

An Empirical Study on the Role of Start-Ups in Generating Employment Opportunities in Rajasthan

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Abstract:

The start-up ecosystem has become an important component of regional economic development, particularly in relation to employment creation, entrepreneurial activity and innovation-led business growth. In this context, the present study examines the contribution of start-ups in creating employment opportunities in Rajasthan. The study is based on a quantitative research approach and uses primary data collected from 165 respondents associated with the start-up ecosystem, including founders/owners, managers/HR persons, employees and local stakeholders. The study considered start-up growth/development score, employment opportunity generation score and role of start-ups in employment generation score as the major construct-level measures. Statistical analysis was conducted through descriptive statistics, one-way ANOVA, Pearson correlation and simple linear regression. The findings indicate that respondents held a moderately positive perception of start-up growth and its contribution to employment opportunities. Significant differences were found across respondent categories regarding the perceived role of start-ups in employment generation. The results also showed a positive association between start-up growth/development and employment opportunity generation, while regression analysis indicated that start-up growth significantly influenced employment generation. The study highlights the relevance of start-ups as emerging contributors to employment development in Rajasthan and suggests the need for stronger support mechanisms to improve their employment potential.

Keywords: Start-up Ecosystem; Employment Creation; Entrepreneurial Development; Regional Economy.

START-UPS AND EMPLOYMENT GENERATION IN RAJASTHAN

Start-ups have increasingly become a significant part of contemporary economic development because they encourage entrepreneurial activity, promote innovation and create new forms of work across different sectors. In India, the growth of start-ups has widened discussions on employment generation, especially in regions where traditional employment avenues may not be sufficient to absorb the growing workforce. Rajasthan, with its expanding entrepreneurial environment and rising interest in local enterprise

development, provides a relevant context for examining how start-ups contribute to employment opportunities.

The importance of start-ups lies not only in the creation of new businesses but also in their potential to generate direct, indirect and skill-based employment. Start-ups may support job creation through hiring employees, engaging service providers, encouraging allied activities and promoting self-employment. They can also contribute to the development of local business networks, innovation-driven work and sectoral diversification. However, the employment contribution of start-ups may not be perceived equally by all stakeholders. Founders, managers, employees and local stakeholders may view the role of start-ups differently because their engagement with start-up activities varies in nature and depth.

Although start-ups are often associated with innovation and economic growth, their specific role in employment generation requires closer empirical attention. In many cases, the discussion around start-ups focuses more on business expansion, funding and entrepreneurship than on their actual contribution to employment opportunities. This creates a need to understand whether start-up growth is connected with employment generation and how different groups perceive this contribution in a regional setting such as Rajasthan.

The present study is positioned within this context and focuses on the role of start-ups in generating employment opportunities in Rajasthan. It considers start-up growth/development, employment opportunity generation and the perceived role of start-ups in employment creation as key conceptual areas. By examining these dimensions, the study seeks to provide a focused understanding of how start-ups are perceived as contributors to employment development in Rajasthan. The present study, therefore, aims to examine the contribution of start-ups in creating employment opportunities in Rajasthan.

REVIEW OF LITERATURE

(Camps et al., 2025) synthesised the expanding field of digital entrepreneurship through bibliometric analysis and an umbrella review of peer-reviewed studies. The review identified major themes related to digital technologies, entrepreneurial ecosystems, innovation, business models and the wider outcomes of digital entrepreneurship. The study highlighted that digital entrepreneurship has become closely associated with economic growth, innovation and new venture development. Its relevance to the present study lies in its explanation of how digital and start-up-oriented entrepreneurial activity can create new business opportunities, which may further influence employment generation and regional economic development. (Sreenivasan & Suresh, 2025) examined whether India provides a favourable environment for start-ups by using bibliometric analysis. The study considered literature related to the Indian start-up ecosystem, entrepreneurship and start-up development, and analysed the selected articles through the Biblioshiny package in R. The findings indicated that India offers a supportive environment for new ventures, particularly due to government initiatives and institutional encouragement. This study is directly relevant to the present research because it situates start-up growth within the Indian policy and ecosystem context, which is important for understanding the contribution of start-ups to employment opportunities in Rajasthan.

(Sharma & Subba, 2025) reviewed the contribution of green start-ups to economic development, with particular focus on sustainability-oriented entrepreneurship, technological innovation, market transformation and employment creation. The review indicated that green start-ups can promote sustainable growth by adopting renewable energy, circular economy practices and eco-friendly

technologies. The study also noted that such ventures may create jobs and improve competitiveness, but their growth depends on policy support, green finance and favourable market conditions. This literature is useful for the present study because it links start-up growth with job creation and broader economic development.

(Jan et al., 2025) investigated the relationship between entrepreneurial ecosystems, sustainable digital innovation and business performance in Gilgit-Baltistan, Pakistan. Using questionnaire data from 431 respondents and partial least squares structural equation modelling, the study examined entrepreneurship education, entrepreneurial culture, government support and social support as ecosystem dimensions. The results showed that entrepreneurial ecosystem factors and sustainable digital innovation positively influenced business sustainability performance. This study is relevant because it demonstrates how supportive entrepreneurial environments contribute to business performance, thereby strengthening the conceptual link between start-up development and employment-related outcomes.

(Griva et al., 2023) explored the characteristics of growing early-stage digital start-ups through a mixed-methods approach that combined a Delphi study, questionnaire survey and comparative case analysis. The study showed that growing digital start-ups were characterised by agile organisational culture, absorptive capacity, innovation capability, adaptive capability and human capital with entrepreneurial skills. The study is relevant to the present research because it identifies internal growth conditions of start-ups that may support expansion and workforce development. It also helps explain why start-up growth should be examined as a construct linked with employment opportunity generation.

(Mitra et al., 2023) examined the elements required for developing a start-up ecosystem within the context of smart cities in India. The study used focus group discussions with experts and proposed a framework that included technology infrastructure, knowledge hubs, public policy, entrepreneurship and the city economy. The findings suggested that a strong start-up ecosystem can support innovation, regional development and stakeholder participation. This study is important for the present research because Rajasthan's start-up environment also depends on ecosystem support, local business networks and policy conditions that may influence employment generation.

(Kuckertz et al., 2020) analysed the challenges faced by innovative start-ups during the COVID-19 crisis and examined how start-ups responded to sudden economic disruption. The study used a mixed-methods design involving qualitative insights from entrepreneurial ecosystem actors and analysis of policy measures reported internationally. The findings showed that start-ups faced serious threats to survival, growth and innovation potential, although many used available resources creatively to cope with the crisis. This study is relevant because it highlights that start-up growth and employment potential depend not only on entrepreneurial capability but also on external support during uncertain conditions.

(Audretsch et al., 2020) reviewed 39 policy initiatives across different countries to understand how innovative start-ups are supported and how policy approaches differ across stages of firm development. The study developed a process-based framework covering the formation, characteristics, behaviour and outputs of innovative start-ups. It emphasised that start-ups may contribute to innovation, employment and economic growth, but their impact depends on the quality of entrepreneurial support and policy design. This literature is directly relevant to the present study as it supports the need to examine how start-up growth is connected with employment opportunity generation.

The reviewed literature shows that start-ups are widely recognised as important contributors to innovation, entrepreneurial development and economic growth. Recent studies have examined digital



entrepreneurship, green start-ups, entrepreneurial ecosystems, start-up growth characteristics, smart-city start-up frameworks and policy support for innovative ventures. However, most of these studies focus on broader ecosystem development, business sustainability, digital entrepreneurship or policy structures, while limited attention has been given to respondent-level perceptions of how start-ups contribute to employment opportunities in a specific regional context. Further, the literature indicates a need to examine whether start-up growth and development are associated with employment opportunity generation. The present study addresses this gap by empirically examining the role of start-ups in generating employment opportunities in Rajasthan, with specific attention to start-up growth/development, employment opportunity generation and respondent-category-based perceptual differences.

RESEARCH METHODOLOGY

Research Objective

To examine the contribution of start-ups in creating employment opportunities in Rajasthan.

Research Design

The present study adopted a descriptive and empirical research design to examine the role of start-ups in generating employment opportunities in Rajasthan. The descriptive design was suitable because the study aimed to understand respondents' perceptions regarding start-up growth, employment opportunity generation and the broader role of start-ups in employment creation. The empirical nature of the study was reflected in the use of primary data and statistical testing of the proposed hypotheses.

Research Approach

The study followed a quantitative research approach. This approach was appropriate because the variables were measured through structured Likert-scale statements and analysed using statistical techniques. The quantitative approach helped in examining differences across respondent categories, assessing the association between start-up development and employment opportunity generation, and measuring the impact of start-up growth on employment generation.

Population and Sample

The target population of the study consisted of individuals associated with the start-up ecosystem in Rajasthan. The respondents included start-up founders/owners, start-up managers/HR persons, start-up employees and local stakeholders. A total sample of 165 respondents was selected for the study. Stratified purposive sampling was used, as respondents were first classified into relevant categories and then selected on the basis of their association with start-up activities, employment practices or local employment outcomes. This technique was suitable because the study required informed responses from specific groups connected with start-ups and employment generation.

Research Variables

The independent variable of the study was start-up growth/development score, measured through the construct mean score of five Likert-scale statements. The dependent variable was employment opportunity generation score, also calculated through the construct mean score of five Likert-scale items. Respondent category was used as the grouping variable and included start-up founders/owners, start-up managers/HR persons, start-up employees and local stakeholders. The role of start-ups in employment generation score was treated as a construct-level perception variable, calculated by averaging five related Likert-scale statements.

Construct mean scores were calculated by adding the responses for all items under a particular construct and dividing the total by the number of items in that construct. This procedure converted item-level responses into construct-level scores, which were then used for descriptive analysis and hypothesis testing. The use of construct mean scores ensured consistency between the questionnaire, variables and statistical analysis.

Instrument Development and Measurement

Primary data were collected through a structured questionnaire developed in line with the research objective and hypotheses. The instrument contained 15 Likert-scale statements covering three constructs: start-up growth/development, employment opportunity generation and role of start-ups in employment generation. Each construct consisted of five statements. Responses were recorded on a five-point Likert scale, where 1 represented Strongly Disagree, 2 represented Disagree, 3 represented Neutral, 4 represented Agree and 5 represented Strongly Agree.

Data Collection Procedure

Data were collected from respondents belonging to the four identified categories of the start-up ecosystem in Rajasthan. The questionnaire was used to obtain structured responses regarding start-up development, employment opportunities and the perceived role of start-ups in employment generation. The data collection procedure focused on respondents who were directly or indirectly connected with start-up activities and local employment outcomes.

Reliability of the Instrument

The reliability of the instrument was examined using Cronbach's alpha. The construct of start-up growth/development recorded a Cronbach's alpha value of 0.737, while employment opportunity generation recorded a value of 0.719. The construct measuring the role of start-ups in employment generation reported a Cronbach's alpha value of 0.712. These values indicate acceptable internal consistency, as all construct-wise alpha values were above the commonly accepted threshold of 0.70. The overall 15-item scale recorded a Cronbach's alpha value of 0.804, indicating good internal consistency of the complete instrument.

Statistical Tools and Techniques

Descriptive statistics were used to summarise the response pattern of respondents. Mean and standard deviation were calculated to understand the central tendency and variation in responses. Group-wise descriptive statistics were also used to compare responses across respondent categories.

One-way ANOVA was applied to examine whether respondents' perceptions regarding the role of start-ups in generating employment opportunities differed significantly across respondent categories. Pearson correlation was used to examine the association between start-up development and employment opportunity generation. Simple linear regression was applied to assess the impact of start-up growth/development score on employment opportunity generation score. The hypotheses were tested at the 5% level of significance, and decisions were made on the basis of the obtained p-values.

LIKERT SCALE STATEMENT ANALYSIS

Table 1: Likert Scale Statements for Start-up Growth/Development

S. No.	Likert Statement	SD	D	N	A	SA	\bar{X}	σ
1	Start-ups in Rajasthan have shown visible growth in terms of business expansion and market reach.	0	28	72	50	15	3.32	0.86
2	Start-ups are contributing to the development of new business models in Rajasthan.	4	18	65	62	16	3.41	0.9
3	The start-up ecosystem in Rajasthan is improving through innovation and entrepreneurial initiatives.	2	23	54	69	17	3.46	0.9
4	Start-ups are strengthening local business networks and support systems in Rajasthan.	8	28	68	51	10	3.16	0.95
5	The growth of start-ups has improved the overall entrepreneurial environment in Rajasthan.	5	25	64	52	19	3.33	0.97

The findings for start-up growth/development indicate a moderate agreement pattern among respondents. The mean scores ranged from 3.16 to 3.46, showing that respondents generally perceived start-ups in Rajasthan as growing through innovation, new business models, business expansion and entrepreneurial initiatives. However, the presence of neutral and disagreement responses suggests that this growth is not viewed as equally strong across all dimensions.

Table 2: Likert Scale Statements for Employment Opportunity Generation

S. No.	Likert Statement	SD	D	N	A	SA	\bar{X}	σ
6	Start-ups are creating direct employment opportunities for young people in Rajasthan.	5	35	61	56	8	3.16	0.92
7	Start-ups are generating indirect employment through allied services and support activities.	5	40	71	47	2	3.01	0.84
8	Start-ups provide opportunities for skill-based and knowledge-based employment in Rajasthan.	2	37	76	42	8	3.1	0.85
9	Start-ups have increased self-employment and entrepreneurial career opportunities in Rajasthan.	4	35	60	54	12	3.21	0.94
10	Start-up activities are helping to diversify employment opportunities across different sectors in Rajasthan.	6	28	83	38	10	3.11	0.88

The findings for employment opportunity generation reflect a moderate level of agreement. The mean scores ranged from 3.01 to 3.21, indicating that respondents acknowledged the contribution of start-ups to direct employment, indirect employment, skill-based jobs, self-employment and sectoral diversification. At the same time, the relatively moderate scores suggest that employment generation through start-ups is perceived as developing, rather than being fully established.

Table 3: Likert Scale Statements for Role of Start-ups in Employment Generation

S. No.	Likert Statement	SD	D	N	A	SA	\bar{X}	σ
11	Start-ups play an important role in reducing employment constraints in Rajasthan.	5	29	73	42	16	3.21	0.95
12	Start-ups support local employment by encouraging new ventures and business activities.	5	33	62	49	16	3.23	0.98
13	Start-ups contribute to employment generation by promoting innovation-driven work opportunities.	5	23	62	59	16	3.35	0.94
14	Start-ups help connect skilled individuals with emerging employment opportunities in Rajasthan.	5	30	53	60	17	3.33	0.99
15	Start-ups have the potential to become a significant source of employment generation in Rajasthan.	4	15	64	57	25	3.51	0.94

The findings for the role of start-ups in employment generation show a comparatively stronger positive tendency. The mean scores ranged from 3.21 to 3.51, with the highest agreement observed for the view that start-ups have the potential to become a significant source of employment generation in Rajasthan. This indicates that respondents recognised the employment-related relevance of start-ups, particularly in innovation-driven work opportunities and emerging job connections.

HYPOTHESES

H₀₁: There is no significant difference in respondents’ perceptions regarding the role of start-ups in generating employment opportunities in Rajasthan.

For testing H₀₁, respondent category was used as the independent grouping variable, while role of start-ups in employment generation score was used as the dependent variable. One-way ANOVA was applied to examine whether respondents’ perceptions regarding the role of start-ups in generating employment opportunities differed significantly across respondent categories.

Table 4: Descriptive Statistics

Respondent Category	n	Mean	Std. Deviation
Start-up managers/HR persons	32	3.61	0.58
Local stakeholders	42	2.79	0.58

Respondent Category	n	Mean	Std. Deviation
Start-up founders/owners	36	3.79	0.50
Start-up employees	55	3.27	0.52
Total	165	3.33	0.65

The descriptive statistics show variation in mean scores across respondent categories. Start-up founders/owners reported the highest mean score ($M = 3.79$, $SD = 0.50$), followed by start-up managers/HR persons ($M = 3.61$, $SD = 0.58$), start-up employees ($M = 3.27$, $SD = 0.52$) and local stakeholders ($M = 2.79$, $SD = 0.58$). This pattern indicates that founders/owners and managers/HR persons perceived the role of start-ups in employment generation more positively than employees and local stakeholders.

Table 5: ANOVA

	Sum of Squares	df	Mean Square	F	p
Respondent Category	22.78	3	7.59	25.75	<.001
Residual	47.48	161	0.29		
Total	70.26	164			

The one-way ANOVA result showed a statistically significant difference among respondent categories, $F(3, 161) = 25.75$, $p < .001$. Therefore, respondents' perceptions regarding the role of start-ups in generating employment opportunities differed significantly across respondent categories.

H_{01} was tested using one-way ANOVA. Since the p-value was less than .05, the null hypothesis is rejected. The finding indicates that perceptions regarding the role of start-ups in employment generation vary across respondent categories. This suggests that respondents who are more directly involved in start-up ownership and management perceive start-ups as stronger contributors to employment generation than local stakeholders.

Since the null hypothesis is rejected, the researcher concludes that there is a significant difference in respondent category with respect to role of start-ups in employment generation score.

H_{02} : There is no significant association between start-up development and employment opportunity generation in Rajasthan.

For testing H_{02} , start-up growth/development score was used as the independent variable, while employment opportunity generation score was used as the dependent variable. Pearson correlation was applied to examine the direction and strength of association between start-up growth/development score and employment opportunity generation score.

Table 6: Correlation

	r	p
Start-up growth/development Score and	0.41	<.001

	r	p
Employment opportunity generation Score		

The Pearson correlation result showed a positive and statistically significant association between start-up growth/development score and employment opportunity generation score, $r(163) = .41, p < .001$. The positive value of correlation indicates that respondents who reported higher start-up growth/development scores also tended to report higher employment opportunity generation scores. The strength of the association may be interpreted as moderate, suggesting that start-up development is meaningfully linked with employment opportunity generation in the context of Rajasthan.

H_{02} was tested using Pearson correlation. Since the p-value was less than .05, the null hypothesis is rejected.

The finding indicates that start-up growth/development and employment opportunity generation are positively associated. This suggests that improvement in start-up development may be linked with better perceived employment opportunities in Rajasthan.

Since the null hypothesis is rejected, the researcher concludes that there is a significant association between start-up growth/development score and employment opportunity generation score.

H_{03} : There is no significant impact of start-up growth on employment generation in Rajasthan.

For testing H_{03} , start-up growth/development score was used as the independent variable, while employment opportunity generation score was used as the dependent variable. Simple linear regression was applied to examine whether start-up growth/development score significantly predicts employment opportunity generation score.

Table 7: Model Summary

R	R ²	Adjusted R ²	Standard error of the estimate
0.41	0.17	0.16	0.56

The regression model showed a positive relationship between start-up growth/development score and employment opportunity generation score, $R = .41$. The R^2 value was .17, which indicates that start-up growth/development score explained 17% of the variation in employment opportunity generation score. The adjusted R^2 value was .16, showing that the model retained explanatory value after adjustment.

Table 8: ANOVA

Model	df	F	p
Regression	1	33.38	<.001

The ANOVA result for the regression model was statistically significant, $F(1, 163) = 33.38, p < .001$, indicating that the model was suitable for explaining variation in employment opportunity generation score.

Table 9: Summary of Regression Coefficients

Model	Unstandardised Coefficient B	Standardised Coefficient Beta	Std. Error	t	p
Constant	1.81		0.23	7.85	<.001
Start-up growth/development Score	0.39	0.41	0.07	5.78	<.001

The regression coefficient for start-up growth/development score was positive and statistically significant, $B = 0.39$, $SE = 0.07$, $\beta = .41$, $t(163) = 5.78$, $p < .001$. The regression equation may be stated as: Employment opportunity generation score = $1.81 + 0.39(\text{Start-up growth/development score})$.

This shows that for every one-unit increase in start-up growth/development score, employment opportunity generation score increases by 0.39 units.

H_{03} was tested using simple linear regression. Since the p-value was less than .05, the null hypothesis is rejected.

The finding indicates that start-up growth/development positively predicts employment opportunity generation. This suggests that stronger start-up growth may contribute to better employment-related outcomes within the Rajasthan start-up context.

Since the null hypothesis is rejected, the researcher concludes that there is a significant influence of start-up growth/development score on employment opportunity generation score.

OVERALL CONCLUSION

The study examined the contribution of start-ups in creating employment opportunities in Rajasthan. The overall findings indicate that respondents held a moderately positive perception of start-up growth/development, employment opportunity generation and the wider role of start-ups in employment creation. The Likert-scale analysis suggests that start-ups are viewed as contributing to innovation, entrepreneurial activity, direct and indirect employment, skill-based work and emerging employment opportunities, although the responses also show that these outcomes are still developing and may not be uniformly experienced across all respondent categories.

The hypothesis results further support the empirical direction of the study. The ANOVA result showed that perceptions regarding the role of start-ups in employment generation differed significantly across respondent categories. The correlation result confirmed a significant positive association between start-up growth/development score and employment opportunity generation score. The regression result also indicated that start-up growth/development score significantly influenced employment opportunity generation score, explaining 17% of the variation in employment opportunity generation. Overall, the study concludes that start-ups play a meaningful role in employment generation in Rajasthan, particularly through entrepreneurial growth, innovation and emerging work opportunities, while also indicating the need for stronger support mechanisms to expand their employment impact.

SUGGESTIONS BASED ON FINDINGS

1. Start-up support policies in Rajasthan should focus more directly on employment creation, so that start-up growth is linked not only with business development but also with measurable job opportunities.
2. Government agencies and start-up support institutions should encourage start-ups to expand direct employment for young people, as respondents showed only moderate agreement regarding direct job creation.
3. More attention should be given to indirect employment opportunities created through allied services, vendors, logistics, marketing, technology support and professional services connected with start-ups.
4. Start-up incubation centres should provide structured guidance on workforce planning, recruitment practices and employment expansion, especially for early-stage start-ups.
5. Skill development programmes should be aligned with the employment needs of start-ups, particularly in technology, digital marketing, finance, operations and innovation-based business functions.
6. Start-ups should be encouraged to generate local employment by hiring from nearby communities and districts wherever suitable, as this may strengthen the regional employment contribution of the start-up ecosystem.
7. Policy support should be directed towards strengthening the start-up ecosystem through innovation, mentoring, market access and entrepreneurial networking, as these areas were positively perceived by respondents.
8. Greater collaboration should be developed between start-ups, educational institutions and training centres to connect skilled individuals with emerging employment opportunities.
9. Start-up founders and managers should adopt more systematic recruitment practices to improve employment stability, career growth and skill-based opportunities for employees.
10. Local stakeholders should be more actively involved in start-up development initiatives, as their perception of start-ups' employment role was lower than that of founders and managers.
11. Awareness programmes should be organised to highlight the employment contribution of start-ups, particularly among local communities and stakeholders.
12. Start-ups should be supported in diversifying employment opportunities across different sectors, rather than concentrating only on limited business areas.
13. Financial and institutional support should be provided to start-ups with clear employment potential, especially those that can create direct, indirect and self-employment opportunities.
14. Start-up policies should include mechanisms for monitoring employment outcomes, such as number of jobs created, type of employment, local hiring and skill-based roles.
15. Efforts should be made to strengthen entrepreneurial career opportunities, as start-ups can contribute not only to wage employment but also to self-employment and venture creation.
16. Employment-focused start-up schemes should give priority to innovation-driven ventures, as respondents recognised the role of start-ups in promoting innovation-based work opportunities.
17. The start-up ecosystem in Rajasthan should be developed in a balanced manner across regions, so that employment benefits are not limited to a few urban or commercially active areas.
18. Start-up managers and HR personnel should be trained to create better workplace systems, including fair recruitment, employee retention and opportunities for professional growth.

19. Public and private institutions should work together to create platforms where start-ups can connect with job seekers, skilled workers, freelancers and local service providers.
20. Future start-up development programmes should give equal importance to business expansion and employment quality, so that start-ups contribute meaningfully to sustainable employment generation in Rajasthan.

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