugal, Saudi Arabia, Singapore, Spain, Switzerland, Taiwan, Thailand, Turkiye, UAE, United Kingdom, United States.

For listed infrastructure equities, low volatility is the most attractive feature across markets

MSCI's factor analysis of the competitive advantage of listed infrastructure equities for investors relative to an average listed equity revealed low volatility is the key driver for attractiveness of returns.

In developed markets, dividend yield was the second most important factor increasing return for listed infrastructure equities. Globally, the average dividend yield for listed infrastructure equities (including both economic and social infrastructure) was 3.6 percent, nearly double the yield of 1.9 percent provided by an average listed equity. This was primarily driven by high dividend yield in developed markets: 3.8 percent for listed infrastructure equities and 1.8 percent for an average listed equity.

In emerging markets, the quality of balance sheet was the second most important factor increasing return for listed infrastructure equities.

Top two factors that drive return for listed infrastructure equities by market (as of October-end 2024)

Global	Low volatility Dividend yield
Developed markets	Low volatility Dividend yield
Emerging markets	Low volatility Quality of balance sheet

Source: MSCI (2024a, 2024b, 2024c). Data as of 31 October 2024.
Note: The factors were selected through a factor exposure estimation relative to MSCI Investable Market Index that covers all global listed equities. A cross-section regression in the MSCI Barra Global Equity Factor Model which has identified six factors as key drivers of risk and return selected based on rigorous research. The factors are estimated through 16 metrics and standardized values from the regression are derived.

MSCI's estimates of Price to Earnings (P/E) ratio indicate that, relative to an average listed equity, listed infrastructure equities are valued more in emerging markets and less in developed markets. In developed markets, the P/E ratio of 17 for listed infrastructure equities was lower than 22 for an average listed equity. In emerging markets, the P/E ratio of 20 for listed infrastructure equities was higher than 16 for an average listed equity.

Infrastructure debt performance

Based on EDHECInfra,
GEMs, Moody's, and S&P data



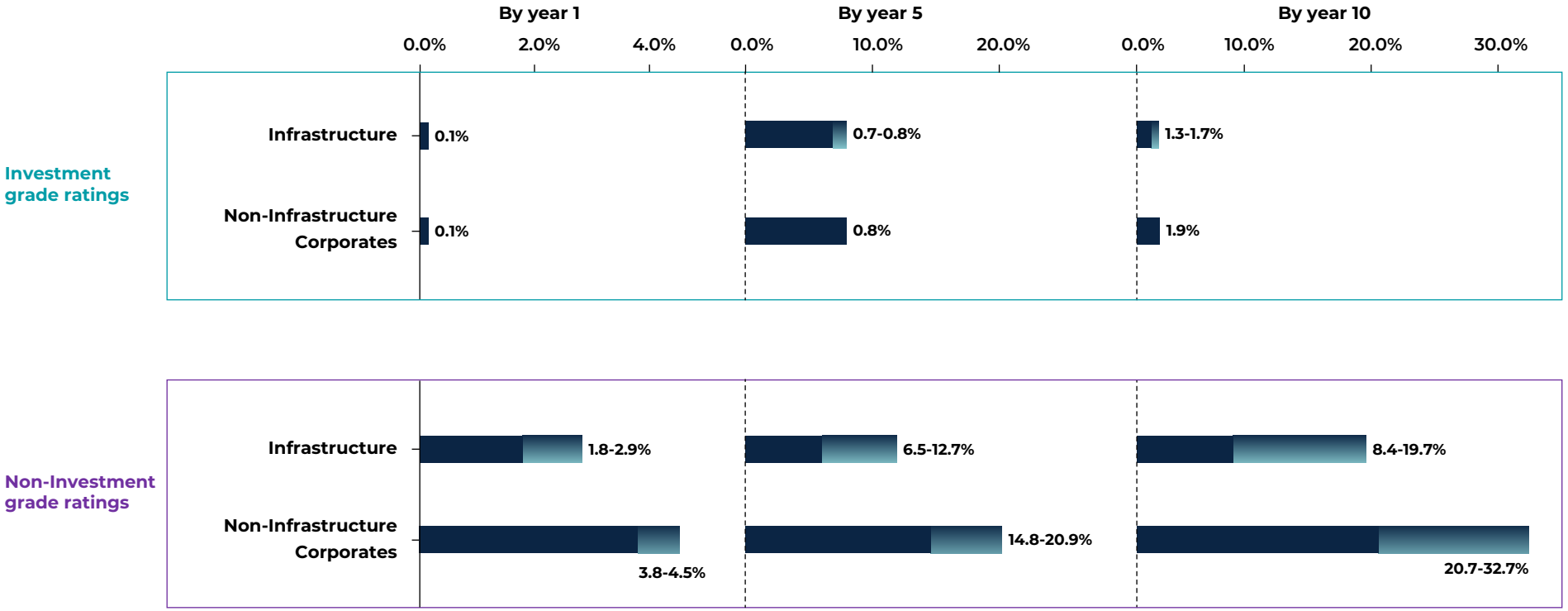
Infrastructure debt exhibit lower default rates than non-financial corporate debt particularly when the debt falls in non-investment grade rating categories

Infrastructure debt rated as investment grade had low cumulative default rates of less than 2 percent even for 10 years loan duration.

In contrast, infrastructure debt rated as non-investment grade that is, credit rating lower than BBB-/Baa3, exhibit relatively higher default rates, but still lower than that for non-investment grade debt of non-financial corporates, across varying loan durations.

According to the credit risk data of leading credit rating agencies (Moody's and S&P), when the rating was non-investment grade, the average cumulative default rates for non-financial corporate debt were at least one and a half times that of infrastructure debt, based on the default rates of debt that originated between 1983 and 2023, across varying loan duration.

Cumulative default rates of rated debt by asset class, rating category, and loan duration (%, 1983-2023)



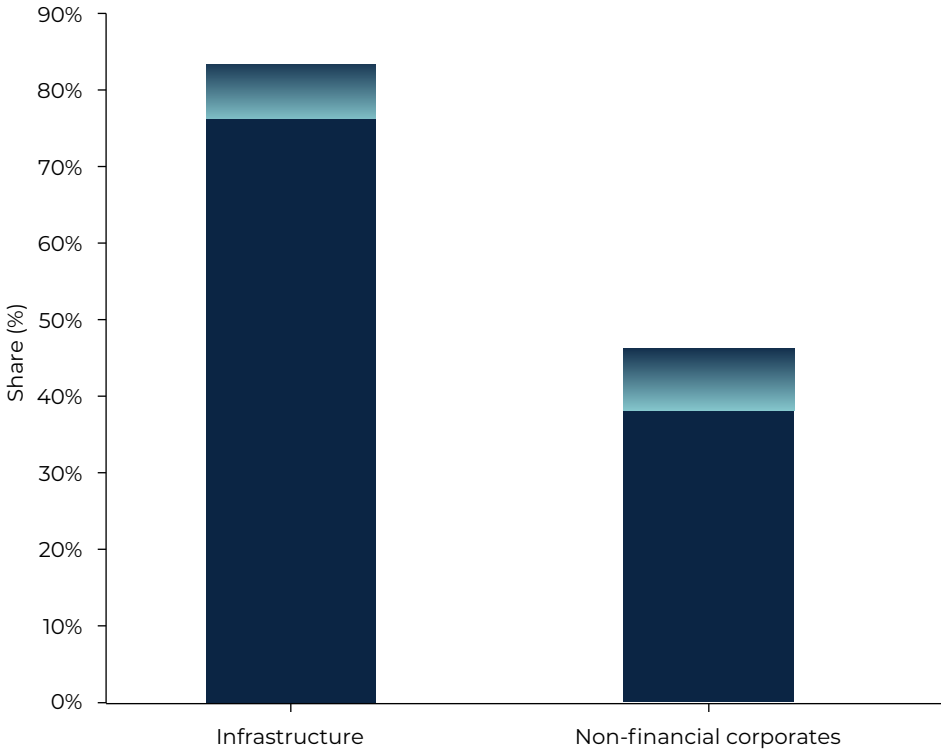
Source: Moody's (2023a), S&P (2024a).
Note: Shaded blue bar presents the range of estimates for cumulative default rates. Estimates represent global rated corporate infrastructure and project finance debt securities including nearly 2,600 debt securities rated by Moody's and S&P from 1983 to 2023. LMICs accounted for over 10 percent of the sample.

When infrastructure debt is rated, it is more likely to receive an investment-grade rating. However, it is more challenging for infrastructure projects to obtain a rating in the first place.

Infrastructure projects are carefully structured through rigorous project preparation phases to clearly establish commercial and financial viability. This makes them more likely to receive investment-grade rating that is, a credit rating of BBB-/Baa3 or better, which is the threshold at which market participants perceive an investment as low risk. The available data indicates that of the debt that was rated by Moody's and S&P, around 80 percent of infrastructure debt had investment-grade rating, while only about 40 percent of non-financial corporate debt had investment-grade rating.

Private investors actively seek investment opportunities with investment-grade rating. Leveraging this strength of higher likelihood of receiving investment-grade rating is challenging for the infrastructure asset class due to several barrier in obtaining a credit rating. Market participants note that it is costly, time consuming, and difficult to obtain rating for an infrastructure project due to its complex structuring coupled with limited transparency and data reporting. Infrastructure projects have complex structuring because responsibilities and obligations of multiple stakeholders are defined through detailed contracts with conditionalities and contingencies spanning over a long-time horizon. The data and information required to assign a rating are not easily accessible because it is not publicly published or confidential in nature. This makes it difficult for credit rating agencies to assign ratings and costly for projects to obtain ratings. Majority of the rated infrastructure debt is domiciled in North America.

Share of investment-grade rated debt securities in total rated debt securities by asset class (%, 1983-2023)



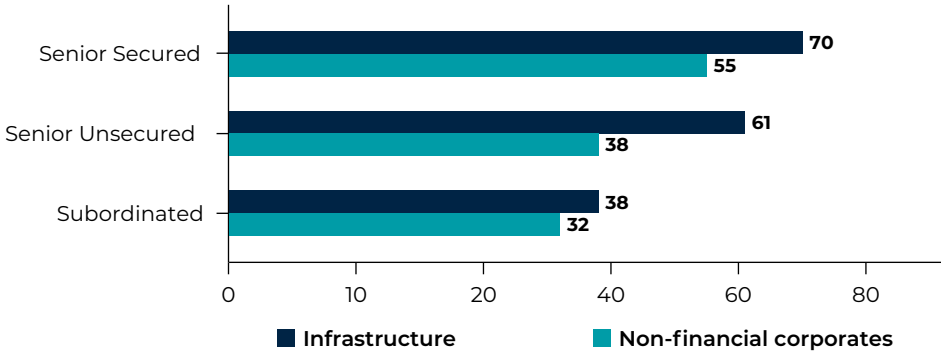
Source: Moody's (2023a), S&P (2024a).
Note: Estimates represent global rated corporate infrastructure and project finance debt securities including nearly 2,600 debt securities rated by Moody's and S&P from 1983 to 2023. LMICs accounted for over 10 percent of the sample.
Shaded blue bar presents the range of estimates for cumulative default rates.

Infrastructure debt also had higher recovery rates upon default than non-financial corporates

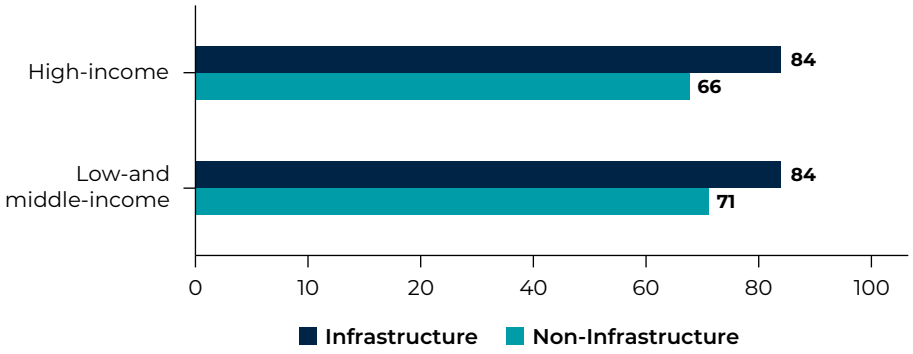
Infrastructure debt had higher trading price recovery rates and ultimate recovery rates upon default than non-financial corporates. Average trading price recovery rates estimate the recovery of trading prices on an issuer's bonds 30 days after its initial missed payment or bankruptcy filing. Data on trading prices is more readily available and have been shown to be good predictors of ultimate recovery rates.

Based on Moody's estimates for average trading price recovery rates on defaulted rated infrastructure corporate and debt securities, senior secured and senior unsecured infrastructure debt securities had average trading price recovery rates of 70 percent and 61 percent respectively: higher than the 55 percent and 38 percent recovery rates for senior secured and senior unsecured debt securities of non-financial corporates, respectively. Even when infrastructure debt is unsecured, it benefits from implied security intrinsic in the nature of infrastructure business. The average trading price recovery rates on subordinated debt was lower as this tranche is most likely to suffer losses upon default. Average ultimate recovery rates were at least 10 percentage points higher than the trading price recovery rates. The recovery rates for infrastructure debt in low- and middle-income countries (LMICs) were close to the levels in high-income countries (HICs). Moody's estimated ultimate recovery rate was 84 percent for unrated infrastructure project finance loans that originated between 1983 and 2021 for HICs as well as LMICs, sizably higher than 66 percent and 71 percent ultimate recovery rate for unrated non-infrastructure project finance loans for HICs and LMICs, respectively. As infrastructure projects are large in size, a default on infrastructure debt puts material pressure on bank balance sheets. As influential stakeholders including governments, large commercial banks, are involved in the project, and the project typically serves critical needs of citizens through essential infrastructure services like electricity, transport, water, waste, telecommunications, that require uninterrupted provision, it is more likely that an infrastructure project will undergo restructuring and negotiations for recovery upon debt default.

Average trading price recovery rates for rated infrastructure corporate and project finance debt securities by debt seniority and asset class (%, 1983-2023)



Average ultimate recovery rate for unrated infrastructure project finance loans by income group and asset class (%, 1983-2021)



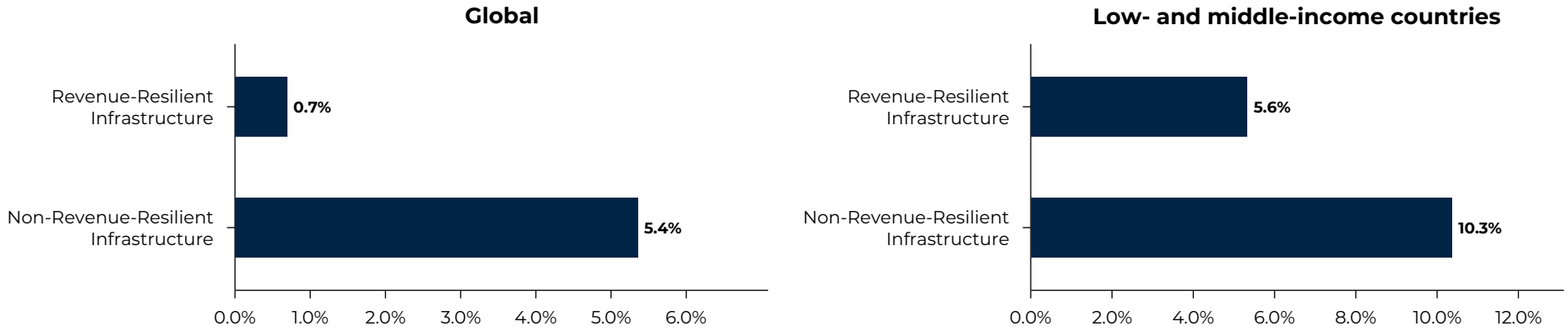
Source: Moody's (2023a), Moody's (2023b).
Note: Estimates for trading price recovery rates are based on 1,146 rated corporate infrastructure and project finance debt securities that originated from 1983-2023. Estimates for average ultimate recovery rate are based on 8,340 infrastructure loans and 1,714 non-infrastructure loans that originated from 1983-2021. The sample size for high-income loans was 7,302 and for low- and middle-income loans was 1,038.

Revenue-resilience – both in emerging and developed economies - is a key determinant of default on infrastructure debt

Globally, infrastructure debt for projects supported by a resilient revenue stream had substantially lower default rates than those for which revenue streams were not resilient, including in LMICs. Moody's mapped rated global infrastructure debt securities that originated between 1995 and 2023 to revenue resilience. The average cumulative default rate over five-year loan duration for revenue-resilient infrastructure debt was 0.7 percent, while the default rate was eight times higher for non-revenue resilient infrastructure debt at 5.4 percent. Even in LMICs, revenue resilience' halved the default rates, as the average default rate for revenue-resilient infrastructure debt was 5.6 percent compared to 10.3 percent for non-revenue resilient infrastructure debt.

Logically, revenue resilience is a key ingredient for establishing bankability and private capital mobilization for infrastructure projects. A clear line of sight on future revenue streams and profits is essential to attract private capital. Ring-fencing revenue streams for infrastructure projects can accelerate development of a bankable pipeline of infrastructure projects. Through payment guarantees, governments can further enhance the perception of revenue resilience. As revenue resilience seem to reduce credit risk, it can improve financing terms and lower expected returns to enhance bankability and affordability of infrastructure projects.

Cumulative Default Rates (5-year) for rated infrastructure debt by revenue resilience (%, 1995-2023)



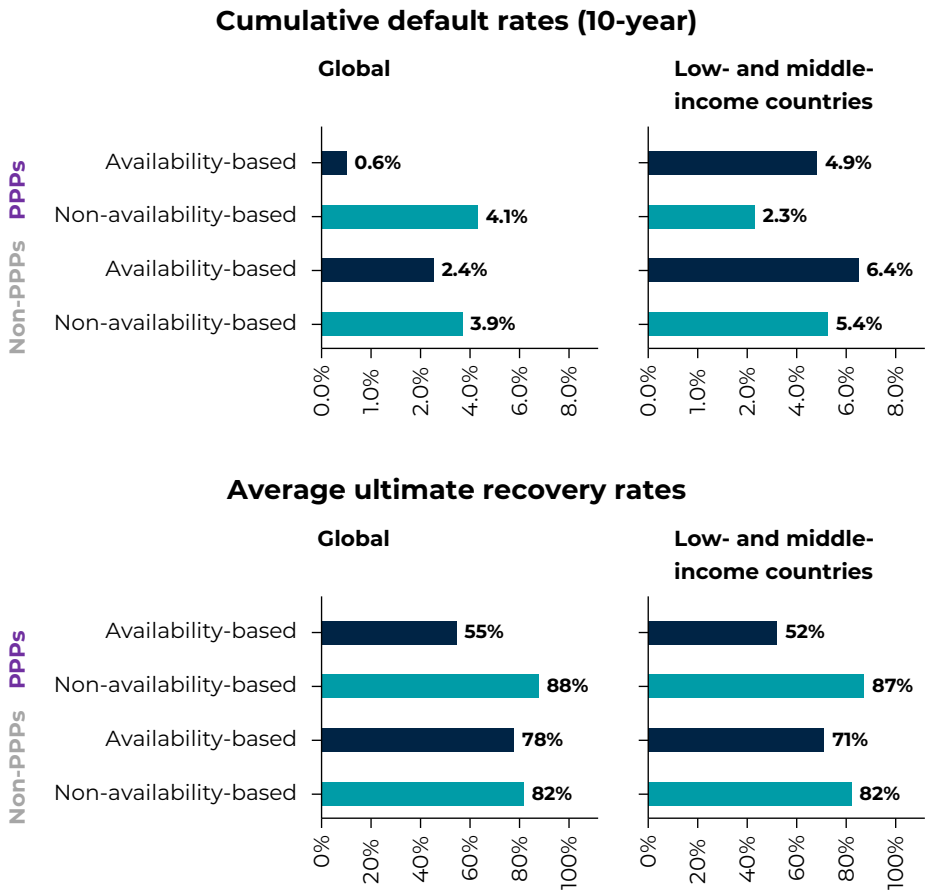
Source: Moody's (2023a).
Note: Revenue-resilient infrastructure includes availability-based payments Public Private Partnership (PPPs) and regulated corporate infrastructure including regulated electric and gas industry, and regulated water utilities.
Non-revenue-resilient infrastructure includes unregulated corporate infrastructure that is, unregulated electric and gas and unregulated water and waste utilities, transportation infrastructure corporates, and project finance other than availability-based PPPs
Global data sample of 923 rated infrastructure debt securities was mapped to 521 revenue-resilient and 421 non-revenue-resilient infrastructure. The sample included 100 low- and middle-income debt securities of which 35 were for revenue-resilient infrastructure and 65 were for non-revenue-resilient infrastructure.

Infrastructure PPPs with availability-based payments had the lowest average default rate

Globally, average cumulative default rate was the lowest at 0.6 percent for infrastructure debt for a PPP with availability-based payment mechanisms, based on Moody's data analysis of infrastructure debt originating between 1983 and 2020. However, as seen previously, the resilience of revenue, in this case the resilience of availability-based payment, plays an important role in reducing default. While PPP structure had lower default rates in LMICs, the use of availability-based payment mechanism did not necessarily lead to lower default rates in LMICs, which could be driven by higher payment risk when revenue source is concentrated with one payer from public sector who could be less resilient if the government is not creditworthy.

When infrastructure debt defaults, ultimate recovery rates were higher when availability-based payment mechanisms were not used. Payment default in the presence of availability-based payment mechanisms means that governments did not pay likely because the project was not delivered up to their expectations. This decision of governments is likely more difficult to challenge, reducing the likelihood of recovering capital for other project participants (debt and equity providers).

Credit risk metrics for infrastructure debt by project type and payment mechanism (%, 1983-2020)



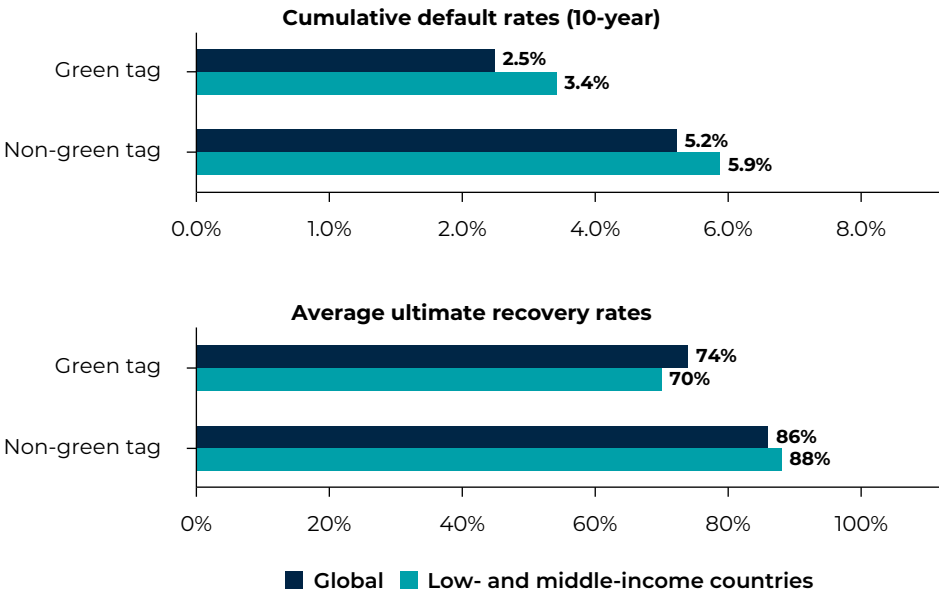
Source: Moody's (2023c).
Note: 8,468 global projects included 1,754 with availability-based payments and 6,714 with non-availability-based payments. 2182 were PPP projects. In this global projects sample, 1470 projects were in LMICs with 178 having availability-based payments and 1,292 had non-availability-based payments. PPPs were 234 projects.

Infrastructure debt with green tag had lower default rates but also lower recovery rates than the projects without green tag

Globally, infrastructure project finance loans which had a green tag that is, the use of proceeds earmarked to only finance green projects, had a lower cumulative default rate over ten years at 2.5 percent than the 5.2 percent rate for the loans without the green tag. Also, for LMICs, the default rate was lower at 3.4 percent with green tag than 5.9 percent without green tag. It could be driven by rapidly expanding government support for green investments and the resulting market transition to a green economy. Also, across all regions of the world, the default rates were lower for infrastructure loans with a green tag. Both renewable power and clean transportation had lower shares of defaults in total projects than non-renewable power and general transport sector, respectively.

However, the global average ultimate recovery rates were lower for infrastructure project finance loans with a green tag at 74 percent than the 86 percent rate for the loans without a green tag. In LMICs, the gap was wider with the recovery rate at 70 percent with a green tag and 88 percent without a green tag. This holds true in all regions except Europe. It could be because of more mature restructuring and negotiation processes in place and/or the availability and use of more insurance and guarantee products to support traditional non-green sectors.

Credit risk metrics for infrastructure project finance loans by green tag (%, 1983-2020)



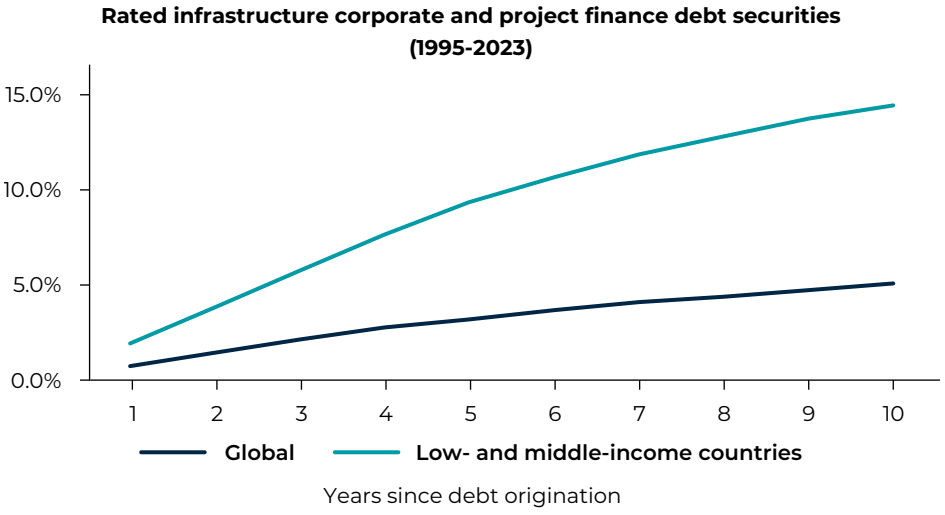
Source: Moody's (2023c).
Note: Data sample of 8,468 unrated infrastructure project finance loans (including 1,470 in LMICs) originating between 1983 and 2020 was mapped. Globally, 3483 loans were mapped to green tag and 3801 were mapped to non-green tag. In LMICs, 430 loans were mapped to green tag and 983 loans were mapped to non-green tag.

The average default rates in low- and middle-income countries were higher than the global average, but the gap varied by the type of project

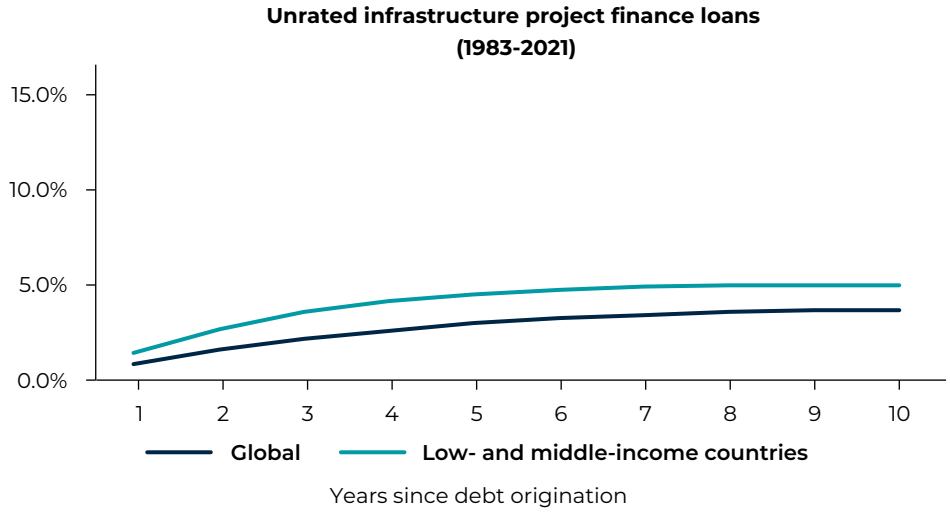
Globally, rated infrastructure debt that originated between 1995 and 2023 had an average cumulative default rate of 4.3 percent by year 10, while it was almost three times higher in LMICs at 13.6 percent. Data indicates that defaults on infrastructure debt in LMICs declined over time, especially for energy, transport and telecommunications sectors. Efforts to replicate best international practices in emerging markets strengthened the enabling environment, increased market activity, and improved maturity in developing infrastructure projects.

Globally, unrated project finance infrastructure loans given by private sector that originated between 1983 and 2021 had an average cumulative default rate of 4.3 percent. The default rate for LMICs was 5.9 percent. This narrower gap in default rates relative to rated infrastructure debt could be due to the reluctance of private sector and higher risk-aversion in providing debt to unrated project finance structures of infrastructure projects in lower income countries. Our Infrastructure Monitor Report 2023 showed how the levels of default rates in 2010s were significantly lower than the levels in 1990s in LMICs, especially for economic infrastructure sectors – telecommunications, transport, energy, water. An analysis over decades by region showed that the spikes in defaults seem to correlate with macroeconomic crises such as sudden foreign capital withdrawal, debt crisis, banking crisis, or low capacity in infrastructure markets to prudently structure deals and high risk-aversion among investors.

Cumulative default rate for infrastructure debt by country income group (%)



Source: Moody's (2023a).



Source: Moody's (2023b).

Note: Data sample for rated corporate infrastructure and project finance debt securities was nearly 1,000 securities including 100 in LMICs. Data sample for unrated infrastructure project finance loans was 8,340 loans with 7,302 in HICs and 1,038 in LMICs.

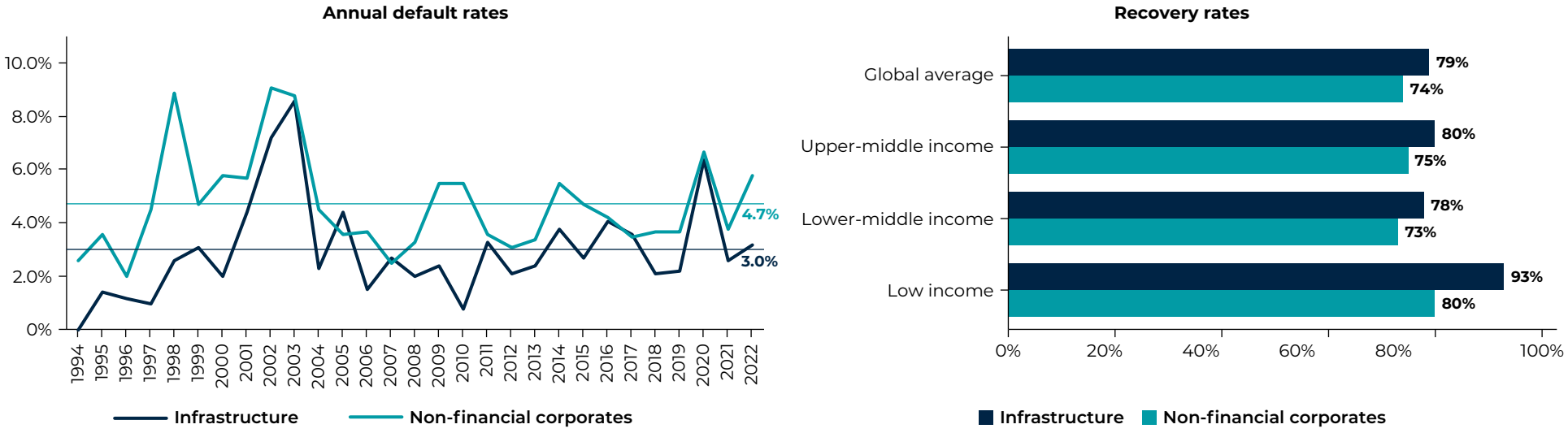
For MDB/DFIs lending to private counterparts, infrastructure exhibit lower default rates than non-financial corporates. The recovery rates were high in low-income countries.

According to the Global Emerging Markets Risk (GEMs) database that is the largest credit risk data hub for emerging markets and developing economies operations of Multilateral Development Banks (MDBs) and Development Finance Institutions (DFIs), the average annual default rate for infrastructure lending contracts with private counterparts was 3.0 percent during 1994-2022. It has mostly remained below the annual default rates for exposures to non-financial corporates which averaged to 4.7 percent during 1994-2022. For MDB/DFI operations in infrastructure, the levels of default rates seem to be on par with other global benchmarks for infrastructure default rates, despite the larger share of lower income countries in MDB/DFI operations. According to GEM analysis, the correlation coefficient between GEMs default rates and those for S&P B-rated firms and for Moody's B3-rated firms is also relatively low, suggesting that the MDB/DFI infrastructure lending can add to diversification of risk-return for an investor's portfolio.

The recovery rates seem to be higher particularly for MDB/DFI infrastructure lending operations in low-income countries relative to global benchmarks for recovery rates. For global MDB/DFI infrastructure lending operations, the GEMS database estimates 79 percent recovery rate upon default and it was even higher at 93 percent for low-income countries.

The GEMs steering committee plans to incorporate data analytics required to inform the development of infrastructure as an asset class with more disaggregation in future annual publications of the GEMs reports.

Credit risk metrics for MDB/DFI contracts with private counterparts by asset class (%, 1994-2022)



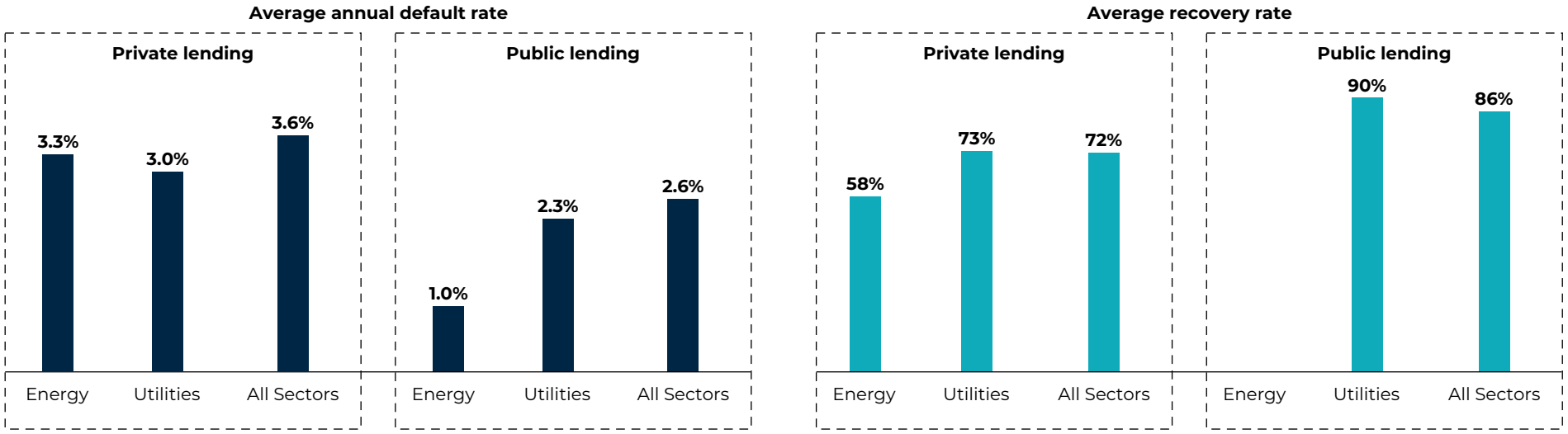
Source: GEMs (2023).
Note: Estimates for default rates are based on 1,697 infrastructure loans and 4,476 non-financial corporate loans. Recovery rates are based on 1,625 infrastructure loans and 4,729 non-financial corporate loans.

With MDB/DFI lending, the default rates in low- and middle-income countries were lower in the utilities and energy sector, especially when the lending was to public counterparts.

According to GEMs database for MDBs and DFIs operations between 1994 and 2023, MDB/DFI lending to private counterparts for energy sector in LMICs had an average annual default rate of 3.3 percent, and the default rate was only 1.0 percent with public counterparts, lower than the market benchmarks for all sectors. Higher default rates in Middle East & North Africa and Sub-Saharan Africa increased the overall default rate of private counterparts. Private counterparts had one of the lowest default rates for utilities. However, utilities also had lower default rates with public counterparts (2.3 percent) than private counterparts (3.0 percent)

Upon default, the average recovery rates for the lending to private counterparts was inconsistently higher or lower than that for all sectors. Across sectors, real estate asset class had the best recovery rates which were over 50 percent even at 10th percentile: the stable cash flows and asset-backed collateral benefits recovery of defaulted real estate lending. While the infrastructure asset class also has these characteristics, they are not formally recognized in financial regulations and markets which is a major roadblock in improving attractiveness of the infrastructure asset class.

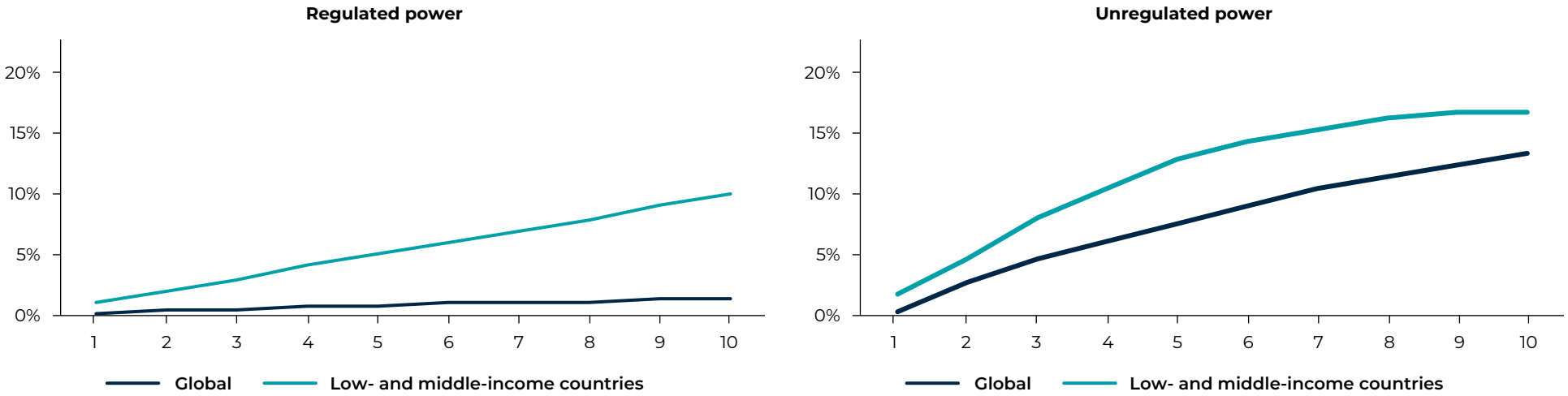
Credit risk metrics for MDB/DFI contracts for energy sector in low- and middle-income countries by type of counterpart (%, 1994-2023)



Source: GEMs (2024).
Estimates are derived from pooled data supplied by 21 member institutions. For private lending, the sample has 235 contracts in energy sector, 1359 in utilities, and 9929 for all sectors. For public lending, the sample has 24 contracts in energy, 171 in utilities and 943 in all sectors.

In the power sector, regulated power had lower default rates than unregulated power. Strong regulatory frameworks seem to help in improving investment performance.

Cumulative default rates for infrastructure debt in power sector by country income group (%)
Rated infrastructure corporate and project finance debt securities (1995-2023)



Source: Moody's (2023a).
Note: Regulated power encompasses electric and gas utility companies and networks that are influenced to a large degree by regulation. They are monopoly providers of essential services, and their activities and rates/tariffs are supervised by a regulator. Global data sample for regulated power included 434 debt securities and unregulated power included 113 debt securities. Nealy 12 percent of the sample was in LMICs.

The energy sector accounts for the largest share of private investment in infrastructure projects: 70 percent globally, 67 percent in HICs and 72 percent in LMICs in 2023.

In the regulated power sector (electric and gas utilities and networks), global rated infrastructure debt securities that originated between 1995 and 2023 demonstrated an average cumulative default rate of 1.4 percent over 10 years: one of the lowest across sectors, and significantly lower than the default rate of 14.2 percent for unregulated power sector, indicating that regulatory environment helps in reducing default rates and improving investment performance.

In LMICs, the default rate even for regulated power sector was much higher at 10.6 percent, still lower than 17.2 percent for unregulated power sector, but suggesting scope for strengthening the regulatory environment. The World Bank's Global Electricity Regulatory Index which benchmarks a country's existing regulatory system against theoretical best practices, estimated a score of 59 percent for 82 non-OECD countries in 2021, suggesting scope to improve regulatory environment in LMICs. For example, the tariff methodologies poorly specify essential features such as automatic tariff adjustments and schedules for major tariff reviews, which were missing in more than 80 percent of the cases. This negatively impacts revenue resilience (Rana, A., Ngulube, M., Foster, V., 2022).

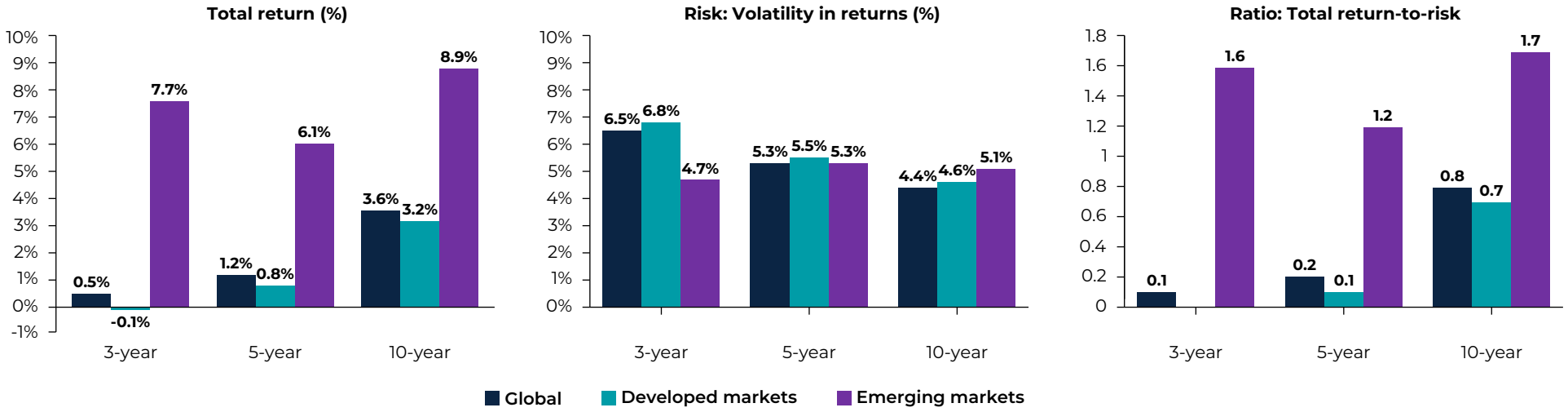
Emerging markets provided better returns to unlisted debt investors in the infrastructure asset class. The gap was wider in recent years

Globally, return on infrastructure debt securities reduced globally from 3.6 percent over ten years to 0.5 percent over three years. In developed markets, return reduced from 3.2 percent over ten years to -0.1 percent over three years. In emerging markets, the return reduced relatively less from 8.9 percent to 7.7 percent during the same time period, as of 31 October 2024. Infrastructure investors being in the long-term financing business have been more sensitive to interest rate risks and proactive in hedging interest rate risks using fixed-rate contracts.

Over a 10-year period, the volatility in return on infrastructure debt securities was higher in emerging markets at 5.1 percent than that in developed markets at 4.6 percent. Over the 3-year period, it was higher in developed markets at 6.8 percent than emerging markets at 4.7 percent. The volatility in central bank policy interest rates was very high in developed markets over the last three years.

While the return to volatility ratio in emerging markets was similar over three years (1.6) and over ten years (1.7), It drastically dropped in developed markets from 0.7 over ten years to nearly zero over three years due to nearly zero returns.

Unlisted infrastructure debt: Return and risk by market and investment time horizon



Source: EDHECInfra (2024). Data as of 31 October 2024.
Note: EDHECInfra data is based on a representative sample of 27 countries that exhibit sizable level of activity that could be measured including Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, Finland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, New Zealand, Poland, Portugal, Russia, Singapore, Slovakia, Sweden, United States of America, Brazil, Chile, Malaysia, Philippines.

Unlike green unlisted infrastructure equities, green unlisted infrastructure debt provided higher returns and lower volatility in returns over all investment time horizons

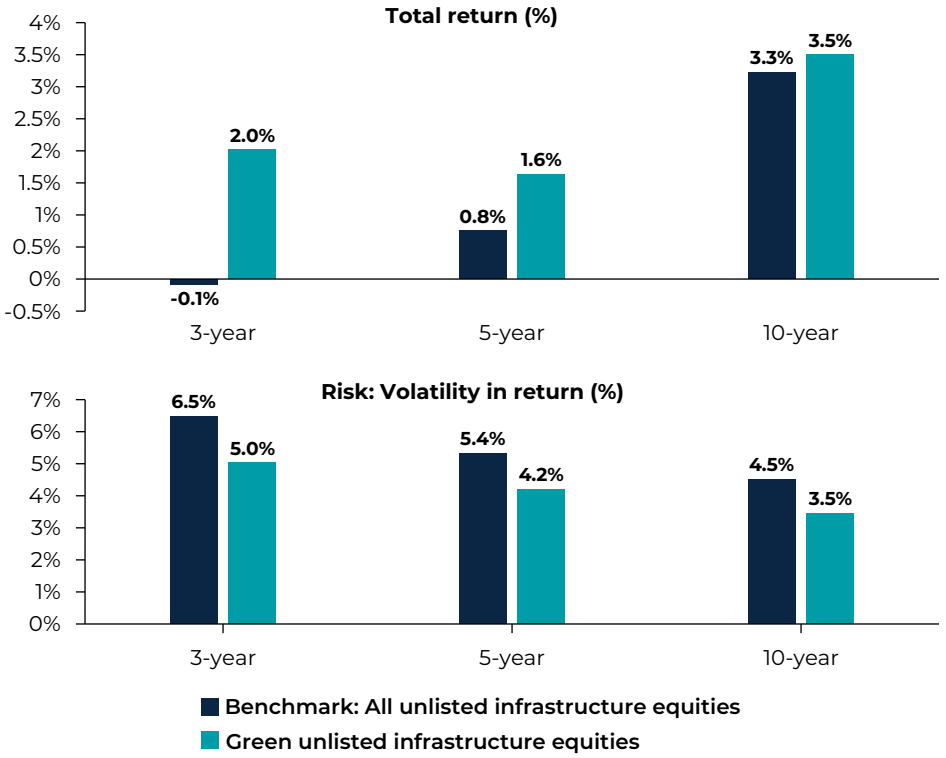
For infrastructure debt, as seen previously, the return decreased and the volatility in returns increased over the preceding decade. These metrics for green unlisted infrastructure debt also followed a similar trend but the decline was less dramatic, thereby increasing their relative attractiveness.

Over the 10-year period, green unlisted infrastructure equities provided an average return of 3.5 percent, slightly higher than 3.3 percent for all unlisted infrastructure equities. Over the last five years, the return declined to 1.6 percent for green unlisted infrastructure equities and 0.8 percent for all unlisted infrastructure equities. In the last three years, the return on green unlisted infrastructure equities registered an increase to 2.0 percent while the return for all unlisted infrastructure equities declined even further to nearly zero.

The volatility in returns on green unlisted infrastructure equities was 3.5 percent over the last ten years, lower than 4.5 percent for all unlisted infrastructure equities. Over time, the volatility levels for both increased, but they increased at a slower pace for green unlisted infrastructure equities. In the last three years, the volatility in returns for green unlisted infrastructure equities was 5.0 percent while that for all unlisted infrastructure equities was 6.5 percent.

In effect, the return to volatility ratio for green unlisted infrastructure equities improved over the past three years.

Green unlisted infrastructure debt: Return and risk by investment time horizon



Source: EDHECInfra (2024). Data as of 31 October 2024.
Note: InfraGreen debt index tracks the performance of the outstanding senior debt of the constituents of the infraGreen Equity index which tracks over 100 investments in solar and wind projects worldwide and provides a unique view of the renewable energy sector's performance. EDHECInfra data is based on a representative sample of 27 countries that exhibit sizable level of activity that could be measured including Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, Finland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, New Zealand, Poland, Portugal, Russia, Singapore, Slovakia, Sweden, United States of America, Brazil, Chile, Malaysia, Philippines.

Environmental, Social, and Governance (ESG) factors in infrastructure



OVERVIEW

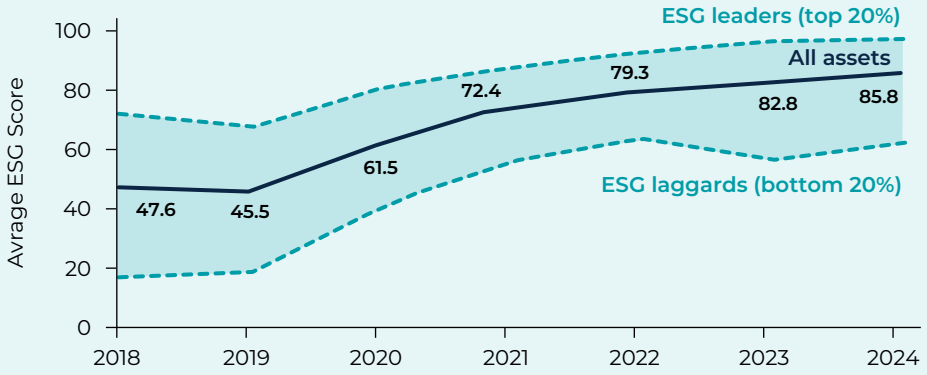
Infrastructure assets continue to improve their ESG scores and are increasingly identifying and assessing climate risks, though many still lack net zero targets

In 2024, infrastructure assets continued to improve their ESG policies, practices and disclosure, as measured by GRESB's ESG Score in its annual *Infrastructure Asset Assessment*. ESG scores for infrastructure assets improved across all three pillars (Environmental, Social and Governance), with the Environmental pillar showing the most progress, particularly in Biodiversity & Habitat.

The increasing integration of sustainability considerations into investment decisions is also evident, as a growing number of infrastructure assets now have systematic processes in place to identify and assess the financial impact of both physical climate risks and transition risks.

Compared with 2023, more infrastructure assets have also reported that they have a net zero target set. However, almost one-third of assets still do not have a net zero target and for those that do, over 40 percent do not have interim targets or are not aligned to a target-setting framework.

GRESB ESG Score for infrastructure assets
(where 0 is the worst score and 100 is the best score, 2018-2024)



Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.
The assessment covers 720 assets across 81 countries.

Identification and assessment of climate risks by type
(% of reporting assets, 2023 vs. 2024)

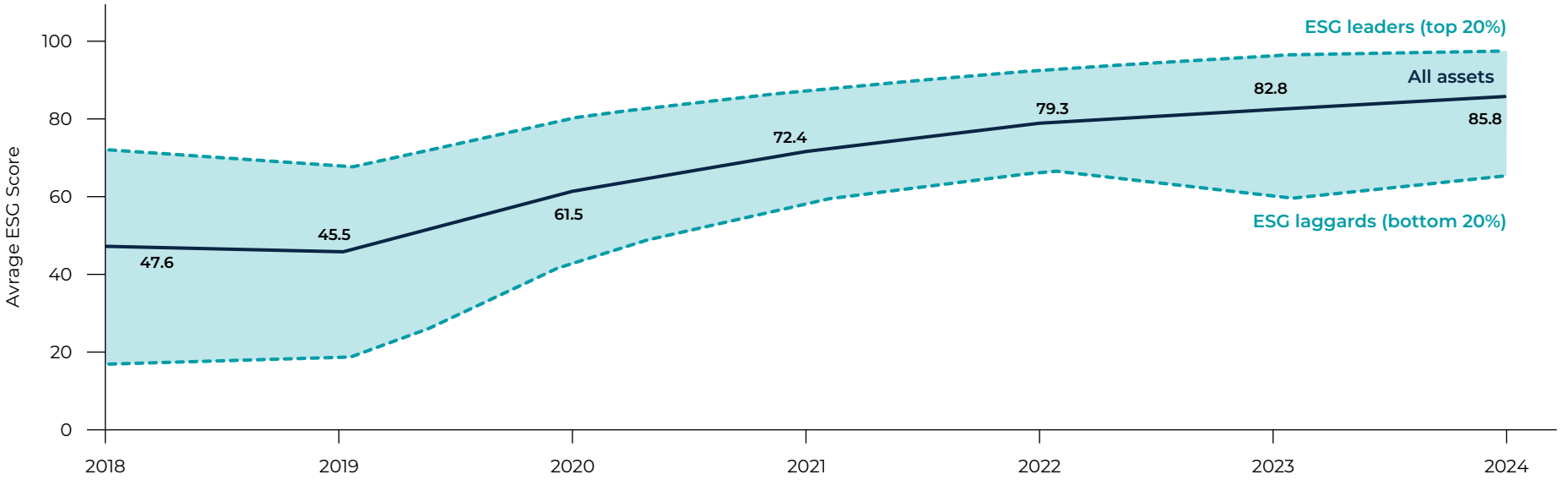


Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.

Infrastructure assets have continued to improve their ESG policies, practices, and disclosure over time

- Data that can support the development of resilient, sustainable and inclusive infrastructure is critical in tracking progress on net zero and other climate outcomes. In this chapter, data from the GRESB *Infrastructure Asset Assessment* has been adopted as a proxy to illustrate change and movement in this area. It is important to note that data from the assessment is provided and self-reported on a voluntary, opt-in basis. Resultingly, the analysis may not be totally representative of the state of ESG for infrastructure assets across the world, particularly in emerging markets; In 2024, 88 percent of the participating assets in the assessment came from high-income countries.
- GRESB is currently the market leading source of ESG (Environmental, Social, and Governance) data for infrastructure assets, collecting data via its annual *Infrastructure Asset & Fund Assessments* and calculating an ESG Score using a bespoke methodology and framework. This ESG Score reflects the extent to which assets have ESG policies in place, manage ESG risk, report transparently on their most material ESG issues, and have current and future ESG targets.
- According to GRESB's *Infrastructure Asset Assessment,* the average ESG Score for infrastructure assets has been increasing steadily since 2019 and continued to do so in 2024, rising from 82.8 in 2023 to 85.8 in 2024.

GRESB ESG Score for infrastructure assets
(where 0 is the worst score and 100 is the best score, 2018-2024)

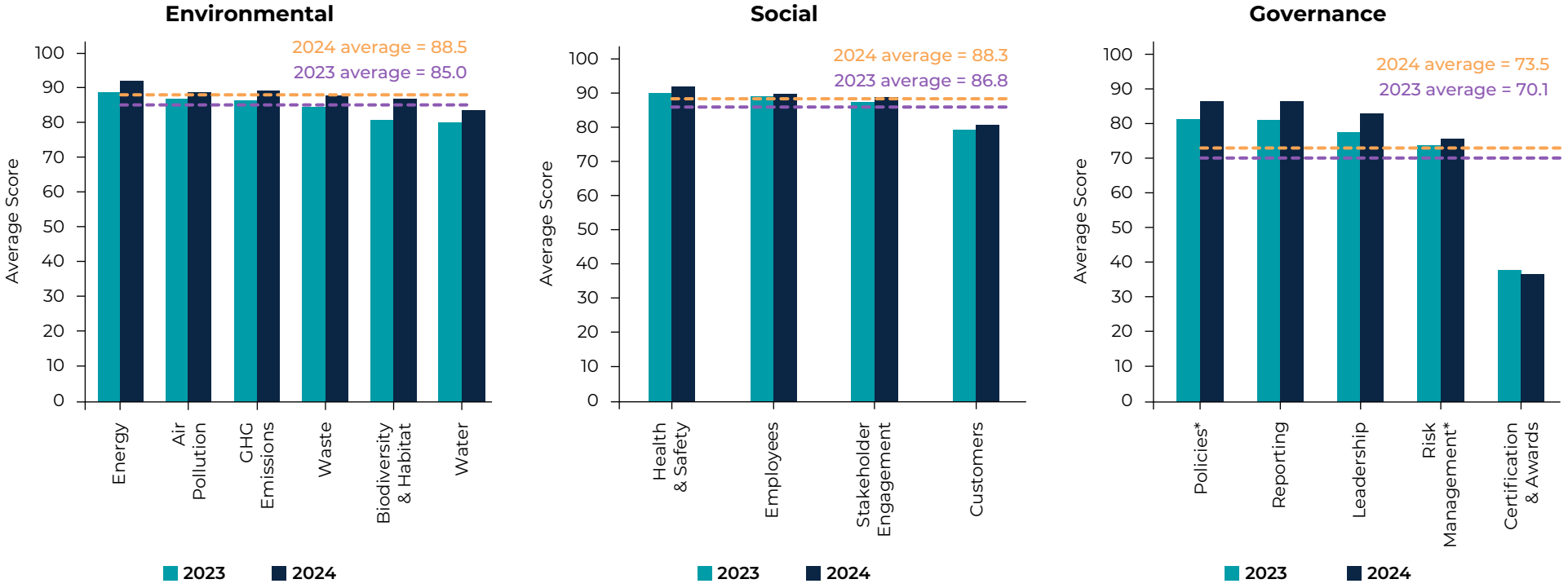


Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*. The assessment covers 720 assets across 81 countries.
Notes: While ESG Scores have been subject to some methodological changes and changing component weights over time, they are still comparable across years.

In 2024, ESG Scores for infrastructure assets improved in all three pillars of ESG

- In 2024, the ESG Scores of infrastructure assets improved across all three pillars of ESG, with the Environmental pillar seeing the most improvement. This improvement was largely driven by significant progress in the Biodiversity & Habitat aspect.
- Notably, Governance saw similar levels of improvement to Environmental, although the Governance pillar continues to lag overall.
- In 2024, Energy has reclaimed its position as the highest scoring individual aspect, surpassing Health and Safety (the extent to which the entity reports on health and safety of employees and contractors, users, and the local community) and Employees (reflecting employee engagement and extent of reporting on diversity and inclusion).

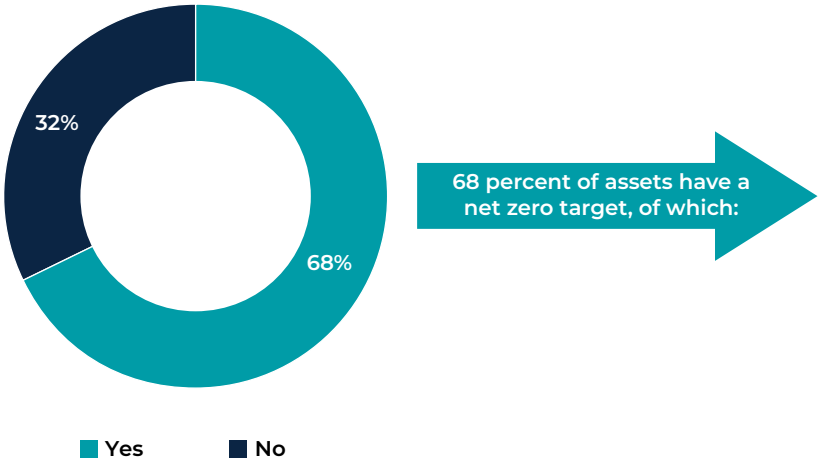
ESG Scores for infrastructure assets by ESG pillar
(where 0 is the worst score and 100 is the best score, 2023 vs. 2024)



Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.
*The Policies and Risk Management aspects contribute to three pillars but have been included in the Governance pillar for the purpose of this chart.

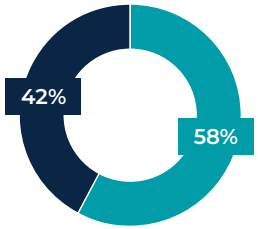
Almost one third of infrastructure assets still have no net zero target. Moreover, over 40 percent of these targets do not have interim targets or target-setting frameworks

Infrastructure assets that have a GHG emissions target aligned with net zero (% of reporting assets)

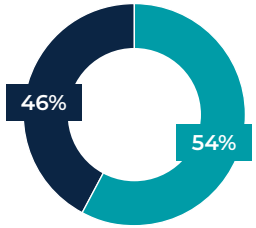


68 percent of assets have a net zero target, of which:

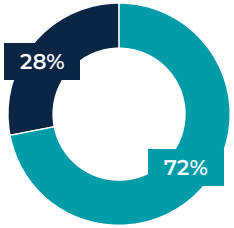
Aligned with a net zero target-setting framework (% of targets)



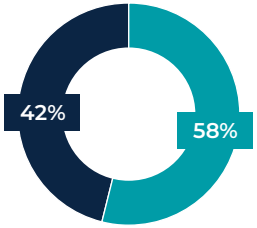
Science-based (% of targets)



Publicly communicated (% of targets)



Includes interim target (% of targets)



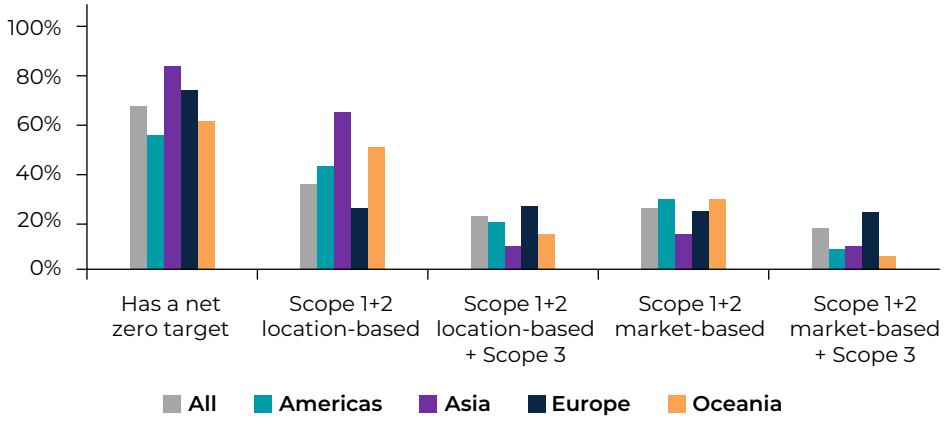
Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.

- GRESB's 2024 *Infrastructure Asset Assessment* reveals an improvement in net-zero target-setting, with 68 percent of reporting assets having a GHG emissions reduction target aligned with net zero. This metric was first captured by GRESB in 2023, when only 60% of assets reported a target. On the flipside, there is still significant progress to be made as this means almost one-third of reporting assets have no GHG emissions target aligned with net zero.
- The data also suggests that organizations are now setting more transparent targets for their infrastructure assets. This year's results saw a general uptick in the proportion of reporting assets that are setting targets aligned with a target-setting framework, are science-based, validated by a third party, publicly communicated, or that include an interim target. Additionally, a greater proportion of reporting assets in 2024 have established timelines for their targets (i.e. they have specified baseline and end years).
- Despite this improvement, only 58 percent of the targets set by the organizations assessed have target-setting frameworks and interim targets. These two attributes form an integral part of setting overarching net zero targets, as targets that lack defined pathways, milestones, and substantive detail on how they will be implemented will be difficult to monitor, evaluate and possibly, achieve. Going forward, targets have the potential to be more ambitious.

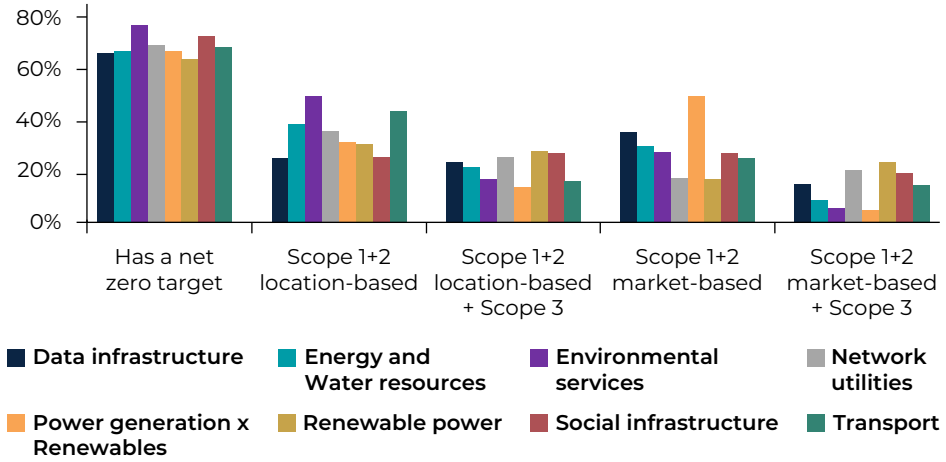
Net zero targets tend to focus on Scope 1+2 emissions and be location-based over market-based. Out of all infrastructure sectors, environmental services assets lead the way in net zero targeting

- Amongst all emissions scopes reported by entities that have a net zero target, location-based targets tend to be more common than market-based targets. Generally, Scope 1+2 emissions targets are also more common than Scope 3 emissions targets.
- Europe continues to dominate market-based targeting, and is also the region with the greatest proportion of Scope 3 emissions targeting (50 percent) – with Scope 1+2 targeting being equally as prevalent (50 percent). Asia remains the region with the lowest proportion of net zero targets capturing Scope 3 emissions, albeit the region saw a 11 percent increase from last year to 20 percent in 2024.
- However, infrastructure assets in Asia are most likely to have a net zero target overall (84 percent), followed by Europe (75 percent), Oceania (62 percent), and then the Americas (56 percent). Overall, and compared to last year's values, 2024 saw an improvement in net zero targeting across all regions.
- There was also an improvement in net zero targeting across all infrastructure sectors, except for network utilities.
- Remarkably, environmental services infrastructure was most likely to have a net zero target, with the sector observing a 30 percent increase upon last year's assessment, where it ranked the lowest across all infrastructure sectors. Overall, the renewable power sector had the lowest proportion of targets, although perhaps because the sector itself is inherently, already net zero aligned.

Net zero targeting by type and region
(% of emissions scopes covered by targets)



Net zero targeting by type and sector
(% of emissions scopes covered by targets)

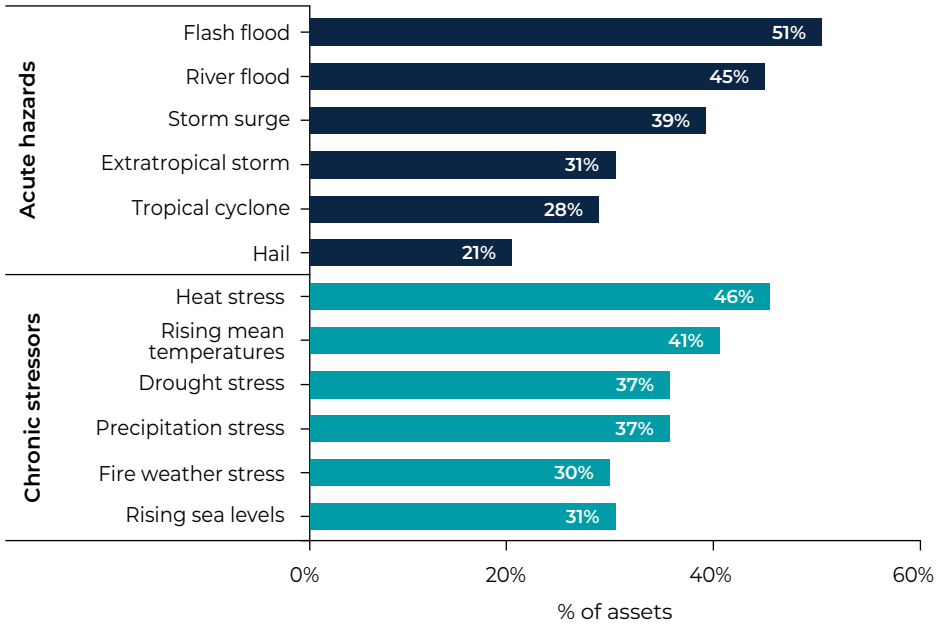


Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.
Note: Entities can select more than one type of scope for their net zero targets.

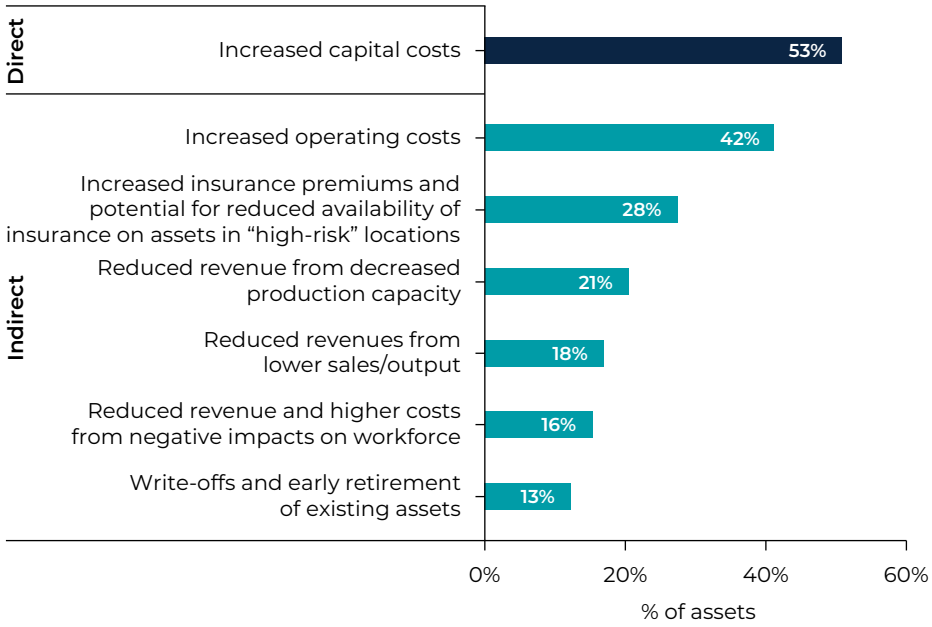
An increasing number of organizations are implementing a systematic process for identifying and assessing the impacts of physical climate risks on their infrastructure assets

- Most infrastructure assets assessed by GRESB have a systematic process for identifying physical risks (94percent of reporting assets) and for assessing their material financial impact (87 percent).
- These values have improved since 2023 by 6 and 9 percentage points respectively, suggesting that the organizations assessed are becoming more adept at identifying physical risks and their potential financial impact on their organization's business and financial plans. Assets in the social infrastructure sector appear to be leading the way for both these metrics.
- The most commonly identified risks continue to be flash flooding (acute) and heat stress (chronic), with approximately half of respondents indicating that their infrastructure assets are exposed to these risks. The most assessed financial risks were increased capital costs (direct) and increased operating costs (indirect).

Physical risk identified by risk type
(% of reporting assets that identify physical risk)



Material financial impacts identified by impact type
(% of reporting assets that assess impact of financial risk)

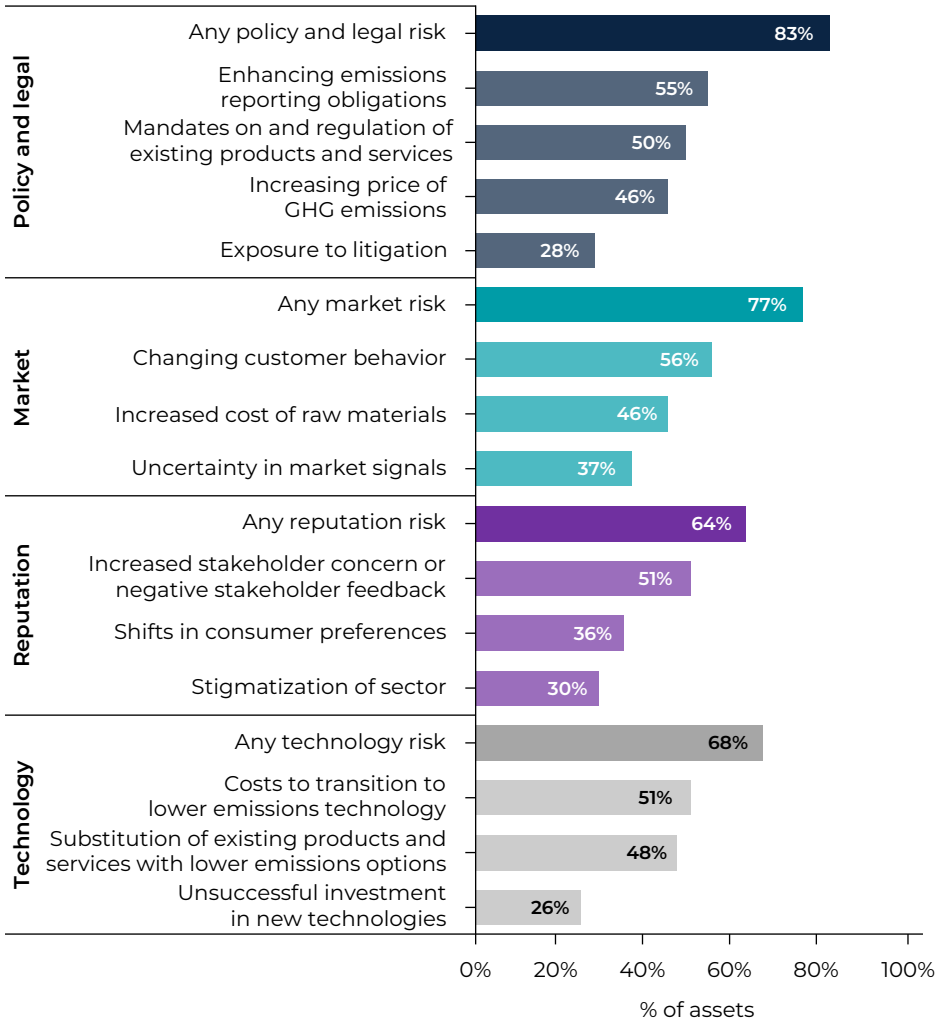


Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.

Transition risks are also widely identified and assessed for infrastructure assets, with policy and legal risks being the most common, and the most likely to have a material financial impact

- The majority of infrastructure assets assessed by GRESB also have a systematic process for identifying transition risks (90 percent of reporting assets), a considerable improvement from last year's value of 77 percent. In addition, 85 percent of reporting assets have a systematic process to assess the material financial impact for the transition risks identified – up from 77% in 2023. This improvement was exhibited across all risk types — policy and legal, market, technology, and reputation.
- Overall, policy and legal risks were the most commonly identified transition risks and also, the most likely to have a material financial impact on infrastructure assets.
- Amongst assets that have a process for identifying transition risks, 83 percent identified a policy and legal risk, most commonly relating to enhanced emissions reporting obligations. Market, reputation, and technology risks were also widely identified by infrastructure assets, particularly the risk of changing customer behaviour (56 percent), increased stakeholder concerns (51 percent), and the costs of transitioning to lower emissions technology (51 percent).
- Similar to the physical risk assessment, social infrastructure is the sector which had the greatest proportion of reporting assets identifying transition risks and their material financial impact (91 percent).

Transition risk identified by risk type
(% of reporting assets that identify transition risk)

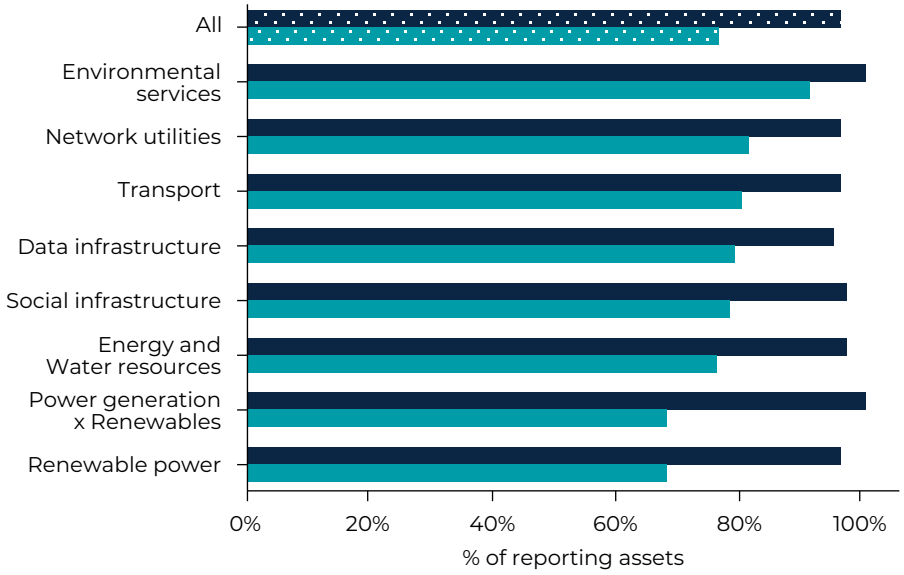


Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.

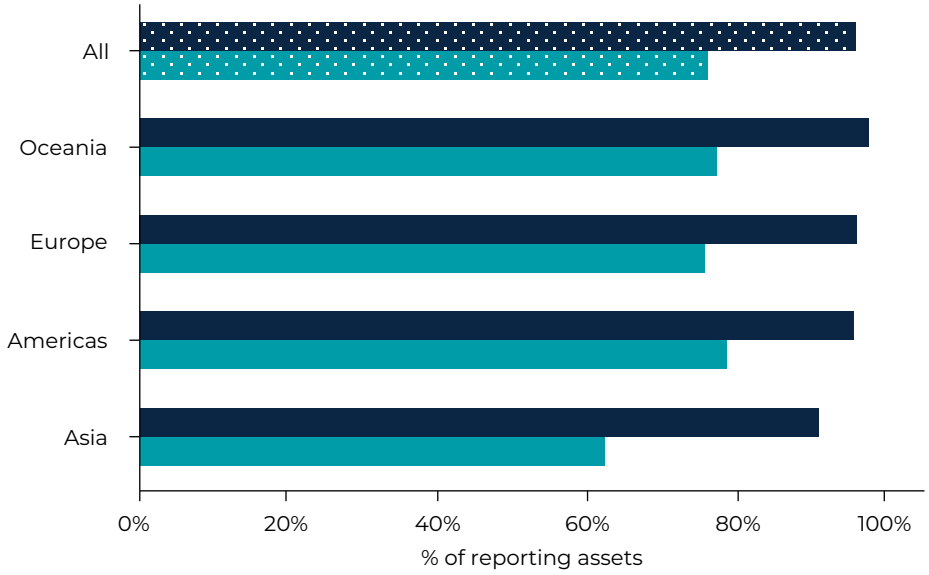
Almost all infrastructure assets have an individual responsible for Diversity, Equity, and Inclusion (DEI) issues with senior decision-maker accountability

- GRESB's Infrastructure Assessment includes a range of metrics to evaluate infrastructure assets' Diversity, Equity, and Inclusion (DEI) commitments and objectives, and how responsibilities for making decisions relating to DEI are assigned.
- Overall, there was an improvement across all DEI metrics in 2024 in comparison to last year's assessment, when the DEI indicators were first collected and implemented by GRESB.
- In 2024, 76 percent of reporting infrastructure assets have a DEI objective. However, most assets (96 percent) still have an individual responsible for DEI issues, even in the absence of a specific DEI objective.
- Although there isn't significant variability amongst regions when it comes to assets having DEI objectives and an individual responsible for implementing DEI, Asia is comparatively lower. For the same metrics, reporting assets in the environmental services sector had the greatest commitment to DEI.

Commitment to DEI by sector
(% of reporting assets)



Commitment to DEI by region
(% of reporting assets)



Have an individual responsible for implementing DEI objectives **Have a DEI objective**

Source: Authors' analysis based on 2024 GRESB *Infrastructure Asset Assessment*.
Note: Sectors with fewer than 25 reporting assets have been excluded (that is, Other and Diversified), but are included in the calculation of "All".

Blended finance and guarantees in infrastructure

This section has been developed in partnership with Convergence, drawing on data from Convergence's historical deals database. It also draws from data in the Berne Union reports.



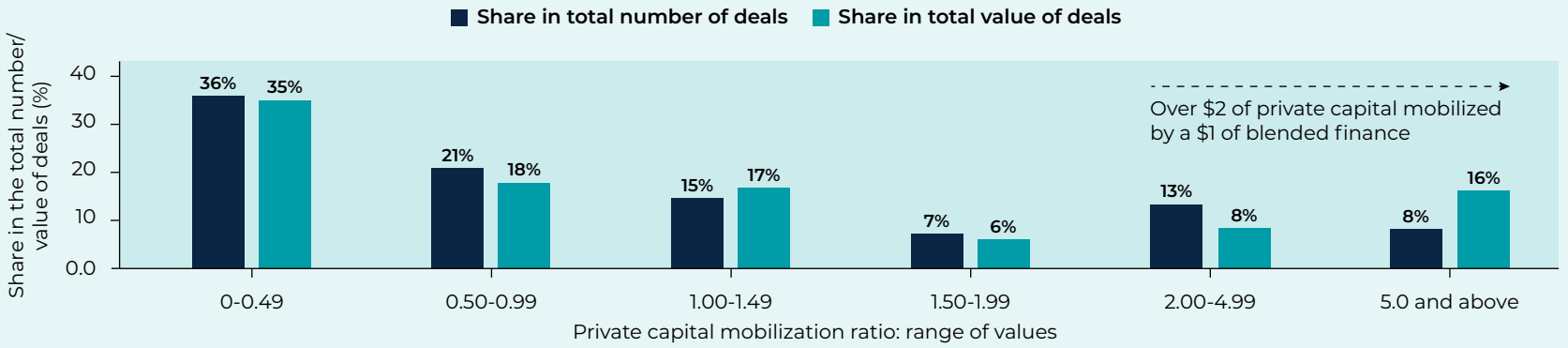
OVERVIEW

Blended finance and guarantees in infrastructure

Maximizing private capital mobilization leveraging constrained public resources has become central to strategies aimed at closing the infrastructure deficit. Blended finance refers to the various approaches to use limited public or philanthropic finance to increase private investment including the use of guarantees. This section examines blended finance approaches in infrastructure deals, particularly their use in financial structuring and mobilizing private capital. Noting the key role played by guarantees in private capital mobilization, it also evaluates recent trends in the availability and performance of cross-border guarantees for infrastructure and longer-tenor business.

The success in mobilizing private capital varies considerably across infrastructure deals. Over half of the blended finance infrastructure deals mobilized less than a dollar of private capital for a dollar worth of blended finance approaches. Encouragingly, about one-fifth of the infrastructure deals mobilized more than $2. A sizable share of this variation can be explained by country-specific factors like per capita income, sector of operations, operating structure, macroeconomic conditions, and financial structuring. **Notwithstanding, the more successful deals had some strategies in common including the use of blended finance for early-stage support, future market creation and addressing payment risk, meeting the requirements of financial regulations, enhancing market tradability, and supporting a pathway to commercial viability.**

Blended finance infrastructure deals (2000-2024): Private capital mobilization ratio by range of values



Sample size: Total: 407	146	85	60	29	54	33

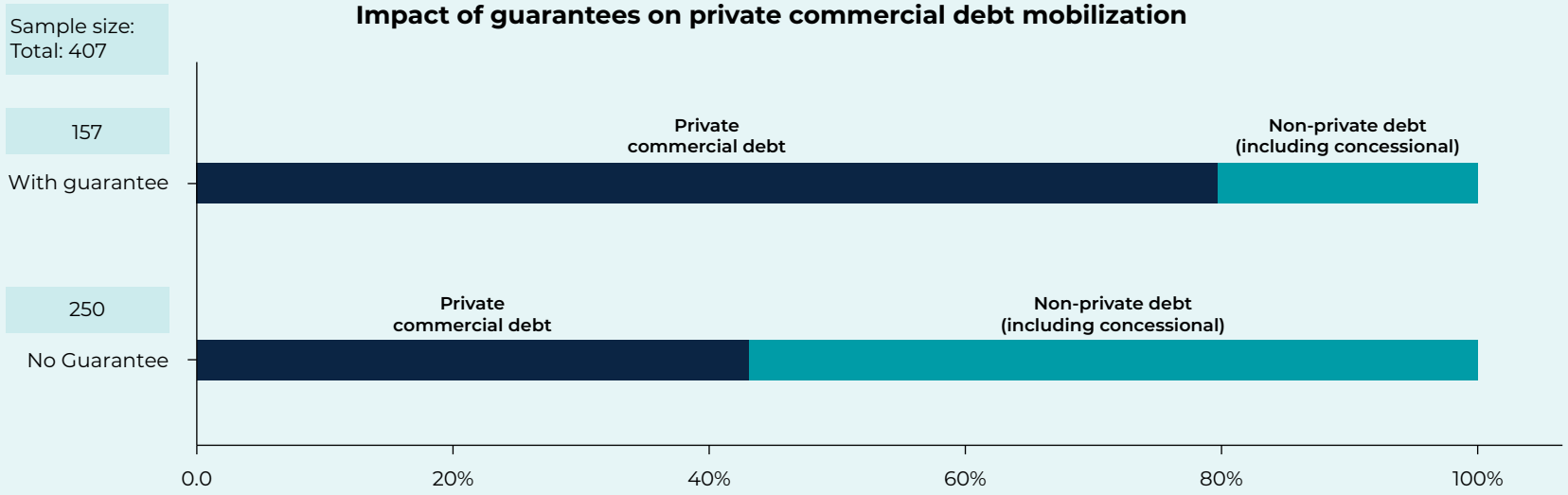
Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which the required data was available. The guarantees had both commercial and concessional terms. To control for deal size, the shares of instruments in total deal size were used.

OVERVIEW

Blended finance was most often used for infrastructure project finance structure, with majority of the support to lower-income countries in Sub-Saharan Africa, and to scale renewable energy generation. Higher income countries are more conducive to mobilizing more private capital. Lower income countries often require blended finance particularly guarantees to attract private capital. By region, Sub-Saharan Africa accounted for majority of the blended finance infrastructure projects, with over 90 percent in low-income countries. By sector, renewable energy generation has increasingly dominated blended finance infrastructure projects. MDBs and DFIs financed a large share of blended finance infrastructure projects, especially in large deals in low-income countries.

Guarantees played a key role in mobilizing private capital mainly by increasing the share of debt. Guarantees by creditworthy entities like MDBs/DFIs reduced punitive risk weights and capital charges applicable in banking regulations on low-income countries due to their sub-investment grade sovereign ratings. Holding the support through concessional capital and grants constant at $1 to estimate the impact of guarantees on private capital mobilization, $4.7 private commercial debt was mobilized for every $4.4 of guarantees cover. This may reduce the overall financing cost on an all-in basis if the guarantees are priced at subsidized levels e.g., much below sovereign borrowing costs for a country.

Since the onset of crisis period in 2020, the global share of deals (both by number and value) supported by guarantees seem to have reduced, but the coverage of deal value increased.



Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which the required data was available. The guarantees had both commercial and concessional terms. To control for deal size, the shares of instruments in total deal size were used.

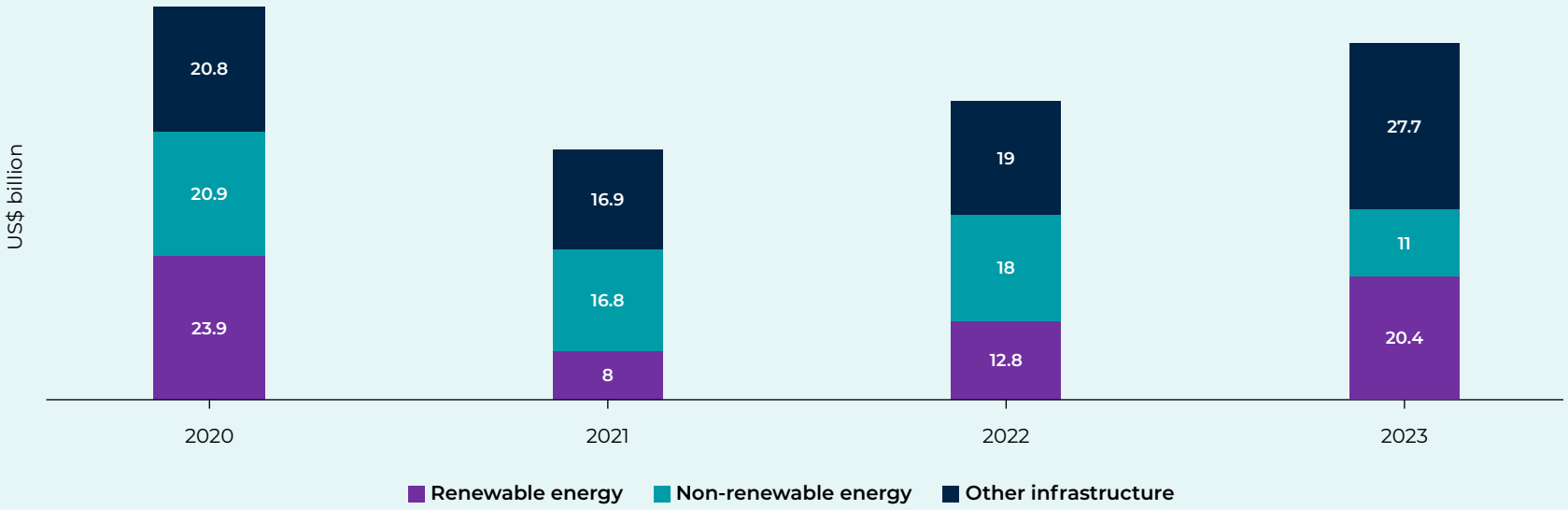
OVERVIEW

Cross-border guarantees: Recent trends and performance

Within infrastructure, energy transition drove new commitments for cross-border guarantees. In 2023, the guarantees for renewables surpassed non-renewables for the first time. New commitments for cross-border guarantees supporting infrastructure increase in 2023 to US$59.1 billion driven primarily by renewable energy and other non-energy infrastructure sectors. In 2020, new commitments for non-renewable energy sector were similar to that for renewable energy sector, and by 2023, they were half that for renewable energy sector. In 2023, renewable energy sector registered US$20.4 billion new commitments of cross-border guarantees across 68 countries. Other innovating guarantees like green guarantees were used to support ambitious climate goals. Other infrastructure sector also noted a record US$27.7 billion in new commitments of cross-border guarantees driven by recovery of the high-volume transportation sector. Public sector provided around 80 percent of the guarantees supporting longer-tenor business. Lower income countries allocated a higher share of these guarantees to infrastructure sector. The infrastructure sector constitutes 18 percent of these guarantees in high-income countries (HICs), and 30-40 percent in low- and middle-income countries (LMICs).

Global cross-border guarantees by type: New commitments value for infrastructure sector by subsector (US$ billion)

For infrastructure sector



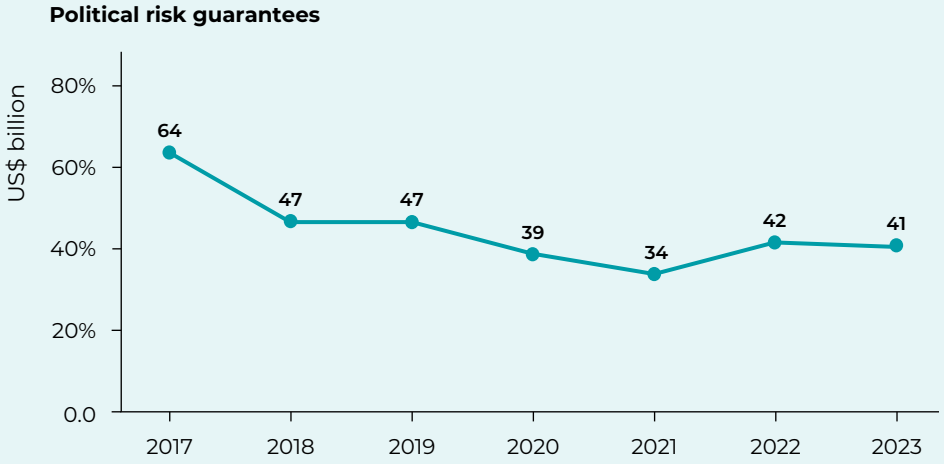
Source: Berne Union (2021, 2022, 2023, 2024).

OVERVIEW

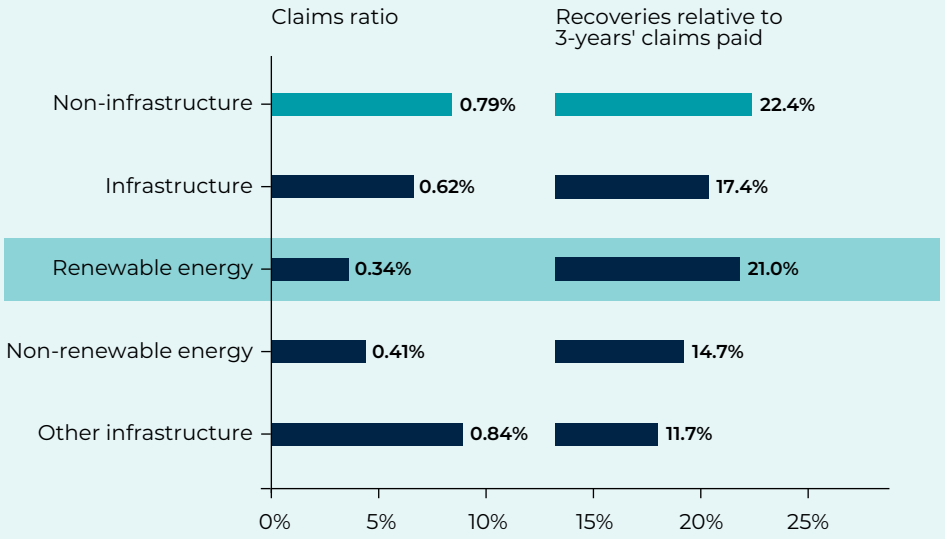
While the new commitments for political risk guarantees slightly declined, they absorbed more risk due to heightened geopolitical conflicts and political risk globally. The value of new commitments for political risk guarantees has been on a long-term declining trend even before the Covid-19 pandemic, falling from US$64 billion in 2017 to US$47 billion in 2019 to US$39 billion in 2020 and further to US$34 billion in 2021. While still below the pre-pandemic levels, the new commitments for political risk guarantees increased to US$42 billion in 2022 and maintained similar level at US$41 billion in 2023. The share of political risk related claims paid for non-performing loans was 55 percent in 2023 in South Asia and Sub-Saharan Africa, and this share was nearly 40 percent in the Middle East and North Africa, and Russia and the Commonwealth of Independent. Besides the Russian invasion of Ukraine, this was due to the political instability driven by difficult economic times.

By sector, renewable energy had the strongest performing cross-border guarantees, with the lowest claims ratio of 0.34 percent and high recoveries relative to 3-years' claims paid.

Global political risk guarantees: New commitments value (US$ billion)



Global cross-border guarantees performance by sector
(%, average 2021-2023)



Source: Berne Union (2021, 2022, 2023, 2024).

Blended finance in infrastructure

This section presents currently available evidence on the success of mobilizing private capital for infrastructure through blended finance approaches in low- and middle-income countries (LMICs) and attempts to identify approaches that seem more effective and scalable.

Blended finance is the use of catalytic capital from public or philanthropic sources to increase private sector investment in sustainable development. - Convergence

Private capital mobilization ratio indicates how much private capital was mobilized for infrastructure deals in which blended finance were used. It represents the ratio of capital provided by private investors (debt, equity or mezzanine finance on commercial terms) to the capital provided by non-private (public and philanthropic) investors in a deal (commercial or concessional debt, equity or mezzanine finance, grants, and guarantees).

Blended finance infrastructure deals: Infrastructure deals in which both public and private stakeholders financed the deal were included in this analysis on blended finance.

Data analysis sample: The analysis is based on 407 blended finance infrastructure deals in the Convergence historical deals database for the time period 2000-2024 for which the detailed data required for this analysis was available for LMICs. Through intensive data collection efforts, the analysis sample increased to 407 deals (US$104.3 billion total deal value) from 162 deals (US$34 billion total deal value) in the blended finance analysis of Infrastructure Monitor 2023. This allowed for a more detailed and disaggregated data analysis and insights in this year's report. Estimates are presented only when sample size had at least five deals. While the database is not exhaustive, it is the best accessible data to study the use of blended finance in infrastructure. The data availability for recent deals especially those launched after 2010 is better, except limited data was available for deals that closed in 2024.

Scope of participants: The deals represent infrastructure financing by all the main types of public, private and philanthropic investors including national, state, or local government entities or government-owned banks, enterprises and companies; international or regional Multilateral Development Banks (MDBs), Development Finance Institutions (DFIs), Export Credit Agencies (ECAs); foundations and NGOs; commercial investors including commercial banks, developers, insurance companies, pension funds, infrastructure funds, sovereign funds, and impact investors. Capital provided by private investors – commercial investors or impact investors – is considered private capital mobilized.

Note: The sample aims to represent the universe of blended finance infrastructure deals. It is not representative of the World Bank Group deals.

Scope and definition of the types of deal structures:

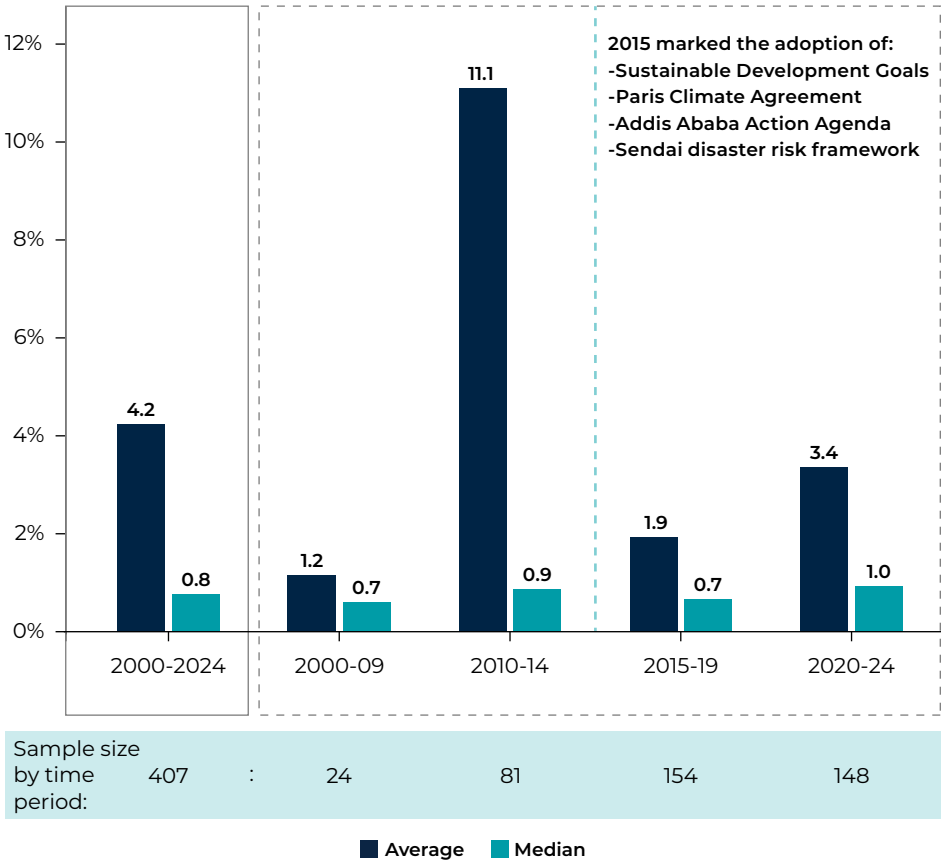
- Projects deal structure include greenfield and brownfield projects, and programs funded through a combination of market-rate and below market-rate capital
- Bonds/notes deal structure include privately placed issuances, listed instruments on public exchanges
- Funds deal structure include limited partnership private equity and debt funds, as well as funds-of-funds
- Facilities deal structure include earmarked allocation of public development resources with private capital at the vehicle level, for deployment towards a specific recipient or intervention
- Companies deal structure include direct private equity and debt financing of businesses on both market-rate and below market-rate terms

Maximizing private capital mobilization leveraging constrained public resources has become central to strategies aimed at closing the infrastructure deficit.

The year 2015 marked the adoption of global sustainable development goals and climate change goals through the legally binding Paris Agreement, as well as the Sendai framework for disaster risk reduction, that call for a significant transformation in foundational structures, that is, infrastructure, required to support the economic transition. United Nations studies estimated that infrastructure will affect the achievement of 92 percent of SDG targets and accounted for 79 percent of global greenhouse gas (GHG) emissions and 88 percent of climate adaptation costs (United Nations, 2022; UNOPS, 2021; UNDDR, 2015). Recognizing the large financing gap to meet the ambitious targets, the Addis Ababa Action Agenda in 2015 called for scaling all sources of financing including domestic public resources, international private finance, and international development finance (United Nations, 2015; OECD, 2023). While government budget deficits and debt stress peaked in controlling the Covid-19 pandemic-induced crisis, the unprecedented spikes in inflation and interest rates have dramatically increased infrastructure development costs and financing gap. In this context, blended finance approaches that can maximize private investments with the use of limited public budgets have taken the centerstage in finding solutions for the global infrastructure financing gap in LMICs.

The overall average ratio was 4.2 while the median was 0.8 indicating wide variations. The median is not affected by extreme values. The median ratio was the highest in 2020-24 time period at 1.0 despite the polycrisis era since the onset of Covid-19 pandemic in 2020. Note: The very high average ratio of 11.1 in 2010-14 and 2020-2024 is driven by a ratio of more than 11 for six out of 81 deals in 2010-14 including deals involving monopoly-like players in commercially viable sectors like telecommunications, airports, water and renewables.

Blended finance infrastructure deals
Private capital mobilisation ratio by time period



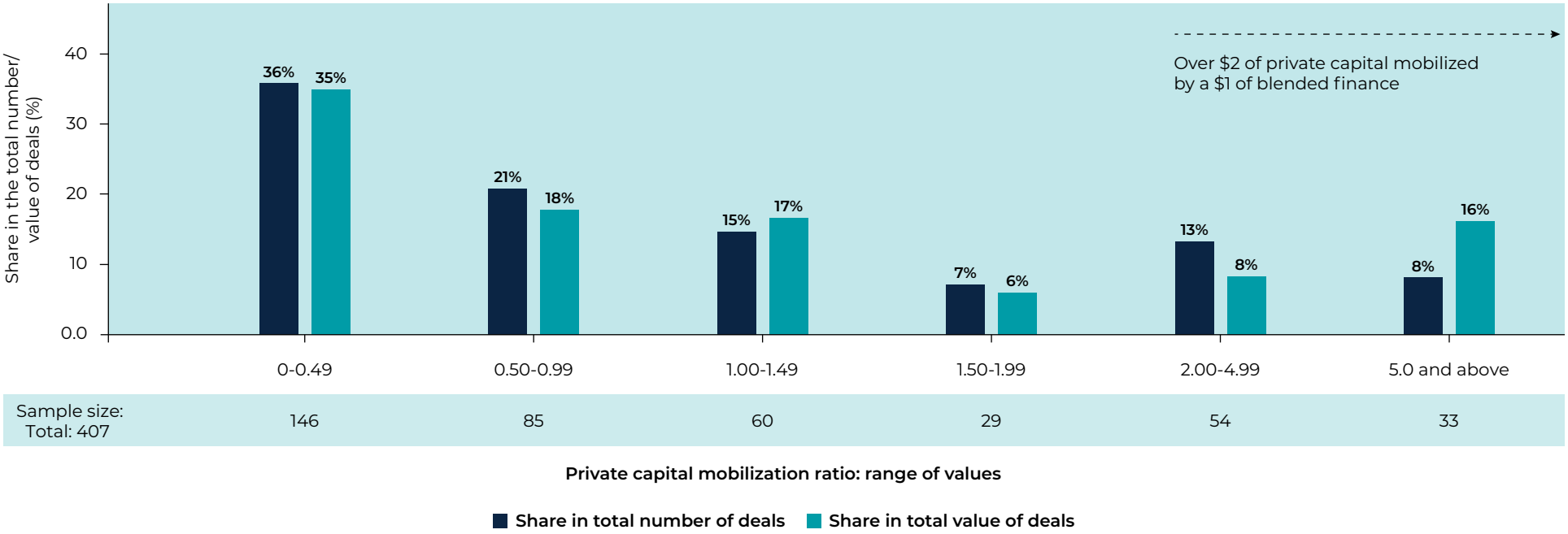
Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which data was available.

More than half of the blended finance infrastructure deals mobilized less than a dollar of private capital for a dollar worth of blended finance approaches.

Over half of the infrastructure deals (by total number or total value) mobilized less than a dollar of private capital for a dollar worth of blended finance approaches. Over one-third of the infrastructure deals mobilized less than half a dollar. This was true across varying time periods during 2000-2024.

Encouragingly, about one-fifth of the infrastructure deals mobilized more than $2 private capital for a dollar worth of blended finance approaches. This also was true across varying time periods during 2000-2024. After 2010, about 7 percent to 10 percent of the deals reported extreme success in mobilizing private capital by mobilizing more than $5 for every dollar worth of blended finance approaches. These highly successful deals had all types of operating structures – projects, bond/note, fund/facility, and company. This suggests potential scope to learn from these highly successful deals for enhancing blended finance approaches in the infrastructure space. The more successful deals had some strategies in common including the use of blended finance for early-stage support, future market creation and addressing payment risk, meeting the requirements of financial regulations, enhancing market tradability, and supporting a pathway to commercial viability.

Blended finance infrastructure deals: Private capital mobilization ratio by range of values (2000-2024, %)



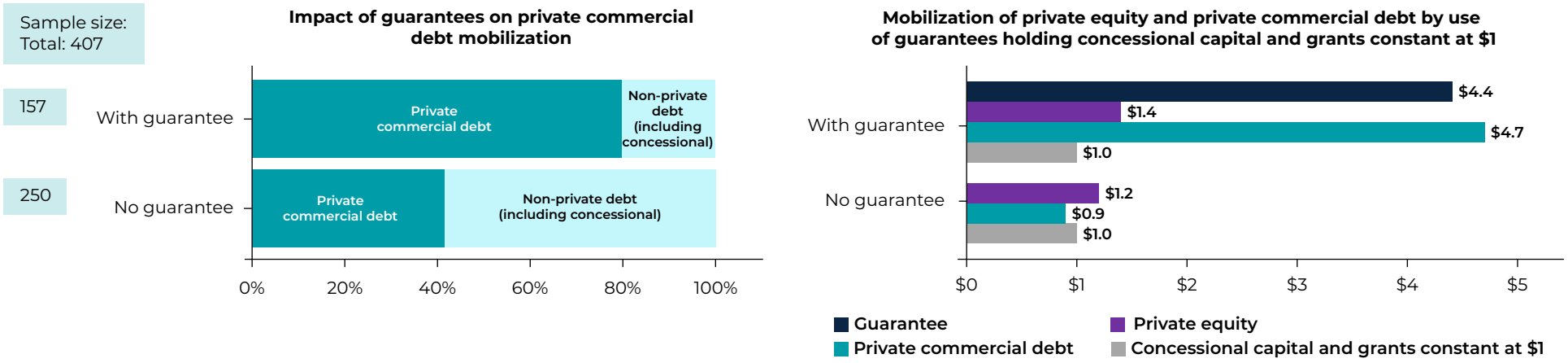
Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which data was available.

Holding concessional capital and grants constant at $1, guarantees had a significant impact on increasing private investment through commercial debt.

The effectiveness of guarantees in mobilizing greater amount of private capital stems from the additional layer of protection provided for repayment of commercial debt.

Holding the support through concessional capital and grants constant at $1 to estimate the impact of guarantees on private capital mobilization, $4.7 private commercial debt was mobilized for every $4.4 of guarantees cover. Without guarantees, $0.9 of private commercial debt was mobilized. Additionally, guarantees had a small positive impact on increasing the mobilization of private commercial equity from $1.2 to $1.4. The increasing popularity of guarantees in the infrastructure community is likely being driven by this effect. By enabling access to more private capital through debt instruments, the financing costs are reduced because debt is cheaper than equity. The benefit is higher for lower-income countries with non-investment grade ratings. However, the nearly one-to-one transfer of risk from debt providers to guarantee/insurance providers needs to be examined in more detail to estimate the effective net benefit in terms of reduced financing costs. Guarantees are effective in mobilizing private debt investors as they can dramatically reduce the punitive risk weights and capital charges applicable in banking regulations (Basel III) on sub-investment grade debt when guarantees are provided by creditworthy entities like the MDBs/DFIs. This may reduce the overall financing cost on an all-in basis if the guarantees are priced at subsidized levels e.g., much below sovereign borrowing costs for a country. Guarantees were provided by public and private sectors on both commercial and concessional terms.

Blended finance infrastructure deals by use of guarantee (2000-2024)



Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which data was available. The guarantees had both commercial and concessional terms. The total 2000-2024 sample was divided into two sub-samples: 157 deals with guarantees and 250 deals without guarantees. To control for deal size, the shares of instruments in total deal size were estimated. The shares of guarantees, private equity, private commercial debt were divided by the sum of shares of concessional capital and grants to show the value of the former instruments holding concessional capital and grants constant at $1.

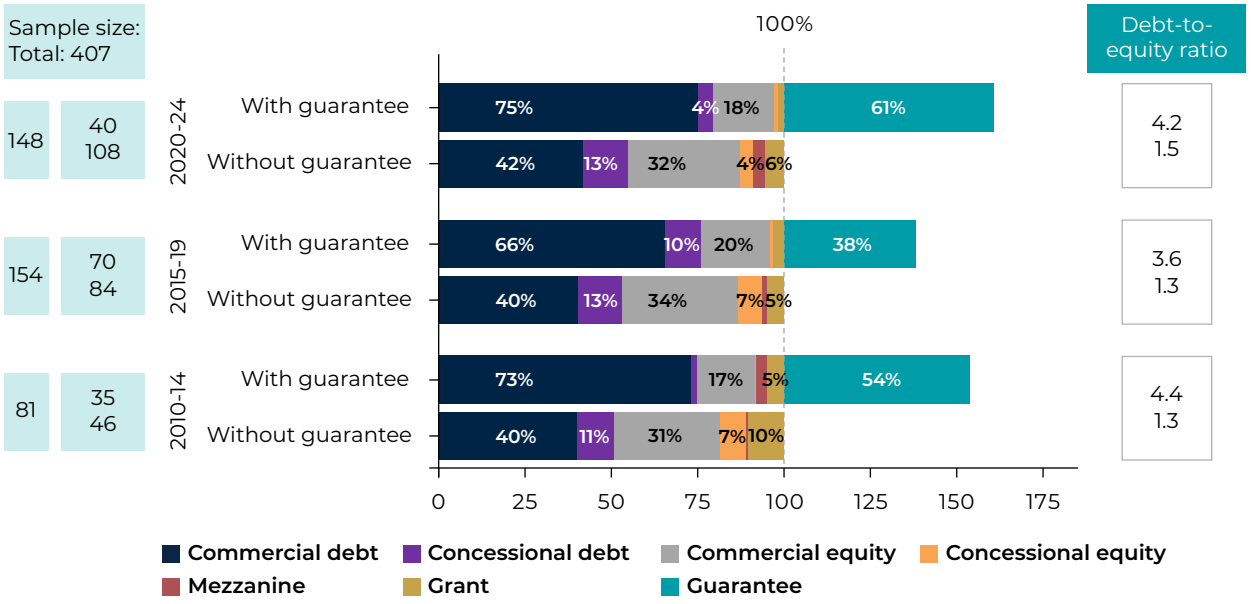
Since the onset of the polycrisis era in 2020, the global share of deals (both by number and value) supported by guarantees reduced, but the coverage of deal value was high.

Since 2020, multiple crisis have increased the general business risk increasing the demand for guarantees but also the cost of providing guarantees. As a share of total number of deals, the deals with guarantees reduced from 45 percent during 2015-19 to 27 percent during 2020-24. The decline was even more as a share of total value of deals which was also seen through decline in the average deal value covered by guarantees.

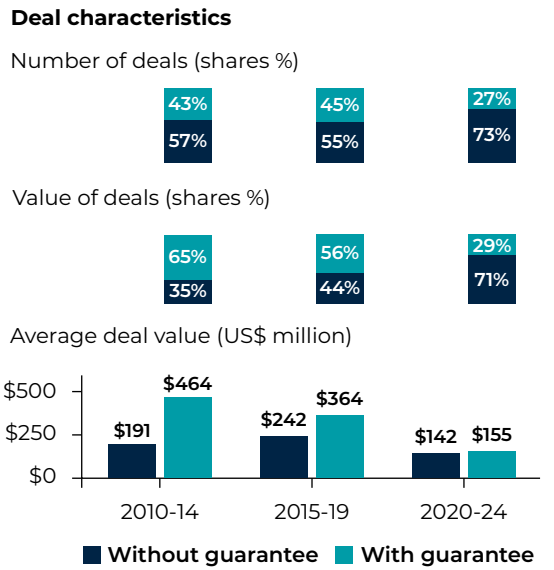
However, the deals for which guarantees were provided in 2020-24 covered an average deal value of 61 percent, significantly higher than the average cover of 38 percent during 2015-19, and higher than the average coverage provided in 2010-14 and 2000-09, which could be a result of intentional targeting on deals that require more support but can lead to greater development impact. Higher guarantee cover increased the average share of commercial debt to 75 percent from 42 percent. Although for deals with guarantees, concessional debt also decreased from 10 percent in 2015-19 to 4 percent in 2020-24, the increase in guaranteed cover was higher. This increased the debt-to-equity ratio from 3.6:1 in 2015-19 to 4.2:1 in 2020-24.

In 2020-2024, the deals with guarantees had a debt-to-equity ratio of 4.2:1 much higher than 1.5:1 for deals without guarantees. While debt is cheaper than equity, the impact on profitability depends on the cost of guarantees with an average cover of 61 percent.

Blended finance infrastructure deals by use of guarantee and time period (2010-2024): Shares of financial instruments in deal value (%)



Blended finance infrastructure deals by use of guarantee and time period (2010-2024)

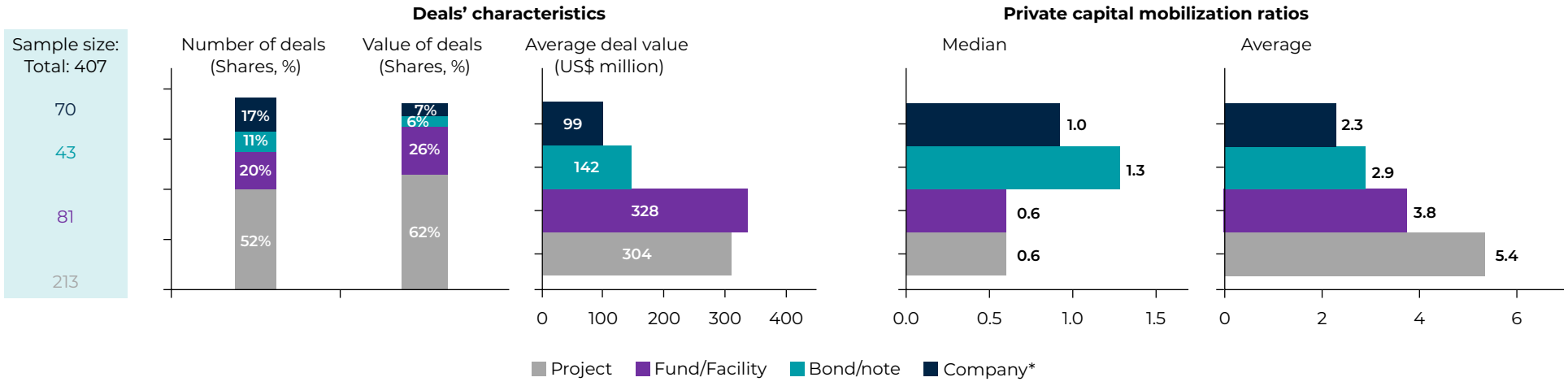


Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which data was available.

Projects structures were most often used in blended finance infrastructure deals and had a higher average deal value. Their success in mobilizing private capital widely varied.

- Blended finance strategy is deployed for the infrastructure asset class through different operating structures - project, funds or facilities, bonds or notes, company, to mobilize private capital for infrastructure investments.
- During 2000-2024, projects constituted majority (52 percent) of the blended finance infrastructure deals accounting for 62 percent of total deals value. Funds/facilities constituted one-fifth of the deals accounting for 26 percent of the total deals value. An average blended finance deal value for projects or funds/facilities exceeded US$300 million. Companies also constitutes about one-fifth of the deal but had lower average deal value of US$99 million that drove down its share in total value of deals to 7 percent. About 11 percent of blended finance infrastructure deals accounting for 6 percent of the total deals value were structured as bond/note. The average value was also lower at US$142 million for bonds.
- The success of projects and funds/facilities in mobilizing private capital widely varied. They recorded higher average private capital mobilization ratios of 5.4 and 3.8 respectively than the average ratios of 2.9 and 2.3 for bond/note and company structure, respectively. However, projects and funds/facilities also recorded the lowest median value. For projects and funds/facilities, the private capital mobilization ratio for half of the deals was less than 0.6.
- For bonds, the median value for private capital mobilization ratios was 1.3, and for companies, it was 1.0, which means at least half of the deals with bond or company structure mobilized at least a dollar for a dollar worth of blended finance approaches.

Blended finance infrastructure deals by operating structure (2000-2024)

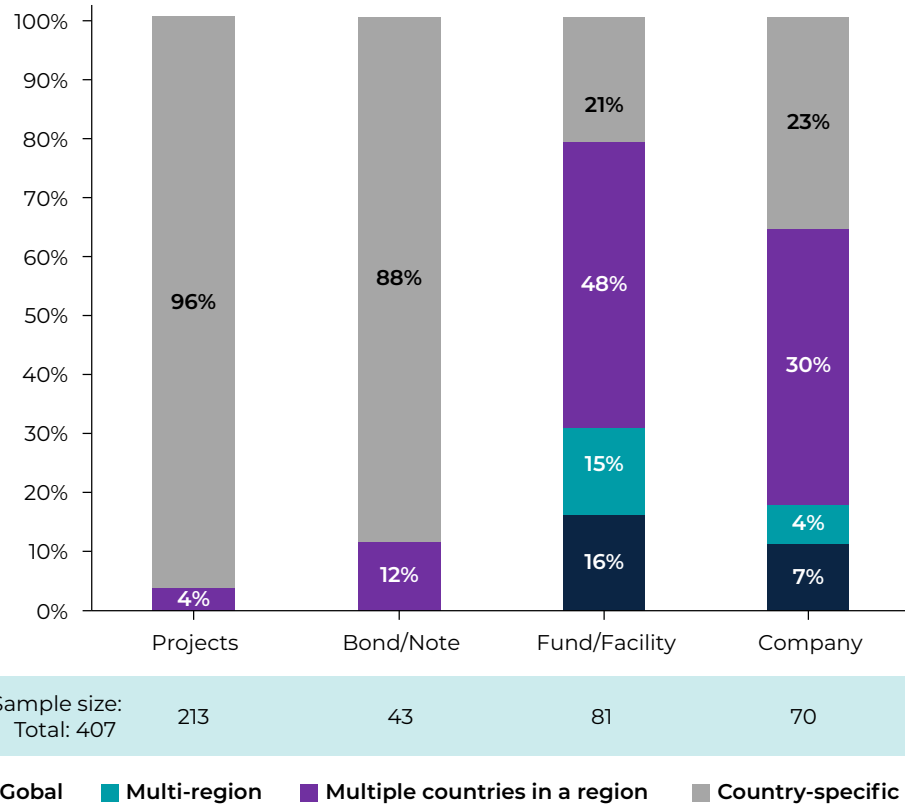


Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which data was available.

Project and bond structures were deployed in infrastructure deals within a country. Fund/facilities and company structures were more prevalent for the deals with multiple countries.

- Blended finance strategy for an infrastructure investment with project structure was mostly pursued at a country level (96 percent of the deals sample) and in multiple countries within a region (4 percent of the remaining sample).
- For blended finance infrastructure bonds/note, about 90 percent were used in a specific country, and the remaining 12 percent were used in multiple countries within a region.
- In contrast, the scope was multiple countries in a region for 48 percent of the blended finance infrastructure funds/facilities and 30 percent of the blended finance infrastructure companies. Only about one-fifth of the blended finance infrastructure funds/facilities had a country-specific focus, and only around a quarter of blended finance infrastructure companies had a country-specific focus.
- For a global scope, funds/facilities structure or companies were used to pursue blended finance strategy for mobilizing private capital for the infrastructure asset class. Also, for the scope covering multiple regions, fund/facilities and company structures were used for the blended finance strategy.
- Within blended finance infrastructure funds/facilities, 16 percent had a global scope and 15 percent had a multi-region scope. Within blended finance infrastructure companies, 7 percent had a global scope and 4 percent had a multi-region scope.
- Broadly, blended finance strategy was mostly deployed through a project or bonds/note structure when the geographical scope was a specific country. The funds/facilities and company structure was mostly used for blended finance infrastructure deals with scope involving multiple countries.

Blended finance infrastructure deals: Geographical use by operating structure (2000-2024)
(Shares in total number of deals, %)



Source: Authors analysis based on Convergence database.
Note: The analysis is based on 407 blended finance infrastructure deals for which data was available.

Project finance structure

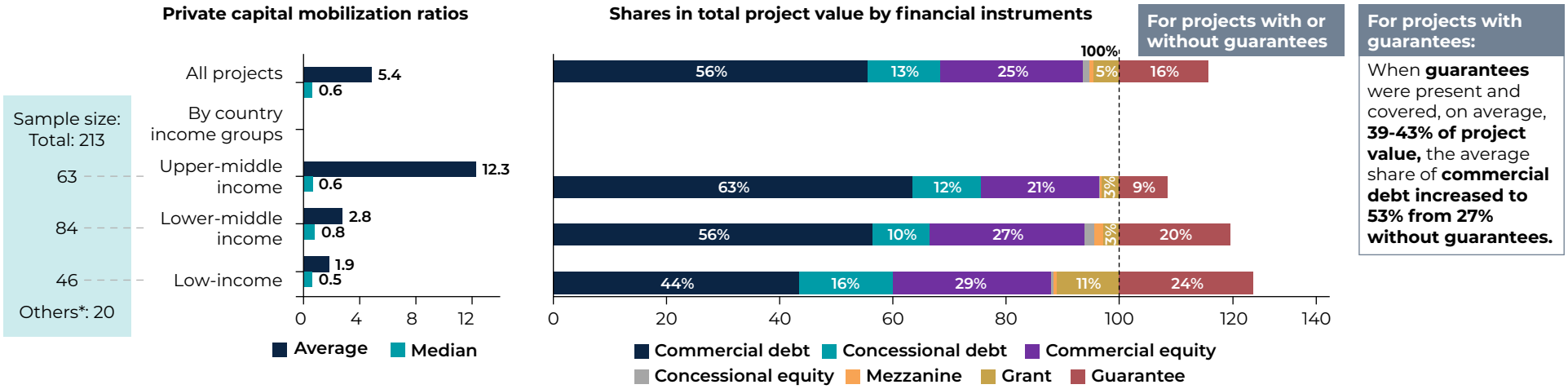


For infrastructure projects by country income groups, higher income countries are more conducive to mobilizing more private capital. Lower income countries often require blended finance especially guarantees to attract private capital.

Simple maximization of private capital mobilization will prove to be an imperfect measure for achieving development outcomes in the short-term, but its trend over time by country income can present improvement in potential to mobilize private capital. Countries with more development challenges are less likely to mobilize more private capital.

- For blended finance infrastructure projects by country income group, higher private capital mobilization ratios were seen for blended finance infrastructure projects in higher income countries. The average ratio was 12.3, 2.8, and 1.9 in upper-middle income, lower-middle income, and low-income country groups, respectively, suggesting that it was more difficult to attain higher private capital mobilization ratios for infrastructure projects in lower income countries, and more scope to scale private investment in higher income countries.
- Guarantees were more often needed in lower income countries to financially close infrastructure projects. Considering all blended finance infrastructure projects with or without guarantees, in upper-middle income countries, guarantees covered 9 percent of the project value, on average, whereas in lower-middle income countries and low-income countries, guarantees covered 20 percent and 24 percent of the project value, respectively.
- Considering only blended finance infrastructure projects with guarantees, guarantees covered a higher share between 39 percent and 43 percent of project value across country income groups.
- The median private capital mobilization ratio in low-income countries of 0.5 was close to the median of 0.6 for all blended finance infrastructure projects.

Blended finance infrastructure projects by country income groups (2000-2024)



Source: Authors analysis based on Convergence database.
Note: The analysis is based on 213 blended finance infrastructure projects for which data was available. Other include global, multi-region or multiple countries' deals.

Illustration: Impact of political risk insurance for a single representative energy project in three differently rated countries.

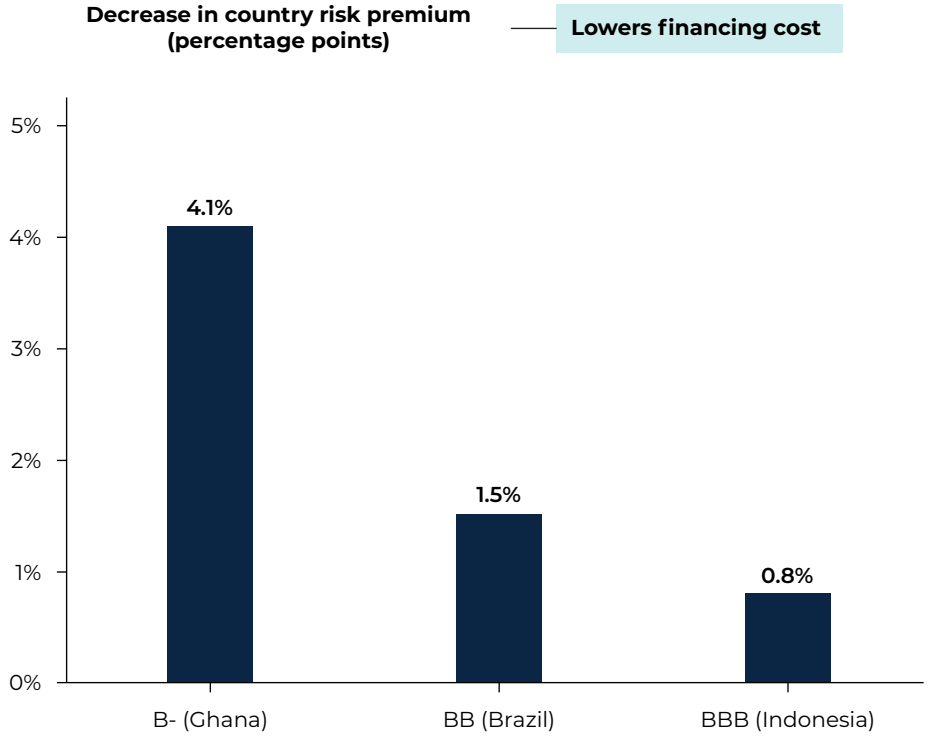
With guarantees, a country with B sovereign debt rating (mostly low-income) could lower its country premium by three to four times a country with BB or BBB sovereign debt rating.

Infrastructure projects are highly susceptible to political and social interference due to their public good nature. Political risks due to high government interference over long lives of infrastructure projects pose more serious concerns for countries that are perceived less creditworthy, that is, countries with lower sovereign debt ratings. which are typically also low-income countries. Investors demand higher premium as a compensation for taking higher country risk. Guarantees/insurance especially help in reducing the financing costs of projects in countries with sovereign debt rating below investment grade.

Lower the sovereign debt rating, higher is the benefit of political risk insurance, but more expensive it is to provide cover for the projects. According to S&P Global (2021), the net benefit is generally positive for countries with sovereign debt rating below investment grade, especially when premiums are tax deductible. The benefit stems from the use of lower discount rate during estimation of project value and rate of return, enabling financing of infrastructure projects at more favorable terms and costs. For a single representative energy project and a standard political risk insurance policy covering 21 country risk events, the country risk premium was estimated to reduce by 4.1 percentage points for a B- rated (Ghana), three to four times higher than the reduction of 1.5 percentage points for a BB rated (Brazil) and a BBB rated (Indonesia) country.

However, political risk insurance is not recognized in key international financial regulations such as the Basel III banking regulation, creating a regulatory roadblock in benefits provided by political risk insurance policy.

Impact of political risk insurance on financing costs by country's credit rating



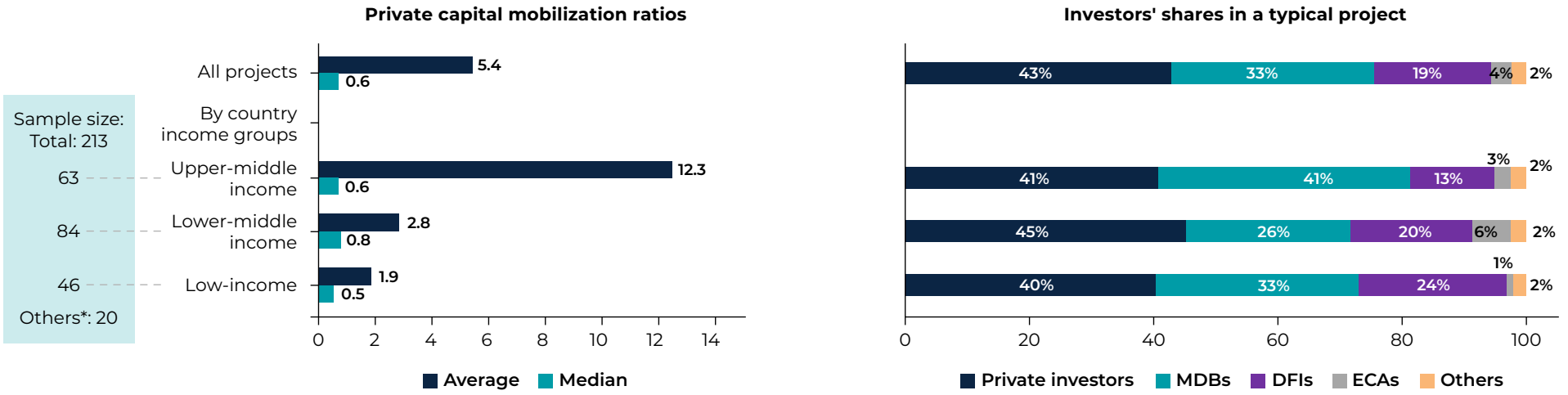
Source: S&P Global (2021)
Note: Results are based on S&P Global Country Risk Investment Model for a power purchase agreement (PPA) with a termination payment. The standard political risk insurance policy covered for 21 country risk events.

MDBs and DFIs financed about half of a typical blended finance infrastructure project value, even more in low-income countries.

- MDBs and DFIs provided around half of the investment for a typical blended finance infrastructure project: MDBs' average share was 33 percent and DFIs average share was 19 percent.
- Private investors and other leading international development finance providers like export credit agencies provided relatively more investment for infrastructure projects of larger size. However, in low-income countries, MDBs led the financing for projects of large size with private investors.

MDBs and DFIs played a crucial role in catalyzing private capital for blended finance infrastructure deals in low-income countries which have less conducive environment for attracting private capital. Intense international focus on maximizing private capital mobilization ratios can conflict with MDBs and DFIs' development objectives of reducing poverty by creating unintended incentives to reallocate some capital away from low-income countries to higher income countries with more conducive environment for mobilizing more private capital. While tracking private capital mobilization at a country level may create pressures to accelerate economic growth and income that can support higher private capital mobilization ratios, it may also conflict with the development objective of reducing global poverty and even inequality within countries as it is likely to be easier to maximize private capital mobilization in rich neighborhoods. **In this context, it is best to use private capital mobilization metrics as secondary outcomes to retain core development metrics as primary outcomes in the international development arena.**

Blended finance infrastructure projects by country income groups (2000-2024)



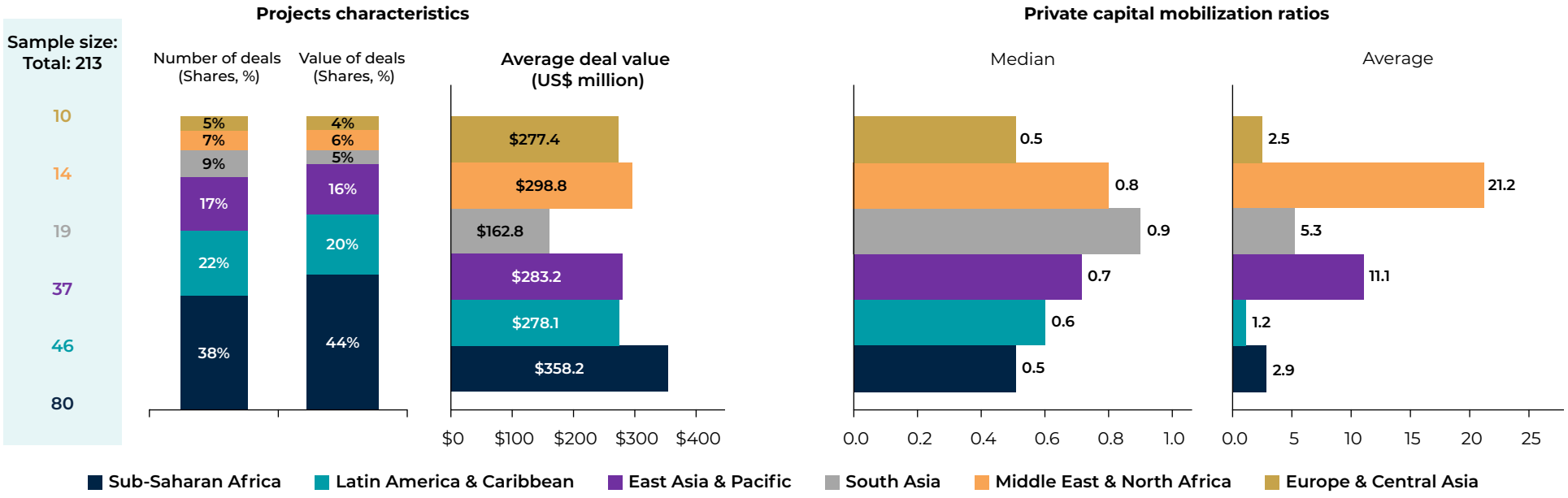
Source: Authors analysis based on Convergence database.
Note: The analysis is based on 213 blended finance infrastructure projects for which data was available. Financing by public investors like MDBs, DFIs, on commercial terms is not considered as private capital mobilized. 'Other' investors includes pension/sovereign funds, central government, state/national banks, state-owned enterprises, foundations and NGOs.

By region, Sub-Saharan Africa accounted for majority of the blended finance infrastructure projects, with over 90 percent in low-income countries where it is more challenging to mobilize private capital.

By region, Sub-Saharan Africa had the highest share in total blended finance infrastructure projects of 38 percent in total number of projects and 44 percent in total value of projects. It also had the highest average value of projects supported at US$358 million, which suggests that larger projects were supported through blended finance approaches in Sub-Saharan Africa. However, it had one of the lowest private capital mobilization ratio in terms of median value of 0.5, but the average was higher at 2.9 suggesting that some projects were successful in mobilizing private capital. It is important to note that Sub-Saharan Africa accounted for over 90 percent of the blended finance infrastructure deals in low-income countries and country income level is a key determinant of success in private capital mobilization.

Middle East & North Africa, East Asia & Pacific, and South Asia had higher average private capital mobilization ratios of 21.2, 11.1, and 5.3, respectively. These regions also had the highest median private capital mobilization ratios. Hence, these regions were more successful in mobilizing private investment in infrastructure.

Blended finance infrastructure projects by region (2000-2024)



Source: Authors analysis based on Convergence database.
Note: The analysis is based on 213 blended finance infrastructure projects for which data was available.

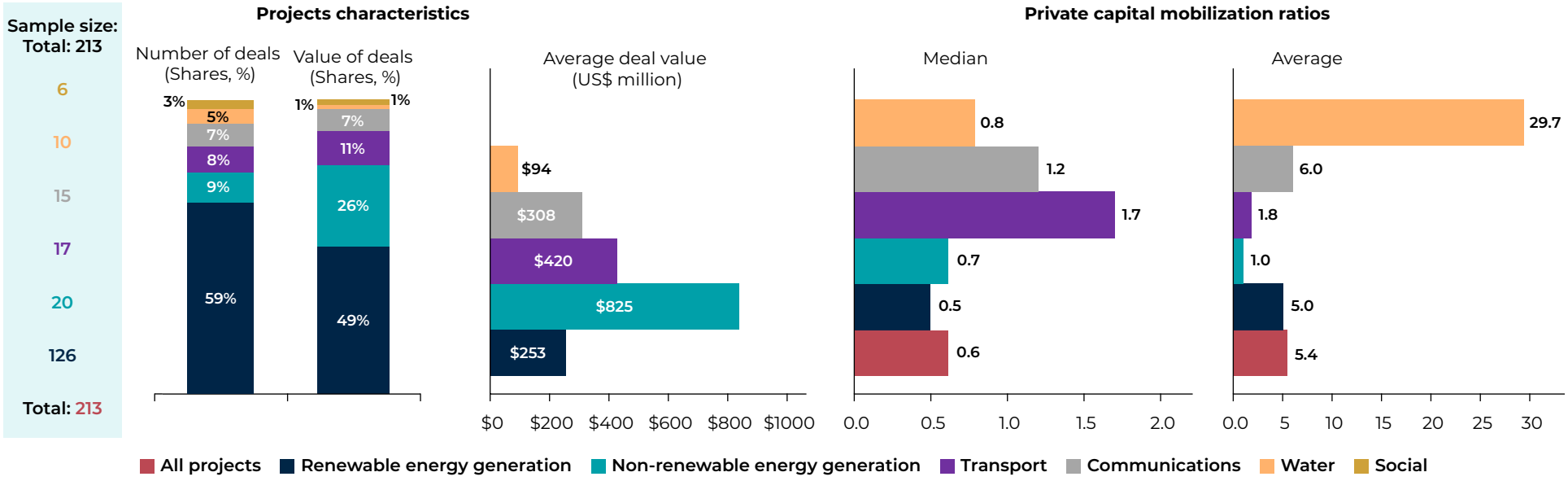
By sector, renewable energy generation dominated the blended finance infrastructure projects.

Renewable energy generation accounted for nearly 60 percent of all the blended finance infrastructure projects over 2000-2024, followed by non-renewable energy generation and transport sectors with 9 percent and 8 percent shares, respectively. The sizably large average size of a non-renewable energy generation project of US$825 million relative to the size of an average non-renewable energy generation project of US$253 million changed their respective shares in the total value of blended finance infrastructure projects to 49 percent and 26 percent respectively: still renewable energy generation dominated the blended finance infrastructure projects even as a share of total value of the projects.

The high-end spectrum of private capital mobilization ratios of more than $2 were dominated by communications, renewable energy generation, and water sectors which had the highest average ratio at 6.0, 5.0, and 29.7, respectively. Transport sector had the highest median value for private capital mobilization ratios at 1.7 which was close to its average ratio at 1.8, which suggests more symmetry in success in mobilizing private capital.

Renewable energy generation sector recorded the lowest median ratio of 0.5, but an analysis by country income group shows that the sector may be using blended finance approaches to support deals for which it was more challenging to attract private capital at the outset. The sample size for other sectors is not large enough to allow a similar analysis.

Blended finance infrastructure projects by sector (2000-2024)



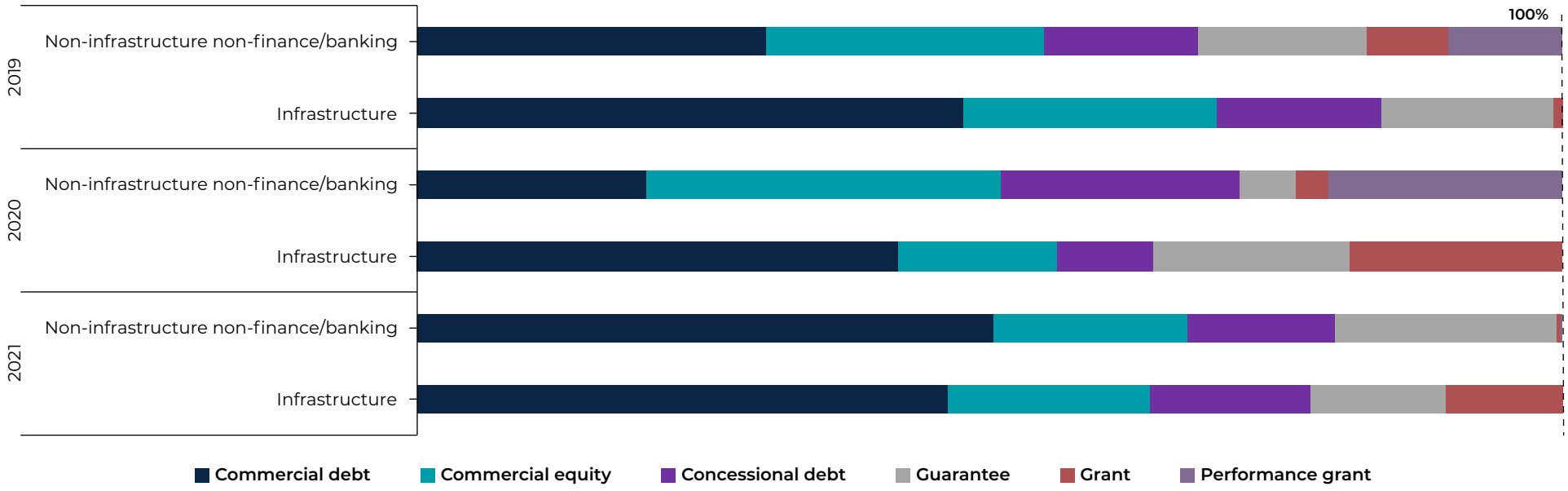
Source: Authors analysis based on Convergence database.
Note: The analysis is based on 213 blended finance infrastructure projects for which data was available. Social includes education, health and social care, housing, tourism, arts and culture infrastructure.

The use of performance grants seemed to be virtually non-existent in the infrastructure sector but was prevalent in other sectors.

The DFI Working Group on Blended Concessional Finance for Private Sector Projects compiles annual data on the use of concessional finance i.e., financing below market rates (or with maturity, grace period, security or rank offered on soft terms) including grants for infrastructure, climate finance, finance/banking and other sectors. The data showed the use of performance grants in climate finance, finance/banking, and other non-infrastructure non-finance/banking sectors, but not in the infrastructure sector in LMICs.

Performance grants were used in the U.S. Bipartisan Infrastructure law which used two types of performance grants: matching grants and regulatory improvement grants. Matching grants encouraged similar levels of investment by state government. The regulatory improvement grants stipulated specific improvements to standards, procedures, and programs, that were necessary to receive the grants (U.S. Department of the Interior). MDBs, DFIs, and other international development actors should enhance the use of performance grants for infrastructure sector to strengthen the enabling environment for mobilizing private capital which has been recommended by several leading studies. For example, the World Bank's Benchmarking Infrastructure Development outlines a detailed and exhaustive list of internationally recognized good practices by country that LMICs can incorporate to improve the quality of regulatory frameworks to develop infrastructure projects with private sector (World Bank, 2024).

Blended Concessional Finance and Grants for Private Sector Projects Shares by financial instruments, sector and year (%, 2019-2021)



Source: Annual reports of DFI Working Group on Blended Concessional Finance for Private Sector Projects

Structures other than project finance

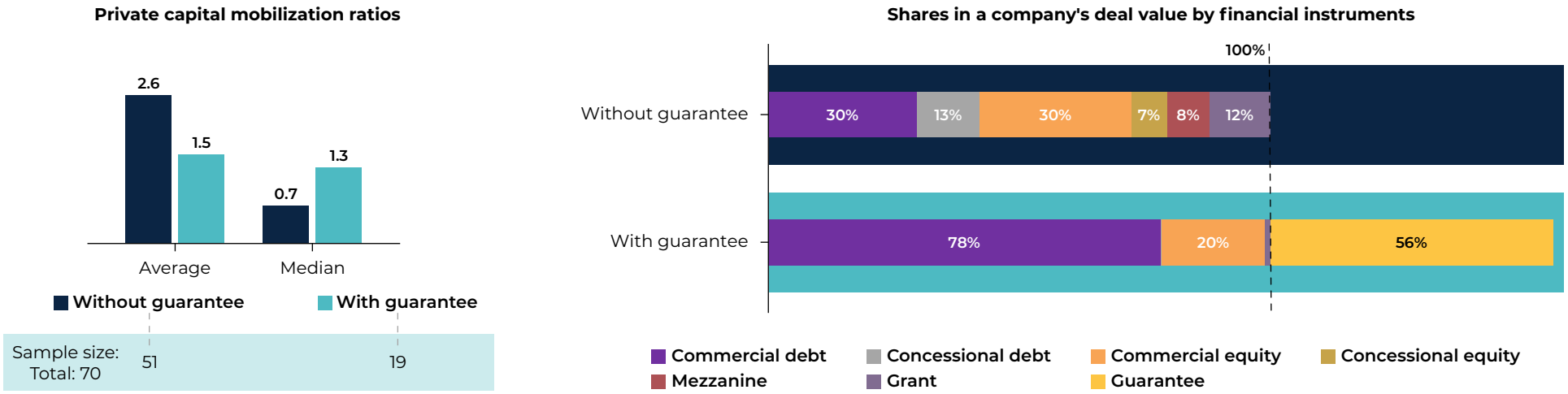


For blended finance infrastructure companies, guarantees significantly increased the share of commercial debt. When guarantees were used, the use of other types of blended finance instruments was negligible.

Private capital mobilization ratio: As seen previously, blended finance infrastructure deals in companies had a higher median private capital mobilization ratio (1.0) than the median for all deals (0.8). For blended finance infrastructure companies, median private capital mobilization ratio was higher at 1.3 when guarantees were used than 0.7 when guarantees were not used. As seen in other blended finance deals, guarantees reduce punitive risk weights and capital charges applicable in banking regulations (Basel III) on companies with sub-investment grade rating, thereby allowing them to mobilize more commercial debt at favorable terms. The banking regulations are more well-defined and differentiated for companies relative to projects, enabling more effective use of guarantees for improving financing terms. Note: The higher average private capital mobilization ratio of 2.6 without guarantees than 1.5 with guarantees is driven by outlier companies with investment-grade ratings that do not significantly benefit from guarantees.

Financial structuring: Blended finance deals of infrastructure companies without guarantees had a higher share of commercial equity and other types of blended finance instruments like concessional debt and equity, mezzanine finance and grants, which collectively financed 70 percent of the deals, while commercial debt financed 30 percent of the deal. When infrastructure companies used guarantees in blended finance deals, the share of commercial debt more than doubled to 78 percent relative to 30 percent share in the deals without guarantees. On average, guarantees provided 56 percent coverage of the deal value. The share of commercial equity reduced to 20 percent relative 30 percent share in the deals without guarantees. The use of other blended finance instruments was nearly non-existent when guarantees were used.

Blended finance infrastructure companies by use of guarantee (2000-2024)



Source: Authors analysis based on Convergence database. Note: The analysis is based on 70 blended finance infrastructure companies for which data was available.

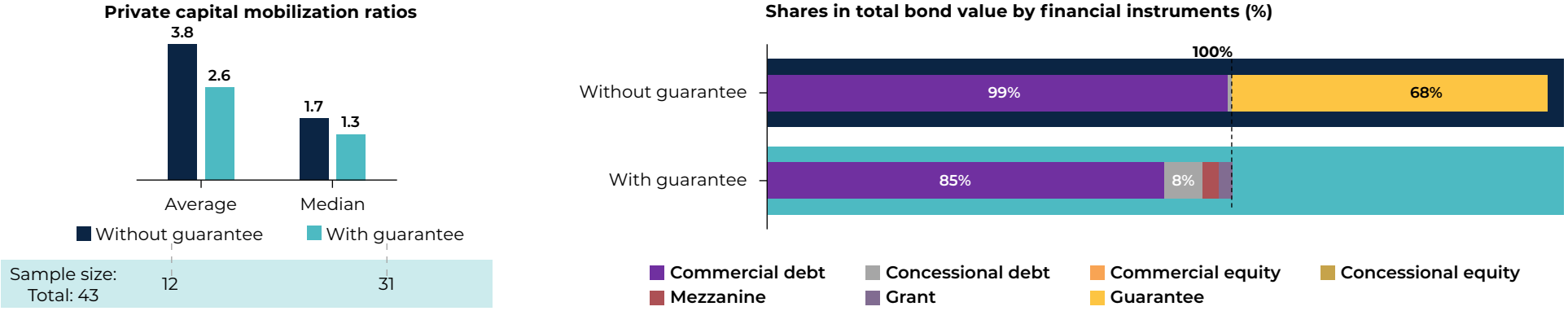
Blended finance infrastructure bonds being a debt instrument significantly benefit from guarantees in attracting private capital, as most low- and middle- income countries have sub-investment grade ratings.

Private capital mobilization ratio: As seen previously, blended finance infrastructure deals in bonds had the highest median private capital mobilization ratio (1.3) across all deal structures. For blended finance infrastructure bonds, the average and median private capital mobilization ratios were higher without guarantees at 3.8 and 1.7 respectively, than the ratios of 2.6 and 1.3 respectively for bonds with guarantee.

Financial structuring: The bonds with guarantees mobilized 99 percent commercial debt with an average 68 percent cover provided by guarantees. The bonds without guarantees mobilized 85 percent commercial debt with 12 percent support through blended finance instruments of concessional debt and grants. The remaining 3 percent was mezzanine finance (hybrid of debt and equity financing). The bonds with guarantees had a lower average value of US$109 million, less than half the average value of US$230 for the bonds without guarantees.

The sample size is not large enough to do an analysis by country income groups, but data suggests that lower income countries with non-investment grade sovereign debt ratings required and received these guarantees. In other words, guarantees were used when it may have been more difficult to mobilize private capital at the outset, in line with the recommended blended finance principles. As guarantees are most effective in mobilizing commercial debt, they are likely to be preferred over other blended finance strategies in improving attractiveness of high-risk debt instruments like bonds for private investors. They reduce debt repayment risk through a guaranteed coverage.

Blended finance infrastructure bonds by use of guarantee (2000-2024)



Source: Authors analysis based on Convergence database. Note: The analysis is based on 70 blended finance infrastructure companies for which data was available.

An analysis of blended finance infrastructure funds/facilities is included in the infrastructure funds section of this report. As blended finance national infrastructure funds/facilities operate in a less stringent regulatory environment, a lower guaranteed coverage seem to enable higher commercial debt mobilization, relative to other structures. The international funds/facilities seem to have a high share of equity notwithstanding the presence of guarantees to ensure multiple investor who pooled the capital remain active shareholders.

Cross-border guarantees: Recent trends and performance

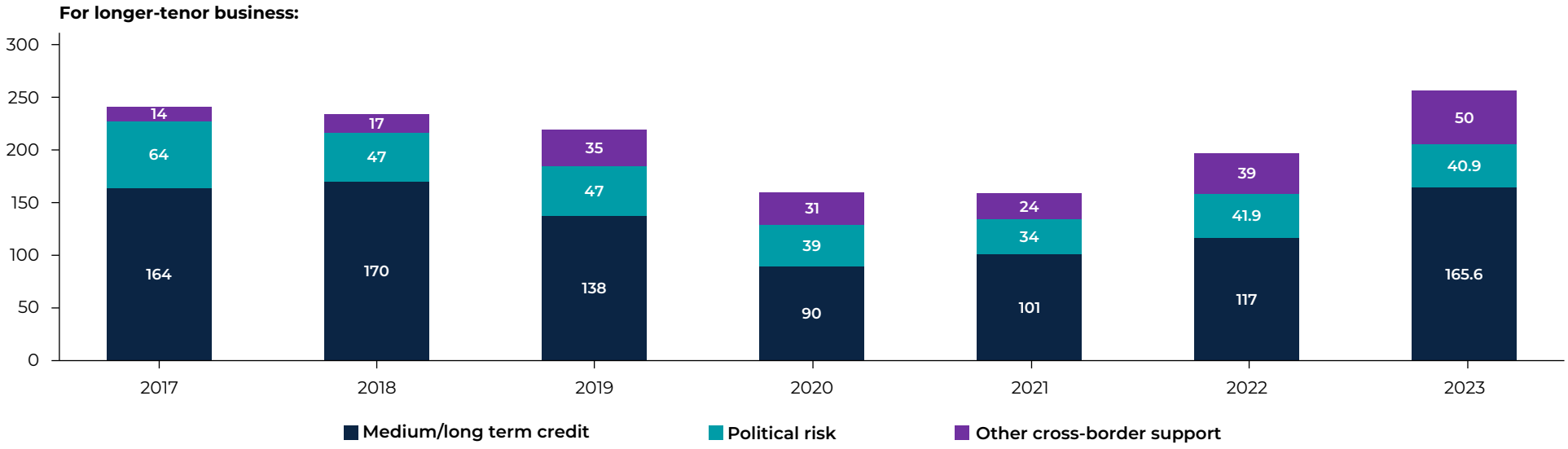
Based on Berne Union reports



Within infrastructure, energy transition drove new commitments for cross-border guarantees. In 2023, the guarantees for renewables surpassed non-renewables for the first time. The growth in political risk guarantees was subdued by heightened political risk.

New commitments for cross-border guarantees supporting longer-tenor business were declining prior to 2020 but suffered a sharper decline in 2020 with the onset of the Covid-19 pandemic. In 2023, new commitments for medium/long term credit guarantees reached a peak of US$165.6 billion, along with other cross-border support guarantees that peaked at US$50 billion in 2023. The value of new commitments for political risk guarantees has been on a long-term declining trend even before the Covid-19 pandemic, falling from US$64 billion in 2017 to US$47 billion in 2019 to US$39 billion in 2020 and further to US$34 billion in 2021. While still below the pre-pandemic levels, the new commitments for political risk guarantees increased to US$42 billion in 2022 and maintained similar level at US$41 billion in 2023. While the new commitments for political risk guarantees slightly declined, they absorbed more risk due to heightened geopolitical conflicts and political risk globally.

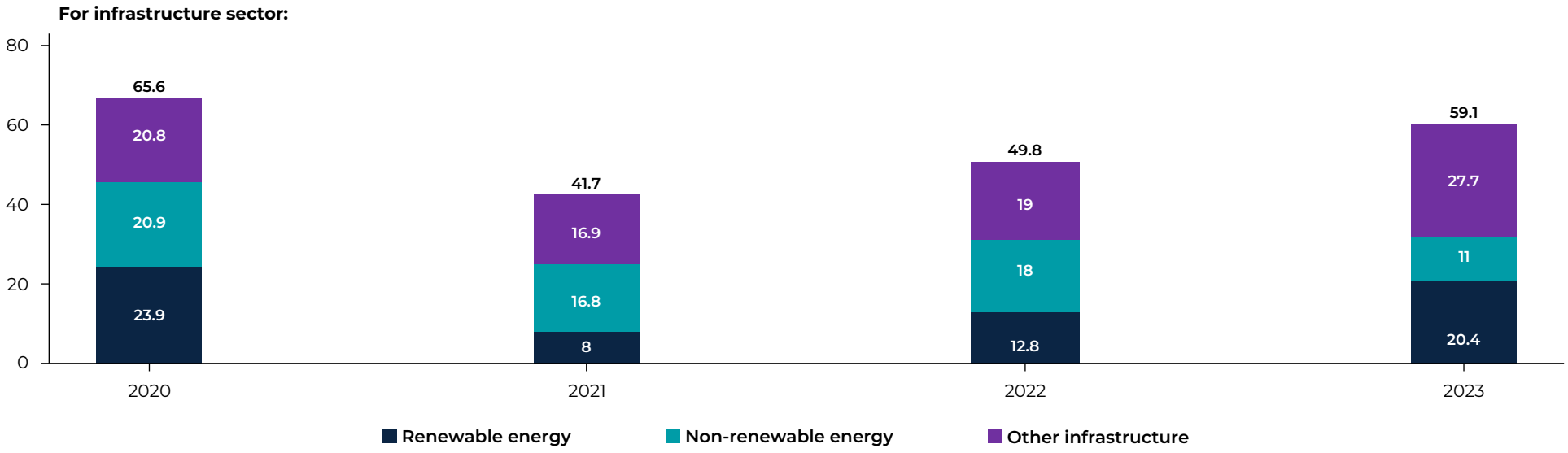
Global cross-border guarantees by guarantee type: New commitments value (US$ billion, 2017-2023)



Source: Berne Union (2021, 2022, 2023, 2024).
Note: The International Union of Credit and Investment Insurance industry (Berne Union) reports estimate new commitments for four types of guarantees – short-term credit, medium/long term credit, political risk, and other cross-border support. Excluding short-term credit, these types of guarantees are indicative of longer-tenor instruments typically associated with infrastructure projects.
Data by sector includes medium and long-term, political risk, and other cross-border guarantees. Other Cross-Border guarantees are included in the estimates because of their strategic shift towards long-term solutions and the overall greater support through non-traditional products.

Infrastructure sector received the strongest support from medium/long-term and political risk cross-border guarantees in 2020 accounting for US$65.6 billion of the US$129 billion, that is, over 50 percent of the new commitments for these guarantees. In 2021, the new commitments for infrastructure fell to a low of US$42 billion driven mainly by the 11 percent decline in new commitments for political risk guarantees. The increase in 2023 to US$59.1 billion was driven primarily by renewable energy and other non-energy infrastructure sectors, while the new commitments for non-renewable energy declined. In 2020, new commitments for non-renewable energy sector were similar to that for renewable energy sector, and by 2023, they were half that for renewable energy sector. In 2023, renewable energy sector registered US$20.4 billion new commitments of cross-border guarantees across 68 countries. Other innovating guarantees like green guarantees were used to support ambitious climate goals. The support for energy transition from renewables to non-renewables is greater in higher income countries. While higher-income countries have a low overall share for the infrastructure sector in new commitments for these guarantees, they have the highest share for the renewable energy sector. Other infrastructure sector also noted a record US$27.7 billion in new commitments of cross-border guarantees driven by recovery of the high-volume transportation sector.

Global cross-border guarantees by guarantee type: New commitments value (US$ billion, 2020-2023)

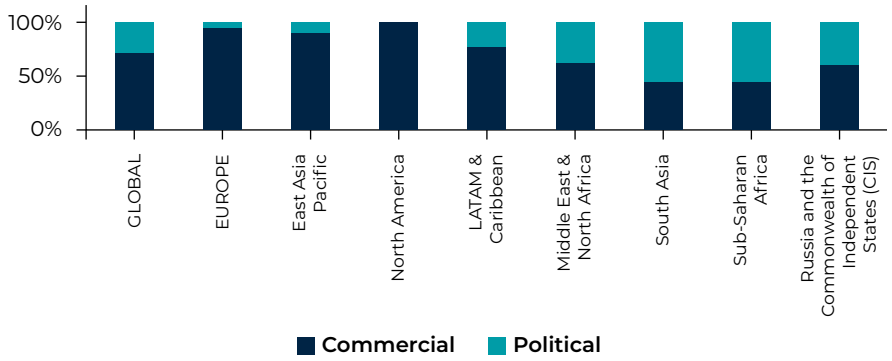


Source: Berne Union (2021, 2022, 2023, 2024).
Note: The International Union of Credit and Investment Insurance industry (Berne Union) reports estimate new commitments for four types of guarantees – short-term credit, medium/long term credit, political risk, and other cross-border support. Excluding short-term credit, these types of guarantees are indicative of longer-tenor instruments typically associated with infrastructure projects.
Data by sector includes medium and long-term, political risk, and other cross-border guarantees. Other Cross-Border guarantees are included in the estimates because of their strategic shift towards long-term solutions and the overall greater support through non-traditional products.

Commitments for political risk guarantees are declining, but they remain crucial in mitigating risks in EMDEs.

The World Bank Finance and Prosperity Report 2024 noted that deteriorating sovereign debt rating, and fragility and conflicts, are the risk categories with the highest risk levels for emerging markets and developing economies. According to the International Union of Credit and Investment Insurance, the share of political risk related claims paid for non-performing loans was 55% in 2023 in South Asia and Sub-Saharan Africa, and this share was nearly 40% in the Middle East and North Africa, and Russia and the Commonwealth of Independent. Besides the Russian invasion of Ukraine, this was due to the political instability driven by difficult economic times.

Share of risk type by region in total claims paid to non-performing loans (%, 2023)



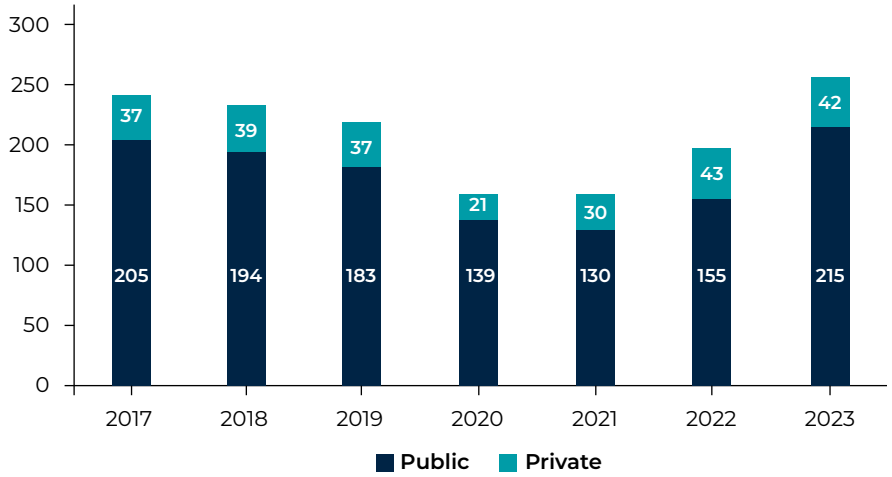
Source: Berne Union (2024)

Public sector provided most of the guarantees supporting longer-tenor business.

In 2023, public sector entities provided US$215 billion, that is, more than 80 percent of the new commitments to support longer-tenor business through cross-border guarantees, increased sharply from US$155 billion in 2022 reaching a record high level. Public sector provided most of these guarantees historically as well. Sub-Saharan Africa was the largest recipient of the guarantees. While private sector has mostly provided less than 20 percent of the annual new commitments for these guarantees at around US$40 billion annually, it provided over half of the new commitments for short-term export credit business exceeding US$1,000 billion annually.

Generally, the availability of cross-border guarantees support for short-term export credit business is sizably stronger than that for longer-tenor business due to greater complexity in estimating pricing for guarantees covering long time periods. Even public sector provided over US$1,000 billion new commitments annually to support the short-term business. In 2023, public sector provided US$1,259 billion and private sector provided US$1,522 billion of new commitments for short-term export credit business.

Global cross-border guarantees for longer-tenor business by provider type: New commitments value (US$ billion, 2017-2023)



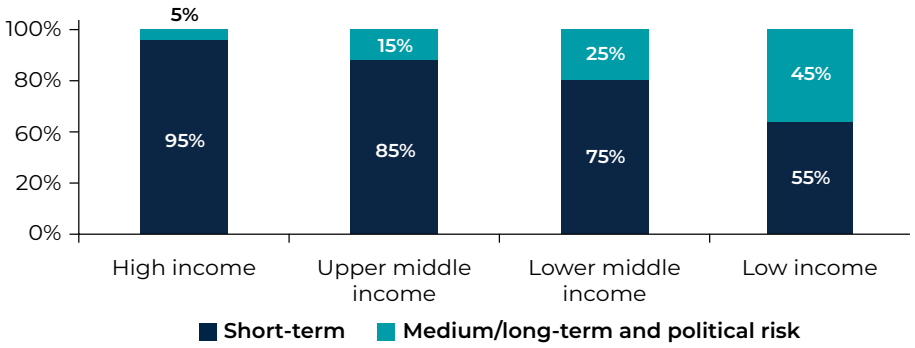
Source: Berne Union (2021, 2022, 2023, 2024).

Low- and middle-income countries attracted a higher share of these guarantees for infrastructure projects. It is more expensive to provide guarantees in these countries.

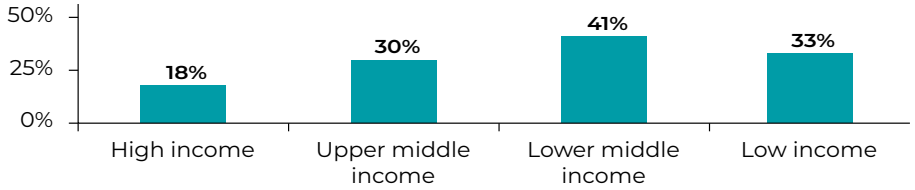
In low-income countries, the share of medium/long-term and political risk guarantees in total cross-border guarantees was 45 percent, while it was only 5 percent in high-income countries. Evidently, there is a greater need for such guarantees in low-income countries which have more macroeconomic and political uncertainty over longer time horizons. Lower income countries allocated a higher share of these guarantees to infrastructure sector. The infrastructure sector constitutes 18 percent of these guarantees in HICs, and 30-40 percent in LMICs.

Given the larger infrastructure deficits in the lower income countries coupled with greater long-term uncertainty, there is a higher demand for guarantees to reduce risk, but it is also more expensive to provide guarantees. In 2024, the average country risk premium in low-income countries at 13.8 percent was more than five times that for high-income countries at 2.5 percent. Even for upper-middle income countries, it was 7.9 percent, three times the level for high-income countries. The sovereign rating was mostly below the minimum cutoff threshold for investment used by most leading global private investors. During 2010-2020, more than 60 percent of private investment in infrastructure projects in middle-income countries was concentrated in only five countries – Brazil, India, China, Turkiye, and Mexico, while the share of low-income countries was barely one percent, according to the World Bank PPI Database.

Global cross-border guarantees by guarantee type and country income group
(% of new commitments value, 2020)

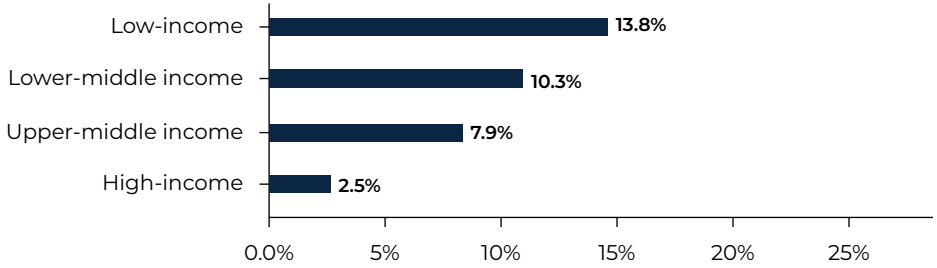


Share of infrastructure in medium/long-term and political risk cross-border guarantees by country income group (%, 2020)

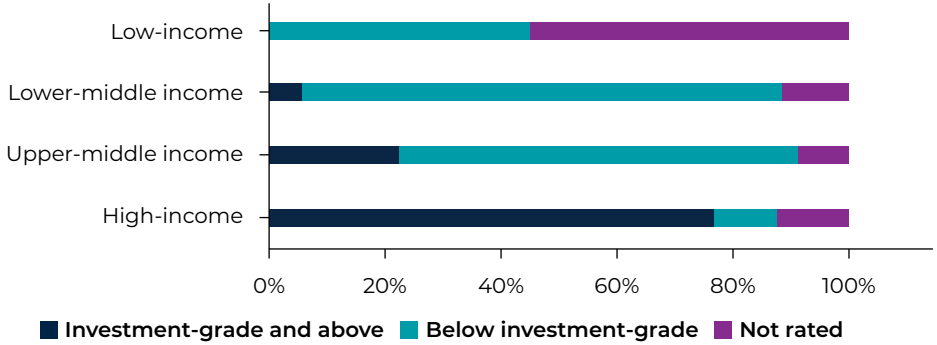


Source: Berne Union (2021).

Average country risk premium by country income group (%, 2024)



Sovereign debt rating level: Share by country income group (%, 2024)



Source: Damodaran, A. (2024).

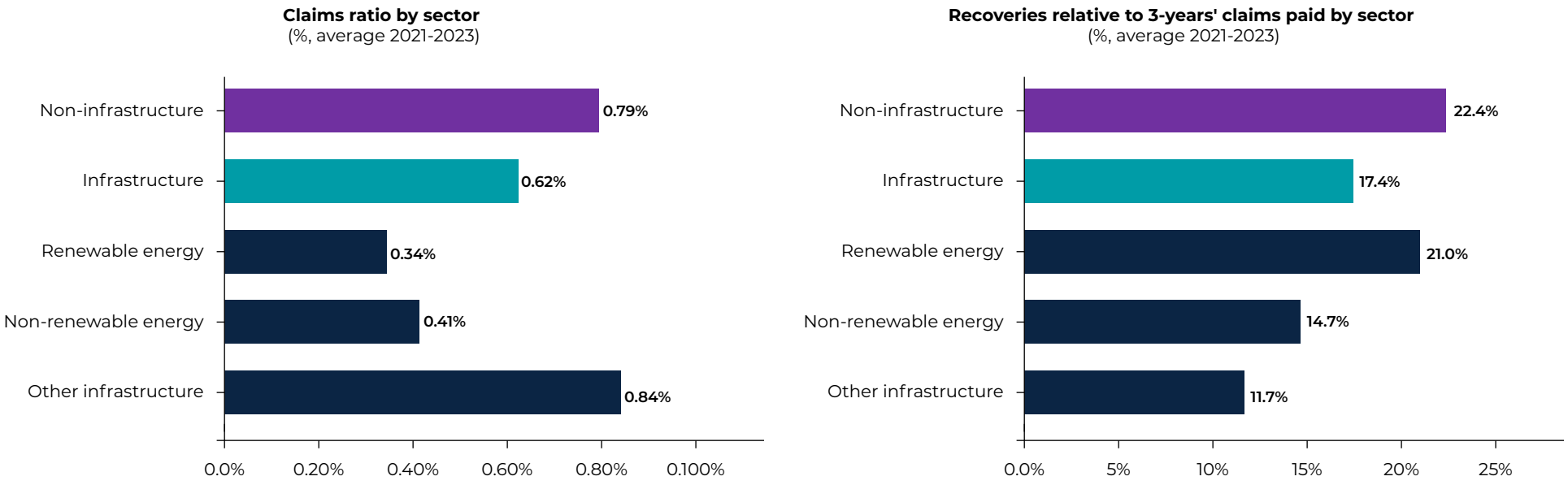
By sector, renewable energy had the strongest financial performance metrics for cross-border guarantees.

Infrastructure sector had a lower claims ratio (0.62 percent) than non-infrastructure sector (0.79 percent), on average during 2021-2023. This was primarily driven by transport related non-infrastructure activities which suffered a setback in demand following the Covid-19 pandemic. Energy sector particularly the renewable energy sector had nearly half the claims ratio (0.34 percent) during the same time. The average claims ratio for non-energy infrastructure (0.84 percent) was similar to non-infrastructure sectors, which was also driven by the setbacks suffered by transport infrastructure due to the Covid-19 pandemic.

Recoveries relative to 3-years' claims paid were also the strong for the renewable energy sector at 21 percent and weaker for other infrastructure sectors at 11.7 percent, on average during 2021-2023. The latter drove the average recoveries relative to 3-years' claims paid for infrastructure to an average of 17.4 percent during 2021-2023, while it was 22.4 percent for non-infrastructure sectors.

The strong performance of renewable energy relative to other sectors is partly driving the supply of longer-tenor and political risk guarantees or insurance products to meet the growing demand and commitment towards scaling renewable energy to meet the climate goals.

Global cross-border guarantees: Medium/long-term and political risk



Source: Berne Union (2021, 2022, 2023, 2024).

Appendix



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Definitions, data sources and methodology



Private investment in infrastructure - Definition and classifications

Financial close	Transaction stage where all financing documentation has been signed, all conditions precedent have been satisfied or waived, and initial drawdown is contractually possible.
Primary market	Primary market transactions include investment in greenfield and brownfield infrastructure, as well as in projects involving privatization of public sector assets.
Private infrastructure investment	Investment made by the private sector in infrastructure projects in primary markets (financed by private and public financiers). Investment values represent commitments made at the financial close of investment and not executed investment. It includes both debt and equity transactions.
Refinancing	The replacement of an existing debt obligation with a debt obligation bearing new and different terms.
Secondary market	Secondary market transactions include acquisitions, refinancing, securitisations, and financing for general corporate operations.
Securitisation	Transaction in which a pool of assets is collateralised into one vehicle of loan products for sale.

Private investment in infrastructure - Definition and classifications

Income group classifications

High-income countries	Antigua & Barbuda, Aruba, Australia, Austria, Bahamas, Bahrain, Barbados, Belgium, Bermuda, British Virgin Islands, Brunei, Canada, Cayman Islands, Chile, Croatia, Curaçao, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Gibraltar, Greece, Guam, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Latvia, Lithuania, Luxembourg, Malta, Mauritius, Monaco, Nauru, Netherlands, New Zealand, Norway, Oman, Panama, Poland, Portugal, Puerto Rico, Qatar, Romania, Saint Martin, Saudi Arabia, Seychelles, Singapore, Slovakia, Slovenia, South Korea, Spain, St. Kitts and Nevis, Sweden, Switzerland, Taiwan, Trinidad and Tobago, United Arab Emirates, United Kingdom, United States, Uruguay, US Virgin Islands
Low- and middle-income countries	Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Chad, China, Colombia, Comoros, Congo, Dem. Rep., Congo, Rep., Costa Rica, Côte d'Ivoire, Cuba, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, Arab Rep., El Salvador, Equatorial Guinea, Ethiopia, Fiji, Gabon, Gambia, The, Georgia, Ghana, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, CR, Haiti, Honduras, India, Indonesia, Iran, Islamic Rep., Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Korea, Democratic People's Rep, Kosovo, Kyrgyz Republic, Lao PDR, Lebanon, Lesotho, Liberia, Libya, Macedonia, FYR, Madagascar, Malawi, Malaysia, Maldives, Mali, Marshall Islands, Mauritania, Mexico, Micronesia, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Russian Federation, Rwanda, Samoa, São Tomé and Principe, Senegal, Serbia, Sierra Leone, Solomon Islands, Somalia, South Africa, South Sudan, Sri Lanka, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tonga, Tunisia, Turkiye, Turkmenistan, Uganda, Ukraine, Uzbekistan, Vanuatu, Venezuela, RB, Vietnam, West Bank and Gaza, Yemen, Rep., Zambia, Zimbabwe

Private investment in infrastructure - Definition and classifications

Sector classifications

Non-renewable energy	Investment in coal-, gas- and oil-fired power plants, nuclear power, and co-generation power.
Renewable energy	Investment in biofuels/biomass, geothermal, hydro, hydrogen, solar (land-based PV and thermal), tidal, and wind (onshore and offshore) energy generation.
Energy storage, transmission and distribution	Investment in electricity storage, transmission, and heat networks.
Gas storage, transmission and distribution	Investment in gas storage, transmission and distribution networks.
Social infrastructure	Investment in defence, education, healthcare, justice, municipal buildings and social housing.
Digital infrastructure	Investment in data centres, and mobile and internet infrastructure.
Transport	Investment in airports, bridges, heavy rail, light rail, ports, roads, tunnels and Zero Emissions Vehicles (ZEV) infrastructure.
Waste	Investment in waste management and treatment facilities, waste-to-energy plants, and recycling and waste minimisation solutions.
Water	Investment in water distribution, treatment, and desalination facilities.

Private investment in infrastructure - Definition and classifications

Region classifications

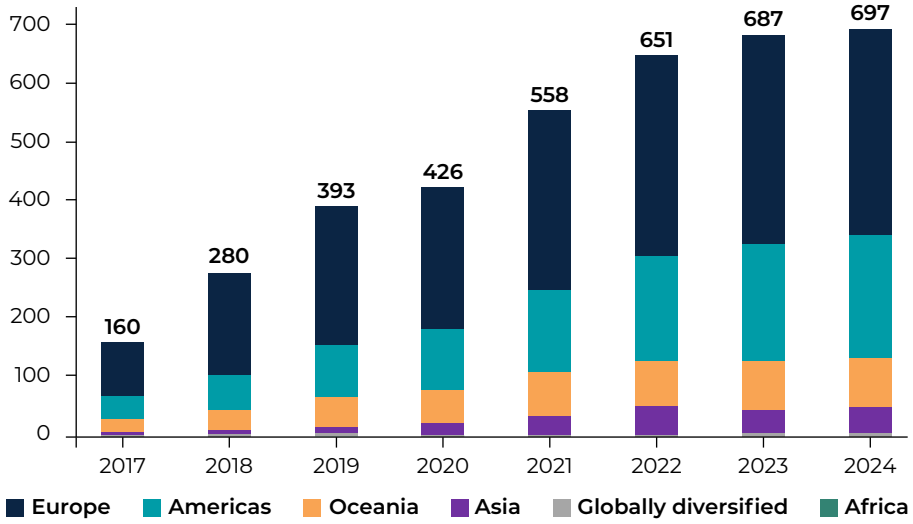
North America	Bermuda, Canada, United States
Europe and Central Asia	Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kosovo, Kyrgyz Republic, Latvia, Lithuania, Luxembourg, Macedonia, FYR, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Turkiye, Turkmenistan, Ukraine, United Kingdom, Uzbekistan
East Asia and Pacific	Australia, Brunei, Cambodia, China, Fiji, Guam, Hong Kong, Indonesia, Japan, Korea, Democratic People's Rep, Lao PDR, Malaysia, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, New Zealand, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, South Korea, Taiwan, Thailand, Timor-Leste, Tonga, Vanuatu, Vietnam
Latin America and the Caribbean	Antigua & Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia, Brazil, British Virgin Islands, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Curaçao, Dominica, Dominican Republic, Ecuador, El Salvador, French Guiana, Grenada, Guatemala, Guyana, CR, Haiti, Honduras, Jamaica, Martinique, Mexico, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Martin, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, US Virgin Islands, Venezuela RB
Middle East and North Africa	Algeria, Bahrain, Djibouti, Egypt, Arab Rep., Iran, Islamic Rep., Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, West Bank and Gaza, Yemen, Rep.
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, São Tomé and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe
South Asia	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka

Environmental, Social, and Governance (ESG) factors in infrastructure - Data Source

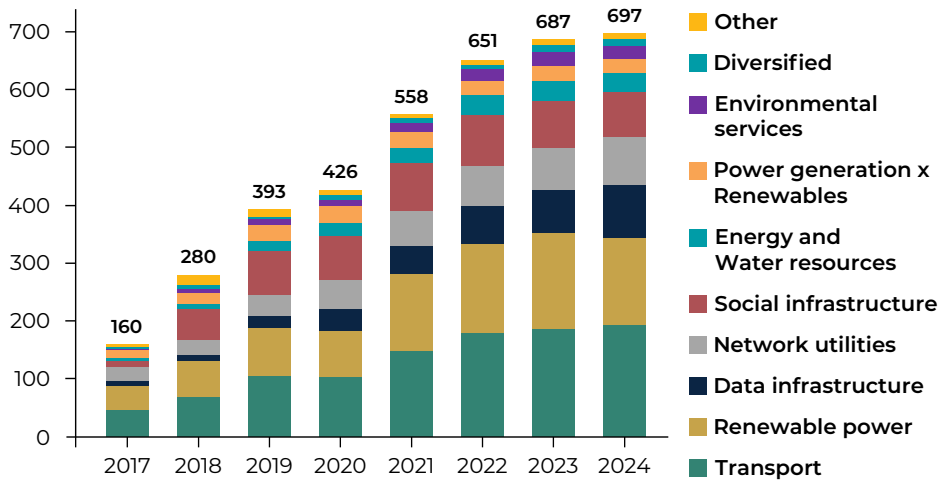
1. Data on infrastructure sector ESG performance are critical to catalyzing more private investment in sustainable infrastructure. However, such data are currently very limited in quality and coverage, particularly at the asset level.
2. For the analysis presented here, PPIAF-GI Hub collaborated closely with GRESB to present findings from GRESB's 2024 *Infrastructure Asset Assessment*, currently the market leading source of ESG data for infrastructure assets.
3. GRESB's ESG Scores reflect the extent to which entities have ESG policies in place, manage ESG risk, report transparently on their most material ESG issues, and have current and future ESG targets. It focuses on the disclosure of management and performance data, with a limited assessment of ESG outcomes and impact. In other words, an asset is assessed on whether it reports on GHG emissions rather than on the amount of GHGs emitted. GRESB is working with the infrastructure industry to reflect outcomes in the ESG Score in future years, to close this critical data gap.
4. GRESB's data represents only a sample of the universe of infrastructure assets reporting on ESG. However, the data can still be interpreted as indicative of the broad market trends in ESG in infrastructure.
5. More detail on GRESB's methodology can be found in the following reference guides: 2024 Infrastructure Asset Standards and Reference Guide and 2024 Infrastructure Asset Scoring Document.

Sample distribution by sector

GRESB *Infrastructure Asset Assessment* participation by region
(number of participating assets)



GRESB *Infrastructure Asset Assessment* participation by sector
(number of participating assets)

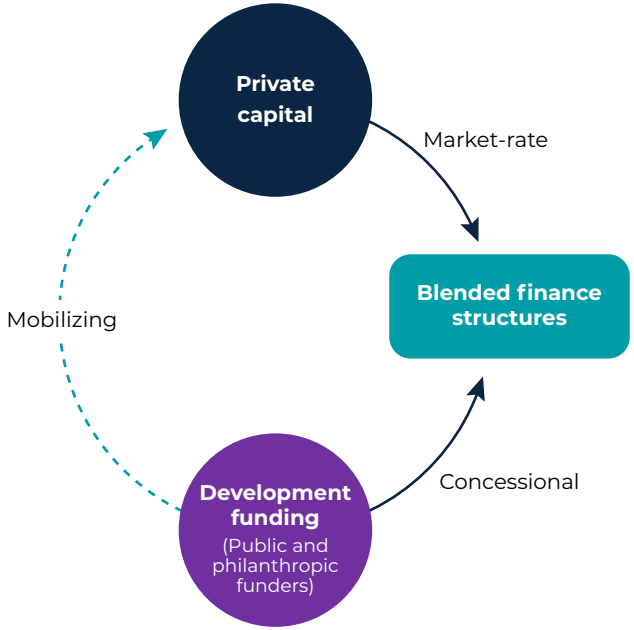


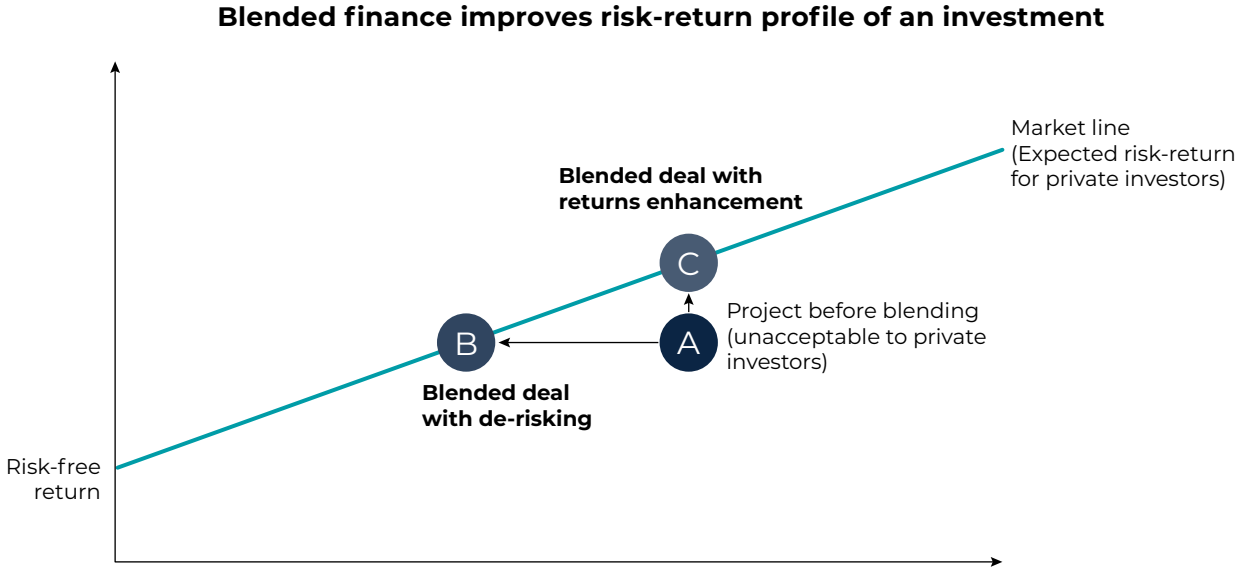
Source: Authors' analysis based on GRESB *Infrastructure Asset Assessment*.

Definition

The blended finance section of the Infrastructure Monitor report is based on Convergence's definition of blended finance. The analysis also draws from the definitions adopted by the DFI Working Group on Blended Concessional Finance for Private Sector Projects for operational guidance and by the OECD Development Assistance Committee (DAC) for policy guidance.

Convergence defines blended finance as the use of catalytic capital from public or philanthropic sources to increase private sector investment in sustainable development. It is a structuring approach that allows public, private, and philanthropic to work together to address the investment barriers while achieving their own objectives. The main barrier to private investment is unattractiveness of risk-adjusted return. Blended finance approaches either enhance returns by providing concessional capital or grants or reduce risks by providing grants and guarantees.





Source: Convergence.

Definition

DFI Working Group on Blended Concessional Finance for Private Sector Projects ("the DFI working group") has adopted a specific definition of blended concessional finance for the private sector operations of DFIs, that is, Combining concessional finance from donors or third parties alongside DFIs' normal own-account finance and/or commercial finance from other investors, to develop private sector markets, address the Sustainable Development Goals (SDGs), and mobilize private resources.

The DFI Working Group has outlined enhanced principles to effectively operationalize blended finance for DFI private sector operations, which are summarized below:

- *Rationale for using blended concessional finance:* DFI support for the private sector should make a contribution that is beyond what is available, or that is otherwise absent from the market, and should not crowd out the private sector. Blended concessional finance should address market failures.
- *Crowding-in and minimum concessionality:* DFI support for the private sector should, to the extent possible, contribute to catalyzing market development and the mobilization of private sector resources and minimize the use of concessional resources.
- *Commercial sustainability:* DFI support for the private sector and the impact achieved by each operation should aim to be sustainable. DFI support must contribute towards the commercial viability of clients. Level of concessionality in a sector should be revisited over time.
- *Reinforcing markets:* DFI support for the private sector should be structured to effectively and efficiently address market failures and minimize the risk of disrupting or unduly distorting markets or crowding out private finance, including new entrants.
- *Promoting high standards:* DFI private sector operations should seek to promote adherence to high standards of conduct in their clients, including in the areas of corporate governance, environmental impact, social inclusion, transparency, integrity, and disclosure.

OECD Development Assistance Committee (DAC) defines blended finance as "the strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries".

The DAC has adopted the five Blended Finance Principles that provide policy guidance for Unlocking Commercial Finance for the Sustainable Development Goals:

- *Principle 1: Anchor blended finance use to a development rationale*. It recommends maximizing development outcomes and impact with commitment to high quality, while linking the deployed development finance to expected results.
- *Principle 2: Design blended finance to increase the mobilization of commercial finance*. It recommends to ensure additionality, seek leverage, address market failures, minimize the use of concessionality, and focus on commercial sustainability.
- *Principle 3: Tailor blended finance to local context*. It recommends to support local development priorities, ensure consistency with the aim of local financial markets development, and align with efforts to promote a sound enabling environment.
- *Principle 4: Focus on effective partnering for blended finance*. It recommends appropriate allocation and sharing of risk between parties, leveraging the complementary motivation of commercial actors while not compromising on the prevailing standards for development finance deployment.
- *Principle 5: Monitor blended finance for transparency and results*. It recommends to agree on metrics from the start, track financial flows, commercial performance and development results, dedicate appropriate resources for monitoring and evaluation, and ensure public transparency and accountability on blended finance operations.

Data sources: Infrastructure equity performance (1/3)

Private investors can invest in the infrastructure asset class through equity markets. Equity investments can be in listed markets where listed infrastructure equities are publicly traded on a stock exchange. Alternatively, they can be in unlisted or private markets where investment opportunities are generally offered through private placements made by the company signatory of the project or concession agreement. The channel of investment is materially correlated with financial performance. The following indicators were used to analyze the performance of infrastructure equity investments:

Listed infrastructure equities performance was measured using two indices:

(i) Morgan Stanley Capital International All Country World Index Infrastructure Capped Index (MSCI ACWI-IC), comprising a global opportunity set of companies that are owners or operators of infrastructure assets that are selected from the parent index – Morgan Stanley Capital International All Country World Index (MSCI ACWI) – covers mid- and large-cap securities across 23 developed markets and 24 emerging markets for five infrastructure sectors: telecommunications, utilities, energy, transport, and social.

(ii) FT Wilshire GLIO Listed Infrastructure Index Series is used to measure the financial performance of listed infrastructure equities (economic infrastructure). The Index series covers global listed infrastructure companies that tend to own long-lived assets that provide essential services to society, such regulated utilities, renewables, energy transportation networks, communications and transportation infrastructure. These services are often in monopoly market situations with high barriers to entry and are supported by long-term contracts or regulation -- providing potentially stable and predictable cash flows. The Index comprises 210 companies of which 76 are in emerging economies. The index series uses free-float market capitalization in US Dollars as weights. It uses a systematic approach to determine company selection and eligibility. Natural Language Processing (NLP) is used to identify candidate companies and isolate infrastructure related EBITDA. NLP applied to each infrastructure sector. Companies and EBITDA are identified via an accept/reject of relevant words and phrases. New constituents must have infrastructure related EBITDA ratio ≥ 0.66 and identified key phrases to be eligible. It remove small and illiquid companies.

Performance is compared against a benchmark of listed global equities. Listed global equity performance is measured by the MSCI ACWI, MSCI's flagship global equity index, which is designed to represent the performance of the full opportunity set of large- and mid-cap stocks across 23 developed and 24 emerging markets. In May 2022, it covered more than 2,933 constituents across 11 sectors and approximately 85 percent of the free float-adjusted market capitalization in each market.

Data sources: Infrastructure equity performance (2/3)

EDHECInfra data is based on a representative sample of 27 countries that exhibit sizable level of activity that could be measured.
The investment universe relevant to measuring performance in the principal market is defined in two steps:

- National-market inclusion: Relevant national markets are determined based on national-level index inclusion criteria, including their level of activity (number and frequency of transactions and market participants), relative size, and minimum data availability.
- Individual-company inclusion: Within the markets that qualify under these criteria, potential index constituents - whether they are equity or debt issuers - must also meet a set of minimum inclusion criteria. These include investability, age and minimum data availability.

Once the investment universe is defined, the third step is to build a sampled universe that meets certain minimum representative criteria.

The markets included in the sample are:

- Developed markets: Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, Finland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, New Zealand, Poland, Portugal, Russia, Singapore, Slovakia, Sweden, United States of America
- Emerging markets: Brazil, Chile, Malaysia, Philippines.

Minimum National Market Inclusion Criteria

Criteria	Minimum Threshold (on measurement date)	
Size	Cumulative primary and secondary dealflow since 2000 represents at least 0.5 percent of the total value of all identified markets AND	
Market Activity	Market turnover ratio	- at least 20 percent by number of transactions OR
		- at least 20 percent by transaction volume OR
		- the country is part of the European Union
Financial Information	Availability of basic procurement and financial information including incorporation and financial close dates, book values, etc.	

For these countries, 9200+ investible infrastructure companies were identified and categorized.

Data sources: Infrastructure equity performance (3/3)

Unlisted infrastructure equities performance was measured by EDHECInfra Infra300 equity index, which is designed as a representation of 6,800 investible unlisted infrastructure companies (often private equity funds) identified in the 27 key markets by infrastructure sector, business model, and corporate structure. The index is equally weighted with 300 constituents with a market capitalization of nearly US$350 billion. The sectoral shares are: (i) transport - 27 percent (ii) renewable power - 20.3 percent (iii) data Infrastructure - 4.3 percent, and (iv) environmental Services - 5 percent. The geographical shares are (i) Europe - 68.7 percent (ii) Oceania - 14.3 percent (iii) Americas - 10 percent, and (iv) Asia - 7 percent. Project finance companies comprise 60 percent of the index.

EDHECInfra uses the estimation methodology most consistent and compliant to the IFRS-13 fair value approach based on the largest data sample of infrastructure investments worldwide. Expected return is estimated using transaction prices of traded infrastructure companies and their dividend forecast. Then, the expected return is decomposed into risk factors: 1. Liquidity (size) 2. Leverage (credit risk (total debt/sales)) 3. Investment (capital expenditure) 4. Interest rates (term spread (different between long-term and short-term interest rates) and 5. Profits (EBITDA/sales), identified to be the key explanatory factors. Infrastructure-specific risk factors like business model/risk, sector, country, age/time to maturity, were also included. The regression is used to extract market risk premia of each risk factor. These factor risk premia estimates are combined with firm-level factor exposure to compute the latest transaction prices of firms that did not trade as well as the overall market risk premia. Risk premia is added to the relevant term structure of interest rates to compute first-specific market calibrated discount rate determining the cost of capital.

In addition, green unlisted infrastructure equity performance was analyzed to assess the relative performance of sustainable and climate-aligned investments. The performance is measured by the EDHECInfra InfraGreen index, which tracks investments in solar and wind projects worldwide and provides a unique view of the renewable energy sector's performance. The InfraGreen equity index tracks 100 investments and goes back 10 years.

The key findings and trends based on these equity indices were further assessed based on literature review, research studies and other data including cost data published by Freightos, G20 national statistics agencies, IMF, Mobilist, Royal Institution of Chartered Surveyors, Statista, OECD, and the World Bank.



Data sources: Infrastructure debt performance (1/2)

Private investors can invest in the infrastructure asset class through debt markets. The debt investment can be in rated debt securities or unrated loans. The financial performance of debt investments in infrastructure were analyzed through the following metrics using the specified data sources:

A. Return and volatility metrics were analyzed using the following data source:

- **EDHECInfra InfraMetrics Debt Indices** track the performance of private debt issued by global infrastructure corporates and project companies. The Infra300 Debt Index reflects the monthly performance of recent senior debt from 300 unlisted infrastructure companies. The companies are selected form a representative sample by infrastructure sectors of an underlying universe of close to 9200+ firms in 25 countries. InfraGreen debt index tracks the performance of the outstanding senior debt of the constituents of the InfraGreen Equity index which tracks over 100 investments in solar and wind projects worldwide and provides a unique view of the renewable energy sector's performance.

B. Credit risk metrics including default and recovery rates were analyzed using the following data sources:

- **Global Emerging Markets (GEMs) Risk database for Multilateral Development Banks/Development Finance Institutions (MDBs/DFI) lending** to private and public counterparts in emerging markets and developing economies. It pools de-identified contract-level data from 27 MDBs/DFIs on their performing and non-performing exposures compiled based on robust, shared methodological framework and harmonized template to derive output statistics encompassing default and recovery rates categorized by various dimensions. The estimates for energy, utilities and all sectors were derived from pooled data from 1994 to 2023 supplied by 21 member institutions, and are based on the following sample:

Sector	Private counterparts sample	Public counterparts sample
Energy	235	24
Utilities	1,359	171
Benchmark: All sectors	9,929	943

GEMs credit risk metrics for MDB/DFI contracts with private counterparts for the infrastructure asset class are based on the 1994-2022 database. The total number of private counterparts in the sample for infrastructure was 1,697 and for non-financial corporates was 4,476. Infrastructure definition includes these GICS sectors: Air Freight & Logistics, Airlines, Marine, Railroads, Trucking, Airport Services, Highways & Rail tracks, Marine Ports & Services, Health Care Facilities, Alternative Carriers, Integrated Telecommunication Services, Wireless Telecommunication Services, Electric Utilities, Gas Utilities, Multi-Utilities, Water Utilities, Independent Power Producers & Energy Traders, Renewable Electricity, Health Care Real Estate Investment Trusts – REITs.

Data sources: Infrastructure debt performance (2/2)

- **For rated infrastructure debt securities, Moody's and S&P data reports were referenced:** Moody's Infrastructure Defaults and recovery rates 1983-2022' data report and data supplement published on 12 December 2023, and S&P's Default, Transition, and Recovery:2023 Annual Infrastructure Default and Rating Transition Study published on 11 September 2024

Data sample: Moody's rated infrastructure debt securities covered 1,147 corporate infrastructure and project finance debt securities with a total value of US$2.7 trillion that originated from 1983 to 2022. By region, the shares in debt value were 54 percent for North America, 34 percent for Europe, Middle East, and Africa (EMEA), 9 percent for Asia Pacific, and 3 percent for Latin America & the Caribbean. LMICs accounted for over 10 percent of the sample. S&P Global Ratings analyzed the rating histories of corporate infrastructure and project finance credits first rated between Dec. 31, 1980, and Dec. 31, 2023. The total number of ratings peaked to 1,488 in 2018. By region, the number of ratings were nearly 500 in the US, 120 in Canada, 460 in EMEA, and over 100 in Asia Pacific and Latin America.

Infrastructure definition: Moody's defines the term infrastructure is used in a broad sense, and includes securities issued by both public and private issuers (operating companies and projects) that provide large, capital-intensive critical assets that underpin economic activity. Typical infrastructure debt finances utilities, including power-generation systems, electric and natural gas transmission and distribution networks, long-haul energy pipelines, water and wastewater utilities and integrated utilities; transportation systems, including roads, bridges, ports, airports and rail networks; and; other fundamental facilities serving a country, city or subdivision, such as stadiums, military installations and hospitals. S&P Global includes five subsectors: utilities, power, oil and gas, social infrastructure, and transportation, and infrastructure was broadly defined to cover investment exposure to real assets vital to a country's economic development and prosperity that provide essential services for the orderly operations of an economy, such as transportation networks, health and education facilities, communication networks, and water and energy distribution systems.

- **Moody's data report on unrated sustainable project finance bank loans** was referenced for the analysis of availability-based payment mechanisms, PPPs and green tag.

The data sample included 8,468 projects and 320 Moody's defaults from 1983 to 2020. Sectoral composition was 54 percent power sector, 33 percent non-power infrastructure sectors, and 13 percent oil and gas sector. The 8,468 projects included in the report were segmented into 6,286 non-PPP projects (74.2 percent) and 2,182 PPP projects (25.8 percent). Availability-based projects were 20.7 percent of the total data sample and 11.5 percent of total defaults.

The subindustries for which the proceeds were typically earmarked to finance green projects were included in defining the green tag. In the renewable power sector, solar, hydro, wind as well as other energy efficiency projects were included. In the clean transportation sector, electric, hybrid, public, rail, nonmotorized, multimodal transportation, infrastructure for clean energy vehicles and reduction of harmful emissions, were included. In the environmental sector, wastewater and water sectors were included. In oil and gas sector, biofuels were included.

Data sources: Blended finance and guarantees

Data Source:

The analysis of blended finance infrastructure deals presented in this section is based on the Convergence historical deals database. The database only covers emerging markets and developing economies.

Convergence maintains the largest and most detailed database of historical blended finance transactions in the market. While this database is not fully comprehensive, it does give a sense of the scale of blended finance. Convergence is continually building out this database to draw better insights about the market. Data is collected from i) credible public sources like press releases, ii) data sharing agreements, and iii) validation exercises with Convergence members.

To be included in Convergence's database, a deal must meet three main criteria: (i) the transaction attracts financial participation from one or more commercial investors that would otherwise not have invested in the opportunity, (ii) the transaction uses catalytic capital in one of the following ways: Public/philanthropic investors are concessional within the capital structure or provided guarantees or risk insurance priced below market-rate, transaction design or preparation is grant funded, transaction is associated with a Technical Assistance facility, and (iii) the transaction intends to create development impact related to the SDGs in developing countries, or directly impacts beneficiaries in developing countries

Sample for analysis:

This analysis is based on a dataset of 407 blended finance infrastructure deals from the Convergence historical deals database with the total deals value of US$104.3 billion. The deals with launch dates during the years 2000-2024 were selected. The data availability for recent deals especially those launched after 2010 is better, except limited data was available for deals that closed in 2024.

The sample was selected from the full Convergence historical deals database based on the following criteria:

- Completeness and quality of the required data for the deal. Where only some data input were missing, data was assumed based on realistic assumptions or literature review. When only one data point was missing, it was derived based on logical mathematical formulas. When multiple data points were missing, they were filled based on detailed review of data available for the deal in secondary data sources in most cases. In a few cases, assumptions on debt-to-equity ratio by sector were made to fill missing data. Otherwise, the deals were deleted from the sample. The difference between the total deal value and the sum of values by financial instruments or investor type was reduced to less than 5 percent.
- Adherence of the deal to the blended finance definition. Only the deals in which both private and public or philanthropic finance were blended were selected. The deals were deleted when they were purely private or public, when private participation was only in management, refinancing, a company launch for which private investment was unknown.
- Quality of analysis: No metric was estimated for which the sample size of deals was less than 5 after disaggregation of the full sample by variables of interest.

Data sources: Infrastructure cross-border guarantees

Longer-tenor business: Export credit and investment insurance

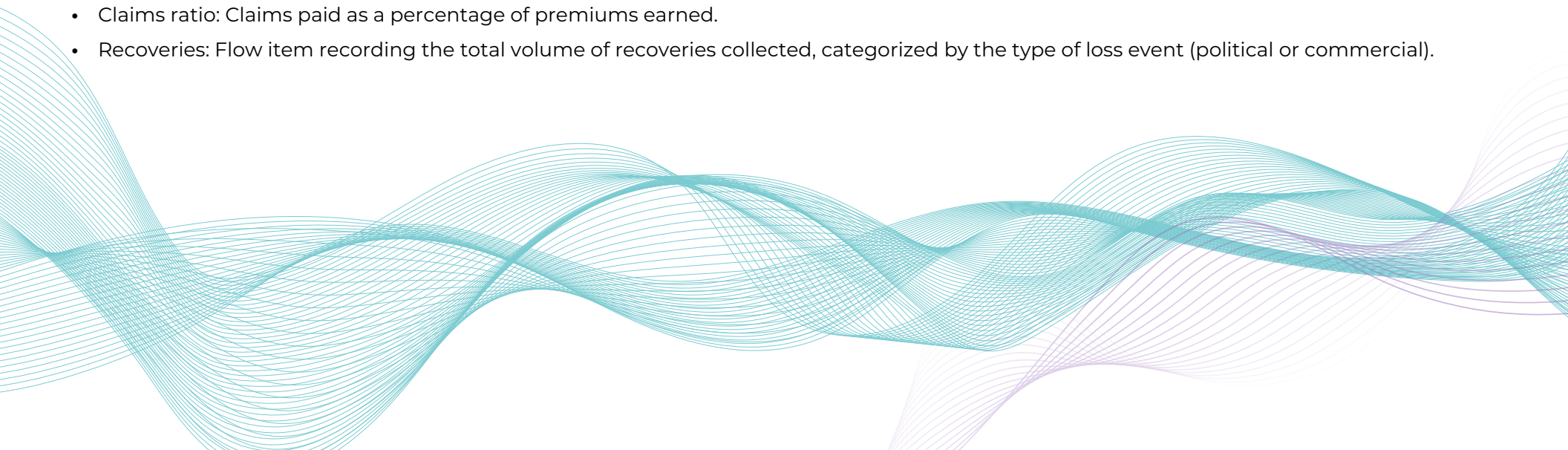
The International Union of Credit and Investment Insurers (Berne Union) includes government backed export credit agencies, private credit and political risk insurers, and multilateral institutions from across the globe who provide direct and indirect support for international trade and cross-border investments through insurance, guarantees, and various direct financing instruments. The Berne Union holds the most comprehensive data set on the business of export credit and investment insurance. Members submit data on their business activities twice annually, covering activity up to the end of the second quarter, and for the full year.

The following two types of products are relevant for the infrastructure asset class and are included in our analysis:

- Medium and long-term export credit: insurance, guarantees, and lending for export/trade finance credit of which the repayment term is greater than 360 days.
- Political risk insurance: insurance or guarantees that indemnify an equity investor or a bank financing the equity investment for losses incurred to a cross-border investment, as a result of political risks.

The metrics analyzed in the report are explained below:

- New commitments: Flow item, showing the total volume of new insurance/guarantee/loan/ etc. commitments issued during the half-year for which commitment has been confirmed. This Includes the full amount of new commitments issued during the half-year, even if disbursements are to take place later.
- Claims paid: Flow item recording the total volume of claims paid or non-performing loans, categorized by the type of loss event (political or commercial).
- Claims ratio: Claims paid as a percentage of premiums earned.
- Recoveries: Flow item recording the total volume of recoveries collected, categorized by the type of loss event (political or commercial).



Methodology: Private infrastructure funds

Private infrastructure capital raised and invested by funds includes infrastructure capital raised and invested for core, core+, debt, value-added and opportunistic strategies.

- Core strategies target essential assets with no operational risk, where the asset is already generating returns. These are typically secondary stage assets in developed countries with transparent regulatory and political environments. Key features of the underlying assets include a monopoly position, demonstrated demand, and long-term stable cash flows that are forecastable with a low margin for error.
- Core+ strategies target assets exhibiting similar characteristics to those of core assets. They are exposed to demand and market risk but are more affected by and correlated with the economic cycle. These assets have features that act to limit these risks, including long-term contracts, long-term government or regulatory price support, and/or high barriers to entry for competitors.
- Debt strategies use debt or issuing debt securities to fund investment activities. These strategies tend to be less risky than other infrastructure strategies, targeting assets and/or infrastructure developers/owners producing regulated revenues for essential services or user revenues from assets with a monopoly position, as well as contracted assets. The risk/return exposure of these strategies depends on the type of debt provided, however, most infrastructure assets are typically financed by senior debt and have simple capital structures.
- Value-added strategies are deemed moderate- to high-risk, targeting assets where enhancements are being made, and where growth in usage of such assets or demand for the service provided or produced is the focus. These are typically greenfield or brownfield assets, potentially involving new or unproven technologies that do not have pricing power at the time of the investment but that can be developed over time to provide pricing power in the future. Pricing power refers to a business's ability to adjust and control the prices of its products or services in response to various factors, such as changes in demand, costs, or market conditions.
- Opportunistic strategies have the highest risk/return profile of infrastructure strategies, focusing less on stable cash flows and more on capital growth via the value of the underlying assets. Assets targeted by these strategies typically do not have an existing cash flow.

Secondaries funds were excluded because they invest in pre-existing infrastructure assets by acquiring interests in private capital funds from the original investors. Funds of funds were excluded because they represent the acquisition of interests in other funds.

Methodology: Blended finance infrastructure funds

Blended finance infrastructure funds include the funds in which investors from public and private sectors pool money to partner and support infrastructure projects. The analysis of blended finance infrastructure funds presented in this section is based on the funds listed in the Convergence historical deals database. The database only covers emerging markets and developing economies. Data is collected from:

1. Credible public sources like press releases
2. Data sharing agreements
3. Validation exercises with Convergence members

To be included in Convergence's database, a deal must meet three main criteria:

1. The transaction attracts financial participation from one or more commercial investors that would otherwise not have invested in the opportunity
2. The transaction uses catalytic capital in one of the following ways — public/philanthropic investors are concessional within the capital structure or provided guarantees or risk insurance priced below market-rate, transaction design or preparation is grant funded, or the transaction is associated with a Technical Assistance facility
3. The transaction intends to create development impact related to the SDGs in developing countries or directly impacts beneficiaries in developing countries

Additional data input required for the analysis were identified through secondary research. The final data sample used in the analysis is based on 81 blended finance infrastructure funds/facilities for which data was available.



Methodology: Infrastructure Project Preparation Funds/Facilities (PPFs)

The Infrastructure PPFs studied for this report provide technical support for infrastructure project preparation, and funding to support infrastructure project preparation. The sample of 130 PPFs was primarily sourced from the PPFs list published by the Overseas Development Institute (ODI), Cities Climate Finance Leadership Alliance (CCFLA), and Sustainable Development Investment Partnership (SDIP), which were validated by the GI HUB.

Global

- Access Co-development Facility
- Adapt–Asia Pacific Project Preparation Facility (AAPP)
- African, Caribbean and Pacific – European Commission Energy Facility II
- AIIB Project Preparation Special Fund
- Arab Financing Facility for Infrastructure
- Asia Pacific Project Preparation Facility (A3PF)
- C40 Cities Finance Facility
- Cities Development Initiative Asia
- City Climate Finance Gap Fund
- Climate Investment Funds
- Climate Support Facility
- EBRO Technical Cooperation Funds
- EIB FEMIP Trust Fund (FTF)
- EIB Water Project Preparation Facility
- EU Technical Assistance Facility (TAF)
- Financing Energy for low-carbon Investment – Cities Advisory Facility (FELICITY)
- Global Environment Facility Sustainable Cities Impact Program (SCIP)
- Global Infrastructure Facility (GIF)
- Green Climate Fund PPF
- Public-Private Partnership Project Preparation in the Southern and Eastern MEDiterranean – MED5P
- Mobilize Your City (MYC)
- Municipal Project Support Facility (MPSF)
- Nature Based Solutions PPFF
- PIDG Technical Assistance
- PIDG DEVCO
- Private Financing Advisory Network (PFAN)
- Public Private Infrastructure Advisory Facility (PPIAF)
- Scaling Solar
- SEED capital assistance facility
- Technical Assistance Facility of International Municipal
- Investment Fund
- The OPEC Fund for International Development - OFID
- US Trade and Development Agency (USTDA)
- UNCDF – Local Finance Initiative (LFI)
- Urban Projects Finance Initiative (UPFI)

Europe

- EIB's EPEC
- European Bank for Reconstruction and Development (EBRD)'s Infrastructure Project Preparation Facility (IPPF)
- European Local Energy Assistance (ELENA)
- Natural Capital Financing Facility
- Rural Community Energy Fund
- Urban Investment Support (URBIS)
- Western Balkans Investment Framework Infrastructure Project Facility

Latin America

- Brazil Infrastructure Project Preparation Fund (PSP)
- Estruturadora Brasileria de Projetos (EBP)
- Finance Line – River Plate Basin Development Fund (FONPLATA)
- IDB AquaFund
- Infra Fund
- Interamerican Development Bank Project Preparation and Execution Facility (PROPEF)
- Interamerican Development Bank Project Preparation Facility
- National Infrastructure Fund Trust Fund (FONADIN)
- NDC Pipeline Accelerator
- Project Preparation Facility in Cuba
- Regional Public-Private Partnership Support Facility
- Sustainable Cities and Climate Change
- Sustainable Energy and Climate Change (SECCI Fund)
- TheCityFix Labs
- Transformative Actions Program (TAP)
- UK – Caribbean Infrastructure Partnership Fund

Asia

- Asia Infrastructure Centre of Excellence
- Clean Energy Financing Partnership Facility (CEFPF)
- Climate Change Fund
- Energy and Environment Partnership Mekong (EEP Mekong)
- Green Finance Catalytic Facility's Project Preparation Unit (ADB GFCF PPU)
- India Infrastructure Project Development Fund (IIPDF)
- Indonesia: Infrastructure Project Development Facility
- InfraCo Asia
- Japan Fund for Poverty Reduction
- Japan Fund for the Joint Crediting Mechanism
- Philippines: Infrastructure Preparation and Innovation Facility
- PPPTAF Bangladesh
- Project Development and Grant Fund (PDGF)
- Project Preparation and Startup Support Facility
- Public Private Partnerships Centre – China
- South Asia Infrastructure for Growth Trust Fund
- Tamil Nadu Urban Development Fund (TNUDF)
- The Philippines PPP Centre
- Urban Environment Infrastructure Fund (UEIF)
- USICEF – US India Clean Energy Finance Facility
- Vietnam Project Preparation Technical Assistance Facility
- Water Financing Partnership Facility

Africa

- Africa Clean Energy (ACE) Programme Competitive Business Facility
- Africa Climate Resilient Investment Facility (AFRI-RES)
- Africa Renewable Energy Access Program (AFREA)
- Africa Renewable Energy Fund Project Support Facility (AREF-PSF)
- Africa50
- African Development Fund Project Preparation Facility
- African Legal Support Facility
- African Water Facility (AWF)
- Cities and Climate Africa (CICLIA)
- Common Market for Eastern and Southern Africa (COMESA) Project Preparation and Implementation Unit (PPIU)
- Covenant of Mayors in Sub-Saharan Africa
- DBSA EIB Project Development and Support Facility (PDSF)
- DBSA Project Preparation Fund
- ECOWAS infrastructure Projects Preparation and Development Unit (PPDU)
- ECREEE-GIZ Technical Assistance Facility for Grid-Connected RE Project
- Energy4Impact
- EU-Africa Infrastructure Trust Fund
- European Union – European Development Finance Institutions Private Sector Development Facility (EU-EDFI EEDF)
- Fund for African Private Sector Assistance (FAPA)
- Sustainable Use of Natural Resources and Energy Finance (SUNREF)
- Infra Co Africa
- Infrastructure Investment Programme for South Africa (IIPSA)
- Kenya Climate Innovation Centre (CIC)
- NEPAD IPPF
- PPP Commission Africa
- PPP Transaction Advisory Services (TAS)
- Program for Infrastructure development in Africa (PIDA) Service Delivery Mechanism
- Project Preparation Fund (Part of PPP Unit)
- Kenya Climate Innovation Centre (CIC)
- NEPAD IPPF
- PPP Commission Africa
- PPP Transaction Advisory Services (TAS)
- Program for Infrastructure development in Africa (PIDA) Service Delivery Mechanism
- Project Preparation Fund (Part of PPP Unit)

PPIAF Donor Partners

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