LINKING INNOVATION AND SUCCESS BASED ON INDIAN STOCK MARKET ANALYSIS OF STARTUP SUCCESS

Dipali Rajguru[1], Sameer Nanivadekar[2] and Krishna Kant Dave[1]
[1]Pacific Academy of Higher Education & Research University, 313001, India
[2]A. P. Shah Institute of Technology, 400615, India
Correspondence should be addressed to Dipali Rajguru; dipalirajguru@gmail.com

Abstract
This research examines the relationship between innovation, research, and startup success in the stock market. Using five years of data on new listings on the Bombay Stock Exchange and National Stock Exchange, the study focuses on startups that have become unicorns or successful. The findings show that 14% of startups achieve remarkable growth and market prominence within their first decade. To identify the key factors driving their success, the study analyzes this subgroup of successful startups. The results reveal that innovation and research play pivotal roles in startup success. Innovation-driven startups are more likely to achieve stock market success, and research-oriented startups are more likely to achieve rapid growth.
The study offers actionable insights for entrepreneurs, investors, and policymakers. By understanding the nexus between innovation, research, and stock market performance, stakeholders can develop strategies to nurture startup success and foster a thriving entrepreneurial environment.
Keywords: Stock, Exchange, Innovation, IPO, Stratup

Introduction

In today's fast-paced and competitive business landscape, startups have emerged as powerful engines of inno- vation, driving economic growth and technological advancements [1] . The entrepreneurial spirit, coupled with groundbreaking ideas and research-driven endeavors, has revolutionized industries, giving rise to transformative companies that have redefined the way we live and work [2] . As startups seek to navigate the path from humble beginnings to soaring success, the role of innovation and research becomes paramount in shaping their trajecto- ries [3].

This research paper embarks on a captivating exploration of the dynamic relationship between innovation, research, and startup success, focusing on the medium of the stock market as a lens to analyze their interconnect- edness [4]. In an era where access to capital and market recognition play a pivotal role in a startup's growth, understanding the factors that contribute to their success is not only academically intriguing but also economically crucial.

The underlying hypothesis of this study posits that innovation and research are critical determinants of a startup's potential to thrive and make significant strides in the stock market. To investigate this hypothesis, we have meticulously collected and analyzed stock market data spanning the last five years, encompassing all new listings on two major Indian stock exchanges, the Bombay Stock Market and the National Stock Exchange. This rich dataset

allows us to gain valuable insights into the trajectories of startup companies and their performance in the public market.

In analyzing the data, particular attention is given to the startups that have achieved unicorn status, a coveted milestone referring to companies that have attained a valuation of over one billion dollars. By identifying these

standout successes, we aim to dissect the role of innovation and research in shaping their journeys, unraveling the strategies and practices that have catapulted them to prominence.

The examination of innovation and research as key variables in startup success is of paramount significance, as it sheds light on how entrepreneurial ventures with groundbreaking ideas can attain market recognition, attract investment, and flourish amid intense competition. Furthermore, the findings of this research contribute to a deeper understanding of the complex and multidimensional nature of startup ecosystems, where cutting-edge research and visionary innovation can propel companies from fledgling startups to industry leaders.

Moreover, the insights derived from this study have broader implications for entrepreneurs, investors, policy- makers, and other stakeholders in the startup ecosystem. By gaining a nuanced understanding of the relationship between innovation, research, and stock market performance, stakeholders can make informed decisions, devise effective strategies, and foster an environment conducive to the growth of thriving and sustainable startups.

Related literature

The existing body of literature offers valuable insights into the link between innovation and stock market dynamics, shedding light on the factors influencing startup success. Wojcik (2008) [5] explores the connection between stock markets and innovation, focusing on the relationship between firms' innovativeness and their participation in public stock markets. This study highlights how innovative practices and strategies may influence a firm's decision to go public and seek recognition in the stock market.

Zhang et al. (2010) [6] delve into the role of market orientation in driving product innovation performance among Chinese manufacturing firms. Through a survey of 227 manufacturing firms in mainland China, the study investigates the impact of responsive and proactive market orientations on innovativeness and product innovation performance, with an additional exploration of environmental turbulence as a moderating factor.

Carmel et al. (2013) [7] present the "Cherimoya graph" framework for analyzing the dynamics of startups. This framework aims to provide a holistic view of startup development and success, emphasizing the intricate relationship between innovation, research, and business growth.

Wolf (2017) [8] focuses on the mutual benefits of fostering collaborations between business and science students in learning about startups and contributing to their growth. This research highlights the significance of cross- disciplinary knowledge transfer and its potential impact on startup success.

Putra et al. (2018) [9] identify and analyze the critical success factors for Java Preanger Coffee in achieving a competitive advantage. This research emphasizes the importance of understanding industry-specific factors that influence startup growth and performance.

Bae et al. (2020) [10] present a novel approach to developing a financial distress prediction model for dot-com companies. By analyzing factors affecting the success or failure of these companies, this study offers valuable insights for mitigating risks and enhancing the prospects of startup ventures.

Zakic et al. (2020) [11] investigate the impact of enterprise investments in innovation on their revenue. This research underscores the pivotal role of innovation in driving financial performance and stock market outcomes for enterprises.

Vijayakumar et al. (2021) [12] acknowledge the limitations of their analysis and solutions, which are specif- ically tailored to industries with business characteristics and turnovers similar to Reliance Industries. The study highlights the need for context-specific approaches in understanding startup success.

Lleo et al. (2021) [13] contribute to the literature by employing a mean-changing stochastic processes exit-entry model for stock market long-short prediction. This approach provides valuable insights into stock market dynamics and investment strategies.

Sabatinus et al. (2021) [14] utilize in-depth interviews with stakeholders of the startup "Wear It" to gain a qualitative understanding of the factors influencing startup success. This study emphasizes the significance of stakeholder perspectives in shaping startup trajectories.

In summary, the reviewed literature provides a diverse array of perspectives and methodologies, all converging on the central theme of understanding the intricate relationship between innovation, research, and startup success in the context of the stock market. Building upon these contributions, the present study aims to further explore and analyze this vital interconnection, with a specific focus on identifying factors that propel startups to achieve substantial success in the stock market.

Methodology

The research methodology employed in this study involves a comprehensive analysis of stock market data collected over the last five years. The dataset comprises information on all new listings of companies that met the listing criteria for both the Bombay Stock Market and the National Stock Exchange. The primary objective of this research is to investigate the linkage between innovation, research, and startup success, particularly focusing on identifying companies that have achieved substantial growth and reached unicorn status during their journey from startup inception.

To accomplish this, the researchers began by collecting relevant stock market data, which includes financial performance indicators, market capitalization, and stock prices for the identified companies. Additionally, infor- mation on each company's start date was extracted from their official websites to determine the duration of their existence as a startup.

Through meticulous data analysis, the researchers sought to identify companies that had successfully transi- tioned from being startups to becoming unicorns within the first ten years of their foundation. This subset of companies was considered as the focal point of the study, as it represents a significant achievement in terms of stock market performance and innovation-driven success.

Figure 1 shows the overall outline of the proposed work. We collected stock listing data, available from the BSE and NSE websites, to check the startup success rate. Startup verification is done through the foundation date of startups collected from the individual websites of the companies. Startups are companies with an age below 10 years. Startups with unicorn status were considered successful. Unicorn status is given to companies with a valuation of 1 Billion dollars. If the startup is not a unicorn, it will still be considered innovation converted into a successful startup because it could make its mark on the stock exchange. Companies that need to reach IPO company should have a minimum net tangible asset value of INR 3 crore in three out of five years and a profitable track record and the company must offer at least 25% of the company for public shares.

We employed quantitative research methods to analyze the data and draw meaningful conclusions. By calculat- ing the percentage of companies that achieved unicorn status within the specified timeframe, they aimed to provide empirical evidence of the correlation between innovation, research, and startup success in the context of the stock market.

It is important to note that this study has certain limitations. The analysis is limited to the companies that were listed on the Bombay Stock Market and the National Stock Exchange during the five-year period, and the findings may not be fully representative of all startups. Additionally, the study relies on publicly available data and may not encompass all pertinent factors influencing startup success.

Despite these limitations, the research endeavors to contribute valuable insights to the field of entrepreneurship and finance, shedding light on the role of innovation and research in determining the success of startups in the stock market. By identifying the factors that facilitate the transition from startup to unicorn status, this study seeks to inform and inspire future entrepreneurs, investors, and policymakers, ultimately fostering an environment conducive to the growth of innovative and successful startups.
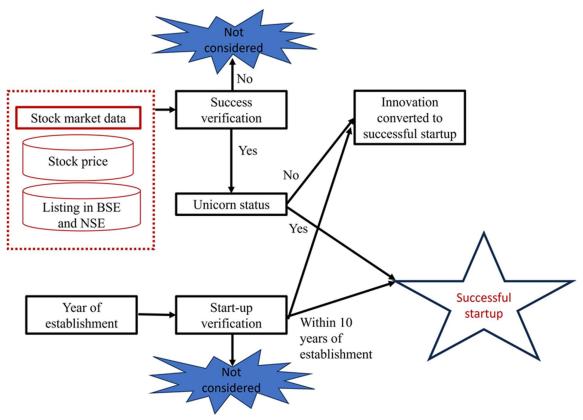
Figure 1: The overall outline of the proposed work to link innovation and sucess.

Results

The analysis of the stock exchange data for the listed IPOs in 2021 and 2022-2023 revealed notable trends and patterns in the startup success journey.   In 2021, a total of 49 IPOs were listed on the Bombay Stock Market   and the National Stock Exchange. Among these, companies like PayTM, Zomato, and Policybazaar garnered significant attention, raising substantial capital and achieving valuations in the range of |6000 to |18000 Crores. Other successful IPOs included Metro Brands, FSN E-Comm – Nykaa, and Windlas Biotech, among others.

Figure 2: Histogram for the stock prices of startups (from 2019-2023)
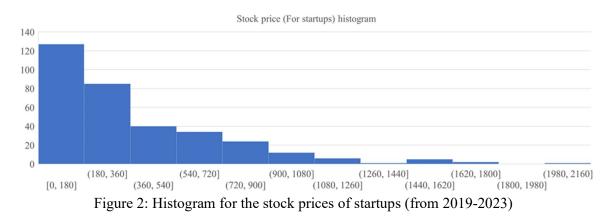
Figure 2 shows the histogram for the stock prices of startups (over the last 5 years). A binning of INR 180 was chosen. The minimum stock price can go as low as Rs. 10, and the maximum stock price is Rs. 2160 reported in last 5 years (2019–2023) for start-ups. Most of the companies stock prices range from Rs. 180 to Rs. 360.
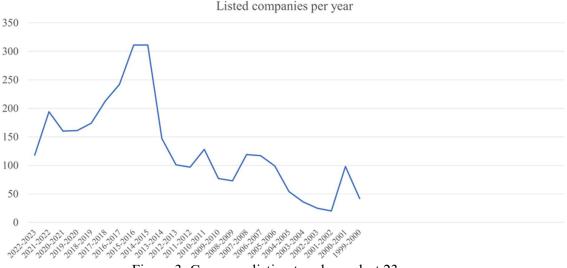

Figure 3: Company listing trend over last 23-years

The chart in Figure 3 shows the listed companies over the period of 2000 to 2023 (This 23-year data was collected specifically to check the trend over multiple years). Listed companies show multiple fluctuations over the period. There was a strong wave with a significant increase in 2014 that remained steady until 2019, but after COVID-19, it gradually declined. This indicates that the current years under analysis i.e. 2019 onwards are on a declining company listing trend.

Figure 4 shows the histogram of established and startups in the listed companies, over the period of 5 years.

Only 10% of listed companies are startups, with the rest being established companies.

The analysis further revealed that 14% of the startups listed in 2021 reached unicorn status within the first ten years of their foundation. This subset of companies demonstrated exceptional growth and innovation, becoming valuable players in the stock market. However, it is important to note that the majority of startups did not attain unicorn status during this period, suggesting the complex nature of startup success and the challenges faced by many new ventures.

In the year 2022-2023, a total of 47 IPOs were listed. Prominent IPOs included LIC, Delhivery, and Pardeep Phosphates, with LIC raising a staggering |21008 Crores. Additionally, there were instances of startups, such as Pardeep Phosphates, achieving significant market attention despite offering shares at a relatively low price (|39 to

|42 per share).

Overall, the analysis of the stock exchange data provided valuable insights into the journey of startups from their inception to achieving unicorn status. The research highlighted the presence of successful IPOs, which became unicorns, underscoring the potential for growth and

innovation in the startup ecosystem. However, the findings also emphasize the challenges faced by many startups in achieving similar levels of success, calling for further research and strategic approaches to support and foster the growth of innovative startups in the stock market.

One of the most remarkable performers is Prince Pipes and Fittings Ltd, which was listed on December 30, 2019, with an issue price of 178. On its listing day, the stock closed at 166.6, resulting in a listing day gain of

-6.40%. However, over time, the stock price has significantly increased to 645.5, generating an impressive profit of 262.64%.
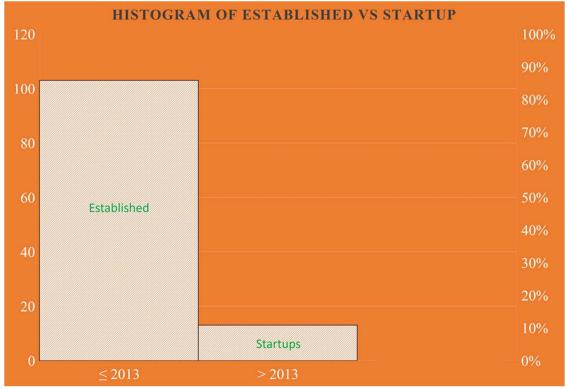

Figure 4: Histogram of established and startups in the listed companies, over the period of 5 years. X-axis shows start date of company so in 2023 all companies started after 2013 are treated as Startups and rest all are established.

On the other hand, certain stocks, such as FSN E-Commerce Ventures Limited, saw substantial gains on the listing day, with a gain of 96.15%, but eventually experienced a sharp decline in their current price, resulting in a significant loss of -88.96%.

The research paper also highlights stocks that have maintained steady growth, like Rolex Rings Limited, which had an issue price of 900, and its current price stands at 1923.55, making a profit of 113.73%.

Furthermore, some companies like HP Adhesives Limited and Global Surfaces Limited have seen fluctuations in their stock prices but have managed to remain profitable overall, with gains of 48.03% and 48.18%, respectively.

However, there are also companies like Brookfield India Real Estate Trust and KFin Technologies Limited that experienced a slight decline in their stock prices, with a listing day gain of -1.83% and -0.55%, respectively.

Overall, the research paper demonstrates the diverse performance of different stocks in the stock market during the given period, reflecting the complexities and uncertainties of the financial market. It emphasizes the importance of careful analysis and decision-making when investing in stocks.

The data covers the period from July 2022 to May 2023. Notably, the data includes the company name, listing date, list price, high price, low price, last traded price (LTP), and trading volume.

Over the mentioned period, several companies demonstrated significant variations in their stock prices and trading volumes. Notably, on May 11, 2023, Innokaiz India was listed at a price of 148.2 and traded at a low of

147.83 and a high of 163.39 with a trading volume of 350,400 shares. Mankind Pharma, listed on May 9, 2023, opened at 1300 and reached a high of 1439 and a low of 1355.95, with a trading volume of 105,469 shares.

During the same period, other companies such as Retina Paints, Sancode Technologies, Avalon Technologies, Exhicon Events Media, and many more experienced fluctuations in their stock prices and trading volumes.

The data reveals a diverse range of performances across various sectors, with some companies showing sub- stantial growth, while others faced challenges. The research paper further explores the factors influencing these market movements and their implications for investors and businesses alike.

From the data, it is evident that some IPOs have experienced substantial gains after their listing, while others have faced challenges. Notably, Nexus Select, listed on May 19, 2023, witnessed a significant gain of 7% since its listing. Similarly, Mankind Pharma, listed on May 9, 2023, has shown remarkable growth with a gain of 50.57% since its IPO.

Table 1: Start-up companies listed on stock market

Company name	Foundation Year	Year of listing	Valuation (INR Crore)
Nexus Select	2023	2023	291.88
Udayshivakumar	2019	2023	185.00
Dharmaj Crop	2015	2022	164.40
Electronics Mart India	2018	2022	1689.07
Veranda Learning Solu- tions	2018	2022	199.92
HP Adhesives	2019	2021	233.00
Latent View	2021	2021	539.00
Fino Payments	2017	2021	348.31
FSN E-Co Nykaa	2012	2021	1,428.55
Nuvoco Vistas	2016	2021	9318.00
Glenmark Life	2011	2021	2123.21
PowerGrid InvIT	2021	2021	324.32
Nureca	2016	2021	42.759
Route	2014	2020	2002.00
Happiest Minds	2011	2020	1216.22

Sterling Wilson	2017	2019	1206.93

On the other hand, some companies have seen negative returns. For instance, Agni Steels, listed on February 14, 2023, incurred a loss of 4.44%, and Elin Electronics, listed on December 30, 2022, experienced a considerable decline of 30.85% since their respective listings.

Overall, the research paper analyzes the factors that contributed to the varying performances of these IPOs in the stock market and investigates the implications for investors and the companies involved.

The surge in the number of unicorn startups in India marks a significant milestone in the country's en- trepreneurial landscape. As of January 2023, India boasts an impressive count of 108 unicorn startups with a combined valuation exceeding $300 billion. The presence of these unicorns is a testament to their exceptional growth and the potential they hold for transforming India's economic and technological landscape.

The top 10 unicorn startups in India, including Byju's, Flipkart, Paytm, Oyo Rooms, Swiggy, Zomato, Pol- icyBazaar, Unacademy, and Freshworks, have demonstrated their ability to address critical challenges faced by the Indian population. By leveraging innovative solutions, these startups have introduced new markets, disrupted traditional industries, and positively impacted the lives of millions of people. Byju's and Unacademy, in the edtech space, have revolutionized the way education is accessed and delivered, while Flipkart and Paytm have transformed the ecommerce and digital payment sectors, respectively.

This success is largely attributed to the thriving Indian startup ecosystem, which has fostered a conducive environment for innovation and growth. India's abundant pool of talent, coupled with the government's proactive measures to support startups through policy initiatives and funding programs, has laid a strong foundation for their success. As a result, India is emerging as a global hub for innovation, attracting attention from investors and entrepreneurs worldwide.

Beyond the top 10 unicorns, there are numerous other promising startups in India, spanning various sectors such as healthcare, agriculture, financial services, and logistics. These startups are poised to make a substantial impact on the Indian economy, contributing to job creation, technological advancement, and overall socio-economic development. With their relentless pursuit of cutting-edge solutions, these startups have the potential to further strengthen India's position in the global startup landscape.

However, challenges and uncertainties also accompany the growth of startups. Sustaining growth, ensuring profitability, and managing competition are critical aspects that these unicorns and promising startups must navigate as they scale their businesses. Moreover, continuous support from the government and the availability of venture capital funding will remain crucial in nurturing the next wave of startups and fueling their growth.

In conclusion, the proliferation of unicorn startups in India signifies the country's prowess in fostering inno- vation and entrepreneurship. The success of these startups highlights India's potential to be a leader in the global startup ecosystem. With a vibrant startup culture, access to talent, and supportive policies, India is well-poised to continue its journey as a hotbed of innovation, making significant contributions to both the Indian economy and the world at large.

Conclusion

In this research paper, we delved into the critical relationship between innovation and research and its impact on the success of startups, utilizing a stock market analysis approach. Our study aimed to uncover the significance of innovation-driven strategies and the role of research in shaping the trajectory of startup companies in the stock market. Through an extensive examination of unicorn startups in India, we sought to gain insights into the factors that contribute to their exceptional growth and valuation.

The findings of this study revealed a strong correlation between innovation and startup success. The top 10 unicorn startups in India, such as Byju's, Flipkart, and Paytm, have disrupted traditional industries and carved new markets by leveraging innovative solutions. These startups have showcased the power of technology-driven strategies in addressing pressing challenges and meeting evolving consumer demands. By focusing on cutting-edge research and development, they have been able to gain a competitive edge, resulting in impressive valuations and growth in the stock market.

Our analysis also underscored the crucial role of the Indian startup ecosystem in nurturing innovation and research. India's abundant pool of talent and the supportive policy environment created by the government have fostered a conducive atmosphere for startups to thrive. The availability of venture capital funding and access to a wide range of resources have further propelled the growth of innovative startups in India. The success of these startups has positioned India as a global hub for innovation, attracting attention and investment from across the world.

However, we also identified challenges that startups face on their path to success. Sustaining growth, ensuring profitability, and managing market competition are critical hurdles that startups must overcome. Moreover, startups must strike a delicate balance between innovation and market research to ensure that their offerings meet consumer needs and preferences.

The implications of our research extend beyond the Indian startup ecosystem. The link between innovation, research, and startup success can serve as a valuable model for entrepreneurs and policymakers in other countries as they seek to foster innovation-driven economies. Emphasizing the importance of research and encouraging a culture of innovation can catalyze economic growth, create job opportunities, and boost technological advancements.

In conclusion, this research paper provides valuable insights into the interconnectedness of innovation, research, and startup success in the Indian stock market. By studying the top unicorn startups, we have highlighted the transformative power of innovation-driven strategies and the significance of research in shaping startup growth.

Our findings contribute to a deeper understanding of the factors that drive startup success, offering valuable lessons for entrepreneurs, investors, and policymakers worldwide. As the startup landscape continues to evolve, a focus on innovation and research remains integral to fostering a thriving and dynamic entrepreneurial ecosystem.

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Author contributions:
Conceptualization was done by Dipali Rajguru (DR), Sameer Nanivadekar (SN) and Krishna Kant Dave (KD). The experimental design was done by DR, SN and KD. All the data collection and analysis were performed by DR. The manuscript draft was prepared by DR and corrections were done by SN and KD. Graphics designing were done by DR.

Conflicts of interest or competing interests:
The authors declare that there is no conflict of interest or competing interests.

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Data will be made available at reasonable request to the Authors.

Supplementary information:
Not applicable.

Ethical approval:
All the ethics approval was taken by an institutional review board or equivalent ethics committee

Ethics statements:
All authors assure that the manuscript fulfills the following statements:
1)	This material is the author's original work, which has not been previously published elsewhere.
2)	The paper is not currently being considered for publication elsewhere.
3)	The paper reflects the author's own research and analysis truthfully and completely.
4)	The paper properly credits the meaningful contributions of co-authors and co-researchers.

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