BEYOND TERRESTRIAL BOUNDARIES: DEVELOPING INDIA'S ANTITRUST FRAMEWORK FOR THE COMMERCIALIZED SPACE SECTOR

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ABSTRACT

India's space industry is undergoing significant change. The Indian Space Policy 2023[1] broke the state's decades-long monopoly, opening commercial opportunities and enabling private participation. While the Competition Act 2002 is theoretically suited to space activities, its design needs recalibration for a commercial space economy. The shift from ISRO's centralised control to a market-driven environment has resulted in concentration tendencies: NewSpace India Limited retains a dominant position in launch services, aided by special access to government facilities. In FY 2024–25, NSIL's income exceeded ₹3,246 crore, yet only 10 of 285 IN-space applications were dismissed, indicating persistent entry barriers despite liberalisation.

By analysing statutory frameworks, market structures, and international precedents, this study highlights regulatory gaps in managing scarcity of orbital resources, network effects in satellite constellations, inequalities in technology transfer, and concentration in space insurance markets. It proposes a reform agenda: (i) clarify competition law to address space-specific commercial activities; (ii) develop sectoral competition guidelines; (iii) enhance coordination between IN-space authorities and the CCI; and (iv) engage in cooperative international regulatory mechanisms.

The framework shifts from reactive enforcement to proactive policy. Given high capital thresholds, limited orbital slots, and dual-use technologies, concentration can emerge rapidly and become self-reinforcing. As India aims for a significant share of the projected USD 1 trillion global space economy by 2040[2]. A robust antitrust regime is both a regulatory necessity and a strategic imperative to promote innovation, efficiency, and equitable economic gains.

Keywords: Indian Space Policy 2023, Competition Act 2002, Market concentration, Orbital resource management, Proactive antitrust reform.

[1] Ministry of Space, Indian Space Policy 2023 (Government of India, 9 April 2023) para 1.
[2] BryceTech, 'Global Space Economy Forecast' (2024) 12.

I. Introduction

One of the most significant regulatory issues of the twenty-first century is the commercialisation of space operations. Scholars and competition law practitioners must immediately address the paradigm shift brought about by India's transition from a government-monopolized space industry to an open commercial environment through the Indian Space Policy 2023. The competitive environment of India's space economy has been significantly changed with the creation of the organization Indian National Space Promotion and Authorisation Centre (IN-SPACe) and the operationalisation of NewSpace India Limited (NSIL), ISRO's commercial arm. This change occurs in a global space economy expected to grow to $1 trillion by 2040, with India aiming for a six-fold rise to obtain a sizable portion of the market. However, the distinct features of space operations, such as their dual-use nature, high capital needs, limited orbital resources, and technological complexity, create competing dynamics that are difficult for conventional antitrust frameworks to handle adequately.

This paper's main contention is that, although India's Competition Act of 2002 is theoretically relevant to space operations, it has to be significantly modified to consider the particular market dynamics of the space industry. The limited availability of orbital resources, the network effects present in satellite constellations, and the strategic significance of space infrastructure for economic growth and national security are all overlooked by the current regulatory framework, which was created mainly for terrestrial commercial activities.

II. The Evolution of India's Space Sector: From Monopoly to Market

A. Historical Context and Regulatory Transformation

Since its establishment in 1969, India's space-related activities have been largely governed by the Indian Space Research Organisation (ISRO). Apart from its administrative nature, this monopolistic system was legally shielded by a number of laws that forbade private participation in space activities[3]. The Defence Research and Development Organisation (DRDO) similarly controlled space-related defence applications, creating a duopoly in the strategic space business. The declaration of space sector changes in 2020 marked the beginning of the transition, resulting in the creation of NSIL as a commercial organisation and IN-SPACe[4] as

[3] K Radhakrishnan, ISRO: A History (ISRO Monograph Series No 1, 2019) 5–7.
[4] Indian National Space Promotion and Authorization Centre, IN-SPACe Guidelines (2023) para 2.

an independent regulatory authority[5]. The Indian Space Policy 2023 codified this change by allowing Non-Government Entities (NGEs) to participate in end-to-end space activities.

B. Current Market Structure and Competitive Dynamics

The modern Indian space industry demonstrates shifts from monopoly to oligopolistic competition. NSIL, ISRO's commercial division, still dominates launch services, which generated over ₹3,246 crores in FY 2024–2025[6]. Because it has access to ISRO's technology, infrastructure, and people resources, the firm has launched 135 worldwide client satellites and continues to enjoy significant competitive advantages. As of 2023, IN-SPACe had 1,387 registered users, indicating a limited but growing private sector presence[7]. Only 285 applications have been filed, though, and only 10 are almost finished. This discrepancy suggests substantial entry obstacles that may require examination in compliance with antitrust laws. Concerning patterns of concentration, the market structure is shown by the market structure, especially in vital sectors like satellite launch services, where NSIL's advantages generate sizable competitive moats.

C. Emerging Competition Concerns

A number of competitive concerns have arisen as a result of this market shift. First, NSIL's exclusive access to ISRO facilities and technology might lead to competitive distortions. Second, because IN-SPACe oversees complex authorisation procedures, bigger, more established businesses can be given precedence over innovative startups. Third, although intended to encourage private sector involvement, the technology transfer processes could establish dependencies that impede true competition. These worries are shown by India's recent space financing experience.

III. Legal Framework Analysis: Competition Act 2002 and Space Activities

A. Jurisdictional Scope and Sovereign Function Exclusion

Section 2(h), which defines *"enterprise"* while excluding *"any activity of the Government relatable to the sovereign functions of the Government, including all activities carried on by the departments of the Central Government dealing with atomic energy, currency, defence, and*

[5] Press Information Bureau, 'Space Sector Reforms' (Press Release, 26 March 2020).
[6] NewSpace India Limited, Annual Report 2024–25 45.
[7] IN-SPACe, User Registration Statistics (31 December 2023).

space," raises complicated legal issues regarding the applicability of India's Competition Act 2002 to space activities.

The extent of competition legislation in the space industry is seriously unclear due to this exclusion. In *Coal India Limited v. Competition Commission of India*[8], the Supreme Court clarified that the exclusion only applies to sovereign powers and not to business ventures carried out by government organisations. Even though *"space"* is specifically included in the exclusion clause, this precedent implies that ISRO's and NSIL's commercial operations are under CCI's purview.

B. The Commercial Activities Doctrine

In space, the differentiation between sovereign and commercial activities becomes essential. It is evident that NSIL's operations, such as satellite launches, technology transfer, and commercial satellite operations, are commercial and therefore susceptible to competition law examination. The commercial aspect of many space programs is further demonstrated by Antrix Corporation, ISRO's commercial arm, involvement in conflicts like the *Devas-Antrix* case[9]. According to developing jurisprudence, judges are becoming more open to scrutinising government organisations involved in business operations under competition law. In *ICAI v. CCI*[10]. The Delhi High Court ruled that statutory organisations may operate as businesses engaged in non-regulatory, commercial endeavours.

C. Definitional Challenges and Regulatory Gaps

The current legal framework does not address some unique aspects of space activities. The concept of *"relevant market"* gets more complex when considering global satellite services, orbital slots as finite resources, and the network effects inherent in satellite constellations[11]. It may be too challenging for the conventional market definition methodologies to capture the competitive dynamics of space markets adequately.

IV. Competition Analysis of Key Space Market Segments

A. Satellite Launch Services: Market Concentration and Barriers to Entry

Due to its high fixed costs, complex technological requirements, and infrastructure

[8] Coal India Ltd v Competition Commission of India (2020) 8 SCC 425 para 14.
[9] Devas (India) Enterprises Pvt Ltd v Antrix Corporation Ltd OMP No 81 of 2020 (Karn HC, 15 January 2021).
[10] ICAI v Competition Commission of India 2021 (2) Comp LR 1 (Del HC) para 23.
[11] OECD, Competition Issues in Satellite Communications (OECD Space Forum Brief No 4, 2022).

requirements, the Indian satellite launch services industry is naturally monopolistic. NSIL's dominance in this sector raises serious antitrust concerns, particularly with regard to pricing, capacity allocation, and access to launch infrastructure.

Commercial competitors encounter major barriers to entry because of NSIL's ability to use ISRO's decades of scientific achievement and infrastructural investment. The company's cost benefits from government R&D expenditure and subsidised infrastructure access may provide it with unfair competitive advantages that warrant an antitrust probe.

B. Satellite Manufacturing and Technology Transfer

There is more room for private sector involvement in the satellite manufacturing industry, which offers distinct competitive dynamics. However, there may be problems with competition due to ISRO's technology transfer procedures. Certain businesses may benefit from market distortions brought about by the selective nature of technology transfer, license conditions, and the need for buyback assurances.

Dependencies that might impede actual competition are created by ISRO's concentration of vital technologies and the scarcity of other technological sources. The study makes the case that these technology transfer agreements should be closely examined by competition law to make sure they support rather than impede the growth of a competitive market.

C. Satellite Services and Applications

The market with the most significant potential for competitive growth is the downstream satellite services sector, which includes communication, navigation, and earth observation services. However, foreclosure issues may be due to the vertical integration between satellite operators and service providers[12]. NSIL's engagement across the value chain, from manufacture to launch to services, needs thorough antitrust scrutiny to avoid anti-competitive bundling or tying arrangements.

D. Technology Transfer Mechanisms and Market Concentration Concerns

The commercialisation of India's space industry has led to previously unheard-of difficulties with technology transfer procedures, which call for careful antitrust examination. One of the most challenging competition law issues facing the space industry is ISRO's Technology

[12] Competition Commission of India, Report on Vertical Agreements (Fair Play No 48, 2023) 22.

Transfer (ToT) framework, which has transferred more than 300 technologies to Indian firms since the 1970s[13]. Despite being intended to encourage private sector involvement, this mechanism unintentionally distorts the market, necessitating a rigorous examination of competition law.

With differing levels of government participation, ISRO's technology transfer is divided into three categories: repurchase technologies, in which ISRO continues to be the principal customer; space applications technologies; and spin-off technologies for civilian use. This tiered method gives licensees varying competitive advantages, which may be against the non-discrimination rules of competition law. Despite seeming competitive, the fact that 80% of technology licenses go to private sector organisations and over 75% to SMEs conceals more serious structural problems.

From an antitrust standpoint, ISRO's buyback guarantee mechanism is the most worrisome feature. ISRO offers long-term buyback assurances for some licensees that reduce market risk when they are the only buyers of a particular technology. According to Section 3 of the Competition Act of 2002, this arrangement may amount to illegal agreements as it produces artificial market circumstances. The restricted nature of these assurances and ISRO's dominating position as a leading purchaser and technology provider raise serious worries regarding market foreclosure and discriminatory treatment.

The competitive analysis becomes more complex when considering NSIL's role in technology commercialization. The exclusive rights to commercialise ISRO-developed technology through Announcements of Opportunity (AO) and Interest Exploratory Notes (IEN) are granted to NSIL by the 2020 MOU between ISRO and NSIL[14]. This structure creates a bottleneck by requiring private enterprises to get essential space technology through a single government-controlled commercial organisation. Such vertical integration between technology development, commercialization, and market participation violates established competition principles and requires immediate regulatory attention.

Other issues with competition are revealed by the technology transfer cost structure. If cost accounting principles are properly applied, developed ISRO items may have *"zero TT costs"* in accordance with the Draft Technology Transfer Policy 2021[15]. Although this appears

[13] ISRO, Technology Transfer—Historical Overview (2022) 1.
[14] Memorandum of Understanding between ISRO and NewSpace India Limited (18 November 2020).
[15] Draft Technology Transfer Policy 2021–22 (Ministry of Space) para 4.

appropriate for the private sector, it unfairly favours Indian companies over their international competitors. It can be unlawful subsidies that hinder market competitiveness. ISRO's hold on downstream markets is further cemented by the policy's preference for revenue-sharing options over upfront license costs.

1. ***Insurance and Financial Services Market Concentration***

The Indian space insurance market is another important area that requires antitrust analysis but has not received significant scholarly attention. When India's space economy hits the $44 billion level by 2033, the insurance sector exhibits concerning concentration patterns that threaten the development of a competitive market. Because there is no comprehensive insurance rules specifically designed for space activities under the current regulatory environment, entrance barriers favour established businesses.

The proposed Space Insurance Regulatory Authority establishment represents a crucial competition policy intervention. However, the oligopolistic circumstances created by the existing market structure, which is dominated by a small number of large insurers, such as Tata AIG, may restrict the possibilities for coverage and drive up the cost of space enterprises. Established firms can take advantage of the inherent obstacles to entry created by the intricacy of space insurance products and the lack of indigenous knowledge to preserve their market dominance.

When considering the statutory insurance needs for space operations, the insurance market concentration becomes especially troublesome. A few insurers can effectively constrain market access for space projects if they are the only ones able to offer space-qualified coverage. Proactive competition policy action is necessary to provide sufficient market alternatives and stop unfair pricing practices.

2. ***Funding and Investment Pattern Analysis***

Funding for the space industry dropped 55% to $59.1 million in 2024, indicating structural market inefficiencies that need to be addressed by competition laws. This decrease occurred in spite of regulatory support, such as the ₹1,000 crore venture capital fund established under IN-SPACe, suggesting that the way the market is now set up may be inhibiting rather than encouraging competitive investment flows.

The majority of funding is still allocated to a small number of powerful companies. An

example of how established companies draw disproportionate resources while early-stage entrepreneurs find it difficult to obtain funding is Alphabet Inc.'s ₹307.08 crore investment in Pixxel. Over the last three years, Indian space entrepreneurs have collected ₹2,500 crore in total, but this money is spread over around 200 companies, suggesting notable disparities that could be a reflection of anti-competitive circumstances.

Government spending further complicates the competitive landscape. Between 2013–14 and 2025–26, budgetary allocations nearly quadrupled, from ₹5,615 crore to ₹13,416 crore. Even though this kind of public investment is necessary for sector growth, its concentration in state-affiliated organisations like NSIL runs the danger of distorting competition, especially because these organisations also participate in commercial markets. Reducing these biases is essential for market justice and overall economic growth, since it is projected that every dollar invested in the space economy yields $2.54 in economic returns.

V. Unique Challenges in Space Market Competition

A. Orbital Resources as Scarce Economic Assets

The limited supply of radio frequency spectrum and orbital slots limits space markets, in contrast to terrestrial markets. Traditional competition analysis must take into consideration the natural scarcities created by these resources, which are distributed through international coordinating procedures. Concentrating premium orbital positions among a few operators can create lasting competitive advantages that transcend traditional market power analysis[16]. The paper argues that competition law must evolve to recognize orbital resources as essential facilities that may require regulated access to ensure competitive market development. It may be anti-competitive behaviour that calls for regulatory action to hoard orbital slots or spectrum allocations without a commensurate operational deployment.

B. Network Effects and Constellation Economics

Strong network effects are seen in satellite constellations, where the more satellites and users there are, the more valuable the service becomes. These repercussions may lead to winner-take-all dynamics and rapid market consolidation. As an example of how network effects may swiftly establish market domination in space, consider Starlink's global dominance, which

[16] International Telecommunication Union, Radio Regulations (2023) art 22.

accounts for almost two-thirds of all operating satellites[17]. Indian competition policy must anticipate and address these network effects to prevent excessive market concentration. This may require proactive merger control, behavioral remedies for dominant operators, and policies to ensure interoperability and standardization that promote competitive alternatives.

C. Dual-Use Technology and National Security Considerations

Space technology frequently has both military and civilian uses, which puts national security goals and competition policy at odds. Certain deviations from the rules of pure competition may be justified by the necessity of preserving domestic capabilities in important space technologies; nevertheless, these deviations must be strictly limited to avoid misuse[18]. The study offers a framework for striking a balance between national security concerns and competition policy, with a focus on proportionality, openness, and regular reviews of security-based exemptions to stop their abuse for profit.

VI. International Precedents and Comparative Analysis

A. United States: Antitrust Enforcement in Space Markets

The US has started to investigate space markets under antitrust laws, focusing on issues with vertical integration and satellite constellation operators. Concerns over Starlink's market dominance and its effects on competition in satellite broadband services have been voiced by the FCC[19]. Increased standards for openness and the evaluation of structural solutions to encourage competition are the results of these worries.

The significance of proactive competition policy in quickly changing space industries is illustrated by the U.S. experience. It seems more beneficial to create competition-focused regulatory frameworks before market concentration solidifies rather than trying to correct dominance after it has been established.

B. European Union: Merger Control and Market Integration

The European Union has scrutinised deals involving satellite operators and aircraft manufacturers by applying competition law to mergers and acquisitions in the space industry. The EU's strategy places a strong emphasis on market integration and avoiding coordination

[17] SpaceX, Starlink Constellation Status (Press Release, November 2024).
[18] Ministry of Defense, Defence Space Strategy (2023) para 6.
[19] Federal Communications Commission, In the Matter of SpaceX, Inc (Docket No 21-330, 15 December 2024).

that might hurt member state competitiveness[20]. India may learn a lot from the EU's experience regulating satellite services, including the necessity of a coordinated approach to competition in linked areas and the significance of avoiding vertical foreclosure in integrated space value chains.

C. Lessons for India's Regulatory Development

Several fundamental ideas are suggested by international experience for the formulation of India's space competitiveness policy. First, proactive competition laws work better than ones that are enforced reactively. Second, specific analytical frameworks that take orbital resource limits and network effects into account are necessary due to the distinctive features of space markets. Third, in order to address the global character of space services and avoid regulatory arbitrage, international collaboration could be required.

VII. Proposed Framework for India's Space Antitrust Regulation

A. Definitional Reforms and Market Analysis

The study suggests changing the definitions of competition law to specifically meet the features of the space industry. The definition of the *"relevant market"* ought to take constellation coverage regions, orbital positions, and frequency distributions into account. Control over limited orbital resources and the network effects present in space services necessitate a revision of the *"dominant position"* paradigm.

B. Sectoral Competition Guidelines

Like the rules now in place for telecommunications and other regulated industries, India should create sectoral competition standards for space operations. These rules have to cover merger analysis in space markets, vertical integration issues, access to necessary facilities, and technology transfer agreements.

The guidelines should establish clear principles for evaluating anti-competitive behaviour in space markets, including predatory pricing by subsidized entities, discriminatory access to facilities, and bundling of services across the space value chain[21].

[20] European Commission, Case M.10124 Airbus/OneWeb (18 June 2025).
[21] Competition Commission of India, Diagnostic Toolkit for Public Procurement (2024) 16.

C. Institutional Coordination Framework

Effective competition regulation in space needs collaboration between the CCI, IN-SPACe, and other relevant regulatory authorities. In order to incorporate competitive concerns into the formulation of space policy and regulatory decision-making, the article suggests a formal coordination structure.

In order to avoid regulatory conflicts and guarantee consistent policy development across competition and sector-specific regulation, this coordination should involve shared analytical frameworks, frequent consultation procedures, and cooperative guidelines.

D. International Cooperation and Harmonization

India's competition policy has to be formulated in collaboration with its foreign equivalents, considering the worldwide scope of space services. This involves signing bilateral cooperation agreements with key space powers, participating in international forums addressing space competition challenges, and standardising competition analysis techniques for international space markets.

VIII. Implementation Strategy and Policy Recommendations

A. Phase-wise Implementation Approach

The suggested framework needs to be put into effect gradually, starting with urgent regulatory clarifications and working its way up to extensive legislative changes. Phase I should create interim rules and explain how current competition legislation applies to space operations. Comprehensive sectoral guidelines and institutional coordination mechanisms have to be a part of Phase II. International harmonisation initiatives and legislative revisions should be the focus of Phase III.

B. Capacity Building and Expertise Development

It takes specific knowledge that blends knowledge of competition law with an awareness of space technology and markets to effectively regulate competition in space. In order to obtain the requisite knowledge, the CCI should collaborate with technical institutes[22] and build its own internal capacity for space market analysis.

[22] NALSAR University, Space Law and Policy Centre Annual Report 2024.

This capacity building should include training programs for competition authority staff, engagement with international space competition experts, and development of analytical tools designed explicitly for space market assessment.

C. Market Monitoring and Early Warning Systems

Establishing market monitoring systems that keep tabs on price patterns, competitive dynamics, and concentration levels in important space market sectors is advised by the report. Before markets become overly consolidated, these technologies should allow for proactive regulatory action and early warning of any competition issues.

IX. Conclusion: Charting the Course for Competitive Space Markets

Significant regulatory obstacles as well as previously unheard-of opportunities are presented by India's space sector revolution. The commercialisation of space operations has produced markets with distinct features that put pressure on established frameworks for competition law. The central thesis of this paper, that India's antitrust framework requires substantial adaptation for space markets, finds strong support in the analysis of current market dynamics, legal frameworks, and international precedents.

The proposed framework addresses these challenges through definitional reforms, sectoral guidelines, institutional coordination, and international cooperation. The understanding that space markets may rapidly become concentrated owing to network effects, resource limitations, and high hurdles to entry is reflected in the emphasis on proactive competition regulation.

In the end, sustaining competitive market conditions that promote creativity, effectiveness, and customer welfare is essential to India's space commercialisation success. Competition law must evolve to meet this challenge, ensuring that the benefits of space technology development are shared broadly rather than concentrated among a few dominant players. The framework proposed in this paper provides a roadmap for this evolution, balancing the need for competitive markets with recognition of the unique characteristics of space activities. Implementing this framework will require commitment from policymakers, regulators, and industry stakeholders to ensure that India's space sector is developing in a manner that maximizes economic benefits while maintaining fair competition.

To guarantee that the last frontier is still accessible for the competitive industry, India's competition legislation must also go beyond conventional constraints as it pursues its space

goals beyond earthly bounds. For India to become a major space power in the twenty-first century, it is both strategically and legally necessary to create a strong antitrust framework for space operations.[23] The intersection of antitrust law and space commerce represents uncharted regulatory territory that demands innovative approaches, specialized expertise, and international cooperation. Since other countries look to India's experience in striking a balance between commercial development and competitive market principles in the space sector, the country's answer to this problem will have a significant impact on the growth of space markets both domestically and internationally.

[23] NITI Aayog, Strategy for New India@75: Space Sector (2025) 42–43.