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National Bank for Financing Infrastructure and Development

CATALYZING INDIA'S ECONOMIC AMBITIONS

THROUGH BOND MARKET DEVELOPMENT







September 2026

Analytical Contacts

National Bank for Financing Infrastructure and Development

Himanshu Gulliani
Executive Vice President & Head - Strategy and Partnerships
Himanshu.Gulliani@nabfid.org

Sujit Kumar
Vice President & Chief Economist
chiefeconomist@nabfid.org

Gaurav Gupta
Vice President & Head Treasury
Head.Treasury@nabfid.org

India Ratings & Research

Soumyajit Niyogi
Director, Core Analytical Group'
+91 22 4035 6111
soumyajit.niyogi@indiaratings.co.in

Dr. Devendra Pant
Chief Economist and Head (Public Finance)
+91 12 4668 7251
devendra.pant@indiaratings.co.in

Prashant Tarwadi
Director, Large Corporate
+91 22 4000 1772
prashant.tarwadi@indiaratings.co.in

Anuradha Basumatari
Director, Public Finance
+91 22 4035 6123
anuradha.basumatari@indiaratings.co.in

Pratik Mundhada
Director, Corporates
+91 22 4000 1724
pratik.mundhada@indiaratings.co.in

Vijay Babu Konda
Associate Director, Large Corporate
+91 40 6766 1900
vijaybabu.konda@indiaratings.co.in

Shivraj Patil
Senior Analyst, Structured Finance
+91 22 4000 1790
shivraj.patil@indiaratings.co.in

S Suryanarayanan
Senior Analyst, Infrastructure & Project Finance
+91 44 4340 1700
suryanarayanan.s@indiaratings.co.in

Abbreviation	Full Form	Abbreviation	Full Form
AI	Artificial Intelligence	**ICD**	Inland Container Depot
ALM	Asset Liability Management	**InvIT**	Infrastructure Investment Trust
AMRUT	Atal Mission for Rejuvenation and Urban Transformation	**IRDAI**	Insurance Regulatory and Development Authority of India
AUM	Assets Under Management	**JV**	Joint Venture
BE	Budget Estimate	**ML**	Machine Learning
BG	Bank Guarantee	**MSRDC**	Maharashtra State Road Development Corporation
BIFR	Board for Industrial and Financial Reconstruction	**MW**	Megawatt
BOOT	Build, Own, Operate and Transfer	**NBFC**	Non-Banking Financial Company
BOT	Build, Operate and Transfer	**NCD**	Non-Convertible Debenture
CAGR	Compound Annual Growth Rate	**NCR**	National Capital Region
CASA	Current Account Savings Account	**NHAI**	National Highways Authority of India
CBDC	Central Bank Digital Currency	**NHPC**	National Hydroelectric Power Corporation
CFO	Cash Flow from Operations	**NMP**	National Monetisation Pipeline
CIO	Chief Investment Officer	**NPS**	National Pension System
CIRP	Corporate Insolvency Resolution Process	**Opex**	Operating Expenditure
CLO	Collateralised Loan Obligation	**PCE**	Partial Credit Enhancement
CRILC	Central Repository of Information on Large Credits	**PCG**	Partial Credit Guarantee
DFC	Dedicated Freight Corridor	**PFT**	Private Freight Terminal
DSCR	Debt Service Coverage Ratio	**PPA**	Power Purchase Agreement
EL	Expected Loss	**PPP**	Public-Private Partnership
EPC	Engineering, Procurement and Construction	**QR**	Quick Response Code
EPFO	Employees' Provident Fund Organisation	**RBI**	Reserve Bank of India
ESG	Environmental, Social and Governance	**REIT**	Real Estate Investment Trust
EV	Electric Vehicle	**SEBI**	Securities and Exchange Board of India
FPI	Foreign Portfolio Investor	**SO**	Structured Obligation
FSR	Financial Sector Regulator	**SPV**	Special Purpose Vehicle
GCT	Gati Shakti Cargo Terminal	**TEU**	Twenty-foot Equivalent Unit
GDP	Gross Domestic Product	**TOT**	Toll-Operate-Transfer
GIS	Geographic Information System	**ULB**	Urban Local Body
GLP	Global Logistics Properties	**UPI**	Unified Payments Interface
GPU	Graphics Processing Unit	**US**	United States
GSDP	Gross State Domestic Product	**USD**	United States Dollar
HAM	Hybrid Annuity Model	**WSPF**	Water and Sanitation Pooled Fund
IBBI	Insolvency and Bankruptcy Board of India	**YTD**	Year-to-Date
IBC	Insolvency and Bankruptcy Code		

Catalysing India's Economic Ambitions through Bond Market Development



Mr. Rajkiran Rai G
Managing Director
National Bank for Financing Infrastructure and Development

Foreword – Bonding for Bharat, Building for 2047

India's economic journey has entered a defining phase. India remains the fastest growing major economy, clocking an average 7.4 percent annual real GDP growth between FY24 and FY26, while managing inflation at 4 percent. The cornerstone of this growth momentum was a massive, government-led push to build the nation's infrastructure. Over the past decade, length of national highways constructed has increased by 46 percent at 1.47 lakh kilometres, turnaround time of ports has been reduced to 0.9 days from 3.4 days in 2016 and 99.6 percent of the country's broad-gauge rail network has been electrified. Globally, India is now the third largest domestic aviation market and ranks third in installed renewable energy capacity at 295 GW as of August 2026.

The coming decades will demand a scale of investment unprecedented in our history as the nation advances toward the vision of Viksit Bharat. The first generation of India's infrastructure growth was largely financed through public expenditure and bank balance sheets. While both will remain critical, the scale of future investment requirements calls for a deeper and more diversified financing architecture. Bond markets must evolve from being a complementary funding channel to becoming a core pillar of India's development framework.

The challenge is not merely raising capital. It is about creating a financial ecosystem where capital can move seamlessly across the lifecycle of an asset, from construction and operation to refinancing, monetisation, and reinvestment. This requires deeper bond markets, stronger secondary market liquidity, broader investor participation, efficient risk transfer mechanisms, and more sophisticated credit assessment frameworks.

Encouragingly, the foundations are already being laid. InvITs have demonstrated how mature infrastructure assets can be monetised and recycled into new investments. Municipal bonds are gradually creating a new financing avenue for urban infrastructure. Credit enhancement structures, securitisation platforms, pooled financing vehicles, and emerging structured credit products offer pathways to mobilise larger pools of domestic and global capital. The next phase of market development will involve scaling these mechanisms to create a more vibrant and diversified debt ecosystem.

Equally significant has been the transformation in the quality of India's infrastructure asset base. A decade ago, infrastructure was among the largest contributors to stress within the banking system, with project delays, land acquisition issues, regulatory bottlenecks, and weak contractual frameworks contributing to elevated NPAs. Today, the sector is fundamentally stronger. Policy reforms, streamlined approval processes, improved land and environmental clearances, stronger concession frameworks, enhanced dispute-resolution mechanisms, long-term power purchase agreements, better risk allocation, and the emergence of stronger counterparties such as NHAI (National Highways Authority of India), SECI (Solar Energy Corporation of India Ltd.), IREDA (Indian Renewable Energy Development Agency Ltd.), etc. have significantly improved project viability and financing visibility.

As a result, infrastructure cash flows have become more predictable, refinancing options have expanded, and recovery prospects have improved. Regular market participation by infrastructure borrowers and development finance institutions is also gradually strengthening the yield curve for infrastructure debt, improving pricing benchmarks and market confidence. Better project structuring, stronger governance standards, and enhanced operational visibility are reducing project risk and creating conditions conducive to greater participation from long-term investors.

This evolution naturally raises the case for more advanced credit assessment tools. As infrastructure assets become increasingly mature, predictable, and institutionalised, frameworks such as Expected Loss, Recovery Ratings, and asset-specific recovery analysis can play a larger role in improving risk differentiation and capital allocation. Recovery focused assessment is particularly relevant for long-duration assets where underlying asset value, contractual protections, and cash-flow visibility are often as important as default probability.

The development of deep, liquid, and diversified bond markets is no longer merely a financial sector aspiration, it is a strategic national imperative. As we deepen markets, foster innovation, and mobilise long-term capital, we have a once-in-a-generation opportunity to build the financial architecture that will finance infrastructure, strengthen economic resilience, and power India's journey towards Viksit Bharat.

At the same time prudence remains essential. New asset classes and financing structures must pass through multiple economic and credit cycles before reaching full maturity. Markets develop through experience, performance history, and investor confidence. This seasoning process is a natural part of financial market evolution and could be viewed as a strength rather than a constraint.

The recommendations and perspectives outlined in this paper are rooted in a common objective: creating a deeper, broader, and more resilient bond market ecosystem. Stronger secondary markets, wider investor participation, innovative financing structures, efficient capital recycling, and more sophisticated risk assessment frameworks are not isolated reforms. Together, they form the foundation of a financial system capable of supporting India's long-term economic ambitions.

As India moves towards Viksit Bharat 2047, developing a deep and vibrant bond market is no longer a financial sector aspiration, but an economic necessity. The next chapter of India's development will not be financed by banks alone. It will be powered by a mature capital market ecosystem where savings become investments, investments create infrastructure, and infrastructure fuels prosperity. A stronger bond market is the bridge between India's capital and its ambitions, turning economic potential into economic reality.

Foreword – Building Financial Architecture for Viksit Bharat



Ananda Bhoumik
Managing Director and
Chief Analytical Officer
India Ratings & Research
(Fitch Group)

India's next phase of growth will not be constrained by opportunities, but by its ability to finance them. As the country advances towards Viksit Bharat, investments in infrastructure, energy transition, logistics, urbanisation, digital infrastructure, and advanced manufacturing will require unprecedented volumes of long-term capital. The central finding of this study is clear: India must gradually move from a bank-dominated financing system towards a deeper, broader, and more efficient bond market ecosystem.

A key insight emerging from this study is that infrastructure can be assessed differently from traditional corporate credit. Infrastructure assets often retain value through long-term concessions, operating rights, regulated returns, and contracted cash flows, even during periods of financial stress. Expanding the use of Recovery Ratings and Expected Loss frameworks can improve risk transparency, support efficient pricing of infrastructure debt, and attract larger pools of institutional capital.

The study also highlights the importance of capital recycling as the next frontier of bond market development. Apart from INVITs, instruments such as Collateralised Loan Obligations (CLOs), securitisation structures, and Partial Credit Guarantees can help transfer seasoned assets from bank balance sheets to long-term investors. This will free up banking system capacity, improve capital efficiency, and create new investment opportunities for insurers, pension funds, and debt investors.

Another major opportunity lies in unlocking capital from the public sector. States account for a substantial share of infrastructure creation but face increasing fiscal pressures. Accelerating asset monetisation, concession-based models, and public-private partnerships can generate resources for new infrastructure without materially increasing public debt. Similarly, municipal bonds can become a powerful tool for financing urban infrastructure, provided they are supported by strong governance, improved revenue mobilisation, and greater market access.

A particularly encouraging trend is the strong financial position of Corporate India. Unlike previous cycles driven by leverage, corporates are increasingly funding growth through internal cash generation. This deleveraging trend is creating valuable financial capacity within the system and allowing infrastructure sectors to emerge as the natural absorbers of long-term capital.

The study also points to the emergence of a new generation of infrastructure assets. While AI infrastructure, data centres, cloud ecosystems, and digital platforms may not always fall within traditional definitions of infrastructure, they are rapidly becoming the backbone of a digital economy. Alongside warehousing, logistics, rail freight, and renewable energy, these sectors are expected to become significant drivers of long-term debt demand and institutional investment.

Importantly, India now possesses many of the building blocks required to support this transformation. The rapid growth of insurance, pension, EPFO, and NPS assets is creating one of the largest pools of patient capital in the country's history. Stable long-term interest rates and the development of a sovereign yield curve extending to 30-year, 40-year, and 50-year maturities further strengthen the foundation for long-duration financing.

In the run-up to this study, we surveyed CIOs, Fund Managers, and Credit Heads across banks, insurance companies, mutual funds, pension funds, and other leading financial institutions. While many of the issues identified are well recognised, the responses reinforced the persistence of key challenges, including taxation, inflation and currency-related risks, a limited investor base, and market liquidity constraints. The feedback provides valuable insights into the priorities and reforms that could shape the next phase of India's bond market development.

Key Priorities Going Forward

- Strengthen market liquidity, investor participation, and risk-transfer mechanisms.
- Promote Recovery Ratings and Expected Loss frameworks to improve risk assessment.
- Along with INVITs, develop CLOs, securitisation, and credit-enhancement structures to recycle capital
- Accelerate state asset monetisation and capital recycling programmes.
- Deepen municipal bond markets, including pooled bond structures for smaller cities.
- Create financing frameworks for digital infrastructure, logistics, and emerging asset classes.

The development of deep, liquid, and diversified bond markets is therefore no longer merely a financial sector aspiration. It is a strategic national priority that will determine India's capacity to finance infrastructure, accelerate innovation, strengthen economic resilience, and ultimately realise the vision of Viksit Bharat.

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Executive Summary – Building Financial Architecture for Viksit Bharat

2047, the challenge is no longer creating opportunities but financing them at scale. The next investment cycle across infrastructure, energy transition, logistics, urban development, advanced manufacturing, digital infrastructure, AI, and emerging asset classes will require unprecedented volumes of long-term capital.

A key conclusion of this report is that while India's bank-led financing model has been instrumental in supporting economic growth, the scale and tenor of future investment needs demand a deeper, broader, and more diversified bond market ecosystem. The objective is not to replace banks, but to complement them by mobilising long-term domestic and global capital more efficiently.

Several structural tailwinds support this transition. Institutional savings pools have expanded rapidly, with insurance assets growing nearly 8x, EPFO investments 10x, and NPS assets 20x over the past decade and a half. At the same time, Corporate India has entered this cycle with stronger balance sheets and lower leverage, creating additional capacity within the financial system to support infrastructure-led growth.

India's next growth phase will also be significantly more capital intensive. Infrastructure, logistics, data centres, AI infrastructure, digital networks, renewable energy, and urban development require financing tenors of 20-30 years, far longer than the maturity profile of most banking liabilities. Global experience shows that such investment cycles are typically supported by deep bond markets and large pools of institutional capital.

The building blocks for this transformation are increasingly visible. InvITs have emerged as a successful platform for infrastructure monetisation and capital recycling. Municipal bonds are gradually establishing a market-based channel for urban infrastructure financing. At the same time, credit-enhancement structures, securitisation, tokenisation, and structured finance solutions offer significant opportunities to improve market depth and capital efficiency.

The report also highlights the improving quality of India's infrastructure ecosystem. Better project structuring, stronger contractual frameworks, enhanced dispute-resolution mechanisms, long-term revenue visibility, and a more mature regulatory environment have materially improved project predictability and recovery prospects. As a result, infrastructure assets increasingly warrant assessment frameworks that look beyond default risk alone.

In this context, Recovery Ratings and Expected Loss frameworks can become important tools for improving risk differentiation, pricing efficiency, and investor confidence. The experience of distressed but operational infrastructure assets demonstrates that project distress does not necessarily imply asset impairment. Understanding recovery potential alongside default probability can broaden investor participation and unlock larger pools of long-term capital.

Finally, the emergence of new infrastructure classes, including AI infrastructure, data centres, digital networks, warehousing, multimodal logistics, and rail-linked infrastructure, is creating a new generation of long-duration investable assets. Financing these sectors at scale will require innovative capital-market solutions and a significant deepening of India's bond market ecosystem.

Key Priorities Going Forward

- Strengthen market liquidity, investor participation, and risk-transfer mechanisms to improve market depth and pricing efficiency.
- Recovery Ratings and Expected Loss frameworks to provide more nuanced risk assessment, particularly for infrastructure and project finance assets.
- Alongside InvITs, develop CLOs, securitisation, and credit-enhancement structures to facilitate capital recycling and improve balance-sheet efficiency.
- Accelerate state asset monetisation and capital recycling programmes to unlock public capital for new infrastructure creation.
- Deepen municipal bond markets, including pooled financing structures, to broaden access to urban infrastructure funding.
- Create financing frameworks for digital infrastructure, logistics, AI infrastructure, data centres, warehousing, and other emerging asset classes that will define India's next investment cycle.

Debt Capital Markets at the Core of Viksit Bharat

Emergence of India's Patient Capital Base

Structure of the Indian Economy

India has become the world's fastest-growing major economy. Yet, discussions on financial sector development often highlight India's relatively low credit-to-GDP ratio as evidence of credit market underdevelopment. Such comparisons, however, overlook a fundamental characteristic of India's economic structure.

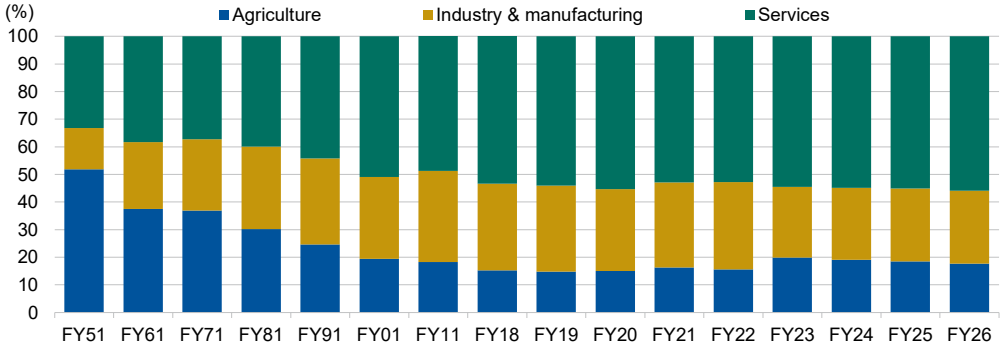
Over the past several decades, India has evolved from an agrarian economy to one predominantly led by services. Agriculture and services together account for nearly three-fourths of the economic output, while manufacturing and industry constitute a smaller share. Unlike manufacturing, infrastructure, or heavy industry, both agriculture and services are relatively less capital-intensive and therefore require lower credit levels. As a result, India's lower credit-to-GDP ratio should not necessarily be interpreted as a sign of inadequate financial deepening; rather, it largely reflects the composition of the economy itself.

This distinction is important because India's next growth phase will be driven by more capital-intensive sectors. Investments in infrastructure, energy transition, logistics, digital networks, urban development, advanced manufacturing, and emerging asset classes such as data centres will require significant long-term capital. Thus, the challenge for India's financial system is not merely to increase credit, but to develop financing channels that efficiently mobilise and allocate long-duration capital to productive investments.

In this context, the development of a deep, liquid, and diversified bond market is a strategic imperative. A robust bond market can complement the banking system, expand access to long-term funding, improve capital allocation, and provide the financial architecture needed to support India's goal of becoming a developed economy under the Viksit Bharat vision.

Figure 1

Sector-wise GDP Composition



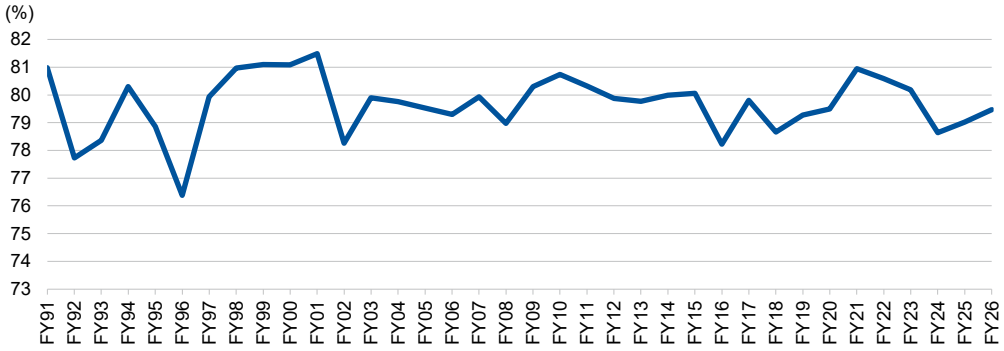
Source: RBI, Planning Commission and Ind-Ra

India's Strong Bank-led Credit Model Now Needs Complementing

India's credit ecosystem has historically been built around the banking system. Banks have played a pivotal role in mobilising household savings, supporting economic development, and financing businesses across sectors. This model has served the country well, particularly during periods when access to capital markets was limited and demand for long-term capital was relatively modest. As a result, bank credit continues to account for a significantly larger share of overall financing in India than many developed economies, where bond markets play a much greater role in funding economic activity.

Figure 2

Trend in Total Deposits-to-Total Assets of Scheduled Commercial Banks



Source: RBI, Ind-Ra

The Deposit Advantage that Powered Growth

A key strength of India's banking system has been its ability to attract stable household savings. Low-cost current and savings account (CASA) deposits, supported by a strong public-sector banking franchise and high depositor confidence, have provided banks with a reliable funding source across economic cycles. This deposit-led model enabled banks to become the primary intermediaries between household savings and productive investments, supporting India's growth journey over the past several decades.

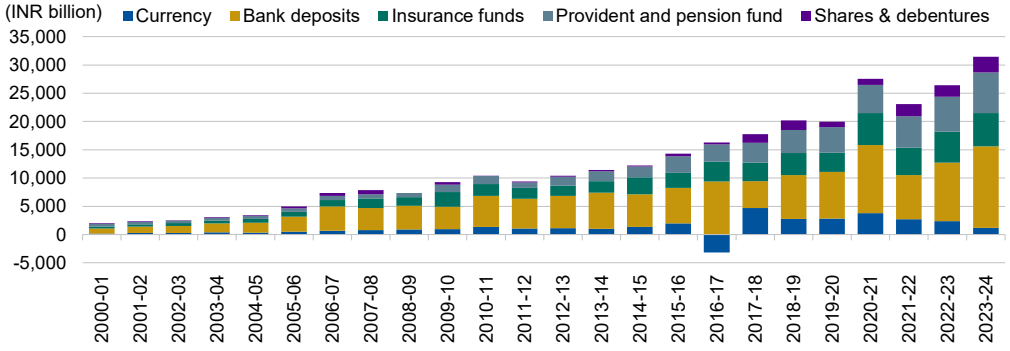
A Changing Savings Landscape

However, the financial behaviour of Indian households is evolving. Rising financial literacy, digital access, expanding investment choices, and growing participation in capital markets have led to a gradual shift in savings from traditional bank deposits towards market-linked instruments such as mutual funds, insurance products, pension schemes, equities, and other financial assets.

This transition not only represents a positive development for financial deepening, but also presents a structural challenge for banks. As savings become increasingly diversified, banks face greater competition for deposits and are finding it progressively more difficult to mobilise stable, long-tenor funding at a competitive cost. The challenge is particularly acute at a time when the economy requires substantially larger amounts of long-term capital.

Figure 3

Trend in Household Savings



Source: RBI, Ind-Ra

Infrastructure Needs Long-Term Capital, Not Short-Term Liabilities

The financing requirements of a Viksit Bharat economy are fundamentally changing. Investments in transportation networks, renewable energy, transmission infrastructure, logistics corridors, data centres, digital infrastructure, urban development, and advanced manufacturing require funding horizons extending over 15, 20, or even 30 years. By contrast, a significant portion of bank liabilities remains short-term in nature.

This maturity mismatch has long been a structural constraint in infrastructure financing. While banks have admirably undertaken the heavy lifting of India's credit growth, relying predominantly on bank balance sheets to fund long-duration assets is becoming increasingly challenging as investment requirements scale up.

Global Experience Points to a Different Model

The experience of developed economies suggests that large-scale infrastructure and industrial transformation are rarely financed through banks alone. In the US, corporate bond markets have become a primary source of long-term financing. Across Europe, pension funds, insurance companies, infrastructure funds, and capital market investors play a critical role in funding transportation, energy, utilities, and digital infrastructure. More recently, even global technology leaders such as Alphabet, Microsoft, Meta, and Amazon have increasingly accessed long-term bond markets to finance AI and digital infrastructure, including issuances extending to 30, 40, and even 50 years.

The lesson is clear: as economies mature and become more capital-intensive, financing increasingly migrates from traditional banking channels towards diversified capital markets.

Bond Markets: The Natural Next Step

Against this backdrop, developing a deeper and more liquid bond market becomes not just a policy objective but an economic necessity. Bond markets can complement the banking system by providing access to long-term domestic and global capital, reducing concentration risks, improving capital allocation, and better matching long-duration assets with long-term investors such as insurance companies, pension funds, sovereign wealth funds, and mutual funds.

Importantly, this is not about replacing banks but about establishing a more balanced financing architecture. Banks will continue to play a vital role while capital markets assume a greater share of long-term financing responsibilities.

Financing India's Next Growth Cycle

The challenge facing India is not inadequate support from the banking system; banks have been the cornerstone of credit intermediation for decades. However, India's economic ambitions are increasingly outgrowing a financing model that relies mainly on deposits and bank balance sheets. As household savings evolve and infrastructure investment needs rise, the next phase of India's growth will require a stronger partnership between banks and capital markets.

In many ways, the development of a vibrant bond market is the next natural step in India's financial evolution. Mobilising long-term savings, attracting institutional capital, and creating diversified financing channels will be essential to support the infrastructure, industrial, and technology investments required to realise the ***Viksit Bharat vision***.

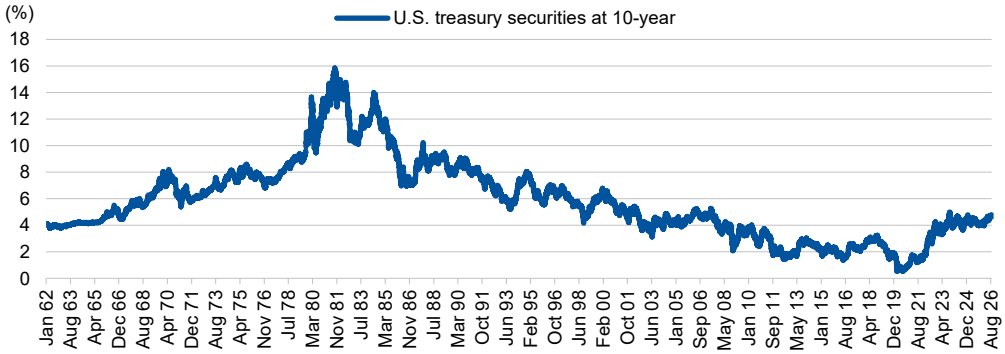
The Global Cost of Capital: What the US 10-Year Treasury Yield Means for India

A Double-Edged Sword for FPI Flows

For India, a structurally higher US yield environment may increase volatility in portfolio flows, particularly in debt markets. Global investors benchmark returns against US treasuries, requiring Indian bonds to offer an adequate spread to compensate for currency, sovereign, and liquidity risks. While India's inclusion in major global bond indices and strong macroeconomic fundamentals support debt inflows, sustained high US yields could moderate the pace of foreign investment compared with the ultra-low-rate era of 2010-2020. At the same time, India's superior growth prospects, improving fiscal position, and deepening capital markets remain attractive for long-term capital.

Figure 4

Fifty Years of Falling Rates and the Emergence of a New Interest Rate Regime



Source: .St Louis FED, ind-Ra Analysis

The Case for Building Domestic Long-Term Capital Pools

The post-COVID rise in global interest rates reinforces a crucial lesson for India: long-term infrastructure and development financing may not remain overly dependent on external capital. Successful countries have funded large-scale infrastructure programmes by building strong domestic pools of patient capital through pension funds, insurance companies, municipal bonds, infrastructure bonds, and deep corporate bond markets. As India invests in transportation, energy transition, urban infrastructure, defence, logistics, and digital infrastructure under the Viksit Bharat vision, developing a deep domestic bond market will be increasingly important in reducing reliance on cyclical global liquidity conditions.

The Rise of Domestic Institutional Capital: Building India's Long-Term Financing Capacity

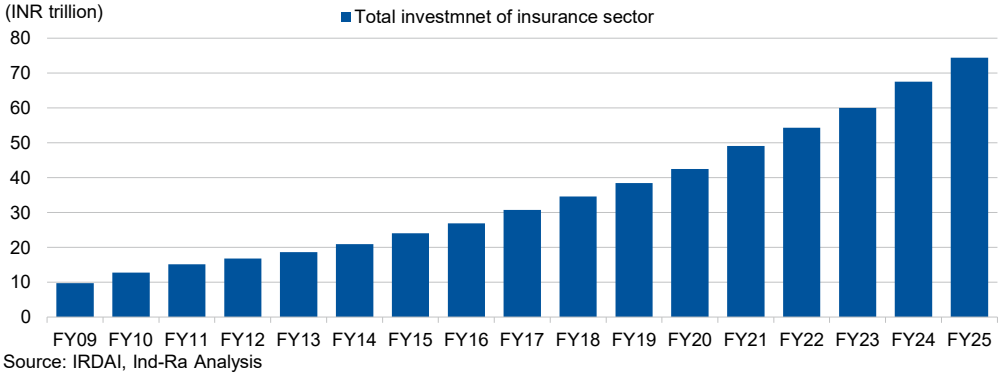
One of the significant-yet-underappreciated developments in India's financial system over the past 15 years is the rapid expansion of domestic institutional savings pools. As household financial savings increasingly migrate from physical assets towards formal financial channels, institutions such as insurance companies, EPFO, and NPS have emerged as custodians of an expanding pool of long-duration capital. This structural shift is creating the foundation for a more resilient and self-sustaining domestic financing ecosystem, reducing reliance on volatile foreign capital and enhancing India's ability to finance long-gestation investments.

A Massive Expansion of Patient Capital

The scale of growth has been remarkable. Over the past 16 years, total investments managed by the insurance sector have increased by nearly 8x, reflecting rising insurance penetration, growing household financial savings, and expanding long-term liabilities. Over the same period, EPFO investments grew almost 10x, supported by formalisation of the workforce, rising incomes, and increasing retirement savings. Even more striking has been the NPS growth, whose assets have increased nearly 20x in just the past decade, emerging as one of the fastest-growing pools of institutional capital in the country.

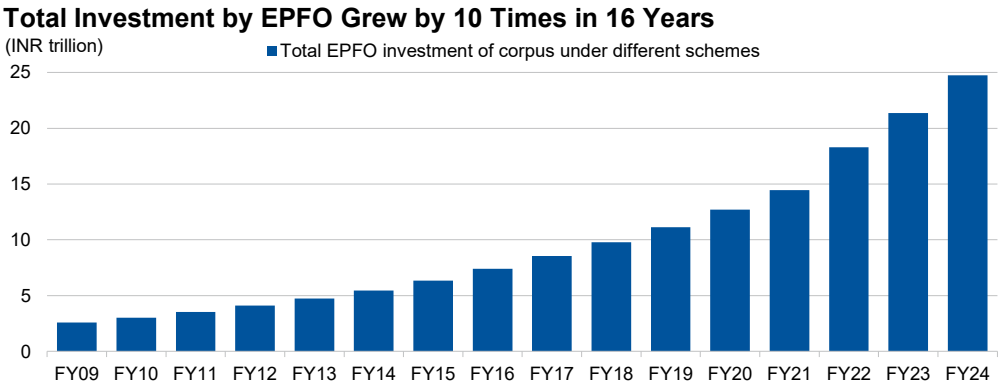
Figure 5

Total Investment by Insurance Sector Grew by 8 Times in 16 Years



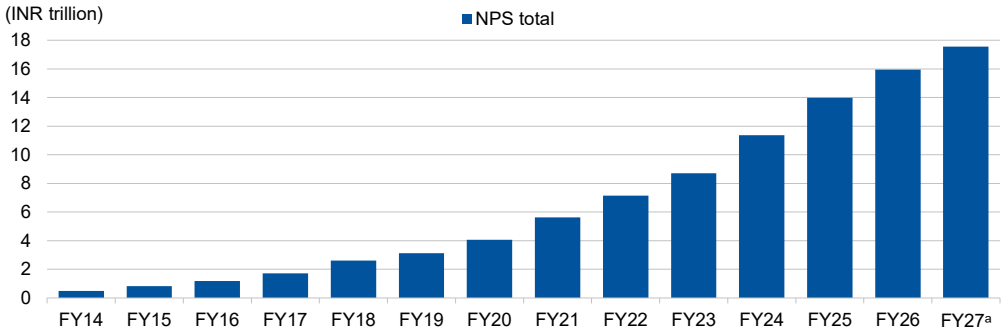
Source: IRDAI, Ind-Ra Analysis

Figure 6



Source: EPFO, Ind-Ra

Figure 7



[a]FY27 data till July 2026
Source: NPS Trust, Ind-Ra

Financing the Sovereign First

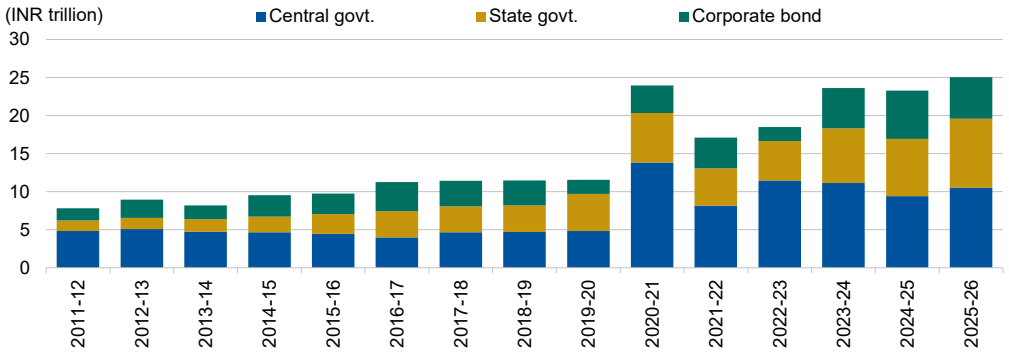
To date, a significant proportion of these expanding savings pools has naturally been directed towards financing central and state government borrowing programmes. Regulatory investment requirements, risk considerations, and the need for highly liquid assets have resulted in substantial allocations toward government securities. This has enabled India to fund large fiscal deficits domestically while reducing external vulnerabilities. However, it has also contributed, to some extent, to a crowding-out effect, whereby a large share of institutional savings remains concentrated in sovereign assets rather than flowing into corporate credit, infrastructure debt, municipal bonds, or other productive long-term assets.

From Government Financing to Development Financing- Slow but Steady

The emerging opportunity lies not only in the growth of these institutions, but also in the scale of incremental capital they will continue to generate. As insurance penetration rises, pension coverage expands, and retirement savings deepen, these institutions will increasingly seek high-quality, long-duration assets that offer stable cash flows and appropriate risk-adjusted returns. Infrastructure debt, municipal bonds, green bonds, InvITs, REITs, and project-finance instruments naturally fit these requirements due to their long asset lives and predictable income streams.

Figure 8

Net Bond Issuance



Source: RBI, SEBI and Ind-Ra

A Natural Match for Infrastructure

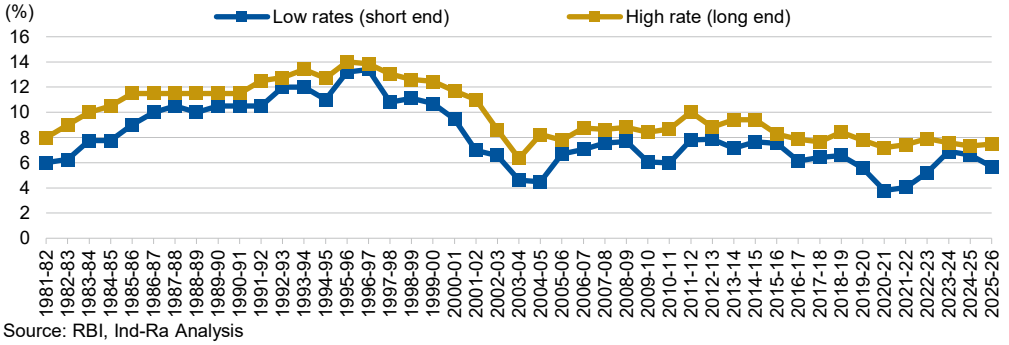
Globally, pension funds and insurance companies play a central role in financing infrastructure projects. Their long-term liabilities allow them to invest comfortably in assets with 20- to 30-year cash flow profiles, providing a natural asset-liability match. India's rapidly expanding institutional savings pools are increasingly acquiring similar characteristics. The challenge, therefore, is not capital availability, but creating sufficient investable opportunities through deeper bond markets, stronger credit enhancement mechanisms, improved project structures, and greater market liquidity.

The Long-Term Interest Rate Advantage: A Strong Foundation for Infrastructure Financing

A review of Indian Government security yields over the past four decades reveals a significant structural shift in the interest rate environment. While short-term rates have remained relatively volatile, reflecting monetary policy cycles, liquidity conditions, inflation expectations, and global market developments, long-term government bond yields have exhibited a clear downward secular trend. The long end of the yield curve, which peaked at 14.0% in FY96 and remained largely in the 11%-13% range during the 1990s, gradually declined through the 2000s and has stabilised at 7.3%-7.9% over the past five years. In comparison, short-end yields have moved more sharply, ranging from 3.79% in FY21 to 6.89% in FY24, illustrating their greater sensitivity to cyclical factors.

Figure 9

India's Interest Rate Evolution: From Double-Digit Yields to a Stable Long-Term Funding Environment



Source: RBI, Ind-Ra Analysis

From High-Cost to Stable Long-Term Capital

Perhaps more important than the absolute decline in yields has been the growing stability of long-term borrowing costs. During the 1980s and 1990s, long-term yields frequently fluctuated between 10% and 14%, creating significant uncertainty for long-gestation infrastructure projects. By contrast, since FY16, the upper end of the government yield curve has largely remained within a relatively narrow band of 7.2%-8.4%, despite periods of economic disruption including the pandemic, global inflation shocks, geopolitical tensions, and monetary tightening cycles.

Why This Matters for Infrastructure

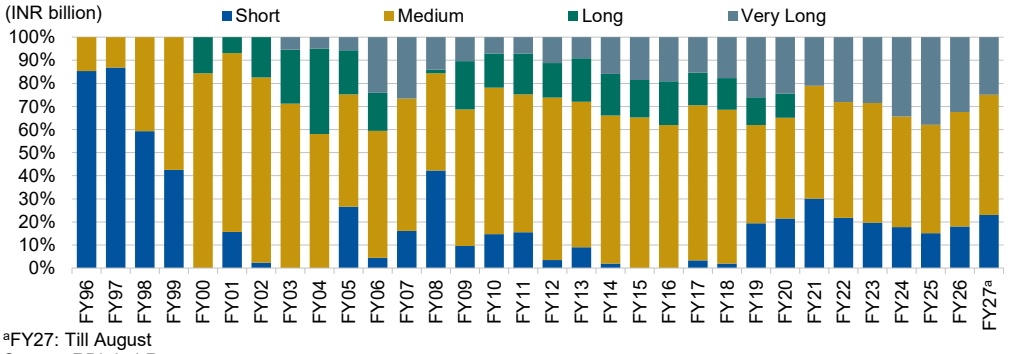
Infrastructure assets typically have economic lives extending over 20-30 years and require large upfront capital commitments with long payback periods. For such assets, the cost and predictability of long-term funding are often as important as the availability of capital itself. A stable long-term interest rate environment improves project viability, enhances debt-servicing capacity, reduces refinancing risk, and supports more efficient asset-liability matching for institutional investors.

A Tailwind for Bond Market Development

The evolution of India's yield curve is therefore a positive structural development for the country's infrastructure financing ecosystem. With long-term sovereign yields increasingly anchored at the 7.5%-8.5% level, infrastructure issuers can access capital at significantly lower and more predictable costs than in previous decades. This creates a favourable backdrop for the expansion of corporate bond markets, infrastructure bonds, municipal bonds, InvITs, and other long-duration financing instruments. As India scales investments across transportation, energy transition, digital infrastructure, urban development, and logistics under the Viksit Bharat vision, the combination of lower long-term rates and deeper bond markets can become a powerful catalyst for mobilising patient capital and supporting sustainable economic growth.

Figure 10

Surge in Very Long Tenure Issuances from FY21



[a]FY27: Till August
Source: RBI, Ind-Ra

Stable Long-Term Yields Have Enabled the Emergence of Ultra-Long Government Bond Markets

The gradual decline and subsequent stabilisation of India's long-term sovereign yields in the 7.5%-8.5% range has created an environment conducive for the development of long-duration government securities. A stable interest rate regime reduces uncertainty around borrowing costs and enables issuers to confidently access capital across longer maturities. As a result, the Government of India has progressively expanded issuance across the yield curve, including 30-year, 40-year and 50-year securities, contributing to the development of a deeper and more representative benchmark yield curve.

The availability of long-dated sovereign instruments has important implications for India's financial system. It provides natural investment avenues for long-term liability holders such as insurance companies, pension funds, and EPFO, whose obligations often extend over multiple decades. A well-defined long-end of the yield curve also improves asset-liability matching, facilitates more efficient pricing of long-term debt instruments, and supports the growth of corporate bond, municipal bond, and infrastructure bond markets.

Importantly, the sustained investor appetite for long-duration government securities reflects growing confidence in India's macroeconomic stability and fiscal framework. For infrastructure financing, where asset lives often extend beyond 20-30 years, the existence of a stable long-term benchmark curve significantly improves financing efficiency by reducing refinancing risks and establishing a reliable reference rate for project debt. In many ways, the evolution of India's sovereign yield curve has laid a critical foundation for mobilising long-term institutional capital and supporting the financing needs of Viksit Bharat through deeper and more mature bond markets.

A Sign of Financial Market Maturity

The sharp increase in medium and very-long maturity issuance over the past decade also reflects India's growing financial market maturity. Investors have demonstrated a willingness to lock capital into long-duration assets, despite periods of global volatility, inflation shocks, and monetary tightening. This sustained appetite has enabled the government to diversify funding sources, reduce refinancing risks, and strengthen the sovereign yield curve.

Implication for Bond Market Development

The data underscore an important structural trend: India's bond market is increasingly capable of supporting long-duration financing needs. The shift from predominantly short- and medium-term borrowing towards sizeable issuances in the very-long segment demonstrates how a stable interest-rate environment and a growing institutional investor base can create the foundation for financing the long-gestation infrastructure investments required for Viksit Bharat. A deeper sovereign yield curve not only reduces funding risk for the government but also lays the groundwork for a more vibrant corporate, infrastructure, and municipal bond market ecosystem.

Global Capital, Global Standards, Stronger Markets

Foreign institutional investors have contributed far beyond capital inflows to India's infrastructure and capital markets. Global pension funds, sovereign wealth funds, infrastructure investors, and strategic partners have brought international governance standards, stronger disclosure practices, sophisticated risk-management frameworks, ESG integration, and operational expertise. For example, leading global investors have partnered with Indian platforms across roads, renewables, transmission, logistics, airports, and InvITs, helping institutionalise asset management, improve operating efficiencies, and introduce globally benchmarked governance practices.

Notable examples include investments by global pension funds and sovereign investors in Indian InvITs, renewable energy platforms, toll roads, airports, and data centre businesses, as well as partnerships with domestic sponsors to develop large infrastructure portfolios. These partnerships have demonstrated that global capital often brings not just funding, but also expertise in asset optimisation, technology adoption, sustainability standards, and innovative financing structures. In many ways, foreign investor participation has helped connect India's infrastructure ecosystem with global best practices, strengthening market credibility, broadening the investor base, and supporting the development of a more mature and internationally integrated bond market.

The Road Ahead

India's next phase of growth will require a financing architecture that moves beyond traditional bank-led intermediation and harnesses the nation's rapidly expanding pools of long-term capital. The priority now is clear: deepen secondary-market liquidity, broaden issuer and investor participation, strengthen municipal and infrastructure bond markets, and develop capital-recycling mechanisms such as InvITs, securitisation, CLOs, and credit-enhancement structures. As infrastructure assets become more predictable, investable, and recovery-oriented, the adoption of advanced credit frameworks and innovative market structures can further accelerate bond market development. Ultimately, a deeper and more diversified bond market will not only complement the banking system but also become a critical enabler of India's journey towards Viksit Bharat, transforming domestic savings into long-term productive capital and economic ambition into sustainable growth.

Corporate Bond Market: Growing, Yet Seeking Depth

Beyond AAA: Early Signs of Market Deepening Amid Structural Constraints

India's Corporate Bond Market: Deep Liquidity, Narrow Participation

India's corporate bond market has witnessed significant growth over the past decade, yet participation remains concentrated among a relatively small group of highly rated issuers. While issuance volumes have expanded, the market continues to be dominated by AAA-rated and AA categories corporates, financial institutions, and public-sector entities, highlighting the gap between overall market growth and true market depth.

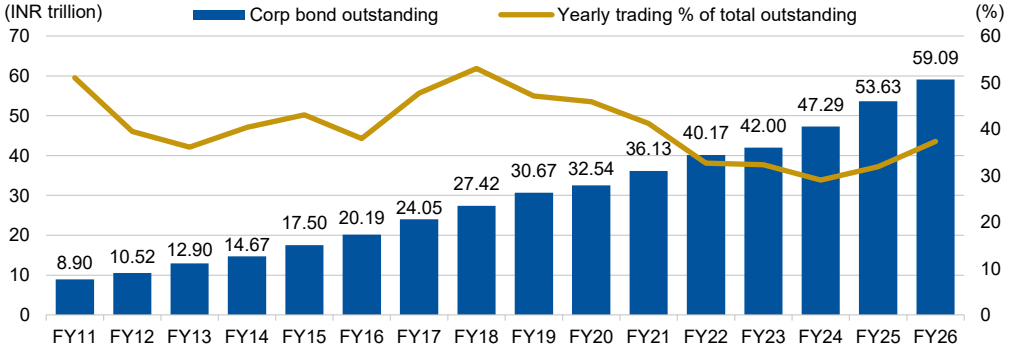
The Liquidity Challenge: Buy-and-Hold versus Active Trading

A well-functioning bond market requires both issuance depth and secondary market liquidity. However, in India, the prevalence of long-term investors means that a substantial portion of outstanding bonds rarely changes hands after issuance. This creates pockets of illiquidity outside benchmark issuers and tenors, making it more difficult for investors to actively manage portfolios and for lower-rated issuers to build a regular investor following.

Consequently, while the primary market has expanded steadily, secondary-market trading remains relatively shallow compared with mature bond markets, where a broader mix of pension funds, insurance companies, mutual funds, hedge funds, banks, market-makers, and foreign investors actively trade debt instruments.

Figure 11

Corporate Bond Market Deepens, While Secondary Trading Begins to Rebound



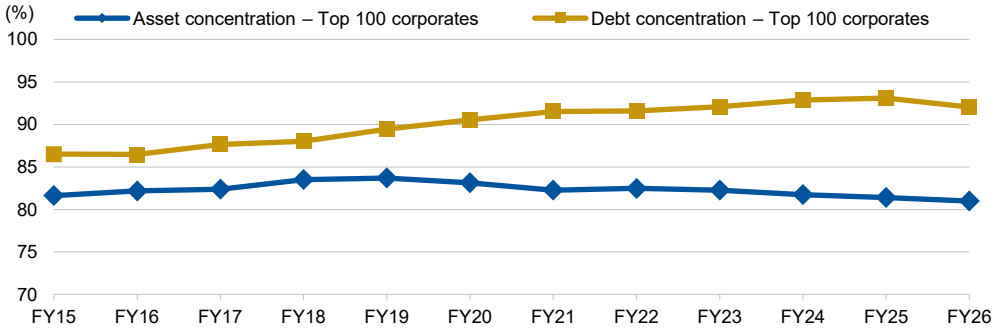
Source: SEBi, Ind-Ra Analysis

A Concentration Challenge for Bond Market Development

The implication is that a disproportionate share of both banking system resources and bond market capital continues to flow towards the same narrow group of borrowers. While this reflects strong credit quality and investor confidence, it also limits the breadth of market participation and constrains the role of bond markets in supporting a wider spectrum of economic activity.

Figure 12

Asset Concentration and Debt Concentration of Top 100 Corporates



Note: Concentration = Total debt (or Asset) of top 100 corporates/Total debt (or Asset) of top 1,000 corporates
Source: Ace Equity, Ind-Ra

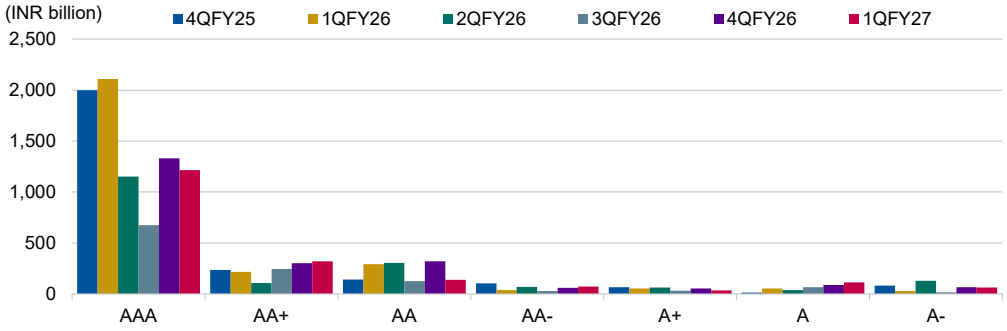
Despite the steady expansion of India's corporate bond market, issuance activity remains heavily concentrated among AAA-rated issuers, including public sector enterprises, large financial institutions, infrastructure financing entities, and a handful of diversified corporate groups. The preference for top-rated credit reflects the risk appetite of the prevailing investor base, which is dominated by insurance companies, provident funds, pension funds, and other long-term institutional investors that are often bound by regulatory investment constraints and conservative portfolio strategies.

As a result, the bond market has evolved into a highly efficient funding platform for the strongest borrowers, while access for lower-rated credits remains relatively limited. This concentration is particularly evident during periods of market uncertainty, when investors increasingly gravitate towards safety and liquidity, further reinforcing the dominance of AAA-rated issuers.

Figure 13

Rating-wise Bond Issuance

AAA and AA+ rated issuers contribute over two-third of issuance

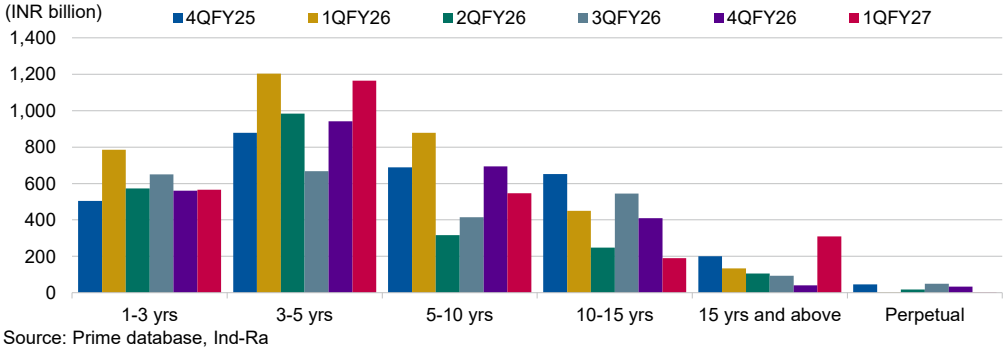


Source: Prime database, Ind-Ra

Figure 14

Tenor-wise Issuance

3-5 year segment emerges as preferred tenor



Source: Prime database, Ind-Ra

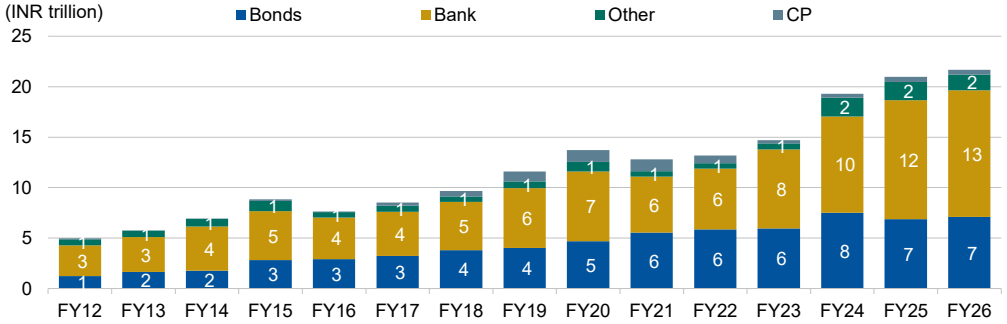
AAA Issuers Increasingly Diversify Funding Through Bond Markets

Interestingly, even within the highest-rated segment, bond funding continues to gain momentum as an important component of corporate liability structures. While AAA-rated corporates continue to maintain strong banking relationships and significant access to bank credit, the share of bond financing in their overall liabilities has steadily increased over time.

Figure 15

Aggregate Borrowings Rise; Banks Remain Dominant Funding Source

Borrowings of AAA rated entities from top 1,400 debt-heavy corporates

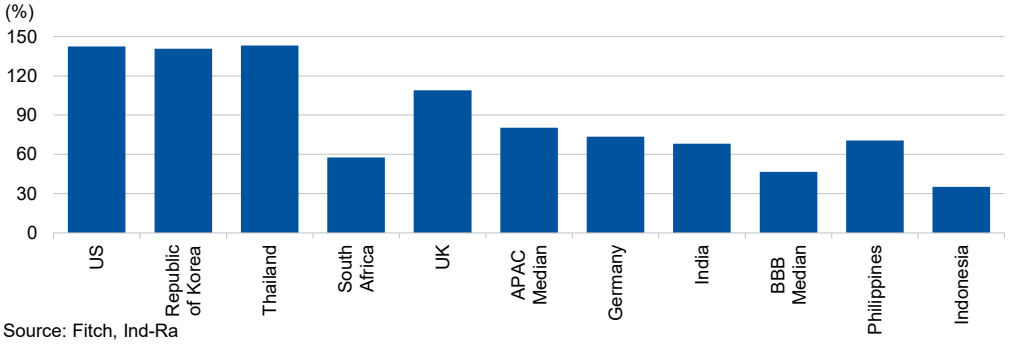


Source: Ace Equity, Ind-Ra Analysis

The growing presence of bonds in the funding mix of top-rated issuers reflects the increasing depth of India's debt capital markets, abundant investor liquidity, competitive pricing, funding diversification benefits, and the ability of capital markets to provide flexible access across maturities. As a result, many highly rated borrowers are increasingly adopting a balanced funding strategy, leveraging both bank loans and bond issuances to optimise their capital structure, diversify funding sources, and enhance financial flexibility. The trend also underscores the gradual evolution of India's financial system towards a more market-based financing architecture, where bond markets complement rather than replace traditional bank funding.

Figure 16

Private Credit to GDP in Line with BBB Median; Yet, Debt Market Penetration Remains Weak



Source: Fitch, Ind-Ra

Mutual Funds: An Important but Selective Participant

Mutual funds have increasingly emerged as an important conduit between household savings and capital markets. However, much of the industry's debt mobilisation continues to be concentrated in short-duration products and liquidity-management mandates. Domestic short-term financing requirements, traditionally financed by banks, are increasingly being met through mutual fund participation, either directly or through structured instruments.

Liquid funds have become a major intermediary between short-term savings and short-term borrowing requirements. However, the investor base of liquid funds remains skewed. A significant majority of flows are driven by corporates and financial institutions, with individuals contributing only a relatively small share. This investor mix results in funding availability that tends to be more cyclical in nature.

When Liquidity Tightens, the Market Feels It

A structural challenge emerges because the liquidity position of corporates and financial institutions typically mirrors broader system liquidity conditions. During periods of abundant liquidity, these institutions act as major suppliers of capital to liquid funds. Conversely, during periods of tighter liquidity, the same institutions often become net borrowers, reducing inflows into debt mutual funds and, in some cases, withdrawing investments altogether.

This dynamic can create additional pressure on mutual fund liquidity precisely when financing requirements increase, resulting in periods of market stress. In contrast, household savings tend to exhibit greater stability across economic cycles and can provide a more resilient source of long-term capital.

Broadening the Credit Spectrum: Lower-Rated Bond Issuances Are Finding a Market

One of the more encouraging developments in India's corporate bond market has been the gradual emergence of issuance activity beyond the traditional AAA and AA-rated universe. While lower-rated bond issuances continue to represent a small proportion of overall bond market volumes, their growing presence signals an important structural shift in market depth and risk appetite.

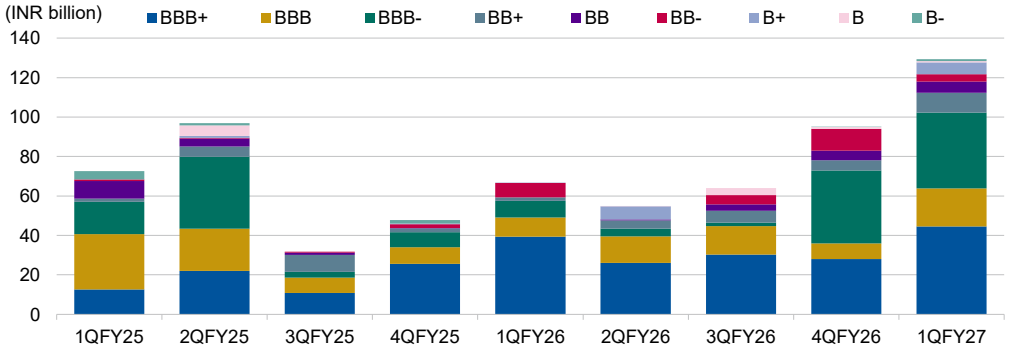
Historically, issuances in the BBB and sub-investment-grade segments were highly sporadic, characterised by irregular issuance patterns and limited investor participation. Access to bond markets for these borrowers was often constrained, forcing greater reliance on bank funding. However, recent trends indicate a steady increase in market access, particularly among NBFCs and select corporate issuers, even in a cautious credit environment.

Successful global bond markets facilitate capital formation across a broad spectrum of credit profiles, allowing investors to allocate capital according to varying risk-return preferences.

The gradual emergence of a functioning market for lower-rated issuers therefore represents an important milestone in the evolution of India's debt markets. It indicates improving credit differentiation, expanding investor sophistication, and a growing willingness to price risk rather than avoid it altogether.

Figure 17

Lower Rated Issuances Gaining Momentum Amid Cautious Environment



Source: Prime database, Ind-Ra

From Occasional Activity to a More Consistent Funding Channel

The issuance data suggest that lower-rated bond activity has become increasingly regular across quarters rather than being concentrated in isolated transactions. The growth has been particularly visible in the BBB+, BBB and BBB- rated borrowers, which continue to account for the majority of issuance volumes within this segment. While issuances remain modest relative to higher-rated borrowers, the increasing frequency of transactions demonstrates that the bond market is gradually extending beyond its traditional concentration among the highest-rated issuers.

NBFCs Lead Market Development

A significant portion of lower-rated issuance continues to originate from NBFCs, many of which are using bond markets as a complementary funding source alongside bank borrowings. These issuances are generally characterised by shorter maturities and lower duration profiles, reflecting both issuer preferences and investor appetite for managing credit risk.

Although coupon rates typically range from the low teens to high teens, materially above yields for higher-rated borrowers, the ability to access market-based financing itself represents a meaningful development. For many issuers, bond market access diversifies funding, reduces dependence on bank credit, and helps establish market visibility and investor relationships.

Absence of Non Senior Debt Market

Indian infrastructure has a plain debt-equity structure. Junior debt is a key component that is missing in infrastructure financing. It is necessary in a project capital structure for several reasons, including the fact that it acts as a credit enhancement, if the repayment schedules are fluid and contingent on cash flows.

Junior/subordinated debt acts as debt during a project's good performance and as equity during temporary cash flow impairments. It is crucial for long-term projects, which could face stress over their economic life and be subject to economic cycles. Weak links in a project could play out adversely at any point during the project's life cycle. The subordinated debt should be structured to protect senior lenders from vulnerabilities, positioning itself as a penultimate claimant (equity holders being the ultimate claimant) in the cash flow waterfall mechanism. This is also required to instil more confidence in the bond market. A 'default' in a bond market would have serious repercussions on asset financing. Therefore, it is crucial for the regulators, and for the market as a whole, to introduce a reasonable subordinate debt market that could act as a 'shock-absorber' or a cushion to handle routine susceptibilities arising out of externalities. The junior debt market is also expected to bring down the arbitrage on the cost of funds from various sources to finance infrastructure assets.

Tokenisation: Building Future-Ready Bond Markets

Tokenisation has the potential to fundamentally modernise India's bond market by converting conventional debt securities into digital tokens on a regulated distributed ledger, enabling near real-time settlement, enhanced transparency, lower operational costs, and improved market efficiency. While the economic characteristics of a bond remain unchanged, tokenisation transforms the underlying market infrastructure through programmable settlement, smart contracts, and atomic delivery-versus-payment mechanisms. India recently took a significant step in this direction with the launch of its first tokenised corporate bond pilot, integrating distributed ledger technology with the RBI's wholesale CBDC framework.

Recent pilots involving tokenised corporate bonds settled using the RBI's wholesale CBDC framework have demonstrated the feasibility of near real-time issuance and settlement, providing a glimpse into the next generation of capital market infrastructure. The pilot witnessed issuances aggregating over INR 10 billion from leading issuers, demonstrating the feasibility of same-day issuance, allotment, and settlement.

However, like all financial innovations, widespread adoption will require regulatory evolution, market acceptance, technological standardisation, and multiple years of testing across market cycles.

Over the medium term, tokenisation could help deepen India's bond markets by improving settlement efficiency, enabling fractional ownership, enhancing secondary market liquidity, reducing counterparty risk, and broadening investor participation. Much like UPI transformed payments infrastructure, tokenisation has the potential to become a foundational layer for the next generation of India's capital markets, creating a more efficient, transparent, and accessible debt ecosystem.

Corporate Deleveraging Is Creating Space for Infrastructure Financing

A Fortuitous Shift in India's Credit Cycle

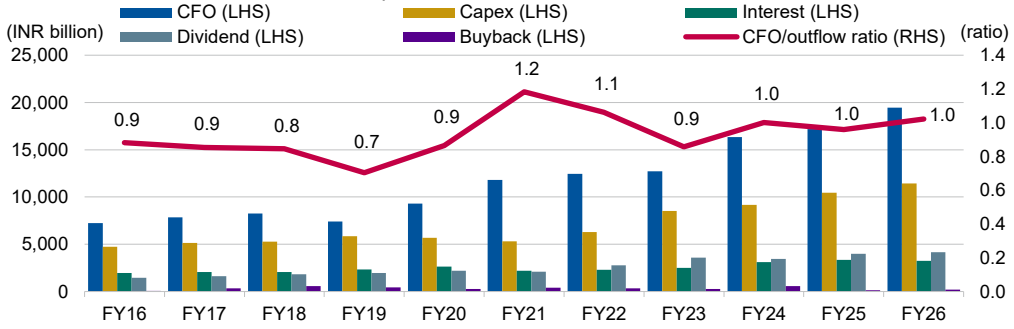
A notable feature of the current credit cycle is that Corporate India is increasingly funding growth through internal cash generation rather than aggressive leverage. This dynamic is creating an important window of opportunity for infrastructure financing. While India's investment requirements are accelerating across transportation, energy transition, digital infrastructure, logistics, and urban development, private-sector demand for incremental external debt has remained relatively measured, allowing infrastructure projects greater access to banking system liquidity and long-term financing resources.

Cash-Rich Corporates, Lower Dependence on External Funding

Figure 18

Inflow to Outflow Ratio Remains Healthy; CFO Growth Rebounds in FY26

Cash inflows and outflows of 4,355 companies



Source: Ace Equity, Ind-Ra Analysis

FY26 reflects a meaningful improvement in Corporate India's financial health. Aggregate cash flow from operations (CFO) across a universe of 4,355 companies increased 13% yoy, comfortably supporting continued growth in capital expenditure (9%) and dividend distributions (4%). Importantly, the CFO-to-outflow ratio remained stable at 1.0x, indicating that corporate investment and shareholder return continue to be largely funded through internally generated cash flows rather than incremental borrowings.

Equally significant is the decline in interest-related outflows by 3% yoy in FY26, marking the first such decline since FY21 and reflecting broad-based deleveraging and financial discipline. This suggests that many corporates are prioritising balance-sheet strengthening over debt-funded expansion.

Balance Sheet Strength Over Balance Sheet Expansion

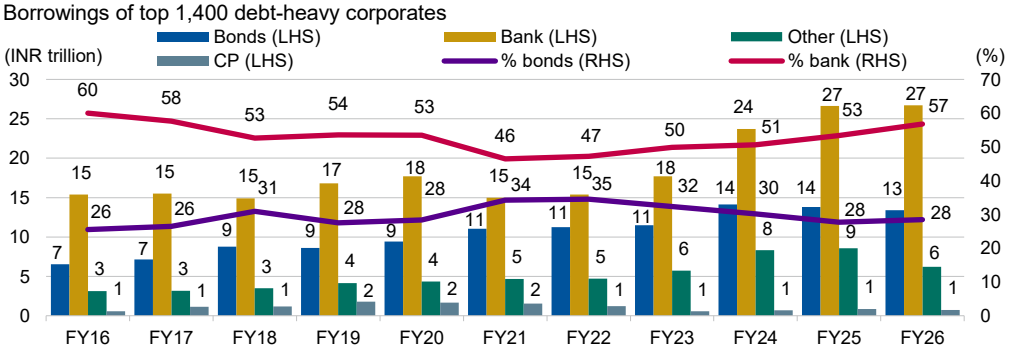
Although borrowings among the top 800 debt-heavy corporates increased marginally, the overall funding pattern remains conservative relative to the size of the economy and corporate profitability. Corporates continue to generate sufficient operating cash flows to fund a substantial portion of growth investments internally.

The resilience of Corporate India has been particularly noteworthy given the succession of external shocks over recent years, ranging from the pandemic and the Russia-Ukraine conflict to Middle East geopolitical tensions, elevated energy prices, and global trade disruptions. Large corporates have emerged stronger through greater scale, enhanced pricing power, technology adoption, stronger supply-chain management capabilities, and improved operational efficiencies. As a result, most external disruptions have been absorbed through earnings volatility rather than balance-sheet stress.

Figure 19

Aggregate Borrowings Rise; Banks Remain Dominant Funding Source

Borrowings of top 1,400 debt-heavy corporates



Source: Ace Equity, Ind-Ra Analysis

Infrastructure Is Emerging as the Natural Credit Absorber

Historically, periods of strong corporate credit demand often competed with infrastructure projects for scarce banking resources. The current cycle appears different. With many large corporates pursuing growth through internal accruals and maintaining healthier leverage positions, infrastructure sectors are increasingly emerging as the principal absorbers of long-term credit demand.

This has important implications for India's financing ecosystem. Large infrastructure programmes across railways, roads, renewable energy, transmission networks, logistics corridors, urban infrastructure, data centres, and digital infrastructure require long-duration capital that is often difficult to finance through conventional short-term banking liabilities. The muted appetite for debt-funded corporate expansion creates additional capacity within the financial system for infrastructure lending and project financing.

A Dynamic Likely to Persist

Given healthy corporate balance sheets, robust cash-flow generation, and the growing concentration of business among financially stronger corporates, this deleveraging trend is likely to persist over the near to medium term. Consequently, infrastructure may continue to enjoy a larger share of available financing capacity, providing a supportive backdrop for long-term project development and capital formation.

In many ways, this evolving dynamic is fortuitous for India. At a time when the country's infrastructure ambitions are expanding rapidly, the moderation in debt-intensive corporate borrowing is helping create financial space for the next investment cycle. This reinforces the broader theme of this paper: that a deeper bond market, supported by growing domestic savings pools and long-term institutional capital, will be essential to financing India's infrastructure-led journey towards Viksit Bharat.

Municipal Bonds: Financing the Urban Infrastructure of Viksit Bharat

The Next Frontier of Urban Finance

Cities at the Core of the Viksit Bharat Vision

Rapid urbanisation, driven by migration for education, employment, and economic opportunities, is placing unprecedented pressure on urban local bodies (ULBs) to expand and maintain civic infrastructure. As the third tier of governance within India's federal structure, ULBs are responsible for delivering a wide range of essential public services, including healthcare, affordable housing, transportation, schools, water supply, sewerage, sanitation, solid waste management, fire services, parks, gardens, and street lighting. The quality of urban infrastructure and civic service delivery will increasingly shape India's economic competitiveness and quality of life as the country advances towards its Viksit Bharat aspirations.

Globally, cities have been at the centre of economic growth, with municipal bond markets playing a critical role in financing urban infrastructure. However, India's urban financing challenge is unique. With a relatively low per-capita income base and a highly heterogeneous population, many essential services such as drinking water, sanitation, public health, and urban welfare cannot be fully financed through user charges alone. Consequently, municipal finance must balance financial sustainability with social and developmental objectives.

Strengthening Municipal Finances in India's Largest Cities

An examination of 34 municipal corporations governing India's million-plus cities shows that stronger own-source revenues, prudent expenditure management, healthy operating surpluses, and improving governance practices are strengthening the financial capacity of larger ULBs. Own revenues remain the cornerstone of municipal finance, with tax and non-tax revenues accounting for around 51% of total revenue on average during FY20-FY24, indicating relatively low dependence on grants among India's largest urban centres. Assigned revenues and compensation constitute another important revenue source, while grants contribute less than 10% of total revenue receipts on average.

Property Tax: The Foundation of Municipal Creditworthiness

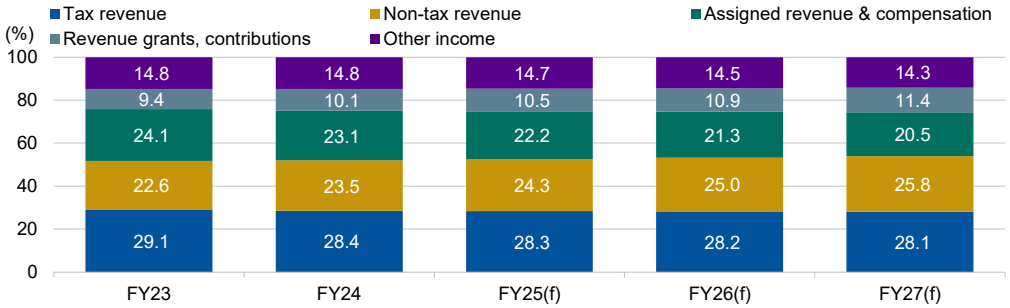
Property tax continues to be a key and resilient source of municipal revenue. It contributed 56.8% of tax revenues during FY20-FY24 across the 34 cities considered and is expected to account for around 61% during FY25-FY27. Collections have improved significantly due to GIS-based mapping, digital payment systems, QR-enabled collection mechanisms, taxpayer database improvements, and focused collection drives.

However, arrears are substantial. While current-year collection efficiency generally averages around 70% for large municipal corporations, overall collection efficiency often is below 45% due to accumulated arrears. Addressing this gap remains one of the largest untapped opportunities for improving municipal financial strength and enhancing credit quality.

Figure 20

Revenue Income: Primary Components

FY23-FY27(f)



f: Ind-Ra forecast
Source: Respective ULB websites, Ind-Ra

Beyond Taxes: Unlocking Additional Revenue Streams

Although non-tax revenues typically contribute less than 30% to the total revenue income, they represent an important area for revenue augmentation. User charges, monetisation of municipal assets, parking facilities, commercial properties, development charges, and other municipal service fees can provide diversified revenue streams and strengthen financial self-reliance.

The experience of mature municipal bond markets globally demonstrates that diversified revenue sources are often a key determinant of municipal creditworthiness and investor confidence.

A Tale of Two Municipal India(s)

India's municipal ecosystem remains highly heterogeneous. Financially stronger ULBs generally fund operating expenditures from their own resources and generate surpluses that support capital expenditure. In contrast, mid-sized and smaller municipalities face significant financial constraints.

In many small ULBs, own-source revenue generation is insufficient to cover operating expenditure requirements. Heavy dependence on grants and transfers from state and central governments limits financial flexibility and constrains their ability to undertake capital investments. A large portion of operating expenditure is often absorbed by establishment and administrative costs, leaving limited room for repairs, maintenance, and surplus generation.

Capital Spending Remains the Growth Imperative

Despite these challenges, large and financially strong ULBs prioritise infrastructure creation. Capital expenditure accounts for nearly 45% of the total expenditure on average, supported by revenue surpluses and capital grants. This has enabled healthier municipalities to sustain infrastructure investments while maintaining relatively moderate debt levels.

Historically, municipal infrastructure projects are financed through internal resources, government grants, Finance Commission allocations, interest-free state government loans, centrally sponsored programmes such as AMRUT, and to a lesser extent, loans from banks and public financial institutions. Many of these investments have focused on water supply augmentation, sewerage systems, wastewater treatment, storm-water drainage, septage management, parks, and green spaces.

Municipal Bonds: The Next Frontier of Urban Finance

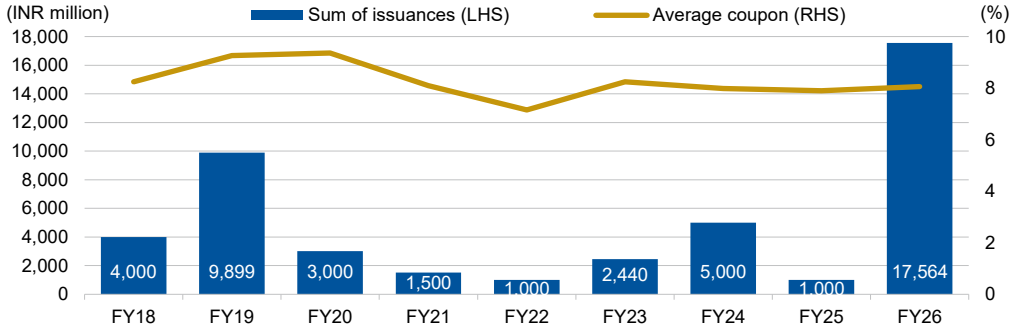
Recognising the scale of urban infrastructure requirements, policymakers have increasingly encouraged municipalities to access market-based financing channels. Since the introduction of municipal bond guidelines in 2015 and the launch of AMRUT-linked incentives in 2021, a growing number of ULBs have explored bond issuances.

While still modest relative to global municipal bond markets, progress has been encouraging. As of 8 September 2026, there have been 31 municipal bond issuances by 22 ULBs, raising an aggregate INR 45,403.40 million since June 2017. Coupon rates have ranged between 7.15% and 10.23%.

Beyond financing, municipal bonds encourage greater transparency, stronger financial discipline, improved governance standards, and enhanced accountability, all of which contribute to stronger municipal institutions over time.

Figure 21

Over the Year Issuances and Average Coupon Movement



Note: No issuance during April 2026 till date
Source: Ind-Ra

Policy Incentives Creating Momentum

The Union Budget FY27 introduced a significant new incentive of INR1,000 million for every municipal bond issuance exceeding INR10,000 million. This is expected to encourage larger ULBs to access debt capital markets for large-scale urban infrastructure projects while strengthening financial governance frameworks.

In addition, the existing AMRUT incentive structure remains in place:

- First-time municipal bond issuances qualify for an incentive equal to 13% of the amount raised, equivalent to INR130 million for every INR1,000 million raised, subject to a maximum of INR260 million.
- Subsequent bond issuances must be structured as green bonds focused on sectors such as water, sanitation, renewable energy, and urban resilience, qualifying for INR100 million per INR1,000 million raised, subject to a maximum incentive of INR200 million.

Creating a New Asset Class for India's Bond Market

The enhanced policy support framework holds considerable promise for expanding municipal bond activity. Several first-time and repeat issuers, including Patna Municipal Corporation, Nagpur Municipal Corporation, Municipal Corporation Raipur, Kanpur Nagar Nigam, Ahmedabad Municipal Corporation, Vadodara Municipal Corporation, Nagar Nigam Moradabad, and the newly created municipal corporations carved out of the erstwhile Bruhat Bengaluru Mahanagar Palike, are expected to access the market in the medium term.

As India urbanises and cities become increasingly important engines of economic growth, municipal bonds can emerge as a critical bridge between urban infrastructure needs and long-term investor capital. Much like the municipal bond markets of developed economies helped finance their urban transformation, a deeper and more vibrant municipal bond market can play a pivotal role in funding India's next generation of urban infrastructure while simultaneously broadening and deepening the country's bond market ecosystem. In many ways, stronger cities and stronger bond markets will be mutually reinforcing pillars of the Viksit Bharat journey.

Reviving Pooled Municipal Bonds: Unlocking Market Access for India's Smaller Cities

While municipal bonds have begun gaining traction among large and financially strong ULBs, a significant portion of India's urban landscape remains outside the ambit of capital markets. Most mid-sized and smaller municipalities continue to face structural constraints, including limited own-source revenues, dependence on grants, weaker balance sheets, and inadequate scale to access bond markets independently. Yet, they are often at the frontline of India's urbanisation challenge and require substantial investment in water, sanitation, drainage, waste management, and local infrastructure.

Benefits of Pooled Municipal Bonds

- Expand market access for small ULBs.
- Create a new asset class for bond investors.
- Accelerate urban infrastructure creation beyond major metropolitan regions.

In many ways, a revitalised pooled bond framework can become for smaller cities what municipal bonds have become for larger corporations, a scalable mechanism for converting infrastructure needs into investable opportunities. By aggregating demand, strengthening credit quality, and attracting institutional capital, pooled municipal bonds can play an important role in financing India's urban future while deepening the country's bond market, a key prerequisite for achieving the ambitions of Viksit Bharat.

A Proven Model Worth Revisiting

Globally, pooled financing structures have emerged as an effective mechanism for enabling smaller municipalities to access long-term capital markets. In the US, state-sponsored municipal bond pools have successfully aggregated the borrowing requirements of small local governments, thereby reducing issuance costs, improving diversification, and enhancing investor confidence. Similar mechanisms have been used in several emerging markets to bridge the financing gap faced by sub-sovereign entities.

For India, the Pooled Finance Bond Programme offers a compelling framework to democratise municipal bond market access. Under this model, multiple ULBs pool their infrastructure financing requirements through a common SPV or pooled finance entity, which subsequently raises capital on their behalf. The structure allows smaller municipalities to benefit from economies of scale, lower transaction costs, and stronger collective credit profiles than would be possible through standalone issuances.

Tested Template for Municipal Market Access

India already possesses a successful proof of concept. Recognising the financing constraints of small municipalities, the Government of Tamil Nadu established the Water and Sanitation Pooled Fund (WSPF) in 2002 under the Government of India's Pooled Finance Development Fund scheme. Acting through a trust structure, the WSPF enabled multiple small and medium-sized ULBs to collectively access debt markets for urban infrastructure financing.

The programme's first pooled bond financed water and sanitation projects across 13 small and medium municipalities, and over time WSPF successfully issued six bonds aggregating INR3,023 million. The Tamil Nadu experience demonstrated that well-structured pooled financing mechanisms can provide capital-market access to municipalities that would otherwise remain excluded from debt markets.

Partial-Credit Guarantee Backed Debt

A Proven Global Tool for Infrastructure Financing

India's infrastructure ambitions across transportation, energy transition, logistics, digital infrastructure, urban development, and emerging sectors will require unprecedented volumes of long-term capital. While the banking system has historically been the primary source of infrastructure financing, the scale and duration of future investment requirements increasingly call for a broader financing architecture capable of mobilising institutional and market-based capital at scale.

In this context, partial credit guarantees (PCGs) can serve as a powerful bridge between infrastructure financing needs and investor requirements. By enhancing credit quality without fully substituting underlying project risk, PCGs help transform viable infrastructure assets into investable opportunities for pension funds, insurance companies, sovereign wealth funds, and other long-term investors. This not only broadens market participation but also facilitates the gradual transition of infrastructure financing from traditional balance-sheet lending towards deeper and more diversified bond market funding.

As India advances towards its Viksit Bharat aspirations, the ability to attract patient, long-duration capital will be as important as the creation of infrastructure itself. The true value of a PCG lies not in eliminating risk, but in improving the investability of risk through stronger credit profiles, enhanced resilience to stress scenarios, and greater transparency for investors. By crowding in institutional capital, improving risk-adjusted returns, and strengthening market confidence, PCGs can emerge as a critical enabler of bond market deepening and a key instrument in financing India's next generation of infrastructure-led growth.

Unlike a full guarantee, which substitutes the credit risk of the issuer with that of the guarantor, a PCG functions as a credit enhancement tool rather than a credit substitute. By providing a predefined level of protection against debt-service stress, PCGs improve the resilience of project cash flows, enhance credit quality, and facilitate access to a wider investor base, including insurance companies, pension funds, sovereign funds, and infrastructure debt investors.

A Proven Global Tool for Infrastructure Financing

Globally, partial guarantee structures have played an important role in deepening bond markets and attracting institutional capital into infrastructure. Development finance institutions such as the World Bank Group, GuarantCo, African Development Bank, Asian Development Bank, and various export credit agencies have extensively used guarantee structures to improve credit quality and facilitate project bond issuances. These instruments have been particularly effective in infrastructure sectors characterised by long asset lives and stable cash flows, including transportation, energy, utilities, and social infrastructure.

The success of these structures lies in their ability to address investor concerns regarding project execution risk, demand cyclicality, refinancing risk, and temporary cash flow disruptions. Rather than eliminating risk, they reallocate and mitigate specific risks, thereby enabling projects to achieve broader market acceptance and more efficient funding costs.

The Power of Structure

A key determinant of PCG effectiveness is the strength of the guarantee structure itself. The degree of investor protection depends not only on the quantum of guarantee available but also on its ability to support timely payment of debt obligations. Features such as unconditionality, irrevocability, liquidity support mechanisms, and the ability to replenish utilised guarantee amounts significantly influence the magnitude of credit enhancement achievable.

Equally important is the relationship between the strength of the guarantor and the underlying issuer. A highly rated guarantor can materially improve the resilience of project debt, particularly where temporary cash-flow disruptions or cyclical stresses could otherwise affect debt servicing. In practice, the objective of a PCG is not merely to increase recoveries after default, but to reduce the probability of default itself.

Enhancing Project Resilience Through Cash Flow Support

For infrastructure projects, a PCG often functions as a form of contingent liquidity reserve, strengthening debt-service coverage, and extending the time available for project cash flows to recover during periods of stress. This characteristic is particularly valuable for infrastructure assets exposed to demand fluctuations, utilisation risks, ramp-up periods, or economic cycles.

A well-structured guarantee can enhance project resilience by allowing temporary revenue shocks to be absorbed without disrupting debt servicing. In effect, the guarantee strengthens the project's ability to withstand adverse scenarios while maintaining investor confidence and preserving market access.

The Role of Tenor and Capital Structure

Infrastructure assets are uniquely suited to credit enhancement because of their long economic lives and predictable cash-flow generation. Debt structures featuring longer amortisation schedules typically require lower annual debt-service coverage, providing greater flexibility during periods of stress and allowing additional time for recovery of project cash flows.

Conversely, shorter-tenor or concentrated repayment structures may require larger levels of enhancement to achieve similar credit outcomes. In this regard, debt structure, amortisation profile, and guarantee sizing form an integrated framework that ultimately determines the achievable level of credit transformation.

1. The Starting Point: Strength of the Underlying Credit

The foundation of any PCE-backed instrument remains the standalone credit quality of the issuer. Unlike a full guarantee, where the guarantor effectively substitutes the credit risk of the borrower, a partial guarantee leaves investors exposed to a portion of the underlying issuer's risk. Consequently, the issuer's unsupported rating, business fundamentals, cash-flow stability, and debt-servicing capability remain key determinants of the final credit assessment.

2. The Guarantor Matters: Quality and Structure of the Guarantee

The value of a PCE structure is heavily influenced by the creditworthiness of the guarantor and the design of the guarantee itself. A strong guarantor can materially improve investor confidence, but the extent of benefit ultimately depends on how the guarantee is structured. Since ratings are based on the timely payment of principal and interest, the primary consideration is whether the guarantee can effectively prevent a payment default rather than merely improve recovery after a default has occurred.

3. Timely Support Over Recovery Value

Not all guarantees provide equal protection. Some are designed to reduce default probability, while others primarily mitigate losses after default. From a ratings perspective, the ability of the enhancement provider to promptly replenish or top up utilised guarantees and maintain uninterrupted debt servicing is significantly more important than potential post-default recoveries. The focus remains on preserving timely payment performance throughout the life of the instrument.

4. Bankruptcy Remoteness: Preserving Investor Protection

A critical feature of a robust PCE framework is the ability of the credit enhancement to remain effective even if the issuer enters insolvency proceedings. The guarantee structure must be sufficiently insulated from the issuer's bankruptcy risk to ensure continued servicing of obligations, at least up to the extent of the available enhancement. The stronger the bankruptcy remoteness of the structure, the greater the potential for meaningful rating uplift.

5. Cash Flow Profile and Debt Amortisation Can Improve Credit Efficiency

The nature of debt repayment obligations plays an important role in determining enhancement requirements. Infrastructure assets with longer amortisation schedules typically experience lower annual debt-servicing burdens, providing greater flexibility during periods of stress and allowing additional time for project cash flows to recover. Consequently, long-tenor infrastructure assets often require lower levels of enhancement to achieve a given level of credit improvement than assets characterised by concentrated repayment obligations.

6. Credit Enhancement Works Better with Strong Underlying Fundamentals

The effectiveness of PCE structures is ultimately linked to the standalone credit quality of the underlying issuer or project. As credit quality declines, default probability increases disproportionately, limiting the scope for meaningful rating uplift. Consequently, credit enhancement is generally more effective when applied to fundamentally viable projects that require incremental support to access a broader pool of investors, rather than projects facing significant business, operating, or structural challenges.

7. Sizing the Enhancement: How Much Support is Enough?

The amount of credit enhancement required to achieve a rating uplift is not uniform and depends on several variables, including:

- The standalone credit profile of issuer
- The credit quality of guarantor
- The predictability and resilience of underlying cash flows
- The speed with which utilised guarantees can be replenished
- The amortisation profile and maturity structure of the debt

Projects with stable and recurring cash flows, longer amortisation schedules, and replenishable guarantees typically require lower levels of enhancement to achieve a meaningful improvement in credit quality.

Operating History Matters

Projects with established operating track records generally offer greater predictability of cash flows than greenfield projects. Infrastructure assets that have successfully completed their ramp-up phase benefit from demonstrated demand, operational stability, and historical performance data. Conversely, projects exposed to demand ramp-up risks may continue to face uncertainty regarding traffic volumes, power dispatch, utilisation levels, or customer adoption, thereby limiting the extent of credit uplift achievable through enhancement structures.

Operational Resilience Influences Credit Outcomes

The long-term viability of infrastructure debt heavily depends on operational performance. Assets requiring highly specialised expertise, significant maintenance expenditure, or complex operating arrangements may remain exposed to execution risks, despite the presence of external credit support. The availability of alternative operators, operational flexibility, and maintenance quality therefore become important considerations in assessing the effectiveness of credit enhancement structures.

The Structure and Size of Enhancement Matter

The level of protection provided by a PCE structure is directly influenced by the quantum of enhancement available and its ability to absorb stress scenarios. The size of the guaranteed amount, the mechanism for replenishing utilised support, and the flexibility of the structure all influence the potential degree of rating uplift. Projects with stable and recurring cash flows are generally better positioned to restore utilised enhancement over time, thereby improving the durability of credit support.

A Dynamic Relationship Between Project Risk and Credit Support

Since a partial guarantee does not eliminate the underlying credit risk, the rating of an enhanced instrument remains influenced by the standalone credit profile of issuer. The ultimate effectiveness of a PCE structure therefore depends on a combination of factors, including project cash-flow resilience, enhancement size, guarantor strength, debt structure, and the ability of the project to withstand potential stress scenarios. In practice, successful credit enhancement is not merely about adding protection; it is about ensuring that the underlying project possesses sufficient economic strength to convert that protection into sustainable credit quality.

Partial Guarantee for a Project SPV – An Illustration

To determine the number of notches of a rating uplift that a transaction can gain from a PCG, Ind-Ra will test the resilience of the cash flow analysis to absorb stresses – commensurate to the proposed rating level. This is done by analysing the impact of variations in key parameters identified by the agency. While variables could differ across various infrastructure assets, they would revolve around revenue – both volume and price – and operating costs – both periodic and routine. Alternatively, a PCG can be viewed as improving debt service coverage (DSCR) ratio, thereby enhancing the transaction's credit quality. The following illustration will help elucidate this concept in the case of a project SPV:

Figure 22

Illustration on PCG Coverage Basis DSCR Threshold

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Revenue	100	105	110	116	122	128	134	141
Opex	20	21	22	23	24	26	27	28
EBITDA	**80**	**84**	**88**	**93**	**97**	**102**	**107**	**113**
Interest	38	36	33	30	25	20	15	8
Repayment	23	29	35	42	49	58	68	79
Debt servicing	**62**	**65**	**68**	**71**	**75**	**79**	**82**	**87**
DSCR	**1.30**	**1.30**	**1.30**	**1.30**	**1.30**	**1.30**	**1.30**	**1.30**
DSCR Threshold	**1.45**	**1.45**	**1.45**	**1.45**	**1.45**	**1.45**	**1.45**	**1.45**
PCG requirement	9.2	9.7	10.2	10.7	11.2	11.8	12.4	13.0
Total PCG	88	79	69	59	48	37	25	13
PCG %	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**
Per notch (%)	8	7	7	7	6	6	6	5
DSCR Threshold	**1.60**	**1.60**	**1.60**	**1.60**	**1.60**	**1.60**	**1.60**	**1.60**
PCG requirement	18.5	19.4	20.4	21.4	22.4	23.6	24.7	26.0
Total PCG	176	158	138	118	97	74	51	26
PCG %	**46**	**44**	**42**	**40**	**38**	**36**	**35**	**33**
Per notch (%)	15	15	14	13	13	12	12	11

Source: Ind-Ra

Ind Ra would evaluate Unsupported Rating without factoring in the PCG at a particular DSCR (1.30 in the example provided above). Ind-Ra would evaluate the improvement in DSCR on account the partial credit guarantee available and the potential uplift in the rating factoring the PCG. The rating notch-up would also depend upon the unsupported credit quality of the underlying asset, nature of cash flows, cyclicality of revenues, extent of stress absorbing capacity of the project.

In the illustration, by virtue of enhancing the DSCR from 1.3x in the base case (project rated in the 'IND A category) to the 1.45x-1.6x range, a PCG can enable the transaction to be rated potentially in the 'IND AA' category. The credit enhancement by a partial guarantee allows the project to withstand more severe stress scenarios and still meet debt service obligations in a timely manner is the key driver for a rating upgrade.

Not All Projects Benefit Equally

While PCGs can significantly improve financing outcomes, their effectiveness varies depending on project-specific characteristics. Certain qualitative factors can constrain the extent of rating uplift regardless of the amount of credit enhancement available.

Projects with significant off-taker concentration risk, uncertain demand profiles, prolonged ramp-up periods, or elevated operational complexity may continue to face credit constraints, despite external support. Similarly, projects dependent on weak counterparties or subject to material regulatory uncertainty may experience limited benefit from credit enhancement structures.

The nature of cash flows is also important. Assets generating stable and recurring revenues generally require lower levels of enhancement than those characterised by revenue volatility or significant dependence on demand growth.

Credit Enhancement Cannot Substitute Weak Fundamentals

While PCE can strengthen credit profiles and improve market access, it cannot completely offset weak underlying fundamentals. Instruments rated in the non-investment-grade category are unlikely to derive significant benefit from partial guarantees because broader business, financial, and execution risks may continue to constrain their ability to avoid payment default. Consequently, PCE is better effective when applied to fundamentally sound issuers seeking to bridge the final gap to investment-grade investor expectations.

Partial Credit Enhancement Is Not a Substitute for Fundamental Project Risks

While PCE can improve a project's credit profile and broaden investor participation, its effectiveness ultimately depends on the underlying characteristics of the project. The degree of credit uplift is often influenced not only by quantitative credit metrics but also by qualitative factors that shape the stability, predictability, and resilience of project cash flows. Consequently, the benefits of credit enhancement can vary materially across projects and sectors.

Off-taker Strength Remains a Critical Determinant

For many infrastructure projects, particularly in sectors such as power, transportation, and utilities, the quality of the off-taker remains a key driver of creditworthiness. Where revenues are concentrated with a single counterparty or linked to a limited number of contractual arrangements, the project's risk profile can remain closely tied to the financial strength of the off-taker. In such cases, credit enhancement can mitigate certain risks, but it may not fully offset weaknesses arising from counterparty concentration or uncertain revenue realisation.

Collateralised Loan Obligations (CLOs)

Unlocking the Next Frontier of Bond Market Deepening

As India's financial system evolves, the challenge is no longer only originating credit but also efficiently recycling and redistributing it. Banks continue to dominate India's credit ecosystem and remain the primary financiers of infrastructure, corporate credit, and NBFCs. However, with deposit growth increasingly lagging credit growth at various points in the cycle, and competition for household financial savings intensifying, banks face periodic pressures on funding, liquidity, and asset-liability management (ALM). In such an environment, capital recycling vehicles such as CLOs could emerge as an important tool for expanding lending capacity while strengthening the bond market.

From Bank Balance Sheets to Capital Markets

Globally, the CLO market has evolved into one of the largest structured credit asset classes, helping banks and lenders transfer diversified pools of loans to capital market investors. By packaging performing loan portfolios into rated securities with varying risk-return profiles, CLOs create an efficient mechanism for connecting bank-originated credit with long-term institutional capital. The model has helped deepen bond markets, improve capital efficiency, and expand financing capacity without requiring banks to continually support growing loan books entirely on their own balance sheets.

Addressing ALM Challenges in a Changing Deposit Landscape

The growing shift of household savings towards mutual funds, insurance products, pension schemes, equities, and other market-linked instruments is changing the dynamics of deposit mobilisation. While deposits remain a stable funding source, maintaining high credit growth through traditional balance-sheet expansion alone may become increasingly challenging.

In this backdrop, CLO structures can provide banks with an additional avenue to manage balance-sheet concentration, improve capital efficiency, and release funding capacity for fresh lending. Rather than holding every loan until maturity, banks can recycle seasoned loan portfolios into investable securities, broadening the investor base while creating additional lending capacity for sectors requiring long-duration financing.

India’s Concentration Challenge

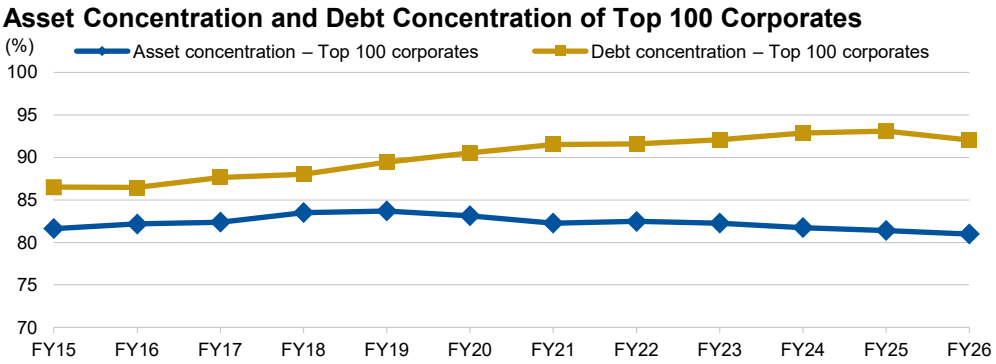
A distinctive characteristic of India's debt market is the concentration of credit exposures among a small number of large corporate groups, infrastructure platforms, financial institutions, and public-sector entities. While these borrowers often possess strong credit quality, concentration risks remain elevated compared with more mature debt markets.

The success of any Indian CLO market would therefore depend heavily on diversification across:

- Borrowers and obligors
- Sectors and industries
- Geographic regions
- Asset types
- Credit profiles

Global experience has consistently demonstrated that portfolio quality, obligor diversity, industry diversification, and recovery prospects are among the critical determinants of CLO performance. Excessive concentration can materially increase default-rate volatility and reduce portfolio resilience during periods of stress.

Figure 23



Note: Concentration = Total debt (or Asset) of top 100 corporates/Total debt (or Asset) of top 1,000 corporates
Source: Ace Equity, Ind-Ra

Infrastructure CLOs: An Idea Worth Exploring

While traditional CLO markets globally have focused primarily on corporate and leveraged loans, India presents a unique opportunity to explore Infrastructure CLOs. Over the past decade, India has accumulated a sizeable stock of operational infrastructure assets across renewable energy, transmission, roads, rail-linked logistics, warehousing, urban utilities, and digital infrastructure.

Many of these assets generate predictable cash flows, possess long operating histories, and benefit from contractual revenue frameworks. Aggregating diversified pools of such infrastructure loans could create a new investable asset class for institutional investors while simultaneously freeing up banking system capacity to finance the next generation of infrastructure development.

Creating a New Asset Class for Long-Term Investors

India's rapidly expanding pools of institutional capital, including insurance companies, pension funds, EPFO, NPS, debt mutual funds, and infrastructure-focused investors, increasingly require long-duration fixed-income assets. Well-structured CLOs backed by diversified pools of infrastructure or corporate loans could provide an additional investment avenue with varying levels of risk and return.

Such structures could also support:

- Better capital allocation
- Enhanced balance-sheet flexibility for banks
- Improved liquidity in underlying credit markets
- Greater participation of institutional investors
- Expansion of market-based infrastructure financing

Infrastructure Assets Are Naturally Suited for Securitisation

The evolution of India's infrastructure ecosystem over the past two decades has resulted in a growing universe of operational assets that exhibit many characteristics typically favoured by structured finance investors:

- Long-term contractual cash flows
- High-quality counterparties
- Predictable revenue streams
- Low operating volatility
- Strong security packages
- Established performance history

Catalysing the Next Stage of Bond Market Development

India's bond market has traditionally been dominated by sovereign securities and highly rated corporate issuers. The development of CLOs could represent the next phase of market evolution by creating a mechanism through which existing loan assets are transformed into tradable capital market instruments.

As India advances towards its **Viksit Bharat** ambitions, financing requirements across infrastructure, manufacturing, logistics, urban development, and energy transition will continue to increase. CLOs cannot replace traditional bond issuance, but they can complement it by enhancing the efficiency of capital deployment within the financial system.

In many ways, CLOs represent the broader aspiration of this paper: moving from a banking-system-centric financing model towards a more diversified ecosystem where banks originate credit, capital markets distribute risk, and long-term investors provide the funding necessary to sustain India's next phase of economic growth.

Road Infrastructure Investment Trusts (InvITs)

The Growth Engine for India's Infrastructure Monetisation

InvITs: Transforming Infrastructure Assets into Market Capital

Infrastructure Investment Trusts (InvITs) have emerged as a notable innovation in India's infrastructure financing ecosystem, serving as a powerful bridge between long-term infrastructure assets and capital market investors. By converting operational infrastructure assets into yield-generating investment vehicles, InvITs are helping unlock capital, improve balance-sheet efficiency, and deepen India's bond and capital markets.

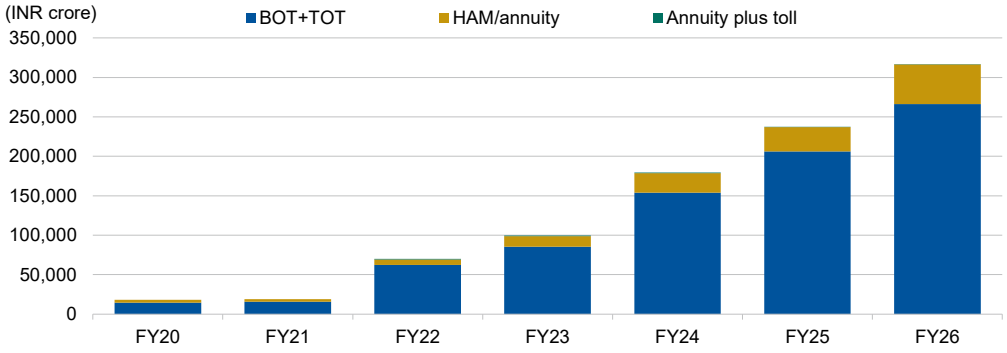
From Asset Creation to Capital Recycling

Traditionally, infrastructure developers and government agencies were required to hold completed assets on their balance sheets for extended periods, limiting their ability to reinvest in new projects. InvITs have fundamentally altered this dynamic by creating a transparent and regulated platform for monetising mature infrastructure assets while attracting long-term domestic and international capital.

The success of this model is evident in the road sector, which has emerged as one of the largest and fastest-growing segments within India's InvIT ecosystem. As of March 2026, road InvIT assets under management (AUM) reached INR 3,168 billion, reflecting strong investor demand for stable, infrastructure-backed cash flows and providing an efficient capital recycling mechanism for asset owners.

Figure 24

Cumulative Assets under Management Grows ~4.5x Since FY22



Source: Ind-Ra, Public sources

A Strong Regulatory Foundation Driving Investor Confidence

A key enabler of InvIT growth has been the robust regulatory framework established by SEBI. The regulations require:

- Minimum 80% investment in operational and revenue-generating assets
- Distribution of at least 90% of distributable cash flows
- Strong governance and disclosure standards
- Prudent leverage management
- Enhanced transparency and investor protection

These safeguards have transformed InvITs into a credible infrastructure asset class capable of attracting pension funds, insurance companies, sovereign investors, family offices, and retail investors seeking long-duration yield products.

More importantly, InvITs have institutionalised capital recycling, allowing sponsors to monetise mature infrastructure assets and redeploy capital into new projects. This creates a self-reinforcing cycle of infrastructure creation, monetisation, and reinvestment that supports India's long-term development objectives.

InvITs Are Creating a New Fixed-Income Asset Class

InvITs have attracted a diverse mix of domestic and foreign investors, reflecting growing confidence in India's infrastructure asset class from a bond market perspective, InvITs represent more than an equity-like infrastructure product. They provide investors with access to infrastructure cash flows that closely resemble long-duration fixed-income instruments.

Domestic participation is led by insurance companies, pension funds, EPFO-related investors, mutual funds, banks, family offices, and retail investors seeking stable long-term yields. On the other hand, global pension funds, sovereign wealth funds, infrastructure funds, and long-term institutional investors have emerged as significant investors, attracted by predictable cash flows, robust regulatory oversight, and India's infrastructure growth story.

This diversified investor base has strengthened capital availability, improved market depth, and established InvITs as an important conduit for channeling both domestic savings and global capital into infrastructure development.

RBI’s Lending Framework Strengthens the Ecosystem

The RBI's 2026 amendments to the lending framework for SEBI-regulated InvITs represent another important milestone in the institutionalisation of the asset class.

The revised framework aligns debt repayment schedules with underlying project cash flows and caps aggregate banking-system exposure at 49% of InvIT asset value, including exposures through SPVs and holding companies.

While borrowings beyond this threshold will increasingly require access to debt capital markets through instruments such as non-convertible debentures (NCDs), this development is likely to further strengthen the linkage between InvITs and India's bond market.

Well-established InvITs, backed by high-quality assets and strong sponsors, are expected to access capital markets with increasing frequency, creating additional opportunities for bond investors and accelerating market development.

Overall Road InvIT AUM to Reach INR6,000 billion by FY30

India's infrastructure monetisation programme continues to provide a substantial growth runway for the sector.

Under the National Monetisation Programme 2.0, NHAI has identified 17 assets spanning 1,692 km for potential monetisation through either the Toll-Operate-Transfer (TOT) route or InvIT platforms during FY27.

As more operational assets enter the monetisation pipeline, overall road InvIT AUM is expected to nearly double to around INR 6,000 billion by FY30, while Hybrid Annuity Model (HAM) assets within InvIT structures could potentially reach INR 1,000 billion.

NHAI Is Creating India's Infrastructure Yield Market

Among all sponsors, the National Highways Authority of India (NHAI) has emerged as significant catalyst for InvIT growth. The agency expects the overall road InvIT to reach around INR6,000 billion AUM aided by NHAI’s periodic monetisation under National Monetisation Program 2.0, and the share of HAM assets within InvITs potentially reaching INR1,000 billion, both by FY30, as more assets become operational.

These vehicles have demonstrated how mature infrastructure assets can be transformed into investment-grade capital market products while generating resources for new infrastructure creation. Their success has also established benchmark structures, governance standards, and investor confidence for future InvIT issuances.

The Future: InvITs as a Pillar of India's Bond Market Ecosystem

The significance of InvITs extends well beyond infrastructure monetisation. They are helping create a new ecosystem where completed infrastructure assets can continuously recycle capital back into development while providing long-term investors with access to stable cash-flow-generating assets.

For a country pursuing the ambitious goals of Viksit Bharat, this model is particularly powerful. As infrastructure investment requirements accelerate across roads, railways, logistics, renewable energy, transmission networks, urban infrastructure, and digital assets, InvITs can serve as a critical mechanism for mobilising patient capital without overburdening bank balance sheets.

In many ways, InvITs represent the evolution of India's financing architecture, moving from a build-and-hold model to a build-monetise-reinvest model, while simultaneously broadening investor participation and deepening the country's bond market ecosystem.

Recovery Ratings: EL Scale

When Corporate Distress Does Not Mean Project Distress

Infrastructure Assets Are Fundamentally Different

Unlike conventional corporate assets, infrastructure projects derive value not only from their balance sheets, but also the underlying economic rights. Long-term concession agreements, power purchase agreements (PPAs), licences, transmission rights, tolling arrangements, annuity structures, regulatory approvals, and contracted cash flows often retain economic value even when the sponsoring entity encounters financial distress.

As a result, sponsor distress does not necessarily imply project failure. A power plant with an operational asset and a long-term PPA, a toll road with established traffic flows, or a transmission network with regulated returns can continue generating predictable cash flows, despite challenges at the corporate level. The distinction between corporate value and project value is therefore far more pronounced in infrastructure than in most other sectors.

- Infrastructure insolvency can be structurally different from conventional corporate insolvency: Value can reside in the underlying project, concession, PPA, licence, operating rights and cash flows, rather than solely in the corporate balance sheet.
- Infrastructure is not a homogeneous high-recovery asset class: IBBI's sectoral analysis shows significant variation in recovery outcomes, with electricity, gas and water supply historically among the weaker recovery segments.
- Project viability can survive sponsor distress: Operational power, roads and other infrastructure projects can continue generating economic value despite the financial distress of the sponsor entity..
- Resolution can preserve substantially more value than liquidation: Cases closing in resolution plan can yield more than liquidation as per the IBBI data for insolvency cases.
- Strategic investors can alter the recovery equation: A sector participant may value a distressed project based on its future cash flows and strategic synergies rather than its liquidation value.
- Timely resolution is critical: Prolonged CIRP can impair project value through operational deterioration, deferred maintenance, contractual disputes, and regulatory uncertainty.

Infrastructure Insolvency Is Fundamentally About Preserving Project Value:

The Insolvency and Bankruptcy Code (IBC) has transformed the resolution of stressed assets in India. However, infrastructure insolvency can differ materially from conventional corporate insolvency because the economic value of the underlying project may survive the financial failure of its sponsor.

In a conventional corporate insolvency, recovery is generally linked to the viability of standalone business, its assets, receivables, and customer relationships. In infrastructure, value can extend beyond the corporate entity to long-term PPAs, concession agreements, operating licences, regulatory approvals, toll or annuity streams, and project cash flows. Therefore, insolvency of the project company does not necessarily imply project failure.

Infrastructure Is Not a Homogeneous Recovery Category

The Insolvency and Bankruptcy Code (IBC) has demonstrated that financial distress at the corporate level does not necessarily imply impairment of the underlying infrastructure asset. Since the inception of the Code until 31 March 2026, 8,987 CIRPs were admitted, of which 1,419 resulted in approved resolution plans. Creditors realised approximately INR4.32 trillion against admitted claims of INR14.14 trillion, representing a recovery of 30.56% of admitted claims. Significantly, these recoveries equated to 166.85% of liquidation value, reinforcing the principle that a viable enterprise can be worth substantially more as a going concern than under liquidation.

Strong Infrastructure Assets Can Retain Significant Value

Infrastructure assets are unique because project value can often survive even when the sponsoring entity faces financial stress. Operational projects supported by long-term contractual arrangements, visible cash flows, established operating histories, and strategic importance frequently continue to attract investor interest during insolvency proceedings. Recent transactions involving distressed power assets illustrate this resilience:

- An 1,800 MW operating power project was acquired for approximately INR160.8 billion.
- A 600 MW operational power asset, along with expansion potential exceeding 1,300 MW, attracted a valuation of around INR41 billion.
- A 1,200 MW operating project changed hands for approximately INR25 billion.
- A 600 MW operating project was acquired for approximately INR11 billion.
- Another 600 MW asset attracted a valuation of nearly INR18 billion.

These examples highlight that infrastructure projects possessing long-term cash flow visibility, proven operational performance, strong contractual frameworks such as PPAs, and strategic relevance can continue to command substantial valuations despite financial distress at the corporate level.

Recovery Outcomes Vary Significantly Across Infrastructure Assets

However, it would be incorrect to conclude that all infrastructure projects enjoy strong recovery prospects. Recovery outcomes can vary substantially depending on asset quality, operational status, counterparty strength, regulatory certainty, project economics, and the extent of value erosion prior to and during the resolution process.

Another set of insolvency cases show that some infrastructure assets have realised only a small fraction of admitted claims, with recoveries ranging from approximately INR60 crore to INR143 crore against claims running into several hundred or even thousand crores. In an extreme instance, liquidation proceeds amounted to only INR0.6 crore against admitted claims of INR2,622 crore.

These outcomes illustrate that the infrastructure label by itself does not determine recovery prospects. Asset quality, operating status, contractual protections, cash-flow visibility, and preservation of project viability through the resolution process remain the key drivers of recovery outcomes.

It would be inappropriate to conclude that infrastructure companies inherently generate higher recoveries. IBBI's sectoral analysis highlights substantial variation across industries, with electricity, gas, and water supply historically among the weaker recovery segments.

Therefore, the relevant determinants of recovery are not simply the asset intensity of the business, but:

- **Operating status and viability of the project;**
- **Strength of contractual and concession rights;**
- **Visibility and durability of cash flows;**
- **Credit quality of the offtaker/counterparty;**
- **Remaining concession or project life;**
- **Incremental capex requirements; and**
- **Investor appetite and strategic value.**

The Critical Risk: Delay Long Term

The infrastructure recovery proposition, however, highly depends on preservation of project value during CIRP. Unlike some conventional corporate assets, infrastructure projects can deteriorate through deferred maintenance, declining operational performance, contractual disputes, regulatory uncertainty, loss of licences or concessions, and weakening cash flows. Consequently, delays in resolution can directly reduce the value ultimately available to creditors.

Recovery Matters as Much as Default

Global infrastructure investors increasingly recognise that recovery outcomes are a critical component of credit risk assessment. Two projects may exhibit similar default probabilities, yet produce materially different outcomes for creditors depending on the value that can be recovered through restructuring, refinancing, asset transfer, or resolution.

The key takeaway is that infrastructure is not a homogeneous recovery category. While high-quality infrastructure assets with durable cash flows can preserve value and command substantial valuations even during financial stress, weaker assets can suffer severe erosion in value. Therefore, recovery outcomes are driven less by the infrastructure label itself and more by the underlying project's economic viability, cash flow resilience, contractual protections, and operational performance.

This divergence in outcomes underscores why recovery analysis and expected-loss frameworks are particularly relevant for infrastructure finance: project distress and corporate distress are not always the same thing, and project value can remain remarkably resilient even when the sponsor does not.

Infrastructure assets are suited to recovery-based analysis because they often possess long economic lives, tangible operating assets, and contractual revenue streams that can survive ownership changes. Strategic investors may also attach value to these assets that far exceed their liquidation value by leveraging operating expertise, portfolio synergies, and existing market presence. In such situations, project value can be preserved and transferred even when the original sponsor is unable to continue.

This characteristic differentiates infrastructure exposure from many traditional corporate exposures, where enterprise value may deteriorate rapidly after financial distress.

Project Can Survive Even When Sponsor Does Not

This distinction is particularly relevant in power and roads. A power project may retain an operating generation asset, long-term PPA, tariff framework, transmission connectivity, and regulatory approvals. Its value to a resolution applicant is therefore linked to its ability to generate cash flows, rather than merely the liquidation value of the plant and machinery.

Similarly, an operational road project may derive value from its concession, toll or annuity cash flows, traffic potential, substitution provisions and termination rights. In both cases, the resolution applicant can potentially acquire a viable project embedded within a distressed corporate structure.

Liquidation generally remains less conducive to value preservation across stressed assets. However, this concern can be particularly acute for infrastructure projects, where project-specific concessions, operating rights, and contracted cash flows may lose significant value if the project is disrupted or the resolution process is prolonged.

From Probability of Default to Expected Loss

For long-term investors such as insurance companies, pension funds, sovereign wealth funds, and infrastructure debt funds, assessing risk requires looking beyond default probability alone. Infrastructure projects often possess characteristics that distinguish them from conventional corporate exposures, with value embedded in not only sponsoring entity but also economic rights, contractual frameworks, and long-term cash-generating capability of the asset. Consequently, project viability and recovery potential can be as important as default risk itself.

This is where Expected Loss (EL) and Recovery Ratings assume significance. By combining default probability with likely recovery in stress scenarios, they provide a more comprehensive assessment of investment risk than traditional credit ratings alone. Such frameworks enable investors to differentiate between projects with similar credit profiles but materially different recovery prospects, reflecting factors such as operating asset quality, contractual protections, concession rights, counterparty strength, and cash-flow visibility.

The importance of this distinction is particularly evident in infrastructure projects, where financially stressed assets can often retain substantial going-concern value. Effective resolution, whether through restructuring, settlement, sponsor substitution, or the IBC process, can preserve economic value and facilitate the transfer of viable assets to investors capable of unlocking their long-term potential. For investors, a clearer understanding of recovery outcomes enhances transparency, improves risk-based pricing, and provides greater confidence in allocating capital to long-duration infrastructure assets. As a result, Recovery Ratings can serve as a valuable tool in broadening institutional participation and supporting the development of a deeper and more efficient debt market infrastructure.

Unique Applicability of EL scale for Infrastructure Projects

Infrastructure assets, especially in India, undergo a significant bias in terms of cost of debt funds due to treatment by investors and lenders/market that charges a significant premium to infrastructure debt instrument in the same risk bucket as compared to an asset from an alternate class. Also, the non-availability of investment appetite for longer term instruments adds a significant premium to the cost of debt.

In order to off-set this bias the EL scale is expected to supplement the conventional ratings by indicating to the investing community, the maximum expected loss or a maximum hair cut the lenders or investors would have to undergo, should a default continue to occur. This additional information, the agency believes, is significant information that would reduce the perceived market bias towards the infrastructure debt instrument. The agency also believes that the EL scale rating will help normalize the risk premium existing between the pricing of infra debt instruments and the non-infra debt papers.

Quite often, the economic life of the asset far exceeds the tenor of debt incurred by the project. Even though the project life cycle is longer, the relatively shorter tenor of the debt lays stress on the project cashflows that does not even allow the project to ramp-up, which is a critical stage in the project's operational life cycle. A project may default because its debt obligations are too high relative to its cash flows. When assessing EL Scale, the agency opines that it is critical to evaluate whether the default is likely to be permanent or whether it stems from an unsustainable debt structure. If the project has strong underlying cash flows but an overly aggressive repayment schedule, the agency may assess its viability under a more appropriate debt structure, including potential refinancing, to determine whether the project remains fundamentally debt serviceable.

Enhancing Transparency and Broadening Market Participation

Globally, recovery-based assessment frameworks have gained acceptance in project finance, infrastructure lending, and structured finance markets because they improve risk transparency and facilitate more efficient pricing of debt instruments. Investors are increasingly seeking greater visibility into downside protection, especially for long-tenor assets where recovery potential can significantly influence investment outcomes.

For India's bond market, Recovery Ratings could play an important role in bridging the gap between project risk and investor appetite. By offering a clearer assessment of potential creditor outcomes, they can support better risk-based pricing, reduce information asymmetry, and expand participation from long-term institutional investors.

This is particularly relevant for insurance companies, which seek long-duration assets with predictable cash flows and capital preservation characteristics. A recovery-oriented framework can provide additional comfort regarding downside scenarios, enabling insurers and other fiduciary investors to allocate capital more confidently to infrastructure debt.

A Catalyst for Infrastructure Bond Market Development

As India's infrastructure financing requirements expand across transportation, energy transition, digital infrastructure, urban development, and logistics, attracting large pools of institutional capital will become increasingly important. Achieving this objective requires more than just project creation; it requires financing frameworks that improve transparency, strengthen investor confidence, and facilitate efficient risk transfer.

Recovery Ratings and Expected Loss-based assessments have the potential to become an important building block in this evolution. By shifting the focus from default risk alone to the broader economics of value preservation and recovery, they can create a more informed and efficient market for infrastructure debt.

Ultimately, infrastructure projects should not be evaluated solely through the lens of potential distress, but through their ability to preserve and transfer economic value over long periods. A robust recovery assessment framework can therefore enhance investor confidence, improve capital allocation, and support the development of a deeper and more resilient bond market, strengthening India's ability to finance its long-term economic ambitions.

Key Imperatives for Market Development

The broader message is clear: project distress does not necessarily imply asset impairment. Regulatory reforms, improved fuel linkages, stronger PPAs, enhanced dispute-resolution mechanisms, and a more mature infrastructure ecosystem have materially improved asset predictability and recovery prospects. As infrastructure assets increasingly exhibit stable cash flows and demonstrable recovery value, the case for incorporating recovery-based assessment frameworks becomes stronger. This evolution can help investors better differentiate between default risk and recovery potential, ultimately supporting more efficient pricing of infrastructure debt and fostering a deeper, more sophisticated bond market.

This approach can enhance investor confidence, improve risk-based pricing, and help attract long-term institutional capital for infrastructure and project finance.

The Roadmap Towards Recovery-Centric Credit Assessment

- Robust Data Infrastructure & Depository
- Regulatory Convergence
- Standardized Methodologies & Enhanced Disclosure
- Greater Investor Education & Market Participation
- Supportive Market & Regulatory Incentives

Unlocking Public Capital: State-Led Asset Monetisation

Investor Appetite is Highly Dependent on Revenue Visibility, Policy Stability, and Enforceability of Contractual Rights

States at the Frontline of Infrastructure Creation

Infrastructure, both social and economic, is considered a public good and more so in a developing economy. In the initial phase of development, government assumes a bigger role in provision of social infrastructure – education (schools, colleges etc.), health (primary and secondary health care), water supply, urban development etc. – and economic infrastructure – energy and transport. The government has a continued obligation to provide quality infrastructure to improve quality of life of its citizens through social infrastructure, while also supporting sustained economic growth through economic infrastructure. The Constitution of India has laid out the roles and responsibilities of provision of social and economic infrastructure between union and state government. In India, while the union government assumes a bigger role in capex for the provision of non-development activities (primarily general services), states play a bigger role in capex for development activities in the areas of social and economic services.

Fiscal Pressures and the Search for New Capital Sources

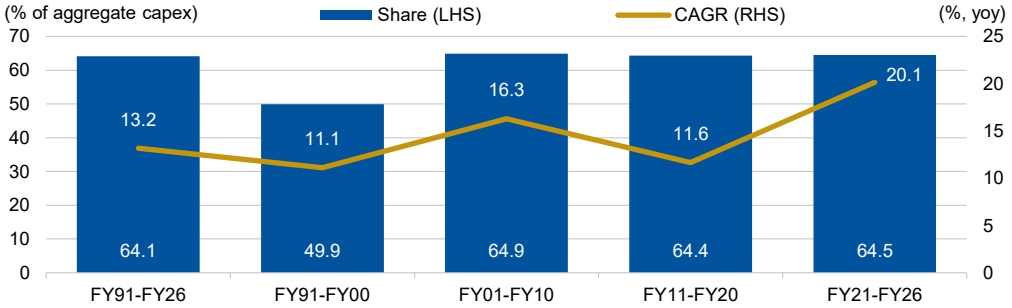
India public finances, both union and states, are under stress due to higher committed expenditure – salary, pension and interest payments. Financing of persistent fiscal deficit through borrowing has increased aggregate debt/GSDP for Indian states to 29.2% in FY26 (budget estimate, BE) from 26.6% in FY08. The provision of infrastructure both social and economic requires huge investment by states. The Niti Aayog has prepared a national monetisation pipeline of INR10,821.09 billion for FY26-FY30 (another INR5,901.92 billion beyond FY30), with majority of monetisation planned through highways (INR4,420.00 billion out of total monetisation pipeline of INR16,723 billion), power (INR2,765.00 billion), ports (INR2,637.00 billion), railways (INR2,623.00 billion), coal (INR2,160.00 billion), and mines (INR1,000.00 billion). Out of this monetisation plan, only INR384.18 billion (3.55% of monetisation pipeline during FY26-FY30) in highways (INR9.35 billion), coal (INR211.92 billion) and mines (INR162.91 billion) have been targeted to be achieved in states. States predominantly incur capex in developmental activities, and this is the primary reason for the minor proportion of states in monetisation plans.

State Capex: Concentrated in Development-Oriented Sectors

Six sectors that dominate in the state capex are: i) water supply and sanitation, ii) urban development, iii) rural development, iv) irrigation and flood control, v) energy, and vi) transport (includes roads and bridges). In aggregate, proportion of capex of these six sectors in aggregate capex during FY91-FY26 (BE) was 64.12% and grew at a CAGR of 13.19%. However, growth during FY21-FY26 (BE) was 20.14%. The capex on energy and transport sectors during FY91-FY26 (BE) grew at a CAGR of 12.49% and 15.92%, respectively, however, growth during FY21-FY26 (BE) was 22.23% and 14.72%, respectively. Energy sector capex in this decade has been higher than the states' aggregate capex growth (20.14%).

Figure 25

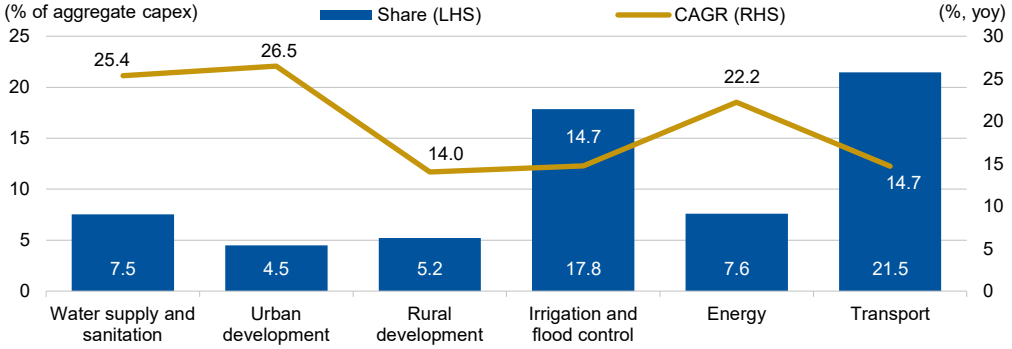
Share and Growth of Six Sectors in States' Aggregate Capex



Note: Six sectors are Water Supply and Sanitation, Urban Development, Rural Development, Irrigation and Flood Control, Energy and Transportation
Source: RBI, Ind-Ra

Figure 26

Share and Growth of Six Sectors in States' Aggregate Capex FY21-FY26BE



Source: RBI, Ind-Ra

While the estimated monetisation from the power sector is INR2,765 billion (16.53% of total monetisation prospect of INR16,723 billion), the contribution from states is expected to be nil. Issues such as subsidies, financial health of state discoms etc. could be the plausible reason for this, despite the state sector's contribution to all India's installed capacity being 24.4% at FYE26.

Not All Public Assets Are Monetisable

Asset monetisation in sectors such as water supply, urban development, rural development, and irrigation and flood control could be difficult due to the services offered by them falling under the social/public goods category and user charges being less than the economic cost incurred by the government in providing them. Energy and transport/roads could be two services which could act as a source of asset monetisation for the states.

Road Monetisation: An Underutilised State Opportunity

So far, state-level monetisation of operational road assets has been limited compared with NHAI's assets monetisation programme. A prominent example of toll asset monetisation is the Mumbai-Pune Expressway by Maharashtra State Road Development Corporation (MSRDC). MSRDC awarded the tolling, operation, and maintenance rights for the Mumbai-Pune Expressway and the old Mumbai-Pune corridor (NH-48) to IRB Infrastructure Developers in February 2020 under a toll-operate-transfer concession agreement up till April 2030 for a total concession consideration of INR82.62 billion with an upfront consideration amount of INR65 billion and the balance payable in deferred installments over three years.

Beyond Roads: Unlocking Value from Urban Transport Assets

In the transport sector, bus stands owned by state road transport corporations offer asset monetisation opportunities. Using PPP frameworks, advertising rights, and other methods could generate non-fare revenue for states, allowing them to finance budgets or increase capex in other priority sectors without affecting the accessibility or quality of public transport services.

Ports: A Successful Blueprint for Asset Monetisation

States have monetised port assets through concession-based long-term PPP arrangements rather than outright privatisation for development and operation of state-port infrastructure. Gujarat has developed ports such as Mundra, Pipavav, Dahej, Hazira, and Dholera through BOT/PPP concessions, where private operators invest, operate, and collect revenues while the state government retains land ownership of land, waterfront, and other port assets.

Andhra Pradesh has monetised its port assets - Krishnapatnam, Gangavaram, and Kakinada ports, through long-term concession agreements under PPP structures. Under the concession agreement, the concessionaire was granted the right to develop, operate, and manage the port while sharing revenues with the state government (Andhra Pradesh Maritime Board) before ultimately transferring the assets back to the government/maritime board. It is likely that states which have the advantage of a long coastline would first invest in developing the common port infrastructure and monetise operating rights through a long-term concession.

Capital Recycling: The Next Frontier for States

States with long coastlines, established transportation corridors, and mature infrastructure assets are likely to be the best positioned to unlock value through concession-based monetisation frameworks. By recycling capital from operational assets into new infrastructure creation, states can supplement traditional borrowing, improve fiscal flexibility, and accelerate infrastructure development without materially increasing debt burdens.

In the context of India's rapidly expanding infrastructure requirements, state-level asset monetisation can emerge as a powerful mechanism for unlocking capital, strengthening public finances, and supporting the broader development of market-based financing channels.

AI Infrastructure Financing

A Blueprint for India's Next Capital Market Opportunity

Digital Infrastructure and AI: The Next Frontier of Capital Formation

Digital infrastructure is rapidly emerging as one of the critical strategic components of India's infrastructure landscape and is expected to account for an increasing share of investments over the coming decade. Unlike traditional infrastructure, which is centred on physical connectivity, digital infrastructure encompasses data centres, fibre networks, cloud platforms, AI compute capacity, edge computing facilities, subsea cable connectivity, and the power systems required to support them. As economies become increasingly data-driven, digital infrastructure is evolving from a technology enabler into a foundational pillar of economic competitiveness.

India's digital economy is entering a phase of exponential expansion, driven by rising digital consumption, cloud adoption, fintech innovation, e-commerce, enterprise digitisation, and the growing application of AI across industries. This transformation is creating unprecedented demand for data storage, processing, transmission, and computing capacity. Consequently, hyperscale data centre operators, telecom providers, cloud service companies, infrastructure funds, and global technology firms are expected to commit substantial capital towards expanding India's digital backbone.

Data Centres: The New Infrastructure Asset Class

At the centre of this investment cycle are data centres, which are increasingly assuming the characteristics of traditional infrastructure assets. As enterprises migrate workloads to the cloud and deploy AI-driven applications, demand for computing power and data storage is accelerating at an unprecedented pace. Despite being one of the world's largest digital markets, India remains underpenetrated in terms of data centre capacity relative to developed economies, creating a multi-year investment opportunity across both primary and emerging digital hubs.

The next phase of growth is expected to extend beyond established markets such as Mumbai, Chennai, Hyderabad, and the National Capital Region, with secondary cities increasingly emerging as viable destinations for digital infrastructure investment. However, data centres do not operate in isolation. Their expansion necessitates concurrent investments in power availability, fibre connectivity, cooling systems, and network resiliency, reinforcing the interconnected nature of modern infrastructure development.

AI Infrastructure: When Technology Becomes Infrastructure

The rise of AI has fundamentally altered the economics of digital infrastructure. While AI is often viewed as a software revolution, its widespread adoption is critically dependent on large-scale investments in physical infrastructure. High-performance computing clusters, GPUs, advanced networking systems, specialised cooling technologies, and reliable power infrastructure have emerged as indispensable components of the AI ecosystem.

As a result, AI is increasingly becoming one of the largest infrastructure investment themes globally. India Ratings and Research (Ind-Ra) estimates that nearly USD584 billion has been raised globally through bonds, loans, private placements, and structured financing instruments during 2025-2026 YTD to fund AI-related infrastructure. The scale of this investment underscores a profound shift in capital allocation patterns. The future of AI is being shaped by software innovation, and the availability of computing infrastructure that can support rapidly growing workloads.

Tech Giants Are Rewriting the Financing Playbook

Perhaps the significant development emerging from the global AI investment cycle is the growing reliance of technology companies on long-term debt markets. Historically, large technology firms were characterised by asset-light business models, strong cash generation, and limited dependence on external borrowing. The AI era is changing that paradigm.

Global hyperscalers such as Alphabet, Meta, Microsoft, and Amazon are increasingly financing digital infrastructure through long-duration debt instruments, despite their substantial internal cash-generation capabilities. Nearly two-thirds of global AI infrastructure funding has been raised by investment-grade issuers, highlighting how access to capital is becoming as important as technological capability itself.

More notably, these companies have successfully issued debt across ultra-long maturities, including 30-year, 40-year, and even 50-year bonds. Such tenors have traditionally been associated with utilities, transportation networks, and other long-lived infrastructure assets, rather than technology companies. This shift reflects a growing recognition that AI infrastructure possesses characteristics similar to traditional infrastructure: high upfront capital expenditure, long asset lives, and predictable long-term demand.

Figure 27

Global AI-Infra Fund Raise (CY25-CY26-ytd)

(USD billion)

Instrument Type	Instrument Tenure (years)					
	0-5	5-10	10-19	20-30	30-50	Total
IG - Bonds	84.2	128.5	56.8	69.0	50.6	389.0
HY - Bonds	41.1	13.8	2.4	-	-	57.3
ABS + CMBS	-	-	-	8.7	2.9	11.6
Private Placement	6.0	23.2	-	39.8	-	69.0
Loans (syndicated)	43.9	12.4	-	-	-	56.2
MUNI	-	1.2	-	-	-	1.2
Total	175.1	179.0	59.2	117.6	53.5	584.3

Source: Bloomberg, Ind-Ra, Company

- IG Bonds: ~USD 280 bn raised by AA-category rated Hyperscalers
- Investors willing to underwrite ultra-long 50-year bonds on Technology
- HY Bonds: Investor appetite healthy; but unable to secure long-term papers
- Private: SPV funding arranged by PEs. Eventual liability with Anthropic and Meta (details next slide)
- Loans: Dominated by Vantage ($38 bn) – arranged by JPM and Coreweave (GPU funding, $11.6 bn)
- Mostly 5-6 years tenure

The ability to access deep and liquid bond markets provides hyperscalers with a significant strategic advantage. Strong credit profiles allow them to secure funding across currencies and maturities, align liabilities with asset life cycles, reduce refinancing risks, and deploy capital at scale. In effect, technology companies are increasingly behaving like infrastructure developers, with bond markets serving as the primary vehicle for long-term capital mobilisation.

Capital Market Access Defines Competitive Advantage

The funding environment for non-hyperscalers presents a contrasting picture. While lower-rated investment-grade borrowers continue to access capital markets, financing for high-yield and unrated issuers remains concentrated in shorter maturities, reflecting investor caution towards technology, execution, and obsolescence risks.

Consequently, financing structures have become increasingly sophisticated, encompassing private placements, syndicated loans, securitisation structures, and SPVs. In many instances, investor confidence relies not only on the infrastructure asset itself but also on the visibility of long-term contractual cash flows from anchor clients, cloud providers, and AI developers.

The divergence between hyperscalers and other market participants illustrates an important reality: in large infrastructure investment cycles, the availability, tenor, and cost of capital often become key determinants of market leadership. Strong credit quality and deep capital-market access enable faster infrastructure deployment, creating a durable competitive advantage.

Lessons for India

The global AI infrastructure cycle offers a compelling roadmap for India. As investments accelerate across data centres, cloud infrastructure, semiconductor ecosystems, AI compute capacity, fibre networks, and digital connectivity, financing requirements will increasingly resemble those of traditional infrastructure sectors rather than conventional technology ventures.

These assets require substantial upfront capital, long development horizons, and patient pools of funding. Consequently, their financing will depend on the same ingredients that underpin successful infrastructure development globally: deep bond markets, institutional capital participation, innovative financing structures, and efficient risk-transfer mechanisms.

For India, the emergence of digital and AI infrastructure represents more than a technological opportunity. It presents an opportunity to create a new class of long-duration investable assets capable of attracting domestic savings, pension capital, insurance funds, sovereign wealth funds, and global institutional investors. Just as highways, ports, airports, and power networks shaped earlier investment cycles, digital infrastructure is poised to become one of the defining capital-formation themes of the coming decade.

The global experience demonstrates a clear lesson: transformative technological growth is ultimately financed through robust capital markets. As India seeks to build the infrastructure underpinning its digital future, the development of deep, liquid, and diversified bond markets will be essential to mobilising long-term capital at scale and catalysing the country's next phase of economic growth.

Warehousing: New Age Infrastructure

Building the Backbone of India's Consumption and Manufacturing Economy

Logistics Infrastructure: The Hidden Engine of India's Next Growth Cycle

As global supply chains undergo structural realignment, logistics infrastructure is emerging as a strategic determinant of economic competitiveness. Geopolitical disruptions, supply-chain diversification, growing e-commerce penetration, and the rise of advanced manufacturing are compelling countries to invest heavily in logistics ecosystems that seamlessly integrate transportation, warehousing, ports, rail networks, and digital infrastructure.

Across developed markets, global logistics players such as Prologis, GLP, Goodman Group, and SEGRO have transformed warehousing and logistics assets into a mainstream infrastructure asset class, attracting substantial institutional and debt capital due to their long asset lives, stable cash flows, and strategic economic relevance.

For India, the opportunity is particularly significant. As the country advances the Atmanirbhar Bharat agenda and positions itself as a key participant in global value chains, reducing logistics costs and improving supply-chain efficiency will be critical to enhancing manufacturing competitiveness. Efficient logistics networks lower inventory carrying costs, improve freight reliability, reduce delivery timelines, and strengthen export competitiveness. Consequently, logistics infrastructure is increasingly moving from a support function to a core pillar of economic growth.

Warehousing: Building an INR1 Trillion Logistics Asset Class

India's non-captive Grade-A warehousing stock was estimated at 650-700 million sq. ft. as of end-2025 and is expected to maintain strong growth momentum over the medium term. Demand is being driven by third-party logistics providers, e-commerce platforms, organised retailers, and emerging manufacturing segments such as EV components, battery storage, electronics, and light engineering. At the same time, occupiers are increasingly transitioning from Grade-B facilities to institutional Grade-A warehouses, driven by compliance requirements, operational efficiency, ESG considerations, and automation needs.

Historically, warehousing stock expansion has tracked economic activity at nearly 1.85x real GDP growth. Even under a relatively conservative growth scenario of 1.5x-1.75x GDP, India's warehousing stock could approach 1 billion sq. ft. by 2030, implying a CAGR of about 10.5% during 2026-2030.

Figure 28

Warehousing: Investment Opportunity of ~INR1.0 trillion by 2030

	2025	2030
Warehousing stock (million sq ft)	650-700	~1,000
Stock growth CAGR (5-year)	13.7%	10.5%
GDP growth multiplier (x)	1.85	1.75-1.50

- Robust IIP Growth – Demand Support
- E-Com – Growth Multiplier So Far
- Industrial Warehousing – Manufacturing, Solar; New Use Cases

Primary Markets[a]	
Current stock (million sq ft)	550-600
Supply (CY26-30, million sq ft)	~300-350
Supply growth	~11%

Secondary Markets	
Current stock (million sq ft)	110-120
Supply (CY26-30, million sq ft)	~50-70
Supply growth	8-9%

[a] **Primary Markets**: Mumbai, NCR, Bengaluru, Chennai, Ahmedabad, Pune, Kolkata, Hyderabad
Source: Industry, Ind-Ra

Total 350-400 million sq ft of incremental supply = Total W/H stock to reach 1.0 billion sq ft by 2030

The majority of development is expected across the country's eight major warehousing hubs, namely Mumbai, NCR, Bengaluru, Chennai, Ahmedabad, Pune, Kolkata, and Hyderabad. These markets alone are expected to add 300-350 million sq. ft. of new warehousing supply between 2026 and 2030, compared to an existing stock base of 550-600 million sq. ft. Secondary markets are also expected to witness healthy expansion, adding another 50-70 million sq. ft. as manufacturing and logistics activity becomes more geographically diversified.

The scale of investment is equally significant. Ind-Ra estimates that creating 300-350 million sq. ft. of additional warehousing capacity will require investment of about INR1 trillion over the next five years. Given stable rental growth of 3%-5% annually, improving occupancy levels, and growing institutional participation, warehousing is increasingly emerging as a long-duration infrastructure asset capable of attracting domestic and international debt capital.

Technology-Enabled Warehousing: From Storage Facilities to Smart Logistics Networks

The warehousing sector is also undergoing a technological transformation. Artificial Intelligence (AI), Machine Learning (ML), predictive inventory management, warehouse automation, robotics, IoT-enabled tracking systems, and digital twin technologies are reshaping warehouse operations globally. Increasing demand from quick-commerce platforms and express logistics players is accelerating the need for highly automated urban fulfilment centres and last-mile logistics facilities.

This convergence of physical and digital infrastructure is transforming warehousing from a passive storage function into an intelligent supply-chain platform. As a result, infrastructure investors are increasingly evaluating warehousing assets on not only on physical capacity but also technology integration, operating efficiency, tenant quality, and data-driven optimisation capabilities.

Rail Logistics: The INR7 Trillion Multimodal Freight Opportunity

The Rise of Integrated Freight Ecosystems

Ind-Ra believes India's rail logistics sector is entering a significant investment cycle, with cumulative investments of INR6 trillion-7 trillion through 2030, supported by rising freight demand, increasing containerisation, operationalisation of the Dedicated Freight Corridors (DFCs), expansion of Gati Shakti Cargo Terminals (GCTs), and policy initiatives aimed at increasing rail's share in freight transportation. Globally, freight rail networks form the backbone of efficient multimodal logistics systems, lowering transportation costs, improving supply-chain resilience, and enhancing manufacturing competitiveness.

As India seeks to strengthen its position within global value chains and advance the Atmanirbhar Bharat agenda, the development of rail-linked logistics infrastructure will be critical to reducing logistics costs and improving economic productivity. Over 2026-2030, investments are expected across rolling stock, containers, inland terminals, freight handling facilities, and rail-linked logistics infrastructure. Private and public sector entities, including Container Corporation of India Limited, are expected to account for nearly 40% of the overall investment pipeline, translating into a sizeable financing opportunity for long-term capital providers, and remaining 60% will be funded through budgetary support.

Figure 29
Railway Logistics

Segment	Cumulative addition over 2026-2030 (est.)	Indicative unit price (INR million)	Total investment (INR billion)	Key driver
Conventional and specialised wagons	150,000-175,000 wagons	INR2.5-2.8 per wagon	INR400-450	Replacement demand and freight capacity augmentation
Containers	75,000-100,000 TEU	INR0.16-0.20 per TEU	INR15-18	Fleet expansion and replacement
Container rakes	330-430 rakes	INR200-250 per rake	INR75-100	Container growth and modal shift
ICDs/GCTs/Terminals			INR75-90	Multimodal logistics infrastructure
Miscellaneous incl. handling equipment			INR25-40	Capacity augmentation and replacement

Source: Ind-Ra

Rolling Stock and Containerisation Lead Capital Deployment

The investment cycle is expected to remain led by rolling stock. Ind-Ra estimates annual additions of 30,000-40,000 conventional and specialised freight wagons, implying cumulative additions of 150,000-175,000 wagons during 2026-2030. Demand is likely to be driven by a combination of replacement requirements and capacity augmentation to support expanding freight volumes. Container rail logistics is also expected to witness substantial capital deployment. With rail container traffic projected to grow at 8%-10% annually, the industry could require additional 330-430 container rakes by 2030, excluding replacement demand. Given that a typical single-stack rake carries 225-250 containers, the resulting fleet expansion might drive significant investments in not only rolling stock and containers but also supporting infrastructure such as inland container depots (ICDs), private freight terminals (PFTs), Gati Shakti Cargo Terminals, cargo handling facilities, and multimodal logistics hubs.

From Freight Corridors to Integrated Logistics Ecosystems

As freight networks become increasingly integrated, investments in ICDs, PFTs, and GCTs are expected to accelerate. While greenfield terminal development will remain a key growth driver, existing facilities will also require substantial capital expenditure towards capacity expansion, mechanisation, automation, digitalisation, and connectivity enhancements. Consequently, rail logistics is evolving beyond a transportation-focused segment into an integrated infrastructure ecosystem comprising rolling stock, terminals, containers, warehousing, and value-added logistics services.

A Natural Fit for Long-Term Debt Capital

Both warehousing and rail logistics possess characteristics that align closely with institutional debt investors. Long asset lives, visible cash flows, identifiable collateral, contractual revenues, and strong linkages to economic growth make these assets well suited for pension funds, insurance companies, infrastructure debt funds, InvITs, and bond market investors.

Collectively, warehousing and rail logistics could attract investments of INR7 trillion-8 trillion over the coming decade, making them one of the largest emerging infrastructure opportunities in the country. More importantly, these sectors sit at the intersection of manufacturing growth, supply-chain resilience, digital transformation, and global trade integration.

As India seeks to reduce logistics costs, strengthen its manufacturing competitiveness, and capture a larger share of global value chains, logistics infrastructure will become a critical enabler of economic growth. Financing this opportunity at scale will require financing mechanisms that extend beyond traditional banking channels, reinforcing the strategic importance of deep, liquid, and diversified bond markets in supporting India's long-term economic ambitions.

Surety Bonds – Emerging Credit Risks Beyond BG Replacement

Contingent Leverage, Unbridled Growth, and Information Asymmetry Key Risks

The rapid adoption of insurance surety bonds (ISBs) represents a structural development for India's infrastructure and engineering, procurement and construction (EPC) sector. Since their roll-out in FY23, ISBs have gained traction, with outstanding issuances now exceeding INR500 billion-600 billion. For context, the outstanding bank guarantees (BGs) for the construction sector amounted to INR3 trillion as of March 2026, indicating ISBs already represent nearly 17% of the overall non-fund exposure.

By reducing dependence on bank guarantees (BGs), releasing non-fund-based banking limits, and lowering liquidity lock-up requirements, ISBs can enhance participation in infrastructure development and improve contractors' financial flexibility. However, the key credit implication of increased surety bond usage lies not in the instrument itself but in the additional contractual obligations that it may enable outside traditional banking channels. Accordingly, Ind-Ra views surety bonds as an increasingly important component of contingent liabilities and overall risk-bearing capacity in evaluating EPC credits.

Surety bonds do not change contractors' underlying contractual obligations. Whether performance security is through a BG or a surety bond, execution risk, completion obligations, and potential recovery liabilities remain with the contractor. Consequently, a decline in BG utilisation should not be interpreted as a reduction in contingent risk. Instead, assessing a company's overall contractual commitments becomes crucial as surety bond penetration rises.

Under IND AS37, contingent liabilities are generally disclosed in the notes to financial statements to help users understand their nature, timing, and amount. Regulatory discussions on incorporating ISBs into the Reserve Bank of India's (RBI) Central Repository of Information on Large Credits (CRILC) framework also acknowledge the information gap for lenders and rating agencies.

Contingent Leverage Can Emerge Faster Than Traditional Credit Metrics

The key credit implication of increased surety bond adoption is the potential rise in contractual obligations without a corresponding rise in funded debt or reported banking exposure. While ISBs reduce a contractor's reliance on non-fund-based limits, they do not reduce their contractual responsibilities. As a result, economic obligations can increase faster than traditional leverage indicators suggest, creating a gap between reported financial metrics and actual risk. Ind-Ra therefore evaluates surety bonds alongside BGs, contingent liabilities, liquidity resources, and cash flow generation to ensure contractual commitments align financial capacity.

Order Book Growth Needs to Remain Consistent with Execution Capability

The liquidity and capacity released by surety bonds can boost bidding activity and accelerate order book expansion, especially for contractors rated below the IND AA- rating where BG costs and collateral requirements are more onerous. While this supports business growth, uncontrolled order-book expansion may eventually outpace operational resources, leading to execution challenges and weakened cash conversion. Ind-Ra therefore emphasises order-book quality, project complexity, execution performance, and revenue conversion metrics to ensure increased contractual commitments result in sustainable earnings and cash flow generation.

Liquidity Benefits, Cash Flow Sustainability Remains Key

Surety bond adoption reduces margin deposits and encumbered cash linked to traditional BG facilities. Analysis of Ind-Ra-rated EPC entities indicates a gradual decline in both lien-marked cash intensity and non-fund-based limit intensity relative to order books over FY24-FY26. This trend reflects multiple factors, including improving credit profiles, order-book growth and evolving security structures, suggesting that contractors can support larger business volumes with lower liquidity lock-up. Nevertheless, the credit benefit hinges on whether the released liquidity aids efficient project execution and sustainable operating cash flows, rather than simply facilitating larger contractual commitments.

Information Asymmetry Remains A Key Emerging Risk

Unlike BGs, surety bond exposures might not be visible through conventional banking monitoring systems, particularly where multiple insurers are involved. Disclosure practices vary across the EPC sector, with largely companies reporting aggregate contingent liabilities but often providing limited details on surety bond exposure. This reflects the relatively recent introduction of surety bonds in India, leading to an information gap that may challenge lenders, investors, and other stakeholders assessing a contractor's overall contingent obligations. Recognising this gap, Ind-Ra has started separately capturing outstanding surety bond exposures in its credit assessment framework.

Ind-Ra's Methodology to Incorporate Surety Bonds in Credit Assessment

Ind-Ra does not view surety bonds as a standalone negative credit factor. Rather, the focus is on whether their use alters a company's risk profile in ways not fully reflected in conventional financial metrics. Accordingly, credit assessment evaluates total contingent obligations, including BGs and surety bonds; order-book growth relative to execution capability; working-capital intensity and liquidity requirements; cash flow generation and debt-servicing capacity; invocation and recovery obligations; transparency and disclosure quality; and overall financial flexibility and risk-bearing capacity. The key credit issue is not whether surety bonds are inherently risky, but whether the additional contractual capacity they provide aligns with execution capability, liquidity resources, and long-term financial strength.

Success of Surety Bonds: The IRDAI Surety Insurance Contracts Guidelines, 2022 established the framework for licensed general insurers to issue surety contracts. IRDAI's published guidance identifies the 2022 surety guidelines as the relevant framework. The market has since moved from pilot adoption towards broader infrastructure use. National Highways Authority of India (NHAI, 'IND AAA'/Stable) reported that 12 insurers had issued around 1,600 bid-security ISBs and 207 performance-security ISBs worth around INR103.69 billion for NHAI contracts through July 2025. As per various sources, the industry estimates put the total ISBs issued in India at over INR600 billion, with roughly INR420 billion outstanding at end-June 2026.

With the government's continued focus on infrastructure creation as could be seen in the FY27 Union Budget, Ind-Ra expects surety bonds to continue to play a pivotal role by supporting bidding, easing liquidity, and enabling procurement. Generally, BGs account for 80%-85% of the overall banking limits in EPC sector. These are used for availing/executing orders and raw material procurement while providing the much-needed liquidity support through mobilisation advances and release of retention money prior to the completion of defect liability period.

Figure 30

Surety Bonds vs BGs in EPC Segment

Particulars	Bank guarantees	Surety bonds
Provider	Bank	General insurer
Primary source	Bank non-fund limit	Insurer underwriting capacity
Underlying contractor risk	Remains	Remains
Claim/payment	Depends on BG wording	Depends on bond/policy wording
Recovery	Bank recourse to customer	Insurer recovery/indemnity
Visibility to bank	Usually high within bank group	May be fragmented across insurers
Diversification	Often multiple banks	May be concentrated in one insurer
Renewal risk	Bank line dependent	Insurer capacity dependent

Source: Ind-Ra

Figure 31

A Surety Arrangement Normally Involves Three Parties

Party	Role	Credit relevance
Principal/contractor	Performs the underlying contract	Primary default/execution risk
Obligee/project owner	Receives security for contractual performance	May invoke the bond following a qualifying default
Surety/insurer	Provides the bond	Takes first-loss payment obligation subject to bond terms and seeks recovery from the principal

Source: Ind-Ra

Market Analysis

Growth in non-fund-based credit to the EPC sector has remained strong, with exposure increasing 54% between FY23 and FY26 to INR2,805 billion. Within the construction segment, exposure grew even faster, rising 60% over the same period, or INR1,057 billion.

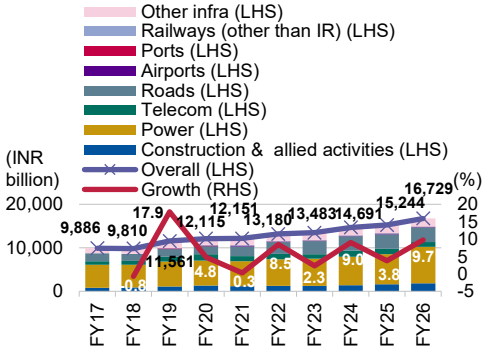
Some of the non-commercial factors leading to the adoption of surety bonds are regulatory encouragement, increasing acceptance by project owners and government authorities, the objective of reducing concentration on the banking system for performance security, alignment with global market practices, and the development of alternative risk-sharing mechanisms to support infrastructure and EPC sector growth.

The Department of Financial Services, operating under India's Ministry of Finance, issued a directive in September 2024 mandating all central government departments and central public sector enterprises to accept ISBs at par with BG. This directive builds upon the 2022 amendments to Rule 170(i) and Rule 171(i) of the General Financial Rules, removing entity-level discretion and making surety bond acceptance an obligation in public procurement.

While entities such as NHAI, Ministry of Road Transport & Highways, and NHPC Limited (IND AAA/Stable) show acceptance of surety bonds, state government departments have been slower to adopt them The latter is primarily driven by operational and implementation challenges rather than regulatory restrictions. While the central government has formally recognised surety bonds as an alternative to BGs, individual states and departments must separately update their procurement rules, tender formats, and acceptance procedures. The adoption has also been constrained by limited familiarity with the product, preference for the well-established BG framework, and concerns around claim invocation, enforcement, and recovery processes. As the surety market matures, standardisation improves, and successful use cases increase, acceptance among state authorities is likely to broaden.

Figure 32

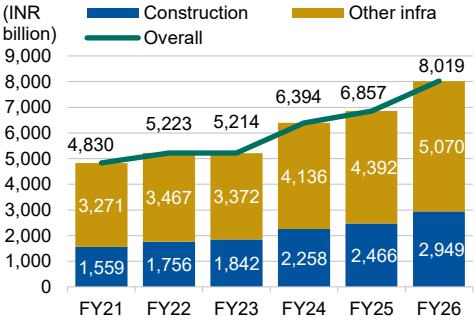
Bank Credit Towards Key EPC Sector



Source: RBI, Ind-Ra

Figure 33

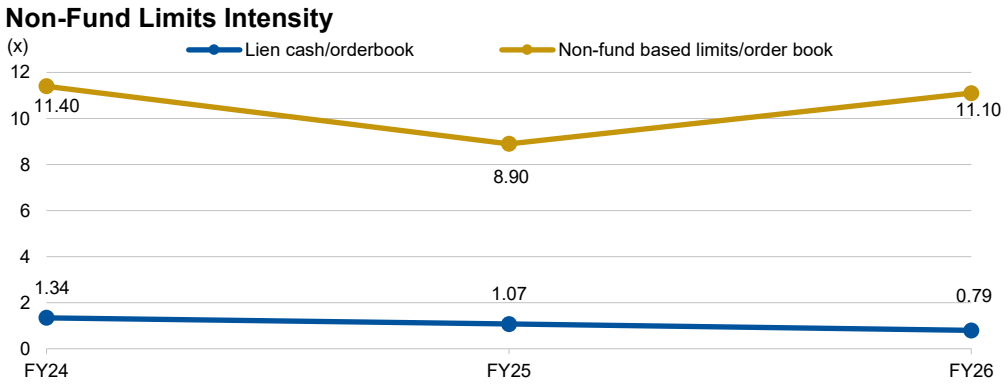
Non-Fund-Based Bank Credit Towards Key EPC Sector



Source: Ind-Ra

Ind-Ra has analysed the order book of its rated EPC entities, specifically in the A+ and below categories, and included higher-rated entities that have meaningfully adopted surety bonds, over the past three years, focusing on financial parameters such as encumbered cash.

Figure 34



Source: Ind-Ra

Figure 34 shows the decline in non-fund-based limit intensity, measured by lien-marked cash relative to order book, results from several factors. These include the gradual adoption of surety bonds as alternative security, improved credit profiles leading to lower collateral requirements for BGs, and order-book growth outpacing encumbered cash balances. Additionally, greater banking comfort, release of margin deposits on completed projects, and diversification of contractual security structures have likely contributed to the reduction. While the impact cannot be attributed solely to surety bond usage, the trend suggests that contractors can support larger order books with less lien-marked cash. Non-fund-based limit utilisation relative to order-book, however, declined in FY25 before increasing in FY26. The FY26 increase was not attributable solely to BG utilisation, with letters of credit also increasing meaningfully.

Recognising the growing relevance of surety bonds for contingent exposure and their implications for liquidity, leverage assessment, and order-book growth, Ind-Ra now tracks the outstanding surety bond exposure of each rated entity in its credit evaluations. This approach allows for a comprehensive assessment of a contractor's total security obligations, including BGs and surety bonds, ensuring that growth in contractual commitments aligns with the entity's execution capability, working capital, and financial profile. Over time, increased visibility of surety bond utilization is expected to strengthen credit monitoring and improve transparency around contingent liabilities across the rated portfolio.

Invocation History: While the Indian surety bond market has witnessed rapid growth in issuances, publicly available data on invocation frequency, claims paid, and recoveries is limited. Recent cases involving NHAI demonstrate that invocation risk is no longer merely theoretical, with listed contractors disclosing partial and material invocation proceedings. However, the lack of comprehensive industry-level claims data limits meaningful assessment of loss frequency and severity. Greater disclosure of invocation, settlement, and recovery experiences will therefore be important as the market matures.

Disclosure Risk: Disclosure practices across rated EPC entities are inconsistent. While many companies disclose aggregate contingent liabilities and BGs, separate and detailed disclosure of surety bond exposures is often limited, particularly in public financial statements. Given that surety bonds were recently introduced in India and their adoption is at an early stage, disclosure frameworks and market conventions are evolving.

The primary gap is the absence of standardised reporting requirements for surety bonds across financial statements, lender reporting packages, and rating disclosures. This is compounded by the relatively small-but-growing size of the surety bond market, lack of established market practices, and varying disclosure approaches adopted by insurers, borrowers, and lenders. Furthermore, many borrowers do not yet view surety bonds as a distinct contingent exposure requiring separate reporting, given their similar economic purpose to BGs. As adoption increases, greater transparency around surety bond utilisation, concentration risks, invocation experience, and liquidity implications is likely to become a market expectation.

Ind-Ra's view while current disclosure practices are developing, the lack of granular surety bond disclosures does not necessarily indicate heightened risk. However, as surety bond penetration increases, enhanced disclosure and monitoring will be important to ensure that lenders and other stakeholders maintain a complete view of a contractor's contingent obligations, execution commitments, and potential liquidity exposures.

Pricing-Arbitrage: Surety bonds can be cheaper than BGs. However, it is not necessarily a pure "pricing arbitrage".

- A BG is a contingent exposure for banks, requiring regulatory capital allocation, and non-fund-based banking limits with an opportunity cost. That cost gets reflected in BG commission and margins.
- Surety bond insurers primarily underwrite risk rather than provide a banking facility, with differing capital requirements, portfolio construction, and risk appetite from banks, allowing more competitive pricing.

Ind-Ra opines that the lower pricing of surety bonds than that for traditional BGs arises from differences in capital requirements, risk assessment, collateral structures, and portfolio diversification between insurers and banks. While this provides a meaningful cost and liquidity benefit to contractors, the pricing differential warrants monitoring as the Indian surety bond market is nascent with limited historical claims experience over a full credit cycle.

From a credit perspective, the lower cost of surety bonds should therefore be viewed as financing benefit, but not necessarily as evidence of lower underlying project or counterparty risk.

Issuers in the higher rating categories, particularly those rated 'AA-' and above find limited economic incentive in replacing BGs with surety bonds. Such entities typically benefit from strong banking relationships, low commission charges, and minimal margin requirements on BG facilities. Consequently, the cost and liquidity advantages offered by surety bonds are often less pronounced for these issuers, leading to lower adoption levels.

In contrast, issuers rated below the 'AA-' category face higher BG commission rates and more stringent margin requirements, which can result in a meaningful lock-up of liquidity and banking lines. For these entities, surety bonds can provide a more attractive alternative by reducing the reliance on bank-guarantee limits and enhancing financial flexibility. As a result, the adoption of surety bonds has been more prevalent among lower-rated issuers where the liquidity and cost benefits are more significant.

Nevertheless, exceptions exist within the 'AA-' rating category, where certain issuers may also demonstrate higher usage of surety bonds due to specific business requirements, project characteristics, banking arrangements, or a strategic preference to preserve non-fund-based limits for growth opportunities.

Figure 35

Key Risks and Assessment Approach

Risk area	Risk description	Ind Ra's approach
Contingent leverage	Surety bonds enable contractors to take on larger contractual obligations without a corresponding increase in funded debt or BG utilisation, potentially masking the true extent of contingent liabilities.	Assess total surety exposure alongside BG; compare contingent obligations to cash flow, and liquidity buffers; evaluate whether contract commitments are growing faster than financial capacity
Aggressive bidding risk	Increased surety bond capacity may encourage pursuit of larger, riskier, lower-margin, or unfamiliar projects by reducing security-related constraints.	Review bidding discipline, margin trends, entry into new geographies/sectors, project risk profile, and management's historical execution record; monitor declining profitability or increased project complexity
Order-book expansion risk	Surety bond capacity can support rapid order-book growth that may outpace operational execution and financial resources.	Compare order-book growth with revenue growth and execution capacity; monitor execution ratios, subcontractor dependence, receivable build-up, cash conversion, and project delivery performance.
Working capital & liquidity risk	Surety bond-enabled growth can significantly increase funding requirements during project execution, creating pressure on cash flows and liquidity.	Analyse working-capital cycle, receivables aging, operating cash flow, utilisation of working-capital facilities, short-term borrowings, and liquidity headroom. Watch for rising debt coupled with growing order books.
Invocation & refinancing risk	Surety bond invocation can create a sudden liquidity shock through recovery obligations, while withdrawal of surety bond support may force replacement with BGs or other security.	Evaluate claim history, project stress indicators, indemnity obligations, available banking limits, dependence on surety bond markets, and ability to replace surety facilities under stressed conditions.
Information asymmetry risk	Incomplete disclosure of surety exposures may result in underestimation of contractual obligations and contingent liabilities.	Assess transparency and reporting practices; obtain consolidated visibility across subsidiaries, JVs, and SPVs; reconcile surety exposures with BG and other contingent commitments.

Source: Ind-Ra

Ind-Ra expects any residual risk arising from surety bond usage is expected to be reflected in its standard EPC credit assessment of leverage, liquidity, working capital, cash flows, execution capability, contingent liabilities, and overall financial flexibility. Surety bond exposure could therefore be viewed as a complementary risk indicator rather than a standalone credit risk driver.

The key issue is therefore not whether surety bonds are inherently risky, but whether their use changes a company's risk profile in ways not adequately captured by conventional financial metrics. Particular attention should be given to contingent leverage, order-book intensity, working-capital requirements, insurer concentration, invocation, and recovery obligations.

Market Voices: Insights from India's Leading Financial Institutions

Capital Market Development and Efficient Capital Mobilisation

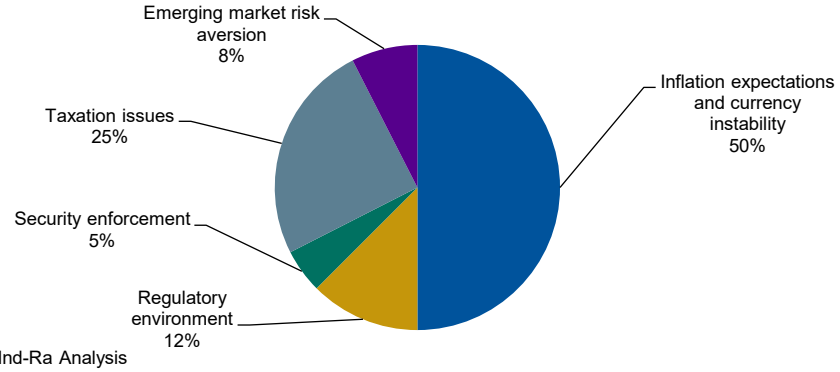
As part of this study, we sought the perspectives of those at the forefront of capital allocation across India's financial system. In the run-up to the report, we surveyed CIOs, Fund Managers, and Credit Heads from banks, insurance companies, mutual funds, pension funds, and other leading financial institutions. While many of the challenges highlighted are familiar, the consistency of responses was striking. Across investor categories, concerns around taxation, inflation and currency risks, a limited investor base, and market liquidity constraints emerged repeatedly. The findings serve as an important reminder that while India's bond market has made significant progress, several structural bottlenecks continue to limit its full potential.

The survey offers valuable insights into the reforms and market priorities that could help unlock the next phase of bond market deepening and support India's long-term development ambitions.

1) **Question:** The Indian financial markets are becoming increasingly attractive to foreign investors (FPIs) both from an equity and debt point of view. Which one of the following factors, in your opinion, are critical impediments in deepening the market and providing long-term overseas capital to borrowers?

Figure 36

Inflation and Currency Volatility the top Hurdles to FPI Investment

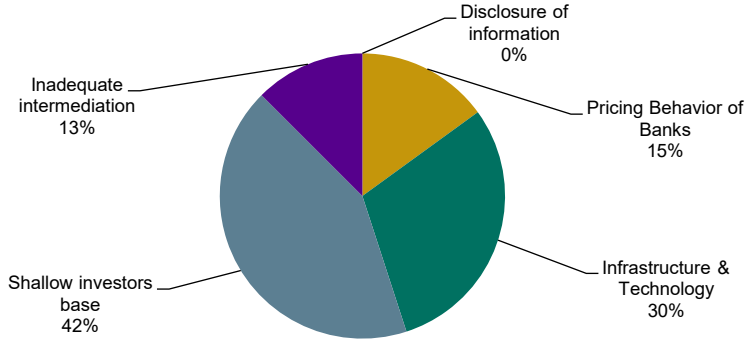


Source: Ind-Ra Analysis

2) Question: Do you think domestic bond prices accurately reflect the underlying risks, such as term premium for longer maturities and credit premium for lower-rated issuers? If not, what are the key reasons for any mispricing in borrowing costs?

Figure 37

Limited Investor Base Restrains Efficient Bond Market Pricing

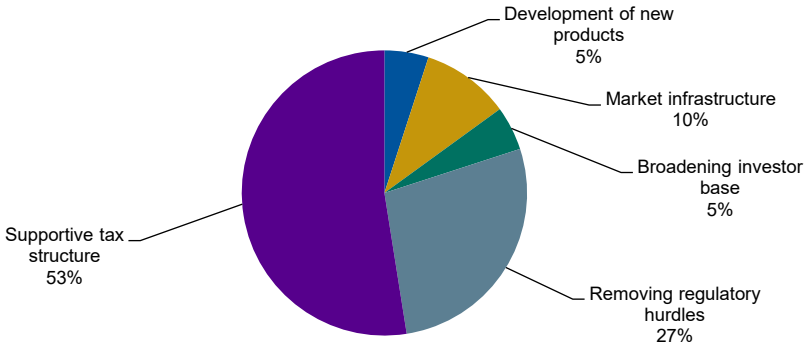


Source: Ind-Ra Analysis

3) **Question:** Which are those areas policy-makers should focus on strengthening capital markets.

Figure 38

Supportive Tax Structures Expected to Support Capital Markets

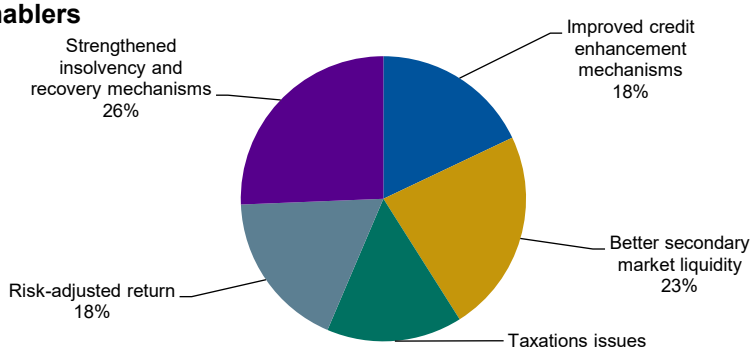


Source: Ind-Ra Analysis

4) **Question:** What are the key factors that would encourage your institution to increase investments in infrastructure-related bonds?

Figure 39

Robust Recovery Framework & Secondary Market Liquidity: Key Infra Bond Enablers

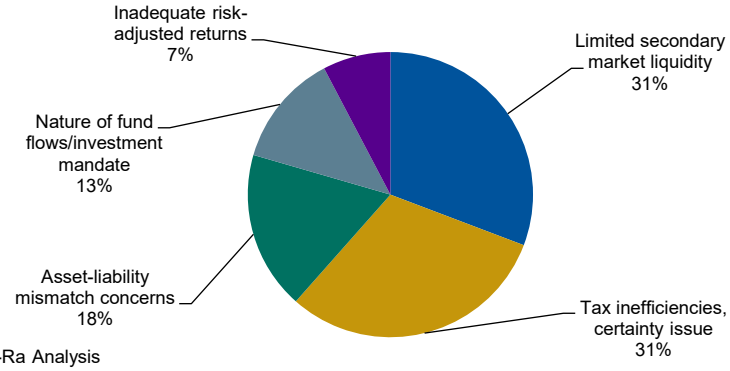


Source: Ind-Ra Analysis

5) **Question:** Which factors constitute the most significant barriers to increasing investments in infrastructure financing through the domestic bond market?

Figure 40

Liquidity Constraints and Tax Inefficiencies Hinder Infrastructure Financing

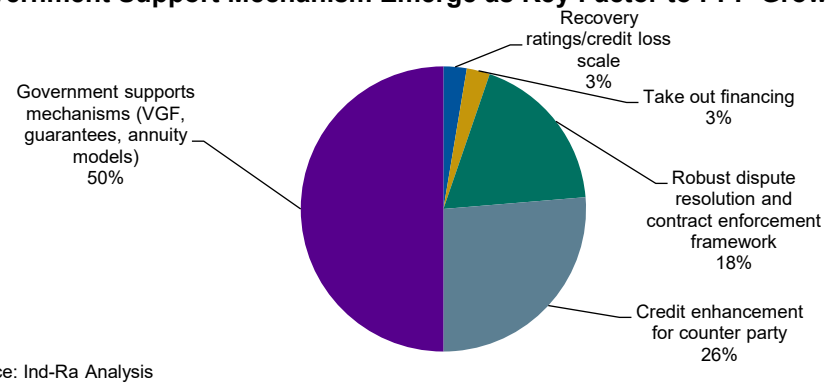


Source: Ind-Ra Analysis

6) **Question:** What are the key factors that would enhance the attractiveness of PPP structures for new Greenfield infrastructure projects?

Figure 41

Government Support Mechanism Emerge as Key Factor to PPP Growth



Source: Ind-Ra Analysis

List of Sources Used in the Report

Official Source/Institution
Association of Mutual Funds in India (AMFI)
Atal Mission for Rejuvenation and Urban Transformation (AMRUT)
Clearing Corporation of India Ltd. (CCIL)
Comptroller and Auditor General of India (CAG)
Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL)
Department for Promotion of Industry and Internal Trade (DPIIT)
Employees' Provident Fund Organisation (EPFO)
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Ministry of Finance, Government of India
Ministry of Housing and Urban Affairs (MoHUA)
Ministry of Railways
Ministry of Statistics and Programme Implementation (MoSPI)
Municipal Corporation Budget Documents
National Highways Authority of India (NHAI)
National Infrastructure Pipeline (NIP)
National Logistics Policy Documents
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RBI State Finances: A Study of Budgets
Securities and Exchange Board of India (SEBI)
State Finance Commissions
U.S. Treasury Department

Notes

About National Bank for Financing Infrastructure and Development:

National Bank for Financing Infrastructure and Development is a Development Financial Institution (DFI) established in April 2021. The institution is dedicated to accelerating the development of India's infrastructure ecosystem by addressing the long-term financing needs of the sector. The institution plays a pivotal role in driving the nation's economic growth and fostering sustainable development. It is committed towards its vision of becoming a strong provider of impact investment, catalysing infrastructure financing for transformative growth of India.

The institution aims to be a key partner in helping India achieve its ambitious infrastructure development objectives – responsibly and sustainably. Additionally, the institution will work towards developing a deep and liquid market for bonds, loans, and derivatives for infrastructure financing.

Website: https://nabfid.org/
LinkedIn: https://www.linkedin.com/company/national-bank-for-financing-infrastructure and-development
X (formerly Twitter) : https://x.com/NaBFID_official

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Contacts:

Business Relations

Vijairaghavan Pv
Senior Director & Head, Large Corporates (West)
E: vijairaghavan.pathangivasudevan@indiaratings.co.in
M: +91 9650022557

Brajesh Tiwari
Director & Head, Large Corporates (South)
E: brajesh.tiwari@indiaratings.co.in
M: +91 96183 69696

Vineet Ahuja
Director & Head, Large Corporates (North & East)
E: vineet.ahuja@indiaratings.co.in
M: +91 810257567

Rituparna Mandal
Director & Head, Mid Corporates (West)
E: rituparna.mandal@indiaratings.co.in
M: +91 75069 48108

Sunil Kumar
Director & Head, Mid Corporates (South)
E: sunil.kumar@indiaratings.co.in
M: +91 9004680612

Amol Sumrani
Director & Head, Mid Corporates (North & East)
E: amol.sumrani@indiaratings.co.in
M: +91 9711809770

Financial Institutions

Anuj Sarin
Director & Head, Financial Institutions
E: anuj.sarin@indiaratings.co.in
M: +91 98338 88472

Investor Relations

Bakul Tongia
Director & Head
E: bakul.tongia@indiaratings.co.in
M: +91 9820876908

Offices:

Mumbai
Wockhardt Towers, 4th Floor,
West Wing, Bandra Kurla Complex,
Bandra East, Mumbai - 400051
T: +91 22 4000 1700
F: +91 22 4000 1701

Chennai
Harmony Square 3rd Floor,
Door No. 48 & 50,
Prakasam Street, T Nagar,
Chennai - 600017
T: +91 44 4340 1700

Kolkata
Room no - 1201, 12th Floor,
OM Towers,
32 Chowringhee Road,
Kolkata - 700071
T: +91 33 4030 2500

Gurugram
DLF Epitome, Level 16,
Building No. 5, Tower B - DLF,
Cyber City, Gurugram,
Haryana - 122002
T: +91 124 668 7200

Bengaluru
Unit No. 1110, 11th Floor,
East Wing, Raheja Tower,
M G Road,
Bengaluru - 560001
T: +91 80 4666 6800

Ahmedabad
510 - Sun Square, St. Xaviers
College Road, Off C. G. Road,
Near Nest / Klassic Gold Hotel,
Navarangpura, Ahmedabad - 380009
T: +91 794911 0700

Hyderabad
36 Urban Center,
Level 4, Road no.36,
Jubilee Hills,
Hyderabad - 500033
T: +91 40 6766 1900

Pune
402, Amar Business Park,
Sadanand Estates,
Baner, Pune,
Maharashtra - 411045
T: +91 20 6718 0100

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