

Economic Analysis of Telecom Spectrum Pricing in India: The 5G Auction Landscape

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Introduction

The telecom spectrum serves as the backbone of modern communication, enabling seamless connectivity across mobile networks. In India, spectrum pricing and allocation play a crucial role in shaping the competitiveness and growth of the telecom sector. With the advent of 5G technology, the 2022–2023 spectrum auctions marked a significant milestone, redefining market dynamics, investment patterns, and policy frameworks. This study analyzes the economic factors influencing spectrum pricing, the strategies adopted by telecom operators, and the long-term implications of India's 5G auction landscape.

TRAI's New Pricing Strategy: A Shift Towards Lower Reserve Prices



Significant Price Cuts

The TRAI's 2025 recommendations introduced significant cuts to 5G spectrum reserve prices compared to the 2018 base, aiming to stimulate greater participation in the auctions.



Differentiated Band Pricing

New differentiated pricing was applied across various bands. For instance, the 37-40 GHz mmWave band saw reserve prices ranging from ₹49 lakh to ₹76 lakh per MHz in key service circles.



Extended Spectrum Validity

To encourage long-term commitment and investment from operators, the spectrum validity period was extended to 20 years.

Despite these strategic price reductions, the spectrum costs remain among the highest globally, reflecting the complex and unique dynamics of the Indian telecom market.

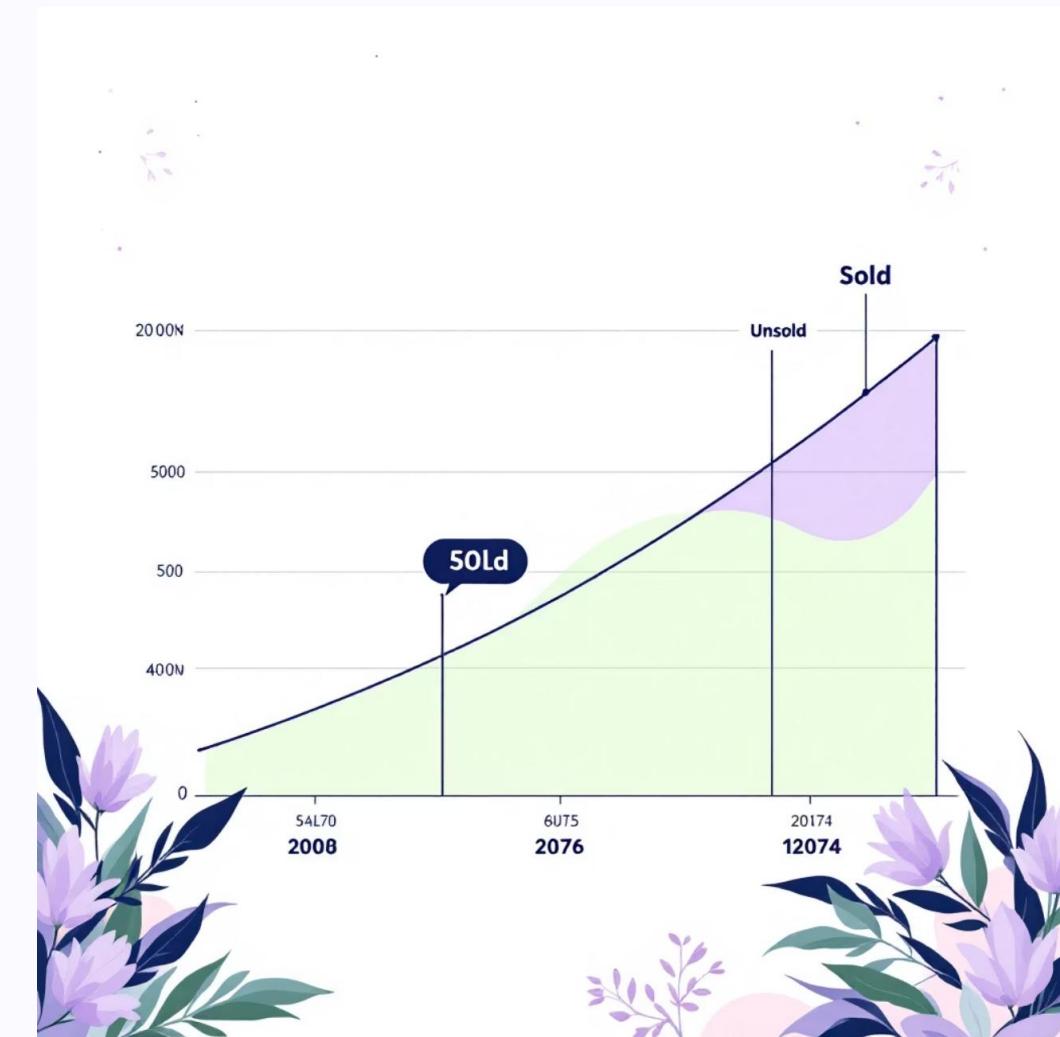
Auction Outcomes: Spectrum Sold vs Unsold Trends

Mixed Demand Signals

The 2022 5G auction successfully sold 71% of the 72,098 MHz of spectrum available, raising a substantial ₹1.5 lakh crore.

However, the smaller 2024 auction saw a more cautious approach, with only 26.5% of the 533.6 MHz available finding buyers, indicating ongoing cost sensitivity and muted demand from telcos.

- High spectrum costs continue to act as a significant constraint on the full uptake of available airwaves.
 - Operators focused strategic acquisitions on mid-band (3.5 GHz) and mmWave bands, which are crucial for immediate 5G network coverage and high-capacity services.



Impact on 5G Rollout and India's Digital Goals



→ Accelerated Deployment

Rationalised pricing has facilitated rapid 5G network deployment by key operators, with Jio alone reporting over 210 million 5G subscribers and near-nationwide coverage.

→ Vi and BSNL Progress

Vodafone Idea (Vi) is targeting commercial 5G services in 17 priority circles by August 2025. BSNL is focusing on a progressive 4G and subsequent 5G rollout strategy.

→ Risk to Digital Inclusion

Persistent high spectrum costs pose a risk of slowing down network expansion and service affordability, which could impede India's broader digital inclusion and connectivity ambitions.

→ Policy Recommendations

The GSMA continues to advocate for the government to prioritise affordable spectrum pricing to ensure sustainable sector growth and maintain high service quality standards.

Global Comparison: Why Is India's Spectrum So Costly?

Indian 5G spectrum costs significantly exceed those of global peers, requiring a deeper look into the valuation methodology.



- TRAI's current pricing model heavily indexes older, highly successful 1800 MHz auction prices, which artificially inflates current reserve prices across all bands.
- High costs are compounded by relative spectrum scarcity, a fragmented auction history, and intense competition among a limited number of powerful telecom players.
- There are strong calls for new, ground-up valuation methods to establish reserve prices based on true economic value, helping to prevent spectrum from remaining unsold.

Conclusion: Balancing Revenue and Growth for India's 5G Future

Critical Trade-off

The Indian telecom sector faces an ongoing challenge: high spectrum prices generate essential government revenue, but this policy simultaneously imposes severe financial pressure on telcos, impacting their capacity for reinvestment.

Signals from the Market

While recent pricing reforms are a positive step, the cautious bidding seen in the latest auction confirms that cost sensitivity remains a major factor for operators.

Sustainable Growth Path

Future sustainable growth necessitates continuous regulatory flexibility, ensuring affordable access to spectrum, and fostering a supportive environment for emerging and existing players.

Unlocking Potential

Strategic, forward-thinking spectrum management is vital to unlock India's full digital potential, securing its position as a global leader in the 5G era.