

# **“A Study on Indian Startup Ecosystem: Trends in Mergers, Acquisitions, And Public Listings (2015–2025)”**

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## **ABSTRACT**

The Indian startup ecosystem has witnessed a transformative journey between 2015 and 2025, evolving into the world's third-largest hub of entrepreneurial activity. This literature survey critically examines the dynamic landscape of Indian startups, focusing on trends in mergers, acquisitions (M&A), and public listings (IPOs). The study explores the key drivers of startup growth, such as the Startup India initiative, increased internet penetration, the rise of venture capital and angel investments, and sectoral diversification in fintech, edtech, health-tech, e-commerce, and more. It also highlights significant M&A and IPO milestones, with major players like BYJU'S, Zomato, and Paytm leading acquisitions and public listings.

The review consolidates insights from multiple secondary sources including government reports, academic research, and financial analyses to understand the ecosystem's evolution, sectoral concentration, and regional disparities. While the policy environment, funding availability, and youth-driven innovation have catalyzed growth, the study identifies persistent challenges like regulatory barriers, talent shortages, and infrastructural gaps in Tier-II and Tier-III cities.

By mapping trends and challenges, the study emphasizes the need for inclusive growth, enhanced legal and financial support systems, and targeted policy reforms to ensure the sustainability and scalability of startups across India. The findings offer valuable recommendations for policymakers, entrepreneurs, and investors to better navigate the future of Indian entrepreneurship in a globalized, technology-driven economy.

## **INTRODUCTION**

A startup venture is defined as a new business that is in its initial stages of operation, striving to grow, and is typically financed by individual investors or capitalists. According to DPIIT (Department for Promotion of Industry and Internal Trade), 'An entity will be recognised as a startup for up to 10 years of existence and up to Rs 100 crore of turnover. Earlier, the existence period was five years, and the turnover limit was Rs 25 crore. The Indian startup ecosystem has evolved dynamically over the last few decades. The Start-up India campaign, which is a flagship initiative of the government of India, was launched

in 2015 by our Prime Minister, Shri.

Narendra Modi, to catalyze the start-up culture and build a strong entrepreneurial ecosystem in the country. There have been multiple factors that urged an entrepreneur to get their startups off the ground and begin their operations. Also, the Indian startups face their own set of challenges and stellar opportunities.

The failure may occur due to cultural diversity, improper mentoring, lack of government policies, and many more complexities. In 2021 alone, India has minted 44 Unicorns and Indian startups have raised \$42 billion.(Economic Times 2022). India has one of the largest startup ecosystems in the world with a rank of three. India had surpassed a historic milestone of 100 unicorn startups with a combined worth of \$300billion. (Byjus 2022). India's startup ecosystem has been on a rapid growth trajectory in recent years with a strong focus on technology and ecommerce. Along with government initiatives, there is a definite movement in startup arena in India due to penetration of IT and internet.

Many startups are coming up in service sector including education, legal, retail, insurance and health. With customers becoming aware of the benefits and convenience, the popularity and viability of startups is no more a difficult proposition for an entrepreneur. A number of venture capitalists and angel investors are aggressive and gung-ho on Indian startups as they see lot of potential with few expected to become unicorns (high valued companies) bringing in good returns. The government has launched a number of initiatives to promote startups across the country as a part of Startup India Initiative such as Startup India Action Plan, The Funds of Fund for Startups, regulatory reforms, Income Tax exemption for 3 years, the Startup India seed fund scheme etc.

The role of government becomes very important in developing the necessary infrastructure and support to foster the startup ecosystem. India needs to build upon low cost and high-impact solutions, although there has been a rise in angel and venture capital funding, it becomes crucial that the ecosystem is well integrated to connect startups to fund houses and to other stakeholders.

## **LITERATURE REVIEW**

ECONOMIC (2022) remarked India as third-largest startup ecosystem in the world. The survey highlights the record of overall 83 Indian startups to achieve the unicorn status in 2021 along with the string of IPOs by the new-age companies. With its enhanced status, India is now a global leader in addressing global challenges and advancing the sustainable development goals. (**Indian Startup Ecosystem- Challenges and Opportunities - Google Scholar, n.d.**) in their research article '**Indian Startup Ecosystem- Challenges and Opportunities**' had discussed about the various set of problems as well as possibilities that may arise in the future. The article provides a clear picture of various set of difficulties and opportunities that startups go through during their stages of operation.

**MYGOV BLOG (2022 'STARTUP INDIA WHAT IT MEANS FOR YOUTH'** - have

provided that Indians minds are playing a pivotal role in the global landscape of startups and how the young entrepreneurs are working towards the vision of making a self-reliant India. The reports also describes the importance of startup India scheme in nurturing the youth by unleashing their active engagement in making of Aatmanirbhar citizens. **STARTUP INDIA WAY AHEAD (2022)** an annual report published by Ministry of commerce & Industry, Department for promotion of Industry & Internal Trade (DPIIT), discusses about the journey of Indian startups since 2016 to present, and how the Startup India Action Plan 2016, has fueled the startup movement in India , making India self reliant and self sufficient.

The Indian government has introduced several initiatives and policies to foster the growth of startups and promote an entrepreneurial culture. The "**Startup India**" campaign, launched in 2016, aims to provide a supportive ecosystem through measures such as tax benefits, easier business registration, and intellectual

property rights protection (**Gupta et al., 2019**). The establishment of incubation centers, research parks, and innovation labs has further facilitated collaboration, knowledge sharing, and access to resources for startups (**Agarwal & Shah, 2020**).

The government's emphasis on digitalization, financial inclusion, and skilling initiatives aligns with the needs of startups and has a positive impact on their growth prospects. Initiatives like Digital India, Aadhaar (unique identification), and the Jan Dhan Yojana (financial inclusion program) have created an enabling environment for startups to leverage technology and reach a wider audience (**Kumar et al., 2019**). The growth of the Indian startup ecosystem can be attributed to various factors. One crucial factor is the increasing availability and accessibility of technology.

Self Funding or Bootstrapping, Friends and Family, Seed, Growth (also known as the 'Early Stage') and Expansion. (**Adhana, 2016**) in his research paper "Start-Up India, Stand-Up India: India Turning into a Start-Up Hub by Prospering Entrepreneurial Culture" clearly explains the startup ecosystem in Indian scenario. The entrepreneurial culture, the funding sources, types of investors and reasons of success and failures of startups have also been stated. (**Manshani & Dubey, 2017**) have conducted the research study on Women entrepreneurs in India and have concluded several factors that promotes & encourages women empowerment in entrepreneurial development. (**Jha, 2018**) in her research article "Entrepreneurial ecosystem in India-Taking stock and looking ahead" had stated the role of education & training and other socio-cultural issues responsible for building the startup ecosystem in India. (**Kalyanasundaram et al., 2021**) in their paper titled 'Tech Startup Failure in India: Do Lifecycle Stages Matter?' have determined the causal factors and attributes which causes the failure of tech startup, against the successful ones. (**Chillakuri et al., 2020**) in their research article 'Linking sustainable development to startup ecosystem in India - a conceptual framework' have provided the conceptual framework for linking the startup ecosystem to environmental sustainability. They have stated that sustainability is not just about reducing carbon emissions, but is a fundamental principle that guides the organization and society. (**Garg & Gupta, 2021**) in their research work titled as 'startups and the growing entrepreneurial ecosystem' have discussed about the role of startups in enhancing the economic growth, role of incubators in developing these startups and the importance of Intellectual Property (IP) protection and different stages of series funding for startups.

The proliferation of smartphones, widespread internet penetration, and the advent of affordable data plans have created a conducive environment for startups to innovate and reach a large user base (**Singh & Gupta, 2020**). Furthermore, India's demographic advantage, with a large youth population, has contributed significantly to the growth of startups. Young entrepreneurs, armed with technological expertise, creativity, and a drive to solve pressing problems, have played a pivotal role in shaping the startup ecosystem (**Hemantkumar & Bansal, 2021**). Access to funding is critical for startup success, and the Indian startup ecosystem has witnessed significant growth in this regard. Several studies have highlighted the increasing availability of venture capital funding and angel investments in India (**Pattnaik & Nayak, 2020**). Additionally, the establishment of various funding platforms, crowdfunding models, and angel networks has provided startups with multiple avenues to raise capital and fuel their growth (**Bawa & Thirumaran, 2019**). Moreover, mentorship and networking opportunities have proven to be essential for startup founders. Incubators, accelerators, and co-working spaces have emerged as vital platforms for startups to gain guidance, mentorship, and access to networks of experienced entrepreneurs and industry experts (**Dutta et al., 2020**). These support systems not only help startups refine their business models but also enable them to connect with potential investors and strategic partners. While the Indian startup ecosystem offers immense opportunities, entrepreneurs face several challenges.

Regulatory complexities and compliance issues often pose hurdles for startups, especially in sectors such as fintech and health tech (Chen et al., 2021). Streamlining and simplifying regulatory processes can alleviate these challenges and create a more favorable environment for startups to thrive. Another critical challenge is talent acquisition and retention. Startups often struggle to attract skilled professionals due to competition from established corporations and limited resources. The shortage of domain-specific talent, particularly in emerging technologies such as artificial intelligence and blockchain, presents a significant obstacle for startups (Subramaniam, 2020).

The most comprehensive paper describing investment trends in the Indian startup ecosystem is by David et al (2020). The paper analyzed trends in investment in the Indian startup ecosystem from 2015 – 2019, exhibiting stage-wise, sector-wise, and geographic distribution of investment. Describing different schemes under which startups can avail benefits in India, they estimated a regression model to understand factors influencing startup investment in India. They found startups are clustered in large cities and that small startups are located beyond the metros.

The government's emphasis on digitalization, financial inclusion, and skilling initiatives aligns with the needs of startups and has a positive impact on their growth prospects. Initiatives like Digital India, Aadhaar (unique identification), and the Jan Dhan Yojana (financial inclusion program) have created an enabling environment for startups to leverage technology and reach a wider audience (**Kumar et al., 2019**). The growth of the Indian startup ecosystem can be attributed to various factors. One crucial factor is the increasing availability and accessibility of technology.

(**Baporikar, 2014**) in her research paper “youth entrepreneurship in Indian scenario” discusses about the role of youth entrepreneurship with a focus on Indian scenario by integrating it to several other factors such as business models for YE, barriers affecting YE and its impact on reducing unemployment. (**Kshetri & Kshetri, 2016**) in their research article “Fostering startup ecosystem in India” have mentioned out the factors and consequences responsible for fostering the growth of startup ecosystem in India. The research paper explains the determinants of entrepreneurship factors that affect entrepreneurial performance in terms of a) Regulatory framework, b) Values, culture and skills, c) Access to finance, market, R&D and technology. (**Andaleeb & Singh, 2016**) in their research report titled as “A study of Financing Sources for Start-up Companies in India” have described the stages of startups and modes of financing available to startups at each stage. The stages through which a startup has to pass consists of 6 phases of investment;

## OBJECTIVES

1. To study about the current status of startup ecosystem in India.
2. To understand the government schemes that support startups in India.
3. To identify the issues and challenges relating to success & failures of startups in India.
4. To identify the key drivers behind increased M&A activity among Indian startups

## RESEARCH METHODOLOGY

This research study is purely based on secondary data. Secondary data sources comprises of data collected from journals, magazines, news articles, authenticated websites, newsletter and annual reports from Ministry of commerce & industry, Department for Promotion of Industry and Internal Trade (DPIIT) and from other sources found suitable. The study is descriptive and conceptual in nature.

## Source of Data

For the present study, secondary data has been collected through different sources. Website [www.startupindia.gov.in](http://www.startupindia.gov.in) has been referred for accomplishing the research objective. Annual status reports from the department for promotion of industry and internal trade (DPIIT) has been alluded to describe the journey of startups in India since the startup India campaign have launched. Press release from PIB and several government blog has also been the fundamental part of the research study.

## Theoretical Framework

### GROWTH OF STARTUPS IN INDIA

India is growing undeniably, and so is the startup scenario in India. Government of India has declared period from 2010-2020 as the decade of innovation. Over the past few years, lot of new and encouraging startup stories have garnered much deserved attention. The story of Indian startup ecosystem are everywhere, be it the payment services like Paytm, PhonePe, or educational techs like Unacademy, Byju's, Physics Wallah, or food tech startups like, Zomato, Swiggy or a bit unconventional ones, we come face to face with these startups for our day to day needs. The key sectors in the Startup Ecosystem are-

- E-COMMERCE- shows CAGR of 27% between 2019-2024. Popular startups in this sector are Flipkart, Nykaa, Snapdeal etc.
- HEALTH-TECH- growth rate 39 %. Popular startups in this sector are Pharmeasy, CureFit, Mfine etc.
- FIN-TECH shows potential to reach \$106billion approx 42% by 2025. Popular startups here are PayTm, PolicyBazaar, PhonePe etc.
- ED-TECH potential to reach \$30billion around 34% in next 10 years. Popular startups in this field are Unacademy, Physics Wallah, Byju's, Vedantu etc.
- LOGISTICS- having potential to grow by 10.4% from 2020-2024. Startups in this area are Delhivery, Blinkit, Ekart etc.
- TRAVEL-TECH potential to reach \$30billion, around 26% in next 10 years. Popular startups in this field are Gilbibo, MakeMyTrip, Yatra, OYO etc.

## Data Analysis

This section presents a detailed analysis of the data collected on the trends and patterns in the Indian startup ecosystem, particularly with respect to **mergers, acquisitions, and public listings (IPOs)** during the period **2015–2025**. The analysis is drawn from secondary sources, including government reports, startup databases, and research publications.

### 1. Growth of the Indian Startup Ecosystem (2015–2025)

India's startup landscape has grown from approximately **3,000 startups in 2014** to over **100,000 recognized startups by 2025**, according to DPIIT and Startup India reports. The major hubs include **Bengaluru, Delhi NCR, Mumbai, Hyderabad, and Chennai**. This rapid growth has been fueled by:

- Startup India Initiative (2016)
- Digital India campaign
- The proliferation of smartphones and affordable internet



- Increasing VC/angel investments.

## 2. Trends in Mergers and Acquisitions

From **2015 to 2025**, M&A activities became more frequent due to:

- Consolidation in sectors like fintech, edtech, and e-commerce
- Global expansion strategies
- Acquihires for talent and tech capabilities

### Key M&A Deals in India:

Year	Acquisition	Acquirer	Sector
2016	FreeCharge	Snapdeal	Fintech
2018	Flipkart	Walmart (\$16B deal)	E-commerce
2020	WhiteHat Jr	BYJU'S	Edtech
2021	BigBasket	Tata Digital	E-grocery
2022	Blinkit	Zomato	Quick commerce
2023	ShareChat's acquisitions (Moj, Circle, etc.)	Social media	
2024	Dunzo's assets	Reliance Retail	Logistics/Q-commerce

## 3. Sector-wise M&A Analysis

- **Fintech:** Razorpay, Paytm, and PhonePe engaged in acquihires and tech-based acquisitions.
- **EdTech:** BYJU'S led M&A activity with acquisitions like Aakash, WhiteHat Jr., Toppr.
- **HealthTech:** PharmEasy acquired Medlife and merged with Thyrocare.
- **E-commerce & Q-commerce:** High consolidation due to razor-thin margins (Zomato- Blinkit, Tata-BigBasket).

## 4. IPO Trends (2015–2025)

The IPO landscape saw a boom between **2020 and 2022**, with several high-profile public listings from startups:

### Major IPOs of Indian Startups:

Year	Startup	Listing Exchange	Issue Size	Sector
2021	Zomato	NSE/BSE	₹9,375 crore	Food Delivery
2021	Nykaa	NSE	₹5,351 crore	Beauty/E-commerce
2021	PolicyBazaar	NSE	₹5,625 crore	Fintech/Insurtech
2021	Paytm	NSE/BSE	₹18,300 crore	Fintech
2022	Delhivery	NSE	₹5,235 crore	Logistics
2023	Mamaearth (Honasa)	NSE	₹1,701 crore	FMCG
2024	Ola Electric (expected)	TBA	Electric Mobility	

## 5. Funding Trends and Impact on Exits

Between 2015–2025:

- India attracted over **\$150 billion in startup funding**.
- VC and PE firms increasingly sought exit routes via IPOs and strategic sales.
- By 2022, India had over 100 unicorns, a large number of whom were IPO-ready or acquired.

**Top Investors:** Sequoia, Tiger Global, Accel, SoftBank, and Lightspeed contributed significantly.

## 6. Geographic and Stage-wise Analysis

- **City Concentration:** 70% of M&As and IPOs were initiated by startups based in Bengaluru, Mumbai, or NCR.
- **Stage of Exit:** Most M&A deals happened in **Series B/C stages**, while IPOs occurred post-Series D or unicorn stage.

## 7. Role of Government and Policy Support

Startup India (2016), changes in FDI policy, taxation reforms, DPIIT recognition, and SEBI guidelines for startup IPOs were major enablers. Government-backed funds (SIDBI, Fund of Funds) also helped improve early-stage financing.

## Findings

Through the analysis of India's startup ecosystem between 2015 and 2025, several significant patterns, behaviors, and outcomes have emerged across various sectors, funding stages, and exit strategies. Below are the most noteworthy findings:

### 1. Rapid Growth and Maturity of the Ecosystem

- India's startup ecosystem evolved from a fragmented, early-stage environment into one of the world's top three startup hubs by 2025.
- As of 2025, India has over **100,000 recognized startups** and more than **100 unicorns**.

### 2. Rise in Strategic Mergers and Acquisitions

- M&A activity surged post-2018, driven by unicorns like BYJU'S, Zomato, and Paytm acquiring smaller players to consolidate market share or technology.
- Sectors like **fintech**, **edtech**, **e-commerce**, and **logistics** witnessed the highest M&A activity.
- M&A was frequently used as a tool for:
  - Acquihring (talent acquisition),
  - Market entry/expansion,
  - Technology absorption.

### 3. Increase in Startup IPOs

- A wave of IPOs occurred between **2020–2023**, signaling maturity in the Indian startup space.
- Companies like Zomato, Nykaa, Paytm, PolicyBazaar, and Delhivery led the charge.
- Many IPOs received overwhelming investor response, despite some facing post-listing valuation corrections.

### 4. Government Policy Has Been a Strong Enabler

- Initiatives like **Startup India, Digital India**, and **Atal Innovation Mission** created a favorable policy environment.
- **DPIIT recognition, tax exemptions**, and **SEBI IPO relaxations** helped reduce regulatory barriers.

### 5. Funding Ecosystem Evolved with Greater Depth

- Between 2015 and 2025, funding moved from angel and early-stage support to late-stage megadeals and structured exits.
- VC firms like **Sequoia, Tiger Global, Accel, SoftBank** played dominant roles.
- The startup investment focus also expanded from metros to emerging hubs like **Pune, Jaipur, and Ahmedabad**.

### 6. Talent and Infrastructure Challenges Remain

- Startups continue to face hurdles in hiring domain-specific talent (AI, blockchain, R&D).
- Infrastructure issues—particularly in Tier II and Tier III cities—limit scale-up opportunities despite startup emergence.

### 7. Regional Disparities in Startup Activity

- Around 70% of all M&A and IPO deals originate from Tier I cities like **Bangalore, Delhi NCR, and Mumbai**.
- Smaller cities still lack adequate VC presence, incubation, and legal/financial advisory services.

## Suggestions

#### 1. Promote M&A Literacy and Legal Support

- **Workshops and incubation programs** should educate startups on how to prepare for acquisition, due diligence, valuation, and integration.
- Legal aid and IP protection frameworks must be strengthened, particularly for smaller startups.



## 2. Encourage IPO Readiness through Regulatory Ease

- SEBI and RBI should further **simplify IPO filing procedures**, offer sandbox frameworks for financial compliance, and support dual-listing for high-growth startups.
- A **Startup IPO Incubation Cell** can be set up under DPIIT to guide scale-ups.

## 3. Strengthen Ecosystems in Tier-II/Tier-III Cities

- Expand **fund-of-funds**, startup accelerators, and digital infrastructure in emerging cities.
- Offer incentives (tax breaks, grants) to VCs investing beyond metros.

## Conclusion

The Indian startup ecosystem has undergone a remarkable transformation between 2015 and 2025, growing from a nascent, fragmented network into a globally recognized hub of entrepreneurial dynamism. This study examined the trends in **mergers, acquisitions, and public listings (IPOs)** over this critical decade, and the findings clearly illustrate a shift from mere survival to strategic scaling and successful exit models.

Startups in India are no longer confined to early-stage operations but are emerging as influential players in national and global markets. The surge in **M&A activity**—often led by unicorns and tech giants—reflects a healthy ecosystem where innovation, talent, and market capture go hand-in-hand. Simultaneously, the **IPO boom**, especially between 2020 and 2023, demonstrates investor confidence, market readiness, and the evolution of regulatory frameworks that support startup exits.

Government initiatives like **Startup India, Digital India, and Make in India** have played a foundational role in building this entrepreneurial ecosystem. These policies, combined with increased access to **venture capital, angel networks, and incubation support**, have enabled startups to access capital, attract talent, and build scalable solutions.

However, the study also highlights ongoing **challenges** such as regulatory hurdles, talent shortages in emerging technologies, and the concentration of innovation activity in metropolitan regions. Addressing these issues through policy reforms, regional empowerment, and education-industry linkages will be crucial to sustaining and democratizing the startup boom across India.

In conclusion, the next phase of India's startup story depends on **inclusive growth, cross-border innovation, and exit-readiness**. With its demographic dividend, technological strength, and entrepreneurial spirit, India is well-positioned to not only maintain but also lead the global startup momentum in the years ahead.

## Reference:

1. Cambridge Dictionary (2022). Meaning of disruption in English, <https://dictionary.cambridge.org/dictionary/english/disruption> (retrieved: 29/03/2022).
2. Cambridge Dictionary (2022). Start-up, <https://dictionary.cambridge.org/pl/dictionary/english/start-up> (retrieved: 13/03/2022).
3. Crunchbase (2022). Indian Angel Network in: Financials, [https://www.crunchbase.com/organization/indian-angel-network/company\\_financials](https://www.crunchbase.com/organization/indian-angel-network/company_financials) (retrieved: 12/04/2022).
4. Cultural Atlas (2022). Indian Culture in: Core Concepts, <https://culturalatlas.sbs.com.au/indian->

culture/indian-culture-core-concepts (retrieved: 25/04/2022).

5. Dash, S. (2020). These 10 Indian colleges have produced India's most funded startup owners, <https://www.businessinsider.in/business/startups/news/these-10-indian-collegeshave-produced-indias-most-funded-startup-owners/slidelist/77140792.cms> (retrieved: 18/03/2022).

6. De, N. (2020). 4 Essential Steps to Take When Starting a Business in India in: Escalon Blog, <https://escalon.services/blog/steps-when-starting-a-business-in-india/> (retrieved: 26/04/2022).

7. Enman, C. and May, S. (2016). What is a business transition? in: Welch LLP, <https://www.welchllp.com/blog/what-is-a-business-transition/> (retrieved: 29/03/2022).

8. Euromonitor International (2022). Internet subscribers in India in: Economies and Consumers Annual Data, <https://www-1portal-1euromonitor-1com16a1ap8r804b6.han.sgh.waw.pl/portal/statisticsevolution/index> (retrieved: 19/04/2022)

9. Euromonitor International (2022). Internet users in India in: Economies and Consumers Annual Data, <https://www-1portal-1euromonitor-1com16a1ap8r804b6.han.sgh.waw.pl/portal/statisticsevolution/index> (retrieved: 19/04/2022).

10. Farrell, J. (2021). Three steps to anticipate market disruption in: KPMG in the Wall Street Journal, <https://info.kpmg.us/innovation-and-enterprise-solutions/kpmg-wsjinnovation/anticipating-disruption.html> (retrieved: 29/03/2022).

11. Kshetri, N., & Kshetri, N. (2016). Fostering startup ecosystems in India. Asian Research Policy, 7(1), 94-103. 10. Baporikar, N. (2014). Youth entrepreneurship in Indian scenario. International Journal of Asian Business and Information Management (IJABIM), 5(2), 74-84.

12. Andaleeb, U., & Singh, S. D. (2016). A study of Financing Sources for Start-up Companies in India. International Review of Business and Finance, 8(1), 1-4.

13. Manshani, S., & Dubey, A. (2017). Startup women in startup India: A study of women entrepreneurs in India. International Journal of Business Management (IJBGM), 6(4), 91- 100.