

## Entrepreneurship and the Growth of Technology–Based Small and Medium–Sized Enterprises: Evidence from Shenzhen, China

Baoli Zhao<sup>1</sup>, and Lu Suo<sup>2</sup>

Stamford International University, Thailand

E-mail: zhecdbl@126.com

**Received** June 19, 2025; **Revised** July 21, 2025; **Accepted** July 30, 2025

### Abstract

This study examines the influence of entrepreneurship on the growth of technology–based small and medium–sized enterprises (SMEs) in Shenzhen, China, with a particular focus on the mediating role of external support. Drawing on entrepreneurship theory, resource–based theory, and ecological systems theory, the research develops a structural model encompassing three key constructs: entrepreneurship, external support, and SME growth. A quantitative research design was adopted, and data were collected from 368 senior–level respondents representing Shenzhen's 4,923 technology–based SMEs using a structured questionnaire. Data analysis involved descriptive statistics, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) using SPSS and AMOS software. The results demonstrate that entrepreneurship—conceptualized through five dimensions: innovation, risk–taking, proactivity, achievement motivation, and professionalism—has a significant positive effect on SME growth and also enhances access to external support. External support, in turn, exerts a direct positive impact on SME growth and partially mediates the relationship between entrepreneurship and growth. These findings confirm the centrality of entrepreneurial orientation in enhancing firm performance, while also emphasizing the enabling role of institutional and environmental factors. The study makes several theoretical contributions, including the development of a multidimensional entrepreneurship scale and an integrated model of entrepreneurship, support, and growth. It also provides practical recommendations for SME managers, policymakers, and ecosystem stakeholders aimed at promoting innovation–driven development. Despite the use of convenience sampling, which may limit generalizability, the study

delivers robust empirical validation. It offers a scalable framework for future research and policy design targeting SME ecosystems in rapidly evolving economies.

**Keywords:** entrepreneurship; SME growth; external support; structural equation modeling; technology-based SMEs; China

## Introduction

Small and medium-sized enterprises (SMEs) are crucial engines of employment, innovation, and economic growth worldwide. Since 2015, however, Chinese technology-based SMEs have confronted intensified external pressures—weak export demand, slowing domestic markets, and disruptions such as the COVID-19 pandemic—that jeopardize their viability and expansion. (Inegbedion et al., 2024; Pu et al., 2021).

Although environmental factors are significant, the internal entrepreneurial orientation—manifested in opportunity recognition, risk-taking, and strategic decision-making—remains the primary driver of SME resilience and performance. (Sturm et al., 2023; YahiaMarzouk & Jin, 2023). Prior research demonstrates that a strong entrepreneurial posture fosters innovation, resource mobilization, and sustainable competitive advantage, especially when complemented by supportive policies and resources. (Alcalde-Calonge et al., 2024; Zighan et al., 2021).

Despite the Chinese government's formal emphasis on entrepreneurship since 2017, the interactive mechanisms through which entrepreneurial behavior and external support jointly promote SME growth remain unclear. This study addresses this gap by examining the direct impact of entrepreneurship on SME growth and exploring how external support mediates this relationship.

## Research Objectives

1. To understand how entrepreneurship directly affects the growth of SMEs.
2. To analyze how external support promotes the growth of SMEs.
3. To analyze the interactive relationship between entrepreneurship and external support.
4. To clarify how external support, as a mediating variable, affects the relationship between entrepreneurship and SME growth.

## Literature Review

### Theoretical Foundation

This study draws on four intertwined theories to elucidate how entrepreneurial traits and external support jointly drive SME growth. First, entrepreneurship theory identifies innovation, opportunity recognition, and risk-taking as core behavioral dimensions (Gartner, 1988; McClelland, 1961). Second, resource-based theory frames these entrepreneurial capabilities as intangible resources that are valuable, rare, inimitable, and non-substitutable (VRIN), which bolster firm performance and facilitate the mobilization of external resources (Barney, 1991). Third, ecological systems theory emphasizes the nested institutional, economic, and policy environments that shape firm actions, positioning supports such as financial policies, tax regimes, and reputational networks as mediators (Bronfenbrenner, 1979). Finally, stage-based growth models suggest early expansion depends on internal capabilities, while sustained development increasingly hinges on external inputs (Churchill & Lewis, 2002). Together, these perspectives form a concise, multidimensional schema linking individual-level entrepreneurial orientation with environment-level enablers in SME development.

### Definitions and Dimensions of Core Variables

Building on the theoretical framework, this study centers on three core constructs: entrepreneurship, external support, and SME growth. Each of these variables is conceptualized as a multidimensional construct and is operationalized based on well-established academic literature. Entrepreneurship is defined as a comprehensive behavioral and psychological capability that enables individuals or organizations to recognize opportunities, take risks, and drive innovation. It encompasses a range of attitudes and actions that facilitate enterprise development and competitiveness. Drawing on Covin and Slevin (1991), Corrêa et al. (2022), and Schaufeli et al. (2002) The study breaks entrepreneurship into five distinct dimensions: innovation, risk-taking, proactive action, achievement motivation, and professionalism.

SME growth, the dependent variable in this research, refers to the overall expansion and performance improvement of small and medium-sized enterprises across various domains. Following the frameworks of Xiang et al. (2022) and Sheng et al. (2023) SME growth is measured through four primary dimensions: profitability, production capacity, technological innovation, and risk management ability.

The third core construct, external support, is positioned in this study as a potential mediating variable between entrepreneurship and SME growth. It is defined as the formal and informal assistance and resources accessible to SMEs through the broader institutional and market environment. Based on the work of Wang (2020) and Zeng et al. (2010) External support is operationalized across six key dimensions: market environment, tax policies, policy subsidies, financing channels, supplier and partner support, and public reputation.

### **Review of Related Empirical Studies**

A significant body of literature confirms the positive impact of entrepreneurship on SME growth. Covin and Slevin (1991) emphasized that innovation and proactiveness are critical in achieving sustainable competitive advantage. Sheng et al. (2023) demonstrated that Chinese SMEs with high levels of entrepreneurial orientation tend to achieve better performance outcomes in profitability and innovation. Moreover, risk-taking entrepreneurs are more likely to enter new markets and make strategic investments, leading to higher firm growth. (Lumpkin & Dess, 1996; Miller, 1983).

The literature also supports the importance of external support in the development of SMEs. Xiang et al. (2022) found that tax incentives and financial subsidies significantly enhance firm survival rates and encourage expansion. Similarly, Wang (2020) reported that local policy environments and financing availability were among the strongest predictors of firm performance in regional economic zones. Zeng et al. (2010) added that public recognition and brand reputation can significantly affect customer trust and access to broader networks.

Some studies have explored the interaction between entrepreneurship and external support, suggesting that these factors may not act independently of each other. Man and Lau (2005) proposed that entrepreneurial competence is a necessary but insufficient condition for firm success unless supported by institutional and market-level enablers. Recent research, such as Moreno and Casillas (2008) and Liu and Wang (2022), has begun to empirically validate the mediating role of external support in the entrepreneurship-growth relationship.

### **Conceptual Framework**

SMEs are pivotal to economic growth, taxation, employment, and innovation, yet technology-based SMEs often struggle with capital shortages, outdated technologies, fierce competition, and management gaps. Entrepreneurial orientation—encompassing innovation, risk-

taking, proactivity, achievement motivation and professionalism—enables firms to identify trends, drive product, process and business–model innovations, and implement effective strategies, while external support—through market conditions, tax incentives, supply–chain collaboration, policy subsidies, financing channels and public opinion—provides vital resources, mitigates risks and expands market access. This study treats entrepreneurial orientation as the independent variable, external support as the mediating variable, and SME growth—measured by profitability, production capacity, technological innovation capability, and risk management—as the dependent variable, to explore how these factors jointly promote rapid development.

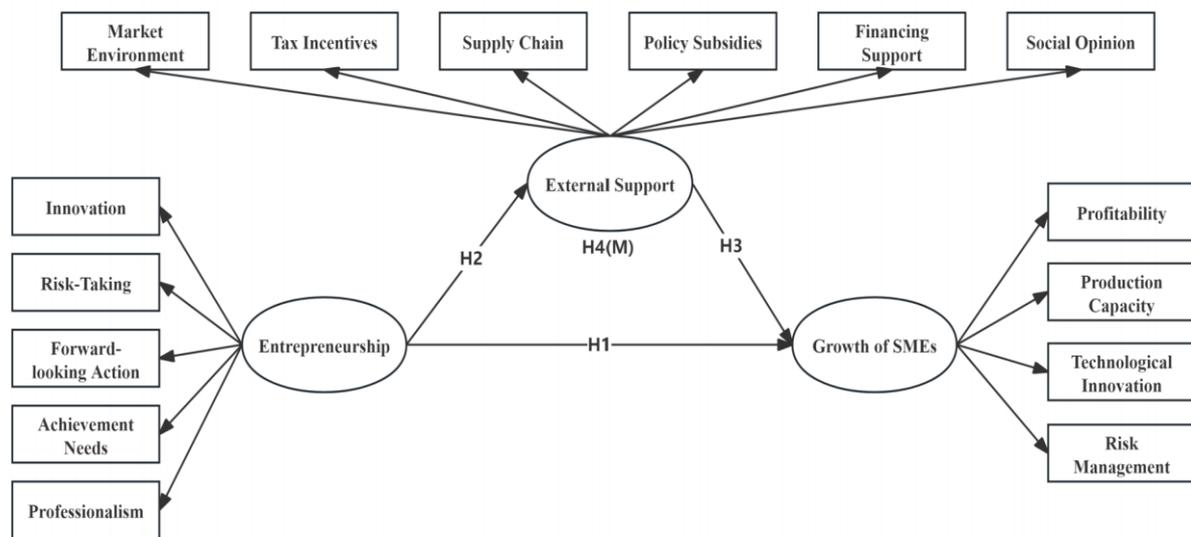


Figure 1 The Conceptual Framework (Designed by the Author, 2025)

Based on the conceptual framework, the hypotheses of this study are as follows:

- H1: Entrepreneurship has a significant impact on the growth of technology–based SMEs.
- H2: Entrepreneurship has a significant impact on External support from enterprises.
- H3: External support from enterprises has a significant impact on the growth of technology–based SMEs.
- H4: External support from enterprises plays a significant mediating role in the relationship between entrepreneurship and the growth of SMEs.

## Research Methodology

This study employs a quantitative research method to investigate the relationship between entrepreneurship, external support, and the growth of small and medium–sized enterprises (SMEs), with

a focus on founders and executives of technology-based SMEs in Shenzhen, China. This study used Shenzhen's 4,923 technology-based small and medium-sized enterprises (SMEs) as the defined research population. A convenience sampling method was employed to collect data efficiently while ensuring access to key informants within this population. Specifically, one senior-level respondent (founder, co-founder, or executive) was targeted from each enterprise. To reach these individuals, the research team utilized professional networks, business associations, startup incubators, and online platforms, including WeChat and email lists affiliated with local innovation hubs. Questionnaires were distributed in both paper and electronic formats—offline through field visits to industrial parks and co-working spaces, and online via web links and QR codes generated by the WJX survey platform. Clear instructions were provided with each survey to enhance respondent understanding and improve response accuracy.

This study employed an item-based sample size estimation approach, where the required number of respondents was determined based on the number of observed variables. Following the guidelines recommended by Hair et al. (2010), which suggest a ratio of 10 participants per item, the study identified 40 observed indicators across the three primary constructs—entrepreneurship, SME growth, and external support—yielding a recommended sample size of 400 participants. A total of 368 valid questionnaires were collected, achieving a 92% effective response rate. This study was conducted in accordance with the ethical guidelines for human subject research. All participants were informed of the study's purpose and provided informed consent prior to participation.

The questionnaire consists of four main parts: demographic information, an entrepreneurship scale (covering five dimensions: innovation, risk-taking, proactive action, achievement motivation, and professionalism), an external support scale, and an SME growth scale. All scales use a 7-point Likert scale and are adapted from well-established instruments in prior studies. In the pre-test phase, 100 respondents completed the survey to evaluate reliability and validity.

The questionnaire comprises four sections: demographics, entrepreneurship, SME growth, and external support, using a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) to capture nuanced perceptions and experiences.

The first section collects respondent background (gender, age, education, position, firm age, growth stage) for sample characterization and subgroup analysis. The entrepreneurship scale (22 items) covers five validated dimensions—innovation, risk-taking, proactivity, achievement motivation, and professionalism—adapted from Covin and Slevin (1991), Corrêa et al. (2022), and Schaufeli et al. (2002).

The SME growth section (12 items) measures four performance dimensions—profitability, production capacity, technological innovation, and risk management—based on Xiang et al. (2022) and Sheng et al. (2023). The external support scale (6 items) assesses perceived market environment, tax incentives, policy subsidies, financing availability, supplier backing, and public reputation, drawing on Wang (2020) and Zeng et al. (2010). A two-stage data collection strategy was employed: a pre-test with 100 responses was conducted to assess reliability and clarity, followed by formal data collection in October 2024. Data were cleaned in Excel 2019 and analyzed using SPSS 26.0 and AMOS. The analysis included descriptive statistics, reliability testing (Cronbach's  $\alpha$ ), Exploratory Factor Analysis (EFA) to assess construct validity, and Confirmatory Factor Analysis (CFA) to evaluate model fit and measurement structure. Structural Equation Modeling (SEM) was employed to test the hypothesized relationships, and the PROCESS macro was utilized to examine the mediating role of external support in the relationship between entrepreneurship and SME growth, thereby ensuring robust empirical validation of the proposed theoretical model.

#### **Reliability and Validity Test**

The internal consistency of all scales was excellent, as indicated by Cronbach's  $\alpha$  values well above the 0.70 threshold. (Hussey et al., 2025). Following a 100-responder pre-test and item analysis, the entrepreneurship scale achieved an overall  $\alpha = 0.991$ , with each sub-dimension (innovation, risk-taking, proactivity, achievement motivation, professionalism) exceeding 0.94. The SME growth scale yielded  $\alpha = 0.974$  (sub-dimensions 0.887–0.920), and the external support scale yielded  $\alpha = 0.935$ . These results confirm that the adapted, established measures are highly reliable for subsequent analyses.

**Table 1** Cronbach's  $\alpha$  coefficient of the Entrepreneurship Questionnaire

Dimensions	Entries	CITC	Clone Bach alpha after deleting an item	Cronbach' $\alpha$
Innovation	A1	.897	.951	0.963
	A2	.906	.954	
	A3	.915	.957	
	A4	.914	.964	
	A5	.918	.956	
Risk-taking	B6	.894	.954	0.947
	B7	.908	.962	
	B8	.908	.953	
	B9	.910	.947	
Forward-looking action	C10	.918	.943	0.943
	C11	.922	.951	
	C12	.920	.949	
Achievement needs	D13	.907	.954	0.947
	D14	.907	.948	
	D15	.900	.955	
	D16	.906	.954	
Professionalism	E17	.924	.967	0.968
	E18	.906	.959	
	E19	.923	.971	
	E20	.897	.988	
	E21	.900	.994	
	E22	.912	.997	

**Table 2** Cronbach's  $\alpha$  coefficient of the SME Growth Questionnaire

Dimensions	Entries	CITC	Clone Bach alpha after deleting an item	Cronbach' $\alpha$
Profitability	F1	.877	.943	0.920
	F2	.868	.936	
	F3	.858	.921	
Production capacity	G4	.853	.895	0.887
	G5	.856	.903	
	G6	.844	.885	
Level of technological innovation	H7	.840	.945	0.903
	H8	.872	.909	
	H9	.883	.921	
Level of risk management	I10	.845	.903	0.892
	I11	.852	.918	
	I12	.855	.896	

**Table 3** Cronbach's  $\alpha$  coefficient for externally supported questionnaires

Dimensions	Entries	CITC	Clone Bach alpha after deleting an item	Cronbach' $\alpha$
External support	J1	.806	.923	0.935
	J2	.830	.920	
	J3	.786	.926	
	J4	.826	.921	
	J5	.789	.925	
	J6	.810	.923	

Content validity was assessed using the Item–Level (I–CVI) and Scale–Level (S–CVI) Content Validity Indices. Seven experts rated each item on a 4–point relevance scale, yielding I–CVI values from 0.83 to 1.00 and S–CVI values of 0.818 (entrepreneurship), 0.833 (SME growth), and 1.000 (external support). These results exceed the accepted thresholds (I–CVI  $\geq$  0.78; S–CVI  $\geq$  0.80), confirming that all items are both relevant and representative of their constructs.

Construct validity was evaluated through an exploratory factor analysis of 100 pre–test responses. High Kaiser–Meyer–Olkin measures (0.931–0.980) and significant Bartlett's tests ( $p < 0.001$ ) justified factor extraction. The Varimax–rotated results explained 88.7% of the variance, with all loadings above 0.50. The 22 entrepreneurship items formed five factors (innovation, risk–

taking, proactivity, achievement needs, and professionalism), the 12 SME growth items formed four factors (profitability, production capacity, technological innovation, and risk management), and the six external support items loaded onto a single factor. Together, these analyses demonstrate that the scales are both theoretically coherent and statistically robust.

**Table 4** Explanation of total variance

Components	Initial eigenvalue			Extract load			Rotational load		
	a percentage of			squared and percent			squared and percent		
	Total	Variance	Cumulative%	Total	Variance	Cumulative%	Total	Variance	Cumulative %
1	18.647	46.618	46.618	18.647	46.618	46.618	18.588	46.471	46.471
2	9.459	23.649	70.267	9.459	23.649	70.267	9.375	23.438	69.909
3	5.442	11.106	81.373	5.442	11.106	81.373	4.848	11.371	81.280
4	4.507	1.267	82.640	4.507	1.267	82.640	4.448	1.121	82.401
5	4.409	1.172	83.812	4.409	1.172	83.812	3.938	1.095	83.496
6	3.439	1.097	84.909	3.439	1.097	84.909	3.432	1.081	84.577
7	3.122	1.054	85.964	3.122	1.054	85.964	3.030	1.075	85.652
8	2.896	.989	86.953	2.896	.989	86.953	2.426	1.065	86.718
9	2.362	.904	87.857	2.362	.904	87.857	2.209	1.022	87.740
10	1.349	.873	88.729	1.349	.873	88.729	1.196	.989	88.729
11	.336	.839	89.569						
12	.309	.773	90.342						
...	...	...	...						

**Table 5** Results of exploration factor analysis of the entrepreneurship questionnaire

Entries	Components									
	1	2	3	4	5	6	7	8	9	10
A1	.646	.284	.332	.293	.349	.233	.289	.167	.251	.143
A2	.672	.253	.212	.412	.139	.194	.237	.375	.304	.175
A3	.757	.257	-.034	.156	.352	.168	.248	.268	.196	.183
A4	.566	.151	.257	.289	.240	.356	.234	.238	.183	.158
A5	.747	.242	.159	.421	.297	.268	.192	.269	.426	.127
B6	.030	.056	.127	.288	.301	.248	.239	.110	.138	.292
B7	.201	.073	.316	.373	.194	.257	.345	-.156	.117	.244
B8	.124	.071	.376	.332	.398	.164	.219	.148	.145	.124
B9	.272	.085	.319	.291	.306	.241	.282	.169	.285	.213
C10	.124	.201	.698	.208	.396	.273	.259	.392	.249	.186
C11	.163	.124	.731	.296	.198	.168	.039	.186	.382	.425
C12	.099	.126	.676	.113	.131	.283	.254	.248	.158	.251

D13	.226	.107	.230	.641	.013	.267	.103	.135	.213	.256
D14	.111	.126	.096	.775	.234	.165	.135	.268	.123	.317
D15	.263	.226	.150	.731	.156	.106	.043	.237	.119	.298
D16	.285	.132	.169	.061	-.153	.085	.156	.103	.104	.260
E17	.207	.128	.129	.251	.733	.042	.042	.263	.102	.254
E18	.374	.421	.102	.266	.609	-.180	.052	.362	.094	.235
E19	.429	.125	.128	.327	.597	-.047	-.159	.349	.091	.227
E20	.197	.253	.115	.027	.683	-.016	-.043	.336	.145	.396
E21	.450	.278	.056	.183	.702	-.026	-.015	.309	.091	.362
E22	.238	.189	-.023	.208	.653	.039	.032	.362	.197	.349
F1	.239	.234	.125	.156	.129	.793	.293	.251	.222	.396
F2	.326	.369	.266	.278	.239	.734	.264	.348	.361	.185
F3	.084	.185	.262	.373	.287	.692	.143	.367	.163	.183
G4	.118	.289	.217	.238	.419	.239	.695	.423	.371	.172
G5	.153	.328	.173	.285	.329	.308	.820	.154	.251	.168
G6	.140	.285	.167	.392	.295	.294	.742	.260	.168	.185
H7	.183	.228	.236	.319	.129	.234	.226	.792	.277	.183
H8	.163	.216	.277	.282	.519	.315	.416	.804	.279	.172
H9	.134	.236	.236	.420	.249	.396	.149	.736	.261	.362
I10	.107	.278	.274	.249	.218	.325	.325	.357	.575	.349
I11	.339	.354	.174	.098	.200	.342	.142	.283	.684	.336
I12	.107	.431	.178	.108	.246	.297	.251	.216	.620	.309
J1	.231	.358	.265	.183	.102	.295	.178	.139	.254	.868
J2	.435	.166	.372	.145	.145	.295	.198	.427	.357	.886
J3	.268	.457	.277	.321	.192	.253	.095	.383	.391	.853
J4	.491	.272	.276	.257	.190	.256	.187	.329	.353	.883
J5	.268	.217	.169	.159	.109	.425	.297	.387	.246	.856
J6	.386	.284	.075	.184	.297	.139	.224	.324	.296	.871

## Research Results

This chapter presents the results of the empirical analysis conducted to examine the relationships among entrepreneurship, external support, and the growth of small and medium-sized enterprises (SMEs). Based on the data collected from 368 valid questionnaires, a series of statistical analyses was performed to test the proposed research hypotheses and evaluate the structural relationships within the theoretical framework established in earlier chapters.

The chapter is structured as follows: it begins with descriptive statistics that provide an overview of the demographic characteristics of the respondents and the distribution of key variables. This is followed by reliability and validity testing to confirm the robustness and internal consistency of the

measurement instruments. Subsequently, exploratory and confirmatory factor analyses are conducted to validate the construct structure of the main variables. The chapter then proceeds with hypothesis testing using regression analysis and structural equation modeling. Finally, the mediating role of external support is examined using the PROCESS macro to explore its impact on the relationship between entrepreneurship and SME growth.

### Demographic Analysis

Through demographic analysis of the respondents who participated in the formal questionnaire survey. A total of 368 valid responses were analyzed. The results reveal a diverse profile of SME founders and executives. In terms of gender, the sample is relatively balanced, though male respondents slightly outnumber females. Regarding age distribution, the majority of participants fall within the 31–50-year age range, reflecting the typical age range associated with entrepreneurial and managerial responsibilities in SMEs. In terms of education level, most respondents hold a bachelor’s or master’s degree, indicating a generally high level of educational attainment among leaders of technology-based SMEs in Shenzhen. Regarding job position, the participants include company founders, co-founders, and senior executives, ensuring that the responses reflect insights from decision-makers. The data also capture the years since company establishment, with most firms being in operation for 3 to 10 years, showing a concentration of relatively young but established enterprises. Lastly, the current growth stage of the companies is distributed across various phases, from initial development to rapid growth and maturity, providing a comprehensive view of SMEs at different life cycle stages. This demographic overview establishes a solid contextual foundation for subsequent statistical analyses.

**Table 6** Demographic Statistics of Samples

Background variables	Classification	N	percentage %
Gender	Male	197	53.5
	Female	171	46.5
Age	Under 25 years old	36	9.8
	26–35 years old	147	39.9
	36–45 years old	132	35.9
	Over 46 years old	53	14.4
Education	College degree and below	23	6.3
	Bachelor's degree	173	47.0
	Master's Degree	159	43.2
Position	Doctoral Degree	13	3.5
	Senior Managers	68	18.5

Background variables	Classification	N	percentage %
	Middle Managers	234	63.6
	Technical staff	24	6.5
	other	42	11.4
Years of establishment of the company	Less than 5 years	49	13.3
	6–10 years	72	19.6
	11–15 years	213	57.9
	16 years and above	34	9.2
Current growth stage of the company	Start-up period	70	19.0
	Growth	100	27.2
	Maturity	124	33.7
	Decline	74	20.1

### Confirmatory Factor Analysis

A Confirmatory Factor Analysis (CFA) was conducted in AMOS on 368 valid responses to verify that our items accurately represent entrepreneurship, external support, and SME growth. The model demonstrated good fit— $\chi^2/df < 3$ , RMSEA  $< 0.08$ , and CFI, TLI, GFI, AGFI  $> 0.90$ —and all standardized loadings exceeded 0.50 (most  $> 0.70$ ), confirming strong convergent validity across dimensions (e.g., innovation and risk-taking under entrepreneurship; financial and policy under external support).

Furthermore, the construct reliability values were all above 0.70, and the AVE values were above 0.50, indicating high internal consistency and that each latent construct explains a substantial portion of the variance in its indicators. These results establish robust construct validity and measurement stability, providing a solid foundation for the subsequent SEM analysis of the hypothesized paths among entrepreneurship, external support, and SME growth.

### Model Analysis

The measurement model demonstrated strong convergent validity, as all factor loadings exceeded 0.50 (with most exceeding 0.70). Construct Reliability (CR) values were above 0.70, and Average Variance Extracted (AVE) values surpassed 0.50, confirming that each set of items reliably represents its corresponding latent construct.

Discriminant validity was established via the Fornell–Larcker criterion: for entrepreneurship, external support, and SME growth, the square root of each AVE exceeded its correlations with other constructs, indicating clear conceptual and statistical distinction among them.

The structural model fit was satisfactory ( $\chi^2/df < 3$ ; RMSEA < 0.08; CFI, TLI, GFI, AGFI > 0.90). Path analyses in AMOS revealed that entrepreneurship has a positive and significant impact on both external support and SME growth. Mediation tests confirmed that external support partially mediates the relationship between entrepreneurship and growth. These findings robustly validate the proposed theoretical framework.

**Table 7** Discriminant validity

Vriable	IS	AS	PA	NA	Profe	Profi	PC	EIL	RML	ES
IS	0.762									
AS	0.589**	0.739								
PA	0.672**	0.639**	0.724							
NA	0.581**	0.592**	0.628**	0.732						
Profe	0.539**	0.544**	0.641**	0.678**	0.745					
Profi	0.598**	0.583**	0.567**	0.502**	0.695**	0.719				
PC	0.479**	0.537**	0.543**	0.499**	0.456**	0.536**	0.695			
EIL	0.406**	0.514**	0.396**	0.460**	0.519**	0.498**	0.413**	0.686		
RML	0.324**	0.431**	0.425**	0.387**	0.469**	0.437**	0.513**	0.496**	0.709	
ES	0.509**	0.581**	0.515**	0.468**	0.497**	0.534**	0.492**	0.526**	0.489**	0.728
√AVE	0.872	0.859	0.851	0.856	0.863	0.848	0.834	0.828	0.842	0.853

### Hypotheses Testing

Structural Equation Modeling (SEM) in AMOS confirmed that entrepreneurial orientation—innovation, risk-taking, and proactivity—has a significant positive impact on SME performance (profitability, production capacity, innovation capability, and risk management), validating H1. The standardized path coefficient for entrepreneurship leading to SME growth was substantial. Statistically significant ( $p < .05$ ). Entrepreneurship also positively influences external support (policies, financing, supply chains, and public reputation), indicating that more entrepreneurial firms are better able to attract and leverage external resources ( $p < .05$ ), validating H2.

External support, in turn, exerts a direct positive effect on SME growth ( $p < .05$ ), confirming H3. Mediation analysis using PROCESS in SPSS showed that external support partially mediates the entrepreneurship–growth relationship: entrepreneurial behavior drives growth both directly and indirectly by enhancing access to external enablers, validating H4. All hypothesized paths were supported at the 0.05 level or better.

These results underscore that SME development hinges on the synergy between internal entrepreneurial capabilities and a supportive external environment. Fostering entrepreneurship alone is insufficient without complementary policies and resource networks; sustainable growth requires integrated strategies that build both firm-level competencies and ecosystem-level support.

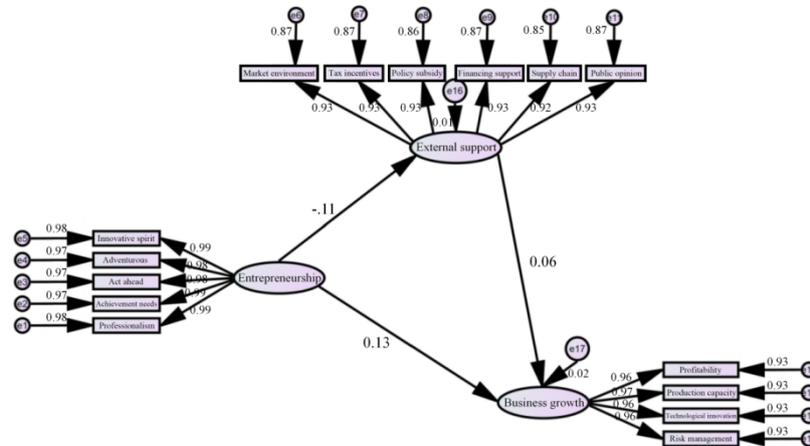


Figure 2 Adjustment model

Table 8 Fit index of the model

Fit indices	$\chi^2 / df$	GFI	AGFI	IFI	TLI	CFI	RMSEA
Recommended	<3	>0.8	>0.8	>0.9	>0.9	>0.9	<0.08
Structural Model	0.958	0.973	0.963	0.992	0.991	0.997	0.025

## Discussions

Consistent with Drawing on Covin and Slevin (1991), Sheng et al. (2023), and Linton (2019) Our results show that entrepreneurial orientation—encompassing innovation, risk-taking, proactivity, achievement motivation, and professionalism—directly drives growth in Shenzhen’s technology-based SMEs. Such orientation equips firms with the dynamic capabilities needed to navigate complex markets, seize opportunities, and sustain performance.

We further demonstrate that entrepreneurial behavior significantly enhances access to external resources—policy subsidies, tax relief, financing channels, and reputational capital—thereby extending Barney (1991)’s resource-based view. External support itself exerts a direct positive effect on SME growth, acting as a partial mediator between entrepreneurship and growth, and highlighting how institutional and market forces shape firm outcomes. (Bronfenbrenner, 1979).

Together, these findings underscore that SME development hinges on the interaction between internal entrepreneurial competencies and ecosystem-level enablers. The validated multidimensional model integrates behavioral, organizational, and environmental perspectives, suggesting that entrepreneurship training and supportive policies must be aligned to achieve optimal outcomes. In innovation-driven economies like Shenzhen, this integrated approach—linking entrepreneurial development with targeted policy mechanisms—is essential for sustaining SME-led technological advancement and economic transformation.

### **New Knowledge**

This study offers four key contributions. First, it develops a holistic entrepreneurship scale—innovation, risk-taking, proactivity, achievement motivation, and professionalism—that surpasses earlier one- or two-dimensional measures. Second, it empirically confirms external support as a mediator linking entrepreneurial behavior to SME growth, showing that entrepreneurship also facilitates access to resources that drive performance. Third, by focusing on technology-based SMEs in Shenzhen, it provides context-specific evidence of how internal capabilities interact with local institutional, financial, and social environments in an innovation hub. Ultimately, the integrated entrepreneurship-support-growth model provides a scalable framework for future empirical research and policy design across various sectors and regions.

### **Conclusion**

This study examined the impact of entrepreneurship on the growth of small and medium-sized enterprises (SMEs), while also exploring the mediating role of external support. Focusing on technology-based SMEs in Shenzhen, China, the research developed and tested a structural model grounded in entrepreneurship theory, resource-based theory, and ecological systems theory. Through quantitative analysis based on 368 valid responses, the study empirically confirmed that entrepreneurship significantly enhances SME growth and that external support not only promotes growth independently but also mediates the relationship between entrepreneurship and growth. Based on these findings, the following sections present practical recommendations and highlight the study's contributions to advancing new knowledge.

### **Suggestions**

SME owners and executives should place greater emphasis on developing entrepreneurial competencies, particularly in areas such as innovation, risk management, proactive market behavior, and professional resilience.

Policymakers should design more targeted and responsive support systems tailored to the needs of entrepreneurial firms.

Government agencies, financial institutions, academic research centers, and industry alliances can provide not only financial or policy-based resources but also shared knowledge, market access, and strategic networks—further amplifying the impact of entrepreneurship on SME growth.

Entrepreneurs take an active approach to seeking and utilizing external resources.

## References

- Alcalde-Calonge, A., Ruiz-Palomino, P., & Sáez-Martínez, F. J. (2024). Fostering the circular economy  
In small and medium-sized enterprises: The role of social capital, adaptive capacity, entrepreneurial orientation, and a pro-sustainable environment. *Business Strategy and the Environment*, 33(8), 8882–8899. <https://doi.org/10.1002/bse.3948>
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press, 352. <https://doi.org/10.2307/j.ctv26071r6>
- Churchill, N. C., & Lewis, V. L. (2002). The five stages of small business growth. *Entrepreneurship: Critical Perspectives on Business and Management*, 3, 83. <https://hbr.org/1983/05/the-five-stages-of-small-of-small-business-growth>
- Corrêa, V. S., Queiroz, M. M., Cruz, M. A., & Shigaki, H. B. (2022). Entrepreneurial orientation far beyond opportunity: the influence of the necessity for innovativeness, proactiveness, and risk-taking. *International Journal of Entrepreneurial Behavior & Research*, 28(4), 952–979. <https://doi.org/10.1108/IJEER-06-2021-0518>

- Covin, J. G., & Slevin, D. P. (1991). A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship Theory and Practice*, 16(1), 7–26.  
<https://doi.org/10.1177/104225879101600102>
- Gartner, W. B. (1988). “Who is an entrepreneur?” is the wrong question. *American Journal of Small Business*, 12(4), 11–32. <https://doi.org/10.1177/104225878801200401>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global Perspective* (7th ed.). Pearson Prentice Hall.
- Hussey, I., Alsalti, T., Bosco, F., Elson, M., & Arslan, R. (2025). An aberrant abundance of Cronbach’s alpha values are at .70. *Advances in Methods and Practices in Psychological Science*, 8(1), 25152459241287123. <https://doi.org/10.1177/25152459241287123>
- Inegbedion, H. E., Thikan, P. R., David, J. O., Ajani, J. O., & Peter, F. O. (2024). Small and Medium enterprise (SME) competitiveness and employment creation: the mediating role of SME growth. *Humanities and Social Sciences Communications*, 11(1), 11.  
<https://doi.org/10.1057/s41599-023-02434-y>
- Linton, G. (2019). Innovativeness, risk-taking, and proactiveness in startups: a case study and conceptual development. *Journal of Global Entrepreneurship Research*, 9(1), 20.  
<https://doi.org/10.1186/s40497-019-0147-5>
- Liu, Y., & Wang, M. (2022). Entrepreneurial orientation, new product development, and firm Performance: The moderating role of legitimacy in Chinese high-tech SMEs. *European Journal of Innovation Management*, 25(1), 130–149. <https://doi.org/10.1108/EJIM-05-2020-0204>
- Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and Linking it to performance. *Academy of Management Review*, 21(1), 135–172.  
<https://doi.org/10.2307/258632>
- Man, T. W. Y., & Lau, T. (2005). The context of entrepreneurship in Hong Kong. *Journal of Small Business and Enterprise Development*, 12(4), 464–481.  
<https://doi.org/10.1108/14626000510628162>
- McClelland, D. (1961). *The Achieving Society* Van Nostrand Reinhold. Princeton.  
<https://dx.doi.org/10.1037/14359-000>
- Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management science*, 29(7), 770–791. <https://doi.org/10.1287/mnsc.29.7.770>

- Moreno, A. M., & Casillas, J. C. (2008). Entrepreneurial orientation and growth of SMEs: A causal Model. *Entrepreneurship Theory and Practice*, 32(3), 507–528.  
<https://doi.org/10.1111/j.1540-6520.2008.00238.x>
- Pu, G., Qamruzzaman, M., Mehta, A. M., Naqvi, F. N., & Karim, S. (2021). Innovative finance, Technological adaptation and SMEs sustainability: the mediating role of government support during the COVID-19 pandemic. *Sustainability*, 13(16), 9218.  
<https://doi.org/10.3390/su13169218>
- Schaufeli, W. B., Salanova, M., González-romá, V., & Bakker, A. B. (2002). The Measurement of Engagement and Burnout: A Two-Sample Confirmatory Factor Analytic Approach. *Journal of Happiness Studies*, 3(1), 71–92. <https://doi.org/10.1023/A:1015630930326>
- Sheng, L., Gu, J., & Wu, J. (2023). How does entrepreneurial orientation influence a firm Performance? The roles of corporate social responsibility and institutional environments. *Corporate Social Responsibility and Environmental Management*, 30(4), 2021–2036.  
<https://doi.org/10.1002/csr.2471>
- Sturm, S., Hohenstein, N.-O., & Hartmann, E. (2023). Linking entrepreneurial orientation and Supply chain resilience to strengthen business performance: an empirical analysis. *International Journal of Operations & Production Management*, 43(9), 1357–1386.  
<https://doi.org/10.1108/IJOPM-07-2022-0418>
- Wang, D. S. (2020). Association between technological innovation and firm performance in small and medium-sized enterprises. *International Journal of Innovation Science*, 11(2), 227–240.  
<https://doi.org/10.1108/IJIS-04-2018-0049>
- Xiang, D., Zhao, T., & Zhang, N. (2022). How can government environmental policy affect the Performance of SMEs: Chinese evidence. *Journal of Cleaner Production*, 336, 130308.  
<https://doi.org/10.1016/j.jclepro.2021.130308>
- YahiaMarzouk, Y., & Jin, J. (2023). Linking environmental scanning and organizational learning With organizational resilience of Egyptian SMEs: the moderating role of environmental uncertainty. *International Journal of Organizational Analysis*, 31(6), 2753–2792.  
<https://doi.org/10.1108/IJOA-12-2021-3066>
- Zeng, S. X., Xie, X. M., & Tam, C. M. (2010). Relationship between cooperation networks and Innovation performance of SMEs. *Technovation*, 30(3), 181–194.  
<https://doi.org/10.1016/j.technovation.2009.08.003>

Zighan, S., Abualqumboz, M., Dwaikat, N., & Alkalha, Z. (2021). The role of entrepreneurial orientation in developing SMEs resilience capabilities throughout COVID-19. *The International Journal of Entrepreneurship and Innovation*, 23(4), 227–239.  
<https://doi.org/10.1177/14657503211046849>