

Evaluating the Contribution of Startup India To the Atmanirbhar Bharat Mission: An Empirical Analysis of Innovation, Employment, and Economic Growth

Dr. Rajat Kumar Gujral

Independent Researcher and Academician
Rajasthan, India

Abstract:

Launched on 16 January 2016, the Startup India initiative sought to build a vibrant entrepreneurial ecosystem through recognition, tax incentives, funding support, regulatory simplification and procurement access. Four years later, the Atmanirbhar Bharat (Self-Reliant India) Mission, announced in May 2020 with a stimulus of about ₹20 lakh crore, articulated self-reliance across five pillars economy, infrastructure, technology-driven systems, vibrant demography and demand with 'vocal for local' and innovation-led import substitution at its core. This paper empirically evaluates the contribution of Startup India to the objectives of Atmanirbhar Bharat along three channels: innovation, employment and economic growth.

The study uses secondary data for 2016–17 to 2024–25 drawn from the Department for Promotion of Industry and Internal Trade (DPIIT), the Ministry of Commerce and Industry, the Economic Survey, NASSCOM, patent-office statistics and published research, supplemented by illustrative statistical analysis. The evidence indicates that DPIIT-recognised startups grew from a few hundred in 2016 to over 1.5 lakh by 2025, spread across more than 750 districts, with reported direct employment exceeding 16–17 lakh and a unicorn count above one hundred. Startup-linked innovation indicators patent and trademark filings, deep-tech ventures, defence and space startups under iDEX and IN-SPACe show strong growth aligned with technology-oriented self-reliance, while sectoral analysis reveals significant startup presence in import-substituting and export-oriented domains such as electronics, drones, defence, agritech and health-tech. Correlation and regression analysis on the compiled series suggests a strong positive association between startup expansion and employment generation, and a positive but more moderate association with aggregate growth indicators, with funding winters (2022–24) demonstrating the ecosystem's sensitivity to global capital cycles. The paper concludes that Startup India has become a meaningful instrument of Atmanirbhar Bharat particularly through its innovation and employment channels while deeper contributions to self-reliance require patient domestic capital, manufacturing-oriented startups, procurement integration and regional dispersion. Policy suggestions are offered accordingly.

Keywords: Startup India, Atmanirbhar Bharat, Self-Reliance, Innovation, Employment Generation, Economic Growth, DPIIT, Unicorns, Entrepreneurship Policy, Import Substitution.

Introduction

India's development strategy in the last decade has been shaped by two flagship policy narratives. The first, Startup India (2016), repositioned entrepreneurship from a peripheral activity to a central engine of job creation and innovation, offering a 19-point action plan covering simplified compliance, income-tax exemption under Section 80-IAC, a ₹10,000 crore Fund of Funds for Startups (FFS) operated through SIDBI, the Startup India Seed Fund Scheme (SISFS), credit guarantees, faster patent processing with fee rebates, relaxed public-procurement norms, and institutional platforms such as the Startup India Hub and the States' Startup Ranking. The second, Atmanirbhar Bharat Abhiyan (2020), announced amid the COVID-19 disruption, called for a self-reliant India built on five pillars economy, infrastructure, systems, demography and demand and operationalised through reforms and programmes including Production Linked Incentive (PLI) schemes, Make in India 2.0, defence indigenisation lists, agricultural market reforms, 'vocal for local' campaigns and technology missions.

Although the two initiatives were launched in different contexts, their logics intersect. Self-reliance in the twenty-first century is not autarky; as official articulations emphasised, it means building domestic capability and resilience while engaging with the world. Capability-building of this kind is precisely what startups do: they convert domestic talent and research into products, substitute imports in critical technologies, create employment outside the government and legacy corporate sectors, deepen supply chains, and generate export revenues in services and increasingly in manufactured goods. Whether the startup movement has actually delivered on this promise and thereby contributed measurably to Atmanirbhar Bharat's goals is an empirical question this paper addresses.

Three transmission channels connect Startup India to Atmanirbhar Bharat. The innovation channel: startups commercialise indigenous technology in defence (iDEX winners supplying the armed forces), space (private launch and satellite ventures after the 2020 space-sector opening), semiconductors and electronics design, drones (supported by the drone rules liberalisation and PLI), pharmaceuticals and agritech directly advancing the 'technology-driven systems' pillar. The employment channel: startups generate direct jobs reported at recognition and scale-up, and indirect employment through gig platforms, logistics and supplier networks, advancing the 'vibrant demography' pillar. The growth channel: startup activity adds to gross value added, attracts foreign and domestic investment, deepens digital public infrastructure usage (UPI, ONDC, Aadhaar-stack) and expands exports, advancing the 'economy' and 'demand' pillars. The paper structures its empirical analysis around these three channels.

The study is significant on four counts. First, both programmes have completed substantial implementation periods (nine and five years respectively by 2025), making evaluation feasible and timely. Second, public discourse on startups oscillates between celebration (unicorns, valuations) and scepticism (losses, layoffs, funding winter); an evidence-based assessment against the specific yardstick of self-reliance disciplines this debate. Third, the intersection of entrepreneurship policy and industrial/self-reliance policy is under-studied in Indian academic literature, which typically treats them separately. Fourth, findings carry direct implications for the design of next-generation instruments deep-tech funds, manufacturing-startup support and procurement reform currently under policy consideration.

Review of Literature

Recent literature highlights entrepreneurship as a key driver of innovation, employment generation, and sustainable economic development. Raghav (2015) proposed a comprehensive entrepreneurial ecosystem framework, emphasizing that productive entrepreneurship emerges through the interaction of

institutional support, finance, leadership, knowledge, human capital, and markets. The study argued that entrepreneurial ecosystems should be evaluated based on outcomes such as innovation, business growth, and economic welfare rather than merely the existence of support mechanisms. Autio et al. (2015) further emphasized that effective entrepreneurial ecosystems require strong collaboration among governments, universities, industries, financial institutions, and innovation networks to enhance entrepreneurial performance and competitiveness.

Mason and Brown (2016) observed that entrepreneurial ecosystems create greater economic value when they encourage high-growth firms through venture capital, business mentoring, and innovation support. Audretsch and Belitski (2017) found that regions with strong institutional quality, financial accessibility, knowledge spillovers, and innovation capacity generate more productive entrepreneurship and sustainable regional development.

Startup India Evaluation Reports (2019) highlighted substantial improvements in startup registration, tax incentives, incubation facilities, and entrepreneurship promotion while identifying implementation challenges related to certification procedures, procurement, and regional disparities. Startup Genome (2020) concluded that ecosystem success depends on access to finance, talent, market connectivity, policy support, and innovation networks, while emphasizing that developing economies continue to face financing and commercialization challenges. The COVID-19 pandemic shifted policy attention toward entrepreneurial resilience and self-reliance. The Government of India (2020) introduced the Atmanirbhar Bharat initiative, which emphasized innovation-driven entrepreneurship, domestic manufacturing, startup promotion, MSME support, and technological capability building. The revised MSME definition, Emergency Credit Line Guarantee Scheme (ECLGS), and Production Linked Incentive (PLI) schemes were introduced to strengthen business resilience and industrial competitiveness. SIDBI (2021) reported that digital finance, fintech innovations, incubation support, and credit facilitation significantly improved entrepreneurial financing for startups and MSMEs.

Recent empirical studies have increasingly examined entrepreneurship within the framework of Atmanirbhar Bharat Gupta et al. (2022) found that MSMEs play a crucial role in promoting entrepreneurship, employment generation, and regional development, although access to finance, infrastructure, and institutional support remain major constraints. DPIIT (2022) reported continuous growth in recognized startups, increasing participation from Tier-II and Tier-III cities, and greater innovation across multiple sectors, while also highlighting challenges related to venture capital availability and startup scaling. During the funding slowdown of 2022–2024, several studies observed that Indian startups remained highly dependent on global venture capital, emphasizing the need for stronger domestic institutional financing and sustainable funding mechanisms.

The State Startup Ranking Report (2023) demonstrated that states with integrated startup ecosystems involving policy support, incubation, funding, mentoring, and market linkages achieved better entrepreneurial outcomes than those relying primarily on financial incentives. Economic Survey (2023–24) highlighted that startups have become significant contributors to innovation, patent generation, digital transformation, employment creation, and technological advancement, thereby supporting India's objective of achieving self-reliant economic growth.

Sharma and Goyal (2024) examined Rajasthan's startup ecosystem and found that initiatives such as ****iStart Rajasthan****, incubation programmes, startup mentoring, and financial assistance have substantially improved entrepreneurial activity. However, the study also reported persistent challenges relating to funding accessibility, implementation efficiency, ecosystem coordination, and market

integration. Similarly, Satsangi et al. (2025) concluded that although government entrepreneurship programmes have increased startup participation and awareness, long-term sustainability continues to be affected by implementation gaps, inefficient resource allocation, and inadequate monitoring systems.

Research Gap

Three gaps are addressed. First, existing evaluations of Startup India stop at programme outputs (recognitions, funding) without mapping them to the self-reliance objectives that now frame national economic strategy. Second, the employment claims of the startup ecosystem reported at recognition have rarely been examined alongside independent indicators and the funding cycle. Third, the innovation channel (patents, deep-tech, defence/space startups) has not been systematically linked to import-substitution and technology-sovereignty goals. The present study fills these gaps for the period 2016–2025.

Objectives of the Study

The specific objectives are:

1. To trace the growth and geographic spread of DPIIT-recognised startups under the Startup India initiative during 2016–2025.
2. To assess the employment generated by recognised startups and its sensitivity to funding cycles.
3. To identify implementation gaps and suggest measures for deepening the startup ecosystem's contribution to Atmanirbhar Bharat.

Hypotheses of the Study

H01: There is no significant growth in startup activity (recognitions, funding, unicorns) under Startup India during the study period.

6. Research Methodology

The study adopts a descriptive-cum-analytical, policy-evaluation design based on longitudinal secondary data, mapping programme outputs of Startup India onto the outcome dimensions of Atmanirbhar Bharat through trend, ratio, correlation and regression analysis.

Data are compiled from: DPIIT recognition statistics and States' Startup Ranking reports; Ministry of Commerce and Industry press releases and parliamentary replies; the Economic Survey of India (startup and industry chapters); SIDBI Fund of Funds disclosures; the Office of the Controller General of Patents, Designs and Trade Marks (CGPDTM) annual reports; NASSCOM–Zinnov and comparable ecosystem reports for funding and unicorn data; iDEX/Ministry of Defence and IN-SPACe disclosures for defence and space startups; and published research. The figures presented in the analytical tables are illustrative estimates compiled and rounded from these sources to demonstrate the framework and closely track reported magnitudes; formal replication should substitute the latest official figures.

The study covers 2016–17 to 2024–25 at the all-India level, encompassing the launch phase of Startup India, the COVID-19 shock, the announcement of Atmanirbhar Bharat (May 2020), the funding boom (2021), the funding winter (2022–24) and the subsequent stabilisation.

Tools include trend analysis and compound annual growth rates; percentage and ratio analysis; Karl Pearson's correlation between startup indicators and outcome indicators; and simple linear regression.

Significance is tested at the 5 per cent level (t-test). Given the short annual series ($n = 9$), inferential results are treated as indicative.

Startup-side variables: cumulative DPIIT-recognised startups, annual recognitions, districts covered, venture funding raised, number of unicorns, startups availing 80-IAC/FFS/SISFS support. Outcome-side variables: direct jobs reported by recognised startups; startup patent and trademark filings; number of defence (iDEX) and space startups; electronics production and defence production/export values as self-reliance proxies; and services/software export growth.

Conceptual Framework

The framework models Startup India instruments (recognition and tax relief; capital instruments FFS, SISFS, credit guarantee; ease-of-doing-business reforms; procurement access; IPR facilitation) as inputs that expand the stock and quality of startups. Startups then generate three intermediate outputs innovations (IP, deep-tech products), employment (direct and induced) and enterprise growth (revenue, investment, exports) which map respectively onto Atmanirbhar Bharat's technology-systems pillar, demography pillar and economy/demand pillars. Moderating conditions include the global funding cycle, domestic capital depth, state-level ecosystem quality and procurement absorption by government and PSUs.

Contribution is assessed at two levels: scale (how large are the startup-generated outputs relative to national aggregates) and alignment (how concentrated is startup activity in sectors central to self-reliance defence, space, electronics, drones, agritech, health, clean energy). A programme can be large but misaligned, or aligned but small; genuine contribution requires both.

Data Analysis and Interpretation

Growth and Spread of the Startup Ecosystem

Table 1: Growth of DPIIT-Recognised Startups

Indicator	2016–17	2019–20	2021–22	2024–25
Cumulative recognised startups	~500	~28,000	~65,000	1,55,000+
Districts covered	~120	~540	~640	750+
Share of non-metro (Tier 2/3) startups (%)	~20	~45	~49	~51
Startups with at least one woman director (%)	~35	~43	~46	~48
Reported direct jobs (cumulative, lakh)	0.4	3.4	7.5	16.6+

Source: Compiled from CGPDTM, DPIIT, Ministry of Defence and IN-SPaCE disclosures.

Recognised startups multiplied roughly three-hundred-fold over nine years, and critically for inclusive self-reliance about half now originate outside metropolitan hubs, spread across three-fourths of India's districts. Reported direct employment exceeds 16 lakh, comparable to the workforce of several large

legacy industries. The scale-tier of the evaluation logic is therefore satisfied at the recognition level, and the growth across all indicators rejects H01.

Funding, Unicorns and the Capital Cycle

Table 2: Venture Funding and Unicorn Creation

Year	VC/PE Funding to Startups (US\$ bn)	New Unicorns	Cumulative Unicorns
2018	10.5	8	18
2020	11.1	11	37
2021	35.0	44	81
2023	8.5	2	111
2024–25	11.0	6	118+

Source: Compiled from CGPDTM, DPIIT, Ministry of Defence and IN-SPACe disclosures.

The funding series exposes the ecosystem's principal vulnerability: the 2021 boom (US\$ 35 billion, 44 unicorns) reversed into a funding winter (2022–24) as global monetary tightening withdrew foreign capital, which supplies the overwhelming share of Indian venture funding. Employment growth decelerated and layoffs occurred in the same window. For a mission of self-reliance, dependence of the innovation engine on external capital cycles is itself a strategic exposure strengthening the case for domestic institutional capital (pension, insurance, family offices) and the deepened Fund-of-Funds/deep-tech fund instruments announced in recent budgets.

The Innovation Channel

Table 3: Startup-Linked Innovation Indicators

Indicator	2016–17	2020–21	2024–25
Patent applications by startups (annual)	~450	~4,500	~12,000+
Trademark filings by startups (annual)	~1,200	~9,000	~22,000+
Recognised deep-tech startups (share, %)	~8	~12	~15+
iDEX/defence startups & MSMEs engaged	—	~250	~800+
Space startups registered with IN-SPACe	—	~40	~300+

Source: Compiled from CGPDTM, DPIIT, Ministry of Defence and IN-SPACe disclosures.

Innovation indicators display the strongest alignment with Atmanirbhar goals. Startup patent filings grew over twenty-fold, aided by the 80 per cent patent-fee rebate and expedited examination; defence startups under iDEX progressed from prototypes to procurement orders under the positive-

indigenisation-list regime; and the 2020 opening of the space sector produced a private space industry launch vehicles, satellites, downstream analytics that scarcely existed at the mission's start. Correlation between cumulative startups and annual startup patent filings on the compiled series is $r \approx 0.97$ (significant at 5 per cent), rejecting H01. Alignment, the second tier of the evaluation logic, is thus strongly evidenced in technology sectors.

Regressing cumulative reported jobs (lakh) on cumulative recognised startups (thousand) across the nine years yields approximately $\text{Jobs} = 0.9 + 0.105 \times \text{Startups}$ with $R^2 \approx 0.98$ about 10–11 direct jobs per recognised startup on average, consistent with DPIIT-reported ratios. Correlation between annual recognitions and annual job additions is $r \approx 0.94$ (significant), rejecting H01. Two qualifications discipline the finding: reported jobs are self-declared at recognition and updates, and induced employment (gig, logistics, supplier networks) plausibly several times direct employment is excluded; conversely, funding-winter layoffs in 2022–23 are only partially captured. Even under conservative reading, the startup ecosystem ranks among the fastest-growing organised employment generators of the period, servicing the demography pillar.

The Growth and Self-Reliance Channel

Table 4: Startup Alignment with Self-Reliant Production (Illustrative Proxies)

Self-Reliance Domain	Indicator	2016–17	2024–25
Electronics	Domestic mobile-phone production (₹ lakh crore)	0.9	4.2+
Defence	Defence production (₹ thousand crore)	74	127+
Defence	Defence exports (₹ thousand crore)	1.5	21+
Drones	DGCA-registered drone startups/OEMs	few	350+
Digital economy	UPI annual volume (crore)	2 (2016–17)	17,000+

Startups are embedded, though not solely causal, in each domain: electronics design and component ventures within the PLI ecosystem; drone manufacturers scaled by the 2021 rules liberalisation and PLI; defence startups supplying indigenised items; and fintech startups riding and enriching the UPI rails that anchor the digital-economy pillar. Correlating a composite startup-scale index with a composite self-reliant-production index over the period yields $r \approx 0.9$ (significant), rejecting H04, though with the caveat that common policy drivers (PLI, digital public infrastructure) contribute to both series; the claim sustained is complementarity, not sole causation.

Findings of the Study

- Startup India transformed the scale of Indian entrepreneurship: from a few hundred recognised startups in 2016 to over 1.5 lakh by 2025 across 750+ districts, with about half from Tier 2/3 locations and nearly half having a woman director (H01 rejected).

- The employment channel is robust: reported direct jobs exceed 16 lakh, averaging 10–11 per startup, with recognition growth and job growth strongly correlated ($r \approx 0.94$; H01 rejected), subject to self-reporting and funding-cycle caveats.
- The innovation channel is the strongest Atmanirbhar alignment: startup patent filings grew over twenty-fold; deep-tech share rose to about 15 per cent; defence (iDEX) and space (IN-SPACe) startups moved from absence to procurement and orbit within the study period (H01 rejected).
- Startup expansion co-moves with self-reliant production proxies electronics, defence production/exports, drones, digital payments indicating complementarity with industrial-policy instruments such as PLI (H01 rejected, with common-driver caveat).
- The ecosystem's principal strategic vulnerability is capital dependence: the 2021 boom and 2022–24 funding winter tracked global liquidity, revealing that India's innovation engine runs substantially on foreign fuel a tension with the self-reliance objective itself.
- Regional and sectoral gaps persist: funding concentrates in three metro clusters, manufacturing startups remain a small minority relative to services, and procurement absorption of startup products by government/PSUs lags the enabling rules.

Discussion

Read against the evaluation logic of scale and alignment, Startup India emerges as a genuine, though incomplete, instrument of Atmanirbhar Bharat. Its scale contribution is clearest in employment and enterprise creation; its alignment contribution is clearest in the technology-systems pillar, where policy deliberately steered startups into defence, space, drones and electronics sectors where self-reliance is strategic rather than rhetorical. The convergence of instruments is notable: recognition and tax relief lowered entry costs, iDEX and positive-indigenisation lists created demand, PLI built adjacent manufacturing capacity, and digital public infrastructure supplied rails on which consumer startups scaled. This orchestration supports Baumol's insight that institutions channel entrepreneurship: Indian policy has, on balance, channelled it productively.

Two structural tensions temper the assessment. First, the capital paradox: an ecosystem meant to underwrite self-reliance is itself reliant on foreign risk capital, as the funding winter demonstrated; resolving it requires unlocking domestic institutional pools and expanding patient public co-investment the direction of the enlarged Fund of Funds and proposed deep-tech fund. Second, the services skew: employment-rich consumer-internet startups dominate, while capital-goods and component startups the heart of import substitution remain few; PLI-linked sub-schemes for startup manufacturers and assured procurement can correct the skew. Finally, measurement honesty matters for credibility: self-reported jobs and valuation-based unicorn counts are imperfect welfare metrics; institutionalising independent, audited outcome data would strengthen both evaluation and policy learning.

Suggestions and Recommendations

- Deepen domestic risk capital: operationalise the expanded Fund of Funds and a dedicated deep-tech fund with long horizons; ease prudential pathways for pension/insurance allocation to AIFs; incentivise domestic family-office and corporate venture participation to insulate the ecosystem from global cycles.

- Manufacture-oriented startup policy: carve startup windows within PLI and component-ecosystem schemes, provide plug-and-play industrial infrastructure, and extend credit-guarantee cover for hardware working capital to shift the sectoral mix toward import-substituting production.
- Procurement as demand policy: enforce and monitor GeM/PSU procurement relaxations for startups with published scorecards; scale iDEX-style challenge procurement to railways, power, health and agriculture departments so that government demand pulls indigenous innovation.
- Regional capital dispersion: state-level fund-of-funds co-investment, cluster-linked incubators in Tier 2/3 cities, and venture-scout programmes to convert the geographic spread of recognitions into a geographic spread of funding.
- Outcome measurement reform: independent verification of employment data, longitudinal tracking of recognised startups (survival, revenue, exports), and publication of an annual 'Startup Contribution to Atmanirbhar Bharat' statistical annex in the Economic Survey.
- Regulatory continuity: stable taxation of ESOPs and capital gains, faster IP examination, and single-window compliance to retain domicile of high-value startups within India (reversing 'flipping'), so that value created by Indian innovation is booked in India.

Conclusion

Atmanirbhar Bharat asks whether India can build the capabilities of a modern economy at home; Startup India is one of the principal wagers that it can. The evidence of 2016–2025 shows the wager substantially paying off: an entrepreneurial base broadened three-hundred-fold and spread across the map, more than a million and a half reported jobs, an innovation surge measurable in patents and visible in orbit-bound rockets and indigenised defence systems, and startup activity interwoven with the electronics, drone and digital-payment successes that headline self-reliant production. The unfinished agenda is equally clear: fuel the engine with domestic capital, tilt the mix toward manufacturing, let public procurement pull indigenous products, carry funding to the districts where founders already are, and measure outcomes with audited honesty. If these corrections are made, the startup movement will stand not merely as a beneficiary of India's growth story but as one of the authors of its self-reliance.

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