INNOVATION, PROTECTION, AND PROSPERITY: A LEGAL-EMPIRICAL ANALYSIS OF INTELLECTUAL PROPERTY RIGHTS IN INDIA

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ABSTRACT

This paper examines the relationship between intellectual property rights protection and economic growth in India through a combined doctrinal and empirical lens. Since India's accession to the World Trade Organisation and its consequent obligations under the Agreement on Trade-Related Aspects of Intellectual Property Rights, the country has undertaken substantial legislative reform of its patent, copyright, trademark, design, and geographical indication regimes. The paper traces this legal evolution and evaluates whether stronger protection has translated into measurable economic gains, including increased patent filings, foreign direct investment, research and development expenditure, and improved innovation rankings. Drawing on data published by the World Intellectual Property Organisation, the Department for Promotion of Industry and Internal Trade, and the Global Innovation Index consortium, the study finds a discernible, though conditional and sector-specific, positive association between the strengthening of India's intellectual property framework and indicators of innovation-led growth, particularly within the pharmaceutical, information technology, and agricultural sectors. The paper further analyses landmark judicial decisions, including *Novartis AG v. Union of India* and the compulsory licensing dispute between Bayer Corporation and Natco Pharma, to illustrate how Indian courts have balanced patent protection against public health considerations. Real corporate experiences of Cipla, Bajaj Auto, Infosys, and the geographical indication disputes over Darjeeling tea and basmati rice ground the analysis in commercial practice. The paper concludes that the growth dividend of intellectual property reform, while genuine, remains contingent on complementary investment in research infrastructure, judicial capacity, and enforcement mechanisms.

Keywords: *Intellectual Property Rights; Economic Growth; Patents Act 1970; TRIPS Agreement; Innovation; Compulsory Licensing; India*

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I. INTRODUCTION

Intellectual property rights occupy an increasingly central place in the architecture of modern economic policy. Once treated as a peripheral concern of private law, patents, copyrights, trademarks, and allied rights are now widely regarded as instruments of industrial strategy capable of shaping a nation's competitiveness, its capacity to attract investment, and its position within global value chains.[2] For a developing economy such as India, the manner in which intellectual property protection interacts with economic growth carries particular significance, since the country has historically had to reconcile two competing imperatives: the promotion of innovation and technology transfer on the one hand, and the preservation of affordable access to essential goods, particularly medicines, seeds, and agricultural inputs, on the other.[3]

India's relationship with intellectual property law has undergone a profound transformation over the past three decades. The Patents Act, 1970, in its original form, was deliberately calibrated to favour a domestic generic pharmaceutical and chemical industry by excluding product patents in these sectors and permitting only process patents.[4] This design choice, often credited with enabling India to be described informally as the pharmacy of the developing world, sat in considerable tension with the intellectual property standards subsequently codified in the Agreement on Trade-Related Aspects of Intellectual Property Rights, which India undertook to implement following its membership of the World Trade Organisation in 1995.[5] The Patents (Amendment) Act, 2005, which reintroduced product patent protection for pharmaceuticals, agrochemicals, and food articles, marked the culmination of a decade-long transitional period and represents perhaps the single most consequential legislative change in the field.[6]

[2]Kenneth J. Arrow, Economic Welfare and the Allocation of Resources for Invention, in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609, 614-17 (Nat'l Bureau of Econ. Research ed., 1962).

[3]Carlos M. Correa, INTELLECTUAL PROPERTY RIGHTS, THE WTO AND DEVELOPING COUNTRIES: THE TRIPS AGREEMENT AND POLICY OPTIONS 3-9 (2000).

[4]The Patents Act, No. 39 of 1970, INDIA CODE § 5 (1970) (as originally enacted, repealed by the Patents (Amendment) Act, No. 15 of 2005).

[5]Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299 [hereinafter TRIPS Agreement].

[6]The Patents (Amendment) Act, No. 15 of 2005, INDIA CODE.

Against this backdrop, scholars and policymakers continue to debate whether the strengthening of intellectual property protection in India has generated the economic dividends anticipated by proponents of the TRIPS framework, or whether it has instead imposed costs on domestic industry and on public welfare that outweigh any corresponding gains in innovation.[7] This paper situates itself within that debate without claiming to resolve it definitively. It proceeds on the premise that the relationship between intellectual property protection and economic growth is neither linear nor uniform across sectors, but is instead mediated by a range of institutional, legal, and market-specific factors that warrant careful doctrinal and empirical examination rather than abstract generalisation.

The paper makes three principal contributions. First, it provides a structured account of the evolution of India's intellectual property legal framework, situating each statutory and judicial development within its broader economic context. Second, it examines available macroeconomic and innovation indicators, including patent filing trends, research and development expenditure, foreign direct investment inflows, and India's standing in the Global Innovation Index, in order to assess whether discernible correlations exist between intellectual property reform and growth-related outcomes. Third, it draws upon real corporate experiences from the pharmaceutical, automobile, information technology, and agricultural sectors, together with leading judicial precedents, to illustrate how the abstract legal architecture of intellectual property operates in commercial practice.

The remainder of the paper proceeds as follows. Part II reviews the existing literature on the intellectual property and growth relationship, with particular attention to studies conducted in the Indian context. Part III traces the legal evolution of India's intellectual property regime. Part IV develops the theoretical channels through which intellectual property protection is thought to influence growth. Part V undertakes an empirical assessment of available indicators. Part VI presents sectoral and corporate case studies. Part VII identifies the principal challenges confronting India's intellectual property regime, and Part VIII offers policy recommendations before the paper concludes in Part IX.

[7]SUDIP CHAUDHURI, THE WTO AND INDIA'S PHARMACEUTICALS INDUSTRY: PATENT PROTECTION, TRIPS AND DEVELOPING COUNTRIES 11-34 (2005).

II. REVIEW OF LITERATURE

The economic case for intellectual property protection traces its lineage to the foundational law and economics literature, which conceptualised patents and copyrights as a response to the market failure inherent in the production of knowledge goods that are non-rival and only partially excludable.[8] An innovator who internalizes the entire cost of research and development risks being unable to recoup that investment if imitators can replicate and commercialize the resulting product at marginal cost. Granting time-limited exclusivity is accordingly presented as a second-best solution that trades a static welfare loss attributable to monopoly pricing against a dynamic welfare gain attributable to continued innovation.[9]

Building on this theoretical foundation, an extensive empirical literature has sought to determine whether stronger intellectual property protection is, in practice, associated with higher rates of innovation, trade, and growth, particularly in developing economies. Keith Maskus surveyed cross-country evidence and concluded that the relationship between intellectual property strength and growth is conditional on a country's absorptive capacity, that is, its existing stock of human capital, scientific infrastructure, and competitive markets, rather than being automatic or universal.[10] Walter Park's widely cited patent rights index, which scores national patent regimes on criteria such as coverage, membership in international treaties, duration, and enforcement, has been used in numerous panel studies to show that stronger patent protection correlates positively with growth and inward technology transfer in middle-income and emerging economies, but shows weak or statistically insignificant effects in the least developed countries that lack complementary manufacturing and research capacity.[11]

A parallel strand of scholarship has questioned whether the harmonised, high-standard intellectual property regime embedded in TRIPS is appropriate for countries at India's stage of development. Drawing on the historical experience of presently industrialised nations, several of which relied on weak patent protection and extensive

[8]Arrow, *supra* note 1, at 616-19.
[9]William D. Nordhaus, INVENTION, GROWTH, AND WELFARE: A THEORETICAL TREATMENT OF TECHNOLOGICAL CHANGE 76-90 (1969).
[10]Keith E. Maskus, INTELLECTUAL PROPERTY RIGHTS IN THE GLOBAL ECONOMY 89-138 (2000).
[11]Walter G. Park, International Patent Protection: 1960-2005, 37 RES. POL'Y 761, 766-74 (2008).

imitation during their own early industrialisation, critics have argued that TRIPS-mandated standards risk closing off a development pathway that wealthier nations themselves once used.[12] In the Indian context, Sudip Chaudhuri's detailed study of the pharmaceutical sector found that the reintroduction of product patents under the 2005 Amendment Act raised the prices of several patented medicines and altered the competitive dynamics between multinational originator firms and domestic generic manufacturers, even as it brought India into closer conformity with its international treaty obligations.[13]

Government and inter-governmental bodies have, by contrast, generally emphasised the prospective growth benefits of a robust intellectual property regime. The National Intellectual Property Rights Policy, adopted by the Department for Promotion of Industry and Internal Trade in 2016, explicitly frames intellectual property as an instrument for converting "creativity and innovative ability into tangible economic outcomes" and links the strengthening of enforcement and awareness mechanisms to long-term competitiveness.[14] Reports published by the World Intellectual Property Organisation similarly treat patent and trademark filing activity as a leading indicator of an economy's innovative capacity and have documented India's improving performance on this metric over the past decade.[15]

Domestic empirical work has reached broadly similar conclusions regarding the conditional nature of the relationship. Studies examining the post-2005 period have generally found a positive association between patent intensity and firm-level research investment among large, listed pharmaceutical and engineering companies, but have found little corresponding effect among small and medium enterprises, which continue to rely predominantly on informal, non-patent mechanisms such as lead-time advantage, brand reputation, and client relationships to protect their innovations.[16] This firm-size disparity is significant because it suggests that the aggregate, economy-wide indicators discussed in Part V may mask considerable

[12]Ha-Joon Chang, Intellectual Property Rights and Economic Development: Historical Lessons and Emerging Issues, 2 J. HUM. DEV. 287, 290-305 (2001).
[13]Chaudhuri, *supra* note 6, at 211-40.
[14]DEP'T FOR PROMOTION OF INDUS. & INTERNAL TRADE, MINISTRY OF COMMERCE & INDUS., NATIONAL INTELLECTUAL PROPERTY RIGHTS POLICY 1-4 (2016).
[15]WORLD INTELL. PROP. ORG., WORLD INTELLECTUAL PROPERTY INDICATORS 2024, at 19-27 (2024).
[16]NAT'L COUNCIL OF APPLIED ECON. RESEARCH, INTELLECTUAL PROPERTY AND INNOVATION IN INDIAN INDUSTRY: A FIRM-LEVEL ASSESSMENT 14-29 (2019).

heterogeneity in how the benefits of intellectual property reform are actually distributed across the Indian industrial landscape.

What emerges from this body of scholarship is not a settled consensus but a layered and conditional understanding: intellectual property protection can support growth, but the strength of that support depends heavily on complementary institutional factors, sectoral characteristics, firm size, and the manner in which flexibilities permitted under international law are exercised domestically. The present paper builds on this literature by combining a doctrinal account of India's post-TRIPS legal evolution with an examination of recent empirical indicators and sector-specific corporate experience, an integration that much of the existing literature, written either as pure law or pure economics, has not fully undertaken.

III. Evolution of the Legal Framework for Intellectual Property Rights in India

A. Colonial Origins and the Pre-1970 Patent Regime

India's modern intellectual property law has its origins in colonial era statutes, beginning with the Patents and Designs Protection Act of 1872 and culminating in the Indian Patents and Designs Act, 1911, both of which were modelled closely on English law and offered relatively strong, unrestricted product patent protection.[17] In the years following independence, a widely shared concern emerged that this colonial-era framework, by permitting strong product patents over medicines and chemicals without any corresponding domestic manufacturing capability, had entrenched the dominance of foreign multinational pharmaceutical companies in the Indian market while leaving essential drugs unaffordably priced for the domestic population.[18] This concern formed the basis of the Ayyangar Committee Report of 1959, which recommended a fundamental restructuring of Indian patent law to exclude product patents for substances intended for use as food, medicine, or drugs, while continuing to permit process patents in these fields.[19]

[17]V.K. AHUJA, LAW RELATING TO INTELLECTUAL PROPERTY RIGHTS 45-49 (3d ed. 2017).
[18]Justice N. Rajagopala Ayyangar, REPORT ON THE REVISION OF THE PATENTS LAW 1-21 (Gov't of India 1959).
[19]Ayyangar, *supra* note 17, at 17-19.

B. The Patents Act, 1970: A Development-Oriented Framework

The recommendations of the Ayyangar Committee were substantially translated into law through the Patents Act, 1970, which came into force in 1972 and replaced the 1911 statute in its entirety.[20] The 1970 Act excluded product patents for pharmaceuticals, agrochemicals, and food, restricted patent terms for process patents in these fields to seven years from the date of filing, or five years from the date of sealing, whichever was shorter, and incorporated broad compulsory licensing provisions intended to ensure that patented inventions were worked within India and made available to the public on reasonable terms.[21] The economic consequences of this framework were significant: freed from the constraint of product patents, Indian pharmaceutical companies such as Cipla, Ranbaxy, and Dr. Reddy's Laboratories developed substantial reverse-engineering and process innovation capabilities, enabling India to emerge as one of the world's largest suppliers of low-cost generic medicines by the early 2000s.[22]

C. TRIPS Accession and the Transitional Period

India's accession to the World Trade Organisation in 1995 brought it within the scope of the TRIPS Agreement, which mandates, among other things, the availability of patents for any invention in all fields of technology, including pharmaceutical products, subject to limited exceptions, and a minimum patent term of twenty years.[23] As a developing country, India was entitled to a transitional period until 1 January 2005 before it was required to extend product patent protection to pharmaceuticals and agrochemicals.[24] During this transitional period, India introduced a mailbox mechanism under which applications for product patents in these fields could be filed and held in abeyance pending the expiry of the transition, together with a system of exclusive marketing rights that offered limited, time-bound market exclusivity to mailbox applicants whose products had already received marketing approval in another WTO member state.[25]

[20]The Patents Act, No. 39 of 1970, INDIA CODE (1970).
[21]The Patents Act, No. 39 of 1970, INDIA CODE §§ 53, 84-92 (1970) (as originally enacted).
[22]Chaudhuri, *supra* note 6, at 45-78.
[23]TRIPS Agreement, *supra* note 4, art. 27, 33.
[24]TRIPS Agreement, *supra* note 4, art. 65(4).
[25]The Patents (Amendment) Act, No. 17 of 1999, INDIA CODE §§ 5, 24A-24F.

D. The Patents (Amendment) Act, 2005 and Section 3(d)

The Patents (Amendment) Act, 2005 brought India into full compliance with TRIPS by reintroducing product patents across all fields of technology, including pharmaceuticals, food, and agrochemicals.[26] At the same time, Parliament inserted, and subsequently strengthened, Section 3(d) of the Patents Act, which excludes from patentability the mere discovery of a new form of a known substance that does not result in enhanced efficacy, as well as the mere discovery of a new property or new use of a known substance.[27] This provision was designed to prevent what is commonly termed patent evergreening, the practice of seeking successive, incremental patents on minor variations of an already known compound in order to extend market exclusivity beyond the original twenty-year term.[28] The Supreme Court's interpretation of Section 3(d) in *Novartis AG v. Union of India*, discussed further in Part VI, has become one of the most significant judicial pronouncements on the balance between patent protection and public health anywhere in the developing world.[29]

E. Copyright, Trademark, and Design Protection

India's copyright regime is governed by the Copyright Act, 1957, which has been amended on several occasions, most significantly in 1994, 1999, and 2012, to extend protection to computer programs and databases, to bring the statute into closer alignment with the WIPO Copyright Treaty and WIPO Performances and Phonograms Treaty, and to strengthen the rights of authors, performers, and persons with disabilities through statutory licensing provisions for accessible formats.[30] The Supreme Court's early decision in *Indian Performing Right Society Ltd. v. Eastern Indian Motion Pictures Association* remains a foundational authority on the relationship between copyright in underlying musical works and the rights of film producers who commission such works.[31]

Trademark protection is governed by the Trade Marks Act, 1999, which replaced the earlier 1958 statute and introduced registration of service marks, recognition of well-

[26]The Patents (Amendment) Act, *supra* note 5, § 4.
[27]The Patents Act, No. 39 of 1970, INDIA CODE § 3(d) (as amended by Act No. 15 of 2005).
[28]Feroz Ali Khader, THE LAW OF PATENTS: WITH A SPECIAL FOCUS ON PHARMACEUTICALS IN INDIA 211-29 (2d ed. 2016).
[29]Novartis AG v. Union of India, (2013) 6 S.C.C. 1 (India).
[30]The Copyright Act, No. 14 of 1957, INDIA CODE (as amended by Act No. 27 of 2012).
[31]Indian Performing Right Soc'y Ltd. v. E. Indian Motion Pictures Ass'n, (1977) 2 S.C.C. 820 (India).

known marks, and a simplified and more transparent registration procedure.[32] Indian courts have, in parallel, developed a robust common law of passing off that operates independently of registration and has proved especially significant for protecting trans-border reputation, as illustrated in *N.R. Dongre v. Whirlpool Corp.*, and for assessing the likelihood of confusion between pharmaceutical trademarks, as illustrated in *Cadila Health Care Ltd. v. Cadila Pharmaceuticals Ltd.*, both discussed further in Part VI.[33] Industrial designs, meanwhile, are protected under the Designs Act, 2000, which grants exclusive rights over the visual appearance of an article for a renewable term and has assumed growing commercial importance in sectors such as automobiles, consumer electronics, and packaged consumer goods.[34]

F. Geographical Indications and Plant Variety Protection

India enacted the Geographical Indications of Goods (Registration and Protection) Act in 1999 in direct response to international controversies over the appropriation of Indian product names, most notably the 1997 patent granted in the United States to RiceTec Inc. over certain rice lines and grains described using the term basmati, which provoked a sustained diplomatic and legal challenge from the Indian government.[35] Darjeeling tea became India's first registered geographical indication in 2004, and the country has since registered geographical indications for products ranging from Mysore silk to the Tirupati laddu, a development discussed further in Part VI in connection with rural economic impact.[36] Separately, the Protection of Plant Varieties and Farmers' Rights Act, 2001 provides a sui generis form of intellectual property protection for new plant varieties, fulfilling India's obligation under Article 27.3(b) of TRIPS while explicitly preserving farmers' traditional rights to save, use, exchange, and sell seeds.[37]

[32]The Trade Marks Act, No. 47 of 1999, INDIA CODE.
[33]N.R. Dongre v. Whirlpool Corp., (1996) 5 S.C.C. 714 (India); Cadila Health Care Ltd. v. Cadila Pharm. Ltd., (2001) 5 S.C.C. 73 (India).
[34]The Designs Act, No. 16 of 2000, INDIA CODE.
[35]The Geographical Indications of Goods (Registration and Protection) Act, No. 48 of 1999, INDIA CODE; see also Shamnad Basheer & Prashant Reddy, The "Experimental Use" Exception Through a Few Indian Lenses, 1 NUJS L. REV. 91, 96 n.14 (2008) (discussing the RiceTec basmati controversy).
[36]Geographical Indications Registry, Government of India, Annual Report on Registered Geographical Indications (2023).
[37]The Protection of Plant Varieties and Farmers' Rights Act, No. 53 of 2001, INDIA CODE §§ 28, 39.

G. THE NATIONAL INTELLECTUAL PROPERTY RIGHTS POLICY, 2016

In 2016, the Government of India adopted its first comprehensive National Intellectual Property Rights Policy, which articulates seven objectives spanning awareness creation, the generation of intellectual property assets, a modernised legal and legislative framework, improved administration and management, commercialisation, enforcement and adjudication, and human capacity building.[38] The Policy designated the Department for Promotion of Industry and Internal Trade as the nodal agency for intellectual property matters and led to the creation of the Cell for IPR Promotion and Management, which has since administered fee rebates and expedited examination schemes for start-ups and small enterprises.[39] The cumulative effect of this legislative and institutional evolution, traced across statutes spanning more than half a century, provides the doctrinal foundation against which the empirical indicators discussed in Part V must be assessed.

IV. THEORETICAL LINKAGES BETWEEN INTELLECTUAL PROPERTY RIGHTS AND ECONOMIC GROWTH

The theoretical case linking intellectual property protection to economic growth rests on several distinct, though related, causal channels. The first and most direct channel operates through innovation incentives. Within the Schumpeterian tradition of growth theory, sustained productivity growth is driven by a continuous process of creative destruction in which new products and processes displace existing ones, and firms are willing to undertake the risk and expense of innovation only where they can expect to capture a sufficient share of the resulting returns.[40] Patent protection, by conferring temporary exclusivity, is theorised to raise the expected private return on research and development and thereby to increase the aggregate rate of innovation.

A second channel operates through foreign direct investment and technology transfer. Multinational firms are, on this account, more willing to establish local manufacturing, research, or licensing operations in a host country, and to transfer more sophisticated technology to such operations, where they have credible assurance that their

[38]NATIONAL INTELLECTUAL PROPERTY RIGHTS POLICY, *supra* note 13, at 5-8.
[39]Cell for IPR Promotion and Management, About CIPAM, Dep't for Promotion of Indus. & Internal Trade, Ministry of Commerce & Indus. (2023).
[40]Philippe Aghion & Peter Howitt, A Model of Growth Through Creative Destruction, 60 ECONOMETRICA 323, 324-30 (1992).

proprietary processes and products will not be appropriated by local competitors.[41] A third channel concerns international trade: stronger intellectual property protection can increase a country's attractiveness as an export destination for technologically sophisticated and brand-sensitive goods, since exporters of such goods are otherwise reluctant to enter markets where their products face a high risk of imitation or counterfeiting.[42]

These channels are counterbalanced by equally well-established theoretical concerns. Strong patent protection confers market power, and the resulting monopoly pricing can impose a static welfare loss, particularly in markets for essential goods such as medicines, where demand is relatively inelastic and the affected population may include a large proportion of low-income consumers.[43] Moreover, the benefit of stronger intellectual property protection to a host economy depends critically on that economy's absorptive capacity, meaning its existing stock of skilled labour, scientific institutions, and competitive domestic firms capable of building upon, rather than being permanently excluded from, newly protected technologies.[44] Where absorptive capacity is weak, stronger protection may do little more than transfer rents to foreign patent holders without generating commensurate local innovation or learning.

For India, these competing channels are not merely abstract possibilities but have played out concretely across different sectors. The information technology and software services sector, characterised by a large pool of technically skilled labour, a globally export-oriented business model, and significant reliance on trade secret and copyright rather than patent protection, has been comparatively well positioned to benefit from the foreign direct investment and trade channels described above. The pharmaceutical sector, by contrast, has experienced both channels simultaneously: stronger patent protection has attracted increased investment in patented, high-value drug development and clinical research by multinational firms, while simultaneously constraining the traditional reverse-engineering and process-innovation business model that allowed Indian generic manufacturers to expand domestically and

[41] Edwin Mansfield, Intellectual Property Protection, Foreign Direct Investment, and Technology Transfer, INT'L FIN. CORP. DISCUSSION PAPER NO. 19, at 1-15 (1994).
[42] Maskus, *supra* note 9, at 109-22.
[43] Arrow, *supra* note 1, at 619-22.
[44] Park, *supra* note 10, at 770-73.

internationally during the pre-2005 period.[45] This sector-specific divergence underscores the conditional, rather than uniform, nature of the intellectual property and growth relationship and motivates the empirical and case-study analysis that follows.

V. EMPIRICAL ANALYSIS: INTELLECTUAL PROPERTY INDICATORS AND ECONOMIC PERFORMANCE IN INDIA

This Part adopts a descriptive empirical approach, examining publicly available indicators published by the World Intellectual Property Organisation, the Department for Promotion of Industry and Internal Trade, and the Global Innovation Index consortium, in order to assess whether observable trends are consistent with the theoretical channels identified in Part IV. The analysis is necessarily correlational rather than causal, given the absence of a controlled counterfactual and the presence of numerous confounding macroeconomic variables, including trade liberalisation, digital infrastructure expansion, and demographic change, that have occurred concurrently with intellectual property reform. The indicators are nonetheless instructive, both individually and in combination.

A. PATENT FILING AND GRANT TRENDS

According to the World Intellectual Property Organisation's World Intellectual Property Indicators 2024 report, India ranked sixth globally in patent applications in 2023, with 64,480 applications filed by applicants of Indian origin worldwide, representing the fastest year-on-year growth, at 15.7 per cent, among the top twenty filing origins and marking the fifth consecutive year of double-digit growth.[46] For the first time, resident applicants accounted for more than half, at 55.2 per cent, of patent applications received by the Indian Patent Office, a milestone that the Office itself has highlighted as evidence of a maturing domestic innovation base rather than one driven primarily by foreign filers.[47] The pace of growth accelerated further in 2024, with patent applications by India-based applicants rising by 19.2 per cent, marking six

[45]Chaudhuri, *supra* note 6, at 134-67.
[46]WORLD INTELL. PROP. ORG., *supra* note 14, at 21-24.
[47]WORLD INTELL. PROP. ORG., *supra* note 14, at 24-25.

consecutive years of double-digit growth.[48] On the grant side, the Indian Patent Office granted 76,053 patents in 2023, an increase of 149.4 per cent over the preceding year, reflecting both increased examiner capacity and a deliberate institutional effort to clear a substantial backlog of pending applications.[49]

B. India's Position in the Global Innovation Index

India's ranking in the Global Innovation Index, jointly published by Cornell University, INSEAD, and the World Intellectual Property Organisation, has improved markedly over the past decade, rising from 81st position among the economies surveyed in 2015 to 48th in 2020, 40th in both 2022 and 2023, 39th in 2024, and 38th in 2025.[50] India has, for fifteen consecutive years, been classified as an innovation overperformer, meaning that its innovation output exceeds what would ordinarily be predicted from its level of economic development, and it currently ranks first among lower-middle-income economies and within the Central and Southern Asian region.[51] Notably, India's strongest sub-component performance is in Knowledge and Technology Outputs, where it ranks twenty-second globally, while its weakest performance is in Business Sophistication and Infrastructure, where it ranks sixty-fourth and sixty-first respectively, indicating that gains in output-side innovation indicators have outpaced corresponding gains in the underlying institutional and infrastructural inputs.[52]

C. Research and Development Expenditure

Despite these gains in patent filings and innovation rankings, India's gross expenditure on research and development remains comparatively low as a proportion of national income, standing at approximately 0.65 per cent of gross domestic product, well below comparator economies such as China, at 2.43 per cent, South Korea, at 2.5 per cent, and Brazil, at 1.15 per cent.[53] This divergence between a rapidly improving innovation output ranking and a comparatively static research investment base

[48]World Intell. Prop. Org., IP Facts and Figures: Patents, https://www.wipo.int/en/ipfactsandfigures/patents (2025).
[49]WORLD INTELL. PROP. ORG., *supra* note 14, at 26.
[50]WORLD INTELL. PROP. ORG., GLOBAL INNOVATION INDEX 2025: INDIA COUNTRY PROFILE 1-2 (2025).
[51]WORLD INTELL. PROP. ORG., *supra* note 49, at 1.
[52]WORLD INTELL. PROP. ORG., *supra* note 49, at 2.
[53]WORLD INTELL. PROP. ORG., *supra* note 49, at 2.

suggests that India's recent gains may be attributable in significant part to a more efficient conversion of existing scientific and engineering talent into filed applications, supported by deliberate institutional reforms such as fee rebates and expedited examination for start-ups, rather than to a commensurate expansion in the underlying resource base devoted to research.

D. Foreign Direct Investment Trends

Foreign direct investment inflows into India have grown substantially over the period coinciding with intellectual property reform, rising from approximately 36.05 billion United States dollars in the 2013-14 financial year to a provisional 81.04 billion United States dollars in 2024-25, an increase of 14 per cent over the preceding year alone.[54] The computer software and hardware sector has consistently ranked among the top two or three sectoral recipients of foreign direct investment equity throughout this period, attracting sixteen per cent of total inflows in 2024-25 alone, a pattern broadly consistent with the theoretical expectation that technologically sophisticated, intellectual-property-intensive sectors respond favourably to a strengthened domestic protection regime.[55] It would, however, be analytically unsound to attribute this growth in foreign direct investment solely, or even primarily, to intellectual property reform, given the concurrent liberalisation of sectoral foreign investment caps, the Make in India and Production Linked Incentive manufacturing initiatives, and broader improvements in India's ease of doing business rankings over the same period.[56]

A further indicator of the deepening relationship between intellectual property activity and economic output is the patent-to-GDP ratio tracked by the World Intellectual Property Organisation, which measures patent filing intensity relative to the size of the underlying economy. For India, this ratio rose sharply from 144 in 2013 to 381 in 2023, more than doubling over the decade and indicating that patent filing activity has grown considerably faster than nominal economic output itself over this period.[57] While such a ratio cannot, on its own, establish a causal contribution of patenting activity to

[54]Press Information Bureau, Government of India, India Records USD 81.04 Billion FDI Inflow in FY 2024-25 (May 2025); Dep't for Promotion of Indus. & Internal Trade, FDI Statistics (2025).
[55]Press Information Bureau, *supra* note 53.
[56]Maskus, *supra* note 9, at 115-19 (cautioning against attributing investment growth to intellectual property reform in isolation from broader liberalisation).
[57]WORLD INTELL. PROP. ORG., *supra* note 14, at 27.

growth, its sharp upward trajectory across a decade that also saw the full implementation of TRIPS-compliant product patent protection and the adoption of the National Intellectual Property Rights Policy is consistent with the broader narrative of an increasingly innovation-intensive economy.

E. Synthesising the Empirical Picture

Taken together, these indicators present a picture of qualified, sector-differentiated correlation rather than uniform causation. The period following the 2005 Amendment Act and, more particularly, the period following the adoption of the National Intellectual Property Rights Policy in 2016, has coincided with accelerating patent filing growth, an improving Global Innovation Index ranking, and rising foreign direct investment, particularly in technology-intensive sectors. At the same time, India's research and development intensity remains low relative to peer economies, and a meaningful share of the improvement in innovation rankings is attributable to output-side metrics rather than to underlying input-side investment, suggesting that the growth dividend of intellectual property reform, while real, has not yet been matched by an equivalent transformation of India's research infrastructure. This nuanced finding is consistent with the conditional theoretical account developed in Part IV and is further illustrated by the sector and corporate level evidence presented in Part VI.

VI. Sectoral and Corporate Case Studies

This Part examines how the legal framework described in Part III and the trends identified in Part V have manifested in specific sectors and disputes, drawing on real corporate experiences to ground the analysis in commercial practice.

A. Pharmaceuticals: Patent Protection, Public Health, and Compulsory Licensing

The pharmaceutical sector provides the clearest illustration of the tension between patent protection and public welfare that has shaped India's intellectual property jurisprudence. In *Novartis AG v. Union of India*, the Supreme Court rejected an application by Novartis for a patent over the beta crystalline form of imatinib mesylate, marketed as Glivec, a drug used in the treatment of chronic myeloid leukaemia, holding that the modified form did not demonstrate the enhanced therapeutic efficacy

required by Section 3(d) of the Patents Act and therefore amounted to an unpatentable new form of a known substance.[58] The decision was widely reported internationally as a victory for access to medicines and for domestic generic manufacturers, who were able to continue producing and exporting low-cost versions of the drug, while Novartis maintained that the ruling discouraged incremental pharmaceutical innovation.[59]

A related episode concerns India's compulsory licensing framework under Section 84 of the Patents Act, which permits any interested person to apply for a compulsory licence three years after the grant of a patent if the reasonable requirements of the public have not been satisfied, the patented invention is not available to the public at a reasonably affordable price, or the patented invention is not worked in India.[60] In March 2012, the Controller of Patents granted India's first compulsory licence under this provision to Natco Pharma Limited in respect of Bayer Corporation's patent over sorafenib tosylate, marketed as Nexavar, a drug used in the treatment of liver and kidney cancer, on the ground that Bayer had failed to make the drug available at a reasonably affordable price and had not adequately worked the patented invention within India.[61] The grant was subsequently upheld by the Intellectual Property Appellate Board and by the Bombay High Court, establishing an important, if cautiously exercised, precedent for the use of compulsory licensing as a public health safeguard within India's patent regime.[62] Cipla Limited's longstanding role in manufacturing low-cost antiretroviral combination therapies for HIV and AIDS treatment, both for the domestic market and for export to other developing countries, similarly illustrates how India's pre-2005 process-patent regime and its continuing use of TRIPS-compliant flexibilities have shaped global access to essential medicines well beyond India's own borders.[63]

Indian generic manufacturers have also engaged actively with intellectual property systems outside India in pursuit of growth in export markets, most notably through Paragraph IV patent challenges before United States courts and regulatory authorities, a mechanism under which a generic applicant may seek approval to market a drug

[58]Novartis, *supra* note 28, at 51-65.
[59]Feroz Ali Khader, *supra* note 27, at 233-51.
[60]The Patents Act, No. 39 of 1970, INDIA CODE § 84 (as amended).
[61]Bayer Corp. v. Natco Pharma Ltd., Compulsory Licence Application No. 1 of 2011 (Controller of Patents, India, Mar. 9, 2012).
[62]Bayer Corp. v. Union of India, (2014) 60 P.T.C. 277 (Bom.) (India).
[63]Chaudhuri, *supra* note 6, at 256-79.

before the expiry of an originator's patent by certifying that the patent is invalid or will not be infringed.[64] Companies including Dr. Reddy's Laboratories and Ranbaxy Laboratories pursued such challenges against patents held by major originator companies on widely prescribed medicines, securing periods of market exclusivity for the first successful generic challenger and, in the process, building substantial international litigation and regulatory affairs capability that has since become a competitive asset for the Indian pharmaceutical industry in its own right.[65]

B. Automobiles: Patent Litigation and Domestic Innovation

The automobile sector offers a useful counterpoint, illustrating patent litigation between two large domestic manufacturers rather than between a multinational originator and a generic competitor. In *Bajaj Auto Ltd. v. TVS Motor Co. Ltd.*, Bajaj Auto alleged that TVS Motor's Flame motorcycle infringed its patent over digital twin spark ignition technology, a fuel-efficiency innovation that Bajaj had developed and patented for use in its own motorcycles.[66] The Supreme Court, while ultimately remitting aspects of the dispute for trial, used the occasion to lay down detailed guidelines for the expeditious disposal of patent infringement suits, recognising the commercial urgency of resolving technology disputes between competing manufacturers in a fast-moving consumer market.[67] The episode is illustrative of a broader pattern in which Indian engineering and automotive companies, having built substantial in-house research and development capability, increasingly rely on patent protection to defend competitive advantage against domestic rivals, a marked shift from the historical pattern in which patent litigation in India was associated almost exclusively with foreign pharmaceutical originators.

C. Information Technology: Software, Trade Secrets, and Export Growth

India's information technology and business process outsourcing sector has grown into one of the largest contributors to services exports and employment, a growth

[64]Drug Price Competition and Patent Term Restoration Act of 1984, Pub. L. No. 98-417, 98 Stat. 1585 (codified as amended in scattered sections of 21 U.S.C. and 35 U.S.C.).
[65]Chaudhuri, *supra* note 6, at 270-78.
[66]Bajaj Auto Ltd. v. TVS Motor Co. Ltd., (2009) 9 S.C.C. 797 (India).
[67]Bajaj Auto, *supra* note 65, at 805-12.

trajectory that has depended less on patent protection, given that Section 3(k) of the Patents Act excludes computer programs per se from patentability, and more on a combination of copyright protection for software code, contractual and trade secret protection for client data and proprietary methodologies, and trademark protection for service brands.[68] Companies such as Infosys Limited and Tata Consultancy Services have nonetheless built substantial patent portfolios in adjacent fields such as artificial intelligence, cloud computing architecture, and financial technology, reflecting a strategic shift from pure services delivery toward proprietary platform and product development.[69] This pattern illustrates that the channels through which intellectual property protection supports growth are sector-specific: in software services, copyright, trade secret, and contractual protections have historically mattered more than patent rights, whereas in product-oriented technology fields, patent strategy has become increasingly important as Indian firms move up the value chain.

D. Geographical Indications and Rural Economic Impact

Geographical indications illustrate how intellectual property protection can generate economic value in rural and agricultural contexts that differ substantially from the urban, technology-driven sectors discussed above. Darjeeling tea, registered as India's first geographical indication in 2004, has used its certification mark to command a price premium in export markets and to combat the sale of tea blended or substituted with leaf grown outside the designated Darjeeling region, a practice that had previously diluted the reputation and market value of genuine Darjeeling produce.[70] The earlier basmati rice controversy, in which RiceTec Inc. obtained a United States patent in 1997 covering certain rice lines described using the term basmati, prompted not only a successful re-examination challenge before the United States Patent and Trademark Office but also catalysed the enactment of India's Geographical Indications of Goods Act itself, illustrating how a single international intellectual property dispute can drive comprehensive domestic legislative reform.[71] More recently, the grant of a geographical indication to the Tirupati laddu in 2009 and to numerous other regional

[68]The Patents Act, No. 39 of 1970, INDIA CODE § 3(k) (as amended).

[69]Infosys Limited, Annual Report 2023-24, at 42-45 (2024); Tata Consultancy Services Limited, Annual Report 2023-24, at 38-41 (2024).

[70]Tea Board of India, Annual Report 2022-23, at 28-31 (2023).

[71]Basheer & Reddy, *supra* note 34, at 96-98.

food and craft products has been promoted by state governments and export promotion councils as a mechanism for protecting traditional producer communities from imitation and for enabling small and medium rural enterprises to access premium domestic and export markets.[72]

E. TRADEMARKS AND BRAND VALUE

Trademark jurisprudence in India has played a particularly significant role in protecting brand reputation as an economic asset, including in circumstances where a mark has not yet been used within the Indian market. In *N.R. Dongre v. Whirlpool Corp.*, the Supreme Court held that Whirlpool Corporation's trans-border reputation, built through international advertising and limited prior use, entitled it to an injunction against a domestic registrant of an identical mark, even though Whirlpool had not yet commenced large-scale sales of washing machines in India at the relevant time.[73] In *Cadila Health Care Ltd. v. Cadila Pharmaceuticals Ltd.*, arising out of a dispute between two companies that had once formed part of the same corporate group, the Supreme Court laid down a now-foundational multi-factor test for assessing the likelihood of confusion between pharmaceutical trademarks, emphasising that a stricter standard of similarity should apply to medicinal products because confusion between drugs carries a risk of harm to public health that ordinary consumer goods do not.[74] These decisions illustrate how Indian trademark law has, over time, developed nuanced, sector-sensitive standards that protect not merely registered rights but the underlying commercial reputation and consumer trust that brands represent, an asset that has become increasingly significant as Indian conglomerates such as Tata, Reliance, and the Amul cooperative have themselves become globally recognised brands.

[72]Geographical Indications Registry, *supra* note 35.
[73]Dongre, *supra* note 32, at 718-24.
[74]Cadila, *supra* note 32, at 80-89.

VII. . CHALLENGES CONFRONTING INDIA'S INTELLECTUAL PROPERTY REGIME

A. THE EVERGREENING AND AFFORDABILITY DEBATE

Notwithstanding the doctrinal clarity introduced by Section 3(d) and its judicial interpretation in Novartis, the underlying tension between robust patent protection and affordable access to medicines remains unresolved as a matter of policy. Multinational pharmaceutical companies and trade associations have periodically characterised India's patentability standards and its compulsory licensing framework as creating an unpredictable investment climate, a concern reflected in the placement of India on international watch lists maintained by foreign trade authorities reviewing the adequacy of intellectual property protection in trading partner countries.[75] Indian public health advocates and domestic generic manufacturers, by contrast, regard Section 3(d) and the compulsory licensing mechanism as essential and proportionate safeguards consistent with the flexibilities expressly preserved under the Doha Declaration on the TRIPS Agreement and Public Health.[76] This unresolved debate continues to generate uncertainty for both domestic and foreign investment decisions in the pharmaceutical sector.

B. JUDICIAL AND ADMINISTRATIVE CAPACITY

For much of the period since liberalisation, intellectual property litigation in India was hampered by lengthy pendency, a shortage of judges and tribunal members with specialised technical training, and the existence of a separate Intellectual Property Appellate Board whose institutional capacity struggled to keep pace with caseload.[77] The Tribunals Reforms Act, 2021 abolished the Intellectual Property Appellate Board and transferred its functions to the High Courts, prompting the Delhi High Court to establish a dedicated Intellectual Property Division in 2021 with specialised rules of procedure for patent, trademark, copyright, and design matters.[78] While this reform has improved the speed and technical quality of adjudication in respect of matters filed

[75]Off. of the U.S. Trade Representative, 2023 Special 301 Report 38-41 (2023).
[76]WTO Ministerial Conference, Declaration on the TRIPS Agreement and Public Health, WT/MIN(01)/DEC/2 (Nov. 14, 2001).
[77]Law Comm'n of India, Report No. 161, Review of Functioning of Central Administrative Tribunal: Reform Measures (1998); Standing Comm. on Commerce, Rajya Sabha, Report on Review of the Intellectual Property Rights Regime in India (2021).
[78]The Tribunals Reforms Act, No. 33 of 2021, INDIA CODE § 13; Delhi High Court Intellectual Property Rights Division Rules, 2022.

in Delhi, it has also raised concerns about jurisdictional inconsistency, since other High Courts have not uniformly replicated the specialised infrastructure, procedural rules, and technically trained benches available in Delhi.[79]

C. Enforcement, Counterfeiting, and Awareness Among Small Enterprises

Enforcement against counterfeiting and piracy remains uneven, particularly outside major metropolitan commercial centres, with customs authorities, state police, and specialised intellectual property cells often lacking the resources and training necessary to detect and act against infringing goods at scale.[80] A related and perhaps more fundamental challenge concerns the comparatively low level of intellectual property awareness among India's vast population of micro, small, and medium enterprises, which collectively account for a substantial share of manufacturing output and employment but historically have filed only a small fraction of total patent and design applications.[81] Government schemes offering fee rebates and facilitator support for start-ups have begun to address this gap, but uptake among traditional small manufacturing enterprises, as distinct from technology start-ups, remains limited.

D. Persistently Low Research and Development Intensity

As discussed in Part V, India's gross expenditure on research and development, at approximately 0.65 per cent of gross domestic product, remains well below the levels observed in comparator economies, and a substantial share of this expenditure continues to be financed by the public sector rather than by private industry, in contrast to the predominantly private-sector-led research and development models of leading innovation economies.[82] This structural feature constrains the extent to which strengthened intellectual property protection alone can be expected to drive sustained innovation-led growth, since patent protection increases the incentive to invest in research only where complementary financial, human capital, and institutional resources for conducting that research already exist.

[79]Standing Comm. on Commerce, *supra* note 76, at 22-27.
[80]NATIONAL INTELLECTUAL PROPERTY RIGHTS POLICY, *supra* note 13, at 18-20.
[81]WORLD INTELL. PROP. ORG., *supra* note 14, at 24 (noting that resident filings, while growing, remain concentrated among large corporate and institutional applicants).
[82]WORLD INTELL. PROP. ORG., *supra* note 49, at 2.

E. The Absence of Dedicated Trade Secrets Legislation

A further, frequently overlooked, gap in India's intellectual property framework is the absence of a dedicated statute governing trade secrets, which continue to be protected, if at all, through a patchwork of contractual confidentiality clauses, the equitable doctrine of breach of confidence, and limited recourse under general civil and criminal law.[83] For sectors such as information technology services and business process outsourcing, where, as noted in Part VI, trade secret protection often matters more than patent protection, this legislative gap creates a degree of uncertainty for both Indian service providers and the multinational clients who entrust them with proprietary processes and confidential data, and has periodically been identified as an area warranting dedicated statutory reform.[84]

VII. Policy Recommendations

Drawing on the doctrinal and empirical analysis presented above, several policy directions appear warranted. First, the government should consider expanding fiscal incentives for private sector research and development, including enhanced weighted tax deductions and matched-funding grant schemes, in order to close the gap between India's improving innovation output rankings and its comparatively static research investment base, since patent protection alone cannot substitute for an adequately resourced research ecosystem.[85] Second, the specialised Intellectual Property Division model adopted by the Delhi High Court should be extended, with appropriate resourcing and judicial training, to other High Courts with significant commercial caseloads, including Bombay, Madras, and Karnataka, in order to reduce jurisdictional inconsistency and litigation forum-shopping.

Third, intellectual property facilitation schemes presently concentrated on technology start-ups should be extended more deliberately to traditional micro, small, and medium manufacturing enterprises, including through regional language outreach, simplified application procedures, and partnerships with industry associations and rural cooperative federations, given the demonstrated economic value that geographical indications and design registrations can unlock for such enterprises.

[83] V.K. AHUJA, *supra* note 16, at 412-19.
[84] NATIONAL INTELLECTUAL PROPERTY RIGHTS POLICY, *supra* note 13, at 12-13.
[85] NATIONAL INTELLECTUAL PROPERTY RIGHTS POLICY, *supra* note 13, at 9-11.

Fourth, while the compulsory licensing framework and Section 3(d) should be retained as essential public health safeguards consistent with the Doha Declaration, the government could enhance predictability for investors by issuing clearer, published guidelines on the circumstances and evidentiary thresholds that will inform future compulsory licensing decisions, thereby reducing the perception of unpredictability without diluting the underlying substantive protections.[86]

Fifth, geographical indication promotion should be more closely integrated with export promotion and rural livelihood programmes, including dedicated marketing support and quality certification infrastructure, to ensure that the price premium associated with geographical indication status is captured by primary producers rather than dissipated along the supply chain. Sixth, the government should give renewed consideration to enacting a dedicated trade secrets statute, drawing on comparable legislative models in other major economies, in order to provide clearer and more predictable protection for the confidentiality-dependent business models that underpin a significant share of India's information technology and business process outsourcing exports. Finally, continued investment in the digitisation and technical capacity of the Indian Patent Office, building on the substantial reduction in patent grant pendency achieved in recent years, should remain a policy priority, since timely and high-quality examination is a precondition for both domestic confidence in the patent system and continued growth in foreign filing activity.

IX. CONCLUSION

This paper has examined the relationship between intellectual property rights and economic growth in India through a combined doctrinal and empirical lens, tracing the legal evolution of the patent, copyright, trademark, design, and geographical indication regimes from their colonial origins through the post-TRIPS reform period, and assessing available macroeconomic and innovation indicators alongside sectoral and corporate case studies. The analysis suggests that the relationship between intellectual property protection and economic growth in India is real but conditional, and is mediated by sector-specific characteristics, absorptive capacity, and the manner

[86]WTO Ministerial Conference, *supra* note 75.

in which TRIPS-compliant flexibilities, such as Section 3(d) and compulsory licensing, are exercised.

The pharmaceutical sector illustrates both the protective and the constraining faces of patent law, balancing innovation incentives against public health imperatives through landmark decisions such as *Novartis AG v. Union of India* and the Bayer-Natco compulsory licensing dispute. The information technology sector demonstrates that copyright, trade secret, and trademark protection, rather than patents alone, can underpin export-led growth in services-oriented economies. The experience of geographical indications such as Darjeeling tea and basmati rice illustrates how intellectual property can generate tangible economic value even within traditional agricultural and rural economies, while ongoing challenges relating to judicial capacity, enforcement, and persistently low research and development intensity demonstrate that legal reform alone is insufficient to realise the full growth potential of intellectual property protection.

India's trajectory, from a deliberately weak patent regime designed to nurture a domestic generic pharmaceutical industry, through full TRIPS compliance in 2005, to its current position as an emerging innovation overperformer within the Global Innovation Index, offers an instructive case study for other developing economies navigating the same trade-offs. The central lesson of this study is that intellectual property reform should not be pursued, nor evaluated, in isolation, but rather as one component of a broader innovation ecosystem that must simultaneously address research investment, judicial and administrative capacity, enforcement infrastructure, and equitable access to the benefits of innovation across both urban technology sectors and rural agricultural communities. Future research, supported by access to firm-level data on research and development expenditure, patent licensing revenues, and litigation outcomes, would be well placed to test the correlational findings presented in this paper using more rigorous econometric methods, thereby further refining the policy recommendations advanced here.