

India–South Korea Semiconductor Cooperation and Technological Strategic Autonomy

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ABSTRACT

Semiconductors have moved from the domain of industrial policy to the center of geopolitical competition, and technological strategic autonomy has become the organizing ambition of states seeking to reduce dependence on concentrated supply chains. This paper examines whether and how India–South Korea semiconductor cooperation advances India's pursuit of technological strategic autonomy. Drawing on a synthesis of academic literature, official policy documents, and think-tank analyses, the paper traces India's semiconductor policy architecture, South Korea's diversification imperative under the US–China chip war, and the institutionalization of bilateral cooperation culminating in the India–Republic of Korea Strategic Vision 2026–2030. The analysis finds real complementarity in the partnership: India brings design talent, market scale, and a policy-driven manufacturing push, while South Korea brings fabrication, packaging, and supply-chain integration expertise. The paper's key move, though, is redefining strategic autonomy — not as self-sufficiency, but as reduced vulnerability within a system both countries still depend on. The cooperation carries risks of a governance trap in which security narratives expand state intervention without delivering resilience, and of replacing dependence on one set of partners with dependence on another. The paper concludes that India–Korea cooperation can meaningfully advance India's strategic autonomy, provided it is embedded in a diversified, multi-partner strategy rather than treated as a substitute for domestic capability building.

Introduction

Semiconductors are the basic technology of the modern digital economy, providing power to telecommunications, mobility, health care, industry, defense and space systems (Kumar, 2023). The world's semiconductor industry is highly centralized, with Taiwan accounting for more than 60 percent of global semiconductor production, and nearly 90 percent of the most advanced semiconductors, meaning that global semiconductor supply chains are vulnerable to shocks and geopolitical tension (Press Information Bureau, 2026). This fragility was clearly visible during the COVID-19 pandemic when economies were affected by shortages, which led to production delays and increased production costs. The United States, the European Union, Japan, and South Korea have all taken steps to boost their own chip production, however, and introduced national programs to diversify supply chains. The rivalry between the United States and China on the technological front has grown with semiconductors having gained significance for economic security, technological competition, and national security.

India has entered this landscape from a position of pronounced dependence. It imports nearly 90 per cent of its semiconductor requirements, making its supply chains vulnerable to geopolitical disruption (IMPRI, 2026). At the same time, India possesses roughly 20 per cent of global semiconductor design talent and has made substantial policy commitments to building domestic capability. (Tripathi, 2025; Press Information Bureau, 2026). South Korea, by contrast, is a leading semiconductor power, with globally competitive firms such as Samsung Electronics and SK Hynix, but faces challenges from its dependence on the Chinese market and the US-China technology rivalry (Korea Center, 2025; Kumar, 2023). The existing studies have focused on India's semiconductor policy, India-South Korea technological cooperation, and the overall geopolitics of semiconductor supply chains. However, limited attention has been given to

whether India–South Korea cooperation on semiconductors can enhance India's technological strategic autonomy, whether by shifting reliance to new partners or by lessening reliance. This paper addresses the following research question: how does India–South Korea semiconductor cooperation contribute to India's pursuit of technological strategic autonomy? The paper suggests a conceptual framework for strategic autonomy in the semiconductor sector and through qualitative literature and document synthesis analyzes the semiconductor strategies of India and South Korea, as well as their bilateral cooperation. It then examines the value of this collaboration to India's technological strategic sovereignty.

Literature Review and Conceptual Framework

Strategic Autonomy as a Concept

Strategic autonomy can be defined as the capacity of a country to take strategic decisions and act according to its national interests independently without becoming too dependent on any external powers (Khurshid, 2023). In the context of India's foreign policies, the term has traditionally been understood as India's decision-making independence and not alignment with any particular great power. Under the Modi government, strategic autonomy, on the other hand, has been pursued through issue-based partnerships where working with particular countries is believed to go along well with the ability to remain flexible in terms of policies (Khurshid, 2023). The same concept of multi-alignment has also been proposed by Jain (2021): India works closely with various countries while not becoming too dependent on any single relation. Muraviev et al. (2022) therefore help in clarifying another important point about the definition of

strategic autonomy – it does not mean isolation and self-sufficiency, but being able to have various options regarding external partners.

This understanding of strategic autonomy can also be extended from foreign policy to the technological domain. In the European context, strategic autonomy and digital sovereignty have become the organizing frames for reducing external dependencies in critical technologies, with the economy and security increasingly treated as inseparable. This "economy–security nexus" shows up clearly in semiconductors, where control over the supply chain, from raw materials to finished products, gets framed in security terms (Farrand, 2024). India does not need to achieve full self-reliance in semiconductors because it is not possible, nor is it needed; what India needs is to cut down its dependencies as much as possible and build up capabilities. What matters instead is building capacity at home, cutting the dependencies that actually put the country at risk, and working with more partners rather than fewer.

Operationalizing Technological Strategic Autonomy

In the semiconductor sector, technological strategic autonomy can therefore be understood as the capacity to reduce critical external vulnerabilities while retaining sufficient domestic capabilities and policy choice to avoid excessive dependence on any single external actor. This paper evaluates this form of autonomy through several dimensions: supplier diversification, domestic technological capability, technology absorption, control over critical intellectual property, domestic value capture, human-capital retention, and technological substitutability. These dimensions distinguish technological autonomy from simple increases in domestic production, since production located within India does not necessarily imply domestic control over the technologies, knowledge, or intellectual property underlying that production. These dimensions

provide the analytical basis for assessing whether India–South Korea cooperation produces genuine technological autonomy or merely expands India's access to foreign-controlled production capacity.

The Paradox of Semiconductors

A central analytical tension runs through all semiconductor policy: the governance of semiconductors is embedded in a sovereignty agenda that can imply that greater self-sufficiency is possible, yet semiconductor production is necessarily globally distributed. Given the geographic and technological specialization of the semiconductor value chain, achieving complete self-sufficiency is extremely difficult in the short to medium term. Strategic autonomy in practice therefore means reducing critical vulnerabilities and increasing choice, not eliminating interdependence (Monsees, 2024). Related scholarship warns of a "governance trap" in which the security threat creates such a degree of government intervention and protectionism that it stifles flexibility, competition, and innovation within the semiconductor ecosystem, making resilience efforts rigid or self-defeating (Lin, 2026). These cautions frame the analysis of the India–Korea partnership below. Therefore, India–Korea cooperation needs to be assessed not simply by how much investment/technology India receives, but by whether it genuinely reduces vulnerability and increases India's strategic choices without creating a new dependency.

The Structure of the Value Chain

The semiconductor value chain broadly encompasses chip design, fabrication, and assembly, packaging and testing (OSAT) (Kumar, 2023). India's strength lies overwhelmingly in

design, while its fabrication and advanced packaging capabilities are nascent (Yadav, 2025). South Korea's strength lies in fabrication, memory production, and packaging, with a comparatively weaker position in design relative to its manufacturing prowess (Kim & Kim, 2006; Yadav, 2025). This asymmetry is the analytical core of the cooperation: the two countries occupy complementary segments of a single value chain, which is precisely why the partnership is described as strategic rather than merely commercial (Kumar, 2023).

Thus, India and South Korea are in different but complementary positions in the semiconductor value chain. This complementarity opens the door for cooperation in the fields of investment, technology, manufacturing, packaging and workforce development (Kumar, 2023). But there is no guarantee of strategic autonomy from complementarity alone. Cooperation could replicate, if not increase, external vulnerability, as India's new capabilities continue to rely on foreign firms, technologies, or critical inputs (Monsees, 2024). India-South Korea cooperation can thus be evaluated according to whether it expands India's strategic options or instead introduces new forms of dependence on South Korea.

Research Gap

The existing scholarship gives important insights into India's semiconductor policy, South Korea's semiconductor capabilities, and the broader geopolitical restructuring of global semiconductor supply chains. However, these strands of literature remain insufficiently integrated. First, existing studies do not adequately distinguish between foreign investment, technology transfer, technology absorption, and the development of durable domestic capabilities. Second, the role of corporate actors in determining the depth and limits of

technological cooperation remains underexamined. Third, technological strategic autonomy is often discussed as a broad policy objective rather than assessed through identifiable dimensions such as supplier diversification, domestic capability, technology absorption, intellectual-property control, domestic value capture, human-capital retention, and technological substitutability. These deficiencies are overcome in this paper by looking into India-South Korea cooperation on semiconductors based on a conceptual approach that focuses on how far cooperation helps India retain capabilities and technological choices while avoiding critical dependencies, in addition to looking into the growth in production and investment.

Table 1:

India–South Korea Semiconductor Value-Chain Complementarity

Semiconductor segment	India	South Korea	Potential for cooperation
Chip design	Strong design talent and growing fabless ecosystem	Strong firms but comparatively greater manufacturing strength	Joint R&D and design collaboration
Fabrication	Nascent manufacturing capability	Major global fabrication capability	Investment, technology cooperation and manufacturing partnerships
Memory	Limited domestic production	Global strength in DRAM and NAND	Technology and production cooperation
Packaging & testing (OSAT)	Developing capability	Established expertise	Korean expertise and investment in Indian facilities
Workforce	Large pool of engineering and design talent	Advanced semiconductor manufacturing expertise	Training and skills development
Domestic market	Large and growing semiconductor demand	Strong global semiconductor companies	Investment and market expansion

Source: Analysis synthesized by the author based on Kumar (2023) and Yadav (2025), among others, dealing with the semiconductor value chain as described in this paper. This table is an analysis synthesis and does not reproduce data from any source.

Table 1 summarizes the structural complementarity between India and South Korea across selected segments of the semiconductor value chain. However, complementarity should

not be interpreted as evidence of technological strategic autonomy. The potential benefits identified in the table depend on whether cooperation results in technology absorption, domestic value capture, intellectual-property control, and the retention of human and technical capabilities within India. The table therefore illustrates potential areas of cooperation rather than predetermined autonomy outcomes.

Methodology

This paper is a qualitative policy synthesis based on secondary sources. The evidence base comprises three categories. First, peer-reviewed academic literature on strategic autonomy, semiconductor governance, and India–Korea economic relations, identified through scholarly database searches. Second, official policy documents, including the India Semiconductor Mission 2.0 documentation and statements on bilateral frameworks (Press Information Bureau, 2026). Third, analyses from policy institutes and reputable news organizations covering the bilateral relationship, the US–China chip war, and corporate investment decisions (Tripathi, 2025; Yadav, 2025). This theoretical framework will rely on the dimensions of technological strategic autonomy established in section 2.2 to assess the extent to which this semiconductor cooperation contributes to building national capacity, technology acquisition, technology-related decision making, and reduces critical dependency.

The analysis is thematic rather than statistical. Sources are examined to identify recurring themes concerning the semiconductor positions of India and South Korea (Kumar, 2023; Yadav, 2025), areas of bilateral cooperation, the drivers of that cooperation, and the constraints that may affect its contribution to India's technological strategic autonomy. Particular attention is given to

whether cooperation reduces India's critical vulnerabilities and expands its strategic choices, or whether it creates new forms of external dependence (Monsees, 2024; Lin, 2026). The principal limitation is that the paper relies on publicly available documents and reporting rather than primary interviews or firm-level data. In addition, the bilateral framework is recent and still being operationalized, so outcome evidence is necessarily preliminary. Claims are cited to their sources throughout; where evidence is indirect or contested, this is noted in the text.

Findings

India's Semiconductor Ecosystem and Strategic Vulnerabilities

The recent semiconductor effort in India has been bolstered by the India Semiconductor Mission (ISM), which was formed in December 2021 along with the wider Semicon India Programme, with an initial investment of INR 76,000 crore (\$9 billion) (Press Information Bureau, 2026). This programme intends to establish the necessary foundations for semiconductor manufacturing within India, and ten such projects have already been announced, which includes collaborations with Japan and South Korea-based companies like Renesas and APACT. Besides ISM, the Design Linked Incentive Scheme has emphasized fostering innovation within the country by building a fabless environment using India's design prowess (Press Information Bureau, 2026).

The Union Budget 2026-27 launched India Semiconductor Mission 2.0, which was a move from creating the ecosystem to consolidating it, and connecting it with international supply chains. The ISM 2.0 will concentrate on creating semiconductor equipment and materials locally, creating full stack Indian semiconductor Intellectual Property (IP), and strengthening local and

international supply chains, with an allocated Rs. 1,000 crores for FY 2026-27. The stated targets are ambitious: by 2029, India expects to design and manufacture chips required for nearly 70–75 per cent of domestic applications, with a roadmap to reach 3-nanometre and 2-nanometre technology nodes, and an aim by 2035 to be among the top semiconductor nations globally (Press Information Bureau, 2026).

Despite the architecture that exists, the Indian ecosystem still has heavy reliance on foreign technology alliances and intellectual property imports. The manufacturing capabilities of the country are still limited, and India has to depend on East Asian ecosystems for their advanced fabrication tools. Industry estimates put the workforce gap at nearly 1.5 million skilled workers and 5 million semi-skilled workers across the value chain (IMPRI, 2026) — India has strong chip-design talent, but limited expertise in advanced fabrication, lithography, and packaging (IMPRI, 2026). South Korea matters here not just as a source of investment, but as a potential partner for closing specific gaps in India's semiconductor value chain (Kumar, 2023). These limitations bring into focus a vital difference between domestic manufacturing and technological independence. Building chip factories in India would minimize some vulnerabilities in the supply chain, but not always translate into the ability of India to independently operate these factories through control of technology, intellectual property rights, machines, and capability. Foreign investments and technology alliances may increase India's production capabilities while not ensuring its technological independence. The relevant question is not simply whether semiconductor activity is located within India, but whether Indian firms and institutions are able to absorb, retain, and develop the capabilities underlying that activity.

South Korea's Semiconductor Capabilities and Diversification Imperative

South Korea is a key node in the global semiconductor supply chain, producing over 70 per cent of DRAM and more than half of NAND flash memory (Yadav, 2025). Its development path is distinctive: scholarship on the Korean semiconductor industry has argued that it was private business groups, rather than the state, that took the initiative and led the industry's development, challenging strong versions of developmental-state theory (Kim & Kim, 2006). Today, Seoul faces growing geopolitical pressures and supply-chain vulnerabilities that have prompted it to intensify efforts to secure and diversify its production capabilities (Yadav, 2025). In light of the above discussion, the semiconductor policy of South Korea is influenced by the state as well as the commercial considerations of big companies. The example of the Korean semiconductor industry indicates that the business players have traditionally made substantial contributions to shaping investments and industry development (Kim & Kim, 2006). This point is critical in the context of India-Korea collaboration since the state-to-state cooperation does not mean a great deal of technology transfer or business investments. Companies like Samsung Electronics and SK Hynix make decisions on the basis of their interests, technological capabilities, intellectual property rights, and risks of different production sites. In addition, tax cuts and investments have been given to help companies that manufacture semiconductors in Korea. In February 2025, K-Chips Act was passed (Yadav, 2025).

South Korea's push to diversify comes largely from its dependence on China, still the biggest market for South Korean semiconductor exports and equipment (Kumar, 2023). As China works toward self-reliance in chips, South Korean policymakers have grown more concerned, fueling debate over diversification and the search for what's been called a "Next China." More broadly, East Asian states are all navigating dependence on the US and China at

once, building policy strategies to manage that dual hegemony, with multilateral alliances taking on a bigger role in supply-chain governance (Aoyama et al., 2024). Within that picture, India looks to South Korea like a promising long-term market and a stable, technologically ambitious partner (Yadav, 2025). This creates overlapping interests. India wants to shore up weak points in its semiconductor ecosystem; South Korea wants to spread its markets, supply chains, and investment beyond China. Cooperation thus provides an incentive for both parties, but mutual strategic interest does not necessarily mean the unlimited transfer of technology. Companies from South Korea will be motivated to safeguard the proprietary technologies, intellectual property, and competitive advantage. India's technological autonomy therefore depends not only on whether South Korean companies decide to invest in India, but also on whether cooperation enables Indian firms and institutions to absorb and develop capabilities in key technologies.

Institutionalizing India–South Korea Semiconductor Cooperation

India and South Korea moved to a "Special Strategic Partnership" in 2015, and semiconductors became a real focus once India launched its ISM in 2021 (IMPRI, 2026). The institutional groundwork followed: IESA and Korea's KDIA signed an MoU in September 2023 covering joint R&D, display technologies, workforce development, and technical exchange (Yadav, 2025). Vedanta struck its own deal that April, signing MoUs with 20 Korean display glass firms to build an electronics manufacturing hub in India. SK Hynix has been looking closely at India's semiconductor incentives, especially around packaging and testing (Yadav, 2025).

The centerpiece of the current phase is the India–Republic of Korea Strategic Vision 2026–2030, announced during the April 2026 state visit of South Korean President Lee Jae Myung to India, the first such visit in eight years (IMPRI, 2026). The visit produced agreements on shipbuilding, defense co-production, and a commitment to double trade to US\$50 billion by 2030, and it launched the India–Korea Digital Bridge to expand cooperation in semiconductors, artificial intelligence, and digital infrastructure. The Strategic Vision is explicitly framed as building a resilient semiconductor ecosystem partnership, with objectives including a resilient supply chain, manufacturing cooperation, design and R&D, technology transfer and skill development, and expanded bilateral trade. The framework functions through layered institutions: annual leadership summits, foreign policy and security dialogues, vice-ministerial 2+2 consultations, the India–ROK Industrial Cooperation Committee, and specialized task forces on semiconductors, AI, supply chains, and emerging technologies. The institutional framework therefore creates channels through which cooperation can contribute to fabrication, packaging, testing, R&D, and workforce development. However, institutional commitments should not be treated as evidence that technological capabilities have already been transferred. The depth of cooperation depends on implementation by firms, the terms governing technology and intellectual property, and India's capacity to absorb and develop the knowledge associated with foreign investment.

Corporate Agency, Technology Transfer and Intellectual Property

The role of corporate actors is central to assessing the technological consequences of India–South Korea cooperation. Bilateral agreements establish an enabling framework, but firms determine whether cooperation becomes operational through investment, licensing, joint

ventures, research partnerships, and the location of production activities. The historical development of South Korea's semiconductor industry further demonstrates that corporate actors cannot be treated simply as instruments of state policy (Kim & Kim, 2006). For India, this means that Korean investment should be evaluated not only according to its financial value or contribution to production capacity, but also according to the capabilities that Indian firms and workers can acquire and retain through that investment.

Technology transfer must similarly be distinguished from technology access. A Korean company may establish or participate in production in India while retaining ownership and control over critical intellectual property, manufacturing processes, design knowledge, or specialized equipment. In such a case, India may gain production capacity without acquiring equivalent technological autonomy. Technology absorption is therefore a separate stage in the process: it requires domestic firms, engineers, and institutions to acquire sufficient knowledge and capabilities to adapt, reproduce, improve, and eventually develop technologies independently. This is particularly true in relation to the semiconductor industry because although manufacturing plants may be scattered in different places, they might still have their intellectual property and know-how confined within certain companies.

Incentives of Korean firms also act as barriers to how much technology can be transferred. There is a commercial incentive for South Korea to maintain its status in technologically advanced semiconductors. There are large corporations that have their own technologies which they need to protect. Strategic congruence between India and South Korea does not necessarily entail unlimited transfer of the best technology. It is likely that cooperation will increase only where there is a commercial incentive but strategic technologies may stay in the hands of companies.

The independence of India in terms of technology then depends on whether there will be any learning and capability through cooperation.

Drivers of Bilateral Cooperation

The cooperation is driven by a convergence of geopolitical and economic incentives. Geopolitically, the US–China chip war has opened up the possibility of a Korea–India semiconductor partnership in which economic engagement veers into technological cooperation. India's recognition of the need for a stable, non-China-centered supply chain, sharpened by the COVID-19-induced supply-chain disruption and by territorial tensions with China, has pushed New Delhi toward building chip ties with like-minded countries (Kumar, 2023). The partnership aligns with broader "China-plus-one" and "friend-shoring" strategies seeking to reduce dependence on China-centric manufacturing ecosystems, and it parallels arrangements such as the Indo-Pacific Economic Framework (IPEF), which aims to secure regional semiconductor supply chains (Aoyama et al., 2024).

Economically, the complementarity is real and often stated outright (Kumar, 2023). India offers South Korea a stable, investment-friendly market with a large design workforce; South Korea offers India access to fabrication and packaging expertise (Yadav, 2025). South Korean semiconductor firms are reportedly eyeing software and R&D as their entry point into India, tapping the country's large pool of skilled workers first (ETHRWorld, 2026). The broader economic relationship provides an existing foundation for deeper cooperation in emerging technologies and semiconductor-related activities.

The motivations for cooperation thus transcend the traditional models of trade and investment. On the Indian side, cooperation with South Korea provides India with a means of diversifying technological dependencies and developing capabilities in various parts of the semiconductor value chain (Kumar, 2023). On the South Korean side, India provides an alternative market and production site in light of growing geopolitical complexities that make South Korea dependent on China (Kumar, 2023). The strategic value of the partnership therefore depends not only on the incentives for cooperation but on whether these incentives generate durable Indian capabilities, technological learning, and greater freedom of technological choice.

Constraints and Risks

India's implementation capacity is the first: infrastructure gaps, talent shortages, and delayed execution keep coming up, and the country still leans on imported IP and foreign technology partnerships (Yadav, 2025). Second, India's business and investment climate still gives some Korean conglomerates pause, especially given how many other destinations they could choose instead — during the 2026 visit, India announced plans for a "Korea enclave" with plug-and-play infrastructure, a sign the concern is at least being taken seriously (NUS Institute of South Asian Studies, 2026). Third, bilateral trade has stayed fairly flat since the CEPA came into force in 2010, and there's now a proposal to upgrade the agreement to cover digital trade, green partnerships, supply chains, and economic security. Fourth, the relationship has long had a gap between what leaders say strategically and how deep cooperation actually runs — something the 2026 framework is explicitly trying to close. Finally, India must remain competitive in attracting Korean investment as global competition for semiconductor investment intensifies. A further constraint concerns the distribution of technological control. Even where Korean investment

increases India's domestic semiconductor production, the resulting facilities may remain dependent on foreign-owned intellectual property, specialized equipment, proprietary processes, and external technical expertise. This creates a distinction between diversification of supply and diversification of technological dependence. While India will become less dependent on a single source, it will still be dependent on foreign firms in terms of technology which enables its production process.

Discussion

These results suggest that there is a qualified answer to the research question. While India–South Korea semiconductor collaboration may help enhance the strategic autonomy of India in technology, this positive effect must be evaluated according to the criteria presented in section 2.2 and not in terms of mere production or investment. Strategic autonomy in semiconductors cannot be achieved by self-reliance, but rather by minimizing the vulnerabilities and maximizing the technological capabilities as well as alliances of India (Monsees, 2024). The partnership will make its contribution to achieving this goal by investing, manufacturing, training workforce, and gaining capabilities in fabrication, packaging, testing, and design (Kumar, 2023). Nevertheless, these advantages are just potential capabilities.

At the same time, the analysis supports a cautionary reading. The literature on the governance trap of strategic autonomy warns that security narratives can justify state intervention that expands without delivering resilience, reducing flexibility and innovation (Lin, 2026). The ambition of India, as far as its semiconductor industry is concerned, must thus be judged not just by the number of semiconductor facilities set up or investment attracted, but whether such efforts

help to strengthen technological capabilities, technology absorptive capacity, domestic value chain, intellectual property, and technological substitutability. The risk associated with the collaboration could lie in the fact that the diversification of supply would not necessarily translate into technological independence if India continues to depend on Korean technology, proprietary processes, specific equipment, or any foreign technological knowhow (Monsees, 2024). Differentiation is key to the understanding of technological strategic autonomy. The cooperation must hence be part of a larger strategy, involving cooperation with Japan, as well as other Indo-Pacific countries (Tripathi, 2025).

This also brings out another asymmetry of interests between the two countries. India is interested in forming a strategic partnership with South Korea as part of a strategy of building resilient supply chains, reducing dependence on China and building technologies via issue-based strategic partnerships (Khurshid, 2023; Kumar, 2023). For South Korea, the collaboration with India is informed by their efforts at diversification due to their exposure to the Chinese market and the ongoing US-China technology war (Kumar, 2023). These motivations are complementary but not identical. More importantly, government-level strategic alignment does not automatically determine corporate behaviour. The depth of cooperation ultimately depends on whether Korean firms consider investment, technology licensing, joint research, production, or other forms of engagement commercially and strategically advantageous.

This will be a possible limitation to India's strategic advantage when acquiring strategically useful technologies. The Korean corporations are economically motivated to protect their proprietary technology and their competitive advantage. This is why India's strategic advantage will depend on the various stages within the semiconductor value chain. Cooperation may generate greater benefits in areas where commercial interests overlap, such as

manufacturing investment, workforce development, packaging, testing, and selected research activities, while the most strategically sensitive intellectual property and production knowledge may remain under foreign corporate control. The relevant measure of success is therefore whether Indian firms, engineers, and institutions progressively acquire the capacity to absorb, adapt, retain, and develop technological knowledge rather than remaining dependent on external firms.

Taken together, the findings suggest that India–South Korea cooperation should be understood as a pathway toward technological strategic autonomy rather than as an outcome that has already been achieved. In the short term, cooperation may lead to better access to investments, production facilities, competencies, and diversified supply chain linkages for India. In the medium term, the impact will be a function of technology absorption, domestic value creation, and human capital formation. And in the long term, genuine autonomy will entail greater control by Indian companies and institutions over crucial technologies, as well as alternate technological and business options. The success of the strategic alliance must therefore be measured not by the mere existence of Korean investments, but by the building up of Indian capabilities and technological options.

Conclusion

The purpose of this study is to explore the collaboration between India and South Korea on semiconductors in order to make technology strategic autonomy possible for India. The discussion above reveals true structural complementarities of India and South Korea: India has an excellent capability in design and engineering along with a huge domestic market, while

South Korea has excellent capabilities in manufacturing semiconductors and corporations' skills (Kumar, 2023; Tripathi, 2025). Collaboration on the basis of Strategic Vision 2026-2030 and India-Korea Digital Bridge is a framework that would help develop these complementarities further (IMPRI, 2026). However, it does not guarantee technology strategic autonomy automatically.

The most important contribution of the paper is that the India-South Korea semiconductor collaboration can benefit India in its pursuit of technological strategic autonomy given its limitations. This can help in diversifying India's foreign relations and also in building up the capabilities of manufacturing and human resources. At the same time, cooperation does not eliminate dependence and may create new forms of dependence if critical intellectual property, proprietary technologies, specialized equipment, or production knowledge remain under foreign control. The distinction between diversification of supply and diversification of technological dependence is therefore essential.

The long-term contribution of the partnership will depend on India's ability to convert foreign investment and cooperation into durable domestic capabilities through technology absorption, indigenous innovation, domestic value capture, and the retention of skilled human capital. Korean corporate participation is particularly important because the depth of technology transfer cannot be determined solely by government-level agreements. India's policy objective should consequently be to use the Korea partnership as one component of a broader multi-partner strategy rather than as a substitute for domestic capability development. Strategic autonomy will be strengthened not when India becomes independent of international semiconductor networks, but when it possesses sufficient technological capabilities, alternative partnerships, and domestic control to exercise meaningful choices within those networks.

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