Model Construction and Empirical Study of Implicit Evaluation on the Entrepreneurial Environment in Dongguan

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Abstract： Entrepreneurial environment is a key factor to promote entrepreneurial activities. Through four studies, implicit research methods and SEM were applied to construct and verify the six-factor implicit evaluation model of the entrepreneurial environment in Dongguan. In Study 1, from 11 unstructured interviews, 118 unstructured questionnaires and literature, 49 items were extracted to describe characteristics of an ideal entrepreneurial environment. In Study 2, from 217 semi-structured questionnaires, 6 factors including 28 items were obtained by EFA. In study 3, from 249 structured questionnaires, 6 factors including 21 items were revised by CFA. In study 4, the revised scale was applied to investigate feelings of Dongguan citizens on its entrepreneurial environment. it showed that the overall satisfaction score was at a relatively good level: 3.713. Among the six factors, satisfaction scores from high to low were: humanistic atmosphere: 3.927, life support: 3.870, market environment: 3.784, entrepreneurial resources: 3.704, professional services: 3.665 and support network: 3.359.

Keywords: Dongguan, entrepreneurial environment, implicit theory, social validity paradigm by Sternberg, SEM

1   Introduction

1.1   Purpose

Creativity refers to the ability of human beings to adapt to and change the environment[33]. After reviewing the literature since 1950,[1] Mayer (1999)[28] summed up the two most important characteristics of creativity: novelty and usefulness. Entrepreneurship means starting a business, which has novelty (starting a new business) and usefulness (producing and selling products useful to the target market). It is the application of creativity in business. Entrepreneurship can promote economic development, enlarge

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employment, optimize industrial structure and enhance innovation ability. Global Entrepreneurship Monitor (GEM), the largest and longest entrepreneurial survey in the world, pointed out that the total early-stage entrepreneurial activity (TEA) was positively correlated with the national economic growth in the coming 2-3 years, and provided 2%-5% of jobs[16].

According to Kurt Lewin's field theory, entrepreneurial activity is the result of interaction between entrepreneurs and entrepreneurial environment. People's cognition of entrepreneurial environment affects their entrepreneurial intention, behavior and performance. Entrepreneurial environment is the link between entrepreneurs and entrepreneurial regions, which can cause regional differences in entrepreneurial activities and affect its rates of generation and success. The importance of entrepreneurial environment has been increasingly recognized and become a hot topic in entrepreneurial studies domestically and abroad[6][22][37], but there are different opinions on the definition of entrepreneurial environment[7][11][17][19]. In this article, entrepreneurial environment is defined as a combination of various social factors affecting entrepreneurial activities, while organizational and family factors are not discussed. Scholars have developed many models containing various factors according to their understanding of entrepreneurial environment, among which Five-Factor model[19], GEM model[18] and MOS model[27] are most widely known. Five factors are involved in each of these three models: financial support, tax relief, education and training, government projects and entry barriers. Domestic scholars have also developed models for different groups and various regions[7][10][43][51][53], but Dongguan's economic structure is unique. Its foreign trade dependence (FTD) has being ranked first in China for years. From 2018 to 2021, its FTD was as high as 140%, and even up to 160% before 2018. Suzhou, ranking second, is only about 110%, and the whole country is just around 30%. And by literature review, it is found that there are few studies on the entrepreneurial environment in Dongguan. Early studies revealed that the overall entrepreneurial environment in Dongguan was continuously improving, but there were still a series of problems[2][20][23][24][25][48][50][52]. It has an important inspiration for us to move on. It is necessary to construct an evaluation model of entrepreneurial environment corresponding to its reality.

1.2   Implicit Research Methods and Structural Equation Model

After reviewing 70 years of entrepreneurship research in China, Zhu et al (2020)[54] divided it into five stages: the planned economy stage (1949-1978), the grassroots stage (1978-1992), the elite stage (1992-2000), the Internet stage (2000-2014), and the mass stage (2014-present). Its methodology have shifted from qualitative to quantitative or both, and from single issue analysis to theoretical system construction. Experience summarization and case study were mainly applied in the planned economy stage and grassroots stage; grounded theory, critical incident method, interview and case study in the Internet stage; mathematical statistics in the Internet stage; factor analysis, structural equation model (SEM) and econometric analysis in the mass stage. In order to further investigate the internal views of Dongguan citizens on the entrepreneurial environment in the city, implicit research methods and structural equation model and were applied.

Implicit research methods have high ecological validity and can better reflect people's inner wishes in natural state[21][38][45][47][49]. Implicit research methods deals with implicit knowledge. It was first proposed by Michael Polanyi in *Personal Knowledge*. He believed that implicit knowledge referred to what was known in practice but could not be conveyed or expressed clearly, such as facial recognition, cycling skills, and so forth[31]. Subsequently, scholars proposed their understanding from various perspectives. Ikujiro Nonaka and Robert J. Sternberg got most attention. Nonaka (1994)[30] thought implicit knowledge came from experience, reflecting beliefs, and concepts. Sternberg (1985, 1998)[34][35] considered implicit knowledge as constructions by people (whether psychologists or laypersons) that resided in their mind while explicit knowledge as constructions of psychologists or other scientists that were based on or at least tested on data collected from people performing tasks presumed to measure psychological functioning.

Although implicit knowledge is difficult to express, it is not undetectable. The three-stage social validity paradigm by Robert J. Sternberg and the 5-stage implicit association paradigm by A. G. Greenwald are mainly adopted. Greenwald's paradigm is usually conducted by recording reaction time on the computer, and is often used to study discrimination, prejudice, self-esteem, anxiety, stereotypes, etc.[3][38] And this article focuses on entrepreneurial environment in Dongguan, and the respondents are Dongguan citizens. Therefore, Sternberg's paradigm was applied to conduct the research.

Social validity paradigm by Sternberg includes 3 stages: defining the scope of study, forming an implicit structure, and applying an implicit structure[8][26][34][46][55]. (1) At the stage of defining the scope, researchers collect views through interviews and questionnaires, and then sort them out and analyze them to form a behavior list. (2) At the stage of forming an implicit structure, researchers re-select respondents to evaluate the typicality or importance of items in the behavior list, and try to find its potential structure. (3) Finally, using the results of potential structure analysis, a questionnaire is compiled and then investigated with. This paradigm has been applied to conduct researches on management, education, psychology, military, medicine, and so on[1][4][5][14][26][29][46].

Applying implicit theory to the study of entrepreneurial environment in Dongguan has certain practical and theoretical significance. In 2021, Dongguan's GDP reached 1,085.535 billion yuan, breaking the trillion yuan mark; the number of registered industrial and commercial households was 1,463,400, an increase of 122,400 over 2020. Entrepreneurial economy plays an important role in the development of Dongguan. It is of practical significance to investigate the entrepreneurial environment in Dongguan to promote entrepreneurial activities. The existing studies mainly describe the objective environment. Applying implicit theory to the study of entrepreneurial environment in Dongguan can reflect subjective cognition of its citizens, making up for the shortcomings of existing studies. This study can also provide references for government to optimize the entrepreneurial environment. At the same time, the author has not yet retrieved any relevant literature on the application of implicit theory to the study of entrepreneurial environment. This study can provide a new perspective for the study of entrepreneurial environment and enrich the content of its research system.

There are many latent variables in psychology, education, sociology, management and other fields, such as depression, learning motivation, social status, business environment, etc. Entrepreneurial environment cognition is also a latent variable. Latent variables are hard to measure directly and can only measured by indirectly through observable variables. Traditional statistical methods are not effective in dealing with latent variables while structural equation model (SEM) can estimate latent variables by model analysis of observable variables. SEM is a Multimodal Analysis technique that verifies the interrelationship among variables. Popular software includes AMOS, LISREL, EQS and MPlus[9][36][40][41][42]. In conclusion, this article applies SEM to process data.

2   Study 1: Unstructured Interview and Questionnaire Survey

2.1   Purpose

Through qualitative research, this article established an item list to describe ideal entrepreneurial environment in the view of Dongguan citizens.

2.2   Methodology

Subjects.
There were 11 interviewees, including 8 founders and 3 top managers; 9 male and 2 female; 3 with graduate degree, 6 with undergraduate degree, 2 with high diploma or below; 4 with business education background and 7 without; and 2 post-70s, 4 post-80s and 5 post-90s. 123 questionnaires were also collected. 5 were removed: 4 did not describe the characteristics of an ideal entrepreneurial environment, and 1 described its enterprise profile. Totally 118 valid questionnaires were obtained. There were 37 existing entrepreneurs, 17 former entrepreneurs, 36 with entrepreneurial intention and 28 without; 65 male and 53 female; 24 with graduate degree, 41 with undergraduate degree, 53 with high diploma or below; 31 with business education background and 87 without; and 23 post-70s, 46 post-80s and 49 post-90s.

Tools.
A self-designed open questionnaire was used, which included six demographic variables (living in Dongguan or not, entrepreneurial status, gender, education background, major and year of birth) and one open question: Please describe characteristics of an ideal entrepreneurial environment. Interviews and questionnaires were applied.

Procedures.
Interviews were conducted offline and questionnaires were distributed online through www.wjx.cn.

Results.

11 interviewees described 38 characteristics, with 3.45 per capita. 118 valid questionnaires described 414 characteristics, with 3.51 per capita. Two management lecturers judged whether to retain or delete the 452 collected descriptions. Cohen's Kappa coefficient is 0.712, and the two raters had high consistency[13]. 16 descriptions were removed because of vague statements or irrelevant to social factors; only 436 descriptions agreed by the two raters were retained. The author encoded 436 descriptions, extracted keywords and classified them, and finally formed 45 items. After referring to the three entrepreneurial environment models: Five-Factor model, GEM model and MOS model, four characteristics covered by them but not appearing in 45 items were added: science and technology foundation, accounting service, banking service and legal service, 49 items in total.

3 Study 2: Exploratory Factor Analysis of Semi-structured Questionnaire

3.1 Purpose

In order to have further insight into the views of Dongguan citizens on the characteristics of an ideal entrepreneurial environment and make adjustments to the 49 items, a semi-structured questionnaire was designed. At the same time, an exploratory factor analysis (EFA) was carried out to extract the implicit structure of an ideal entrepreneurial environment.

3.2 Methodology

Subjects.

292 questionnaires were collected. Questionnaires as follows were removed: having never lived in Dongguan, answer time less than 2 seconds per question, making the same choice for 90% of the questions describing an ideal entrepreneurial environment. Totally 217 valid questionnaires were obtained. There were 52 existing entrepreneurs, 43 former entrepreneurs, 54 with entrepreneurial intention and 68 without; 102 male and 115 female; 58 with graduate degree, 120 with undergraduate degree, 39 with high diploma or below; 87 with business education background and 130 without; and 53 post-70s, 106 post-80s and 58 post-90s.

Tools.

According to the 49 characteristics, the author compiled a semi-structured questionnaire including three parts: demographic variables, environmental characteristics and one open question "If you have any new supplements to the characteristics of entrepreneurial environment, please write them below and assign their importance". In order to improve the comprehensibility, four items were briefly explained: simple procedures (simple company registration procedures), loose management (loose management by

the government), fair implementation (fair and open in policy implementation), and project support (government provides projects to new companies).

Procedures.

In order to avoid misunderstanding caused by vague expressions, 134 students from Dongguan University of Technology: 79 Chinese juniors, 32 finance juniors and 23 students who participated in the 8th China International College students' "Internet +" Innovation and Entrepreneurship Competition were invited for pre-investigation. Suggestions were collected, expressions were modified, and then questionnaires were distributed online through www.wjx.cn.

3.3   Results

The open question received 23 replies, mainly involving government policies, fair law enforcement, industrial exhibitions and training guidance. They could be integrated into policy support, fair implementation, publicity channels and entrepreneurial training respectively, so no new characteristics of ideal entrepreneurial environment were added.

Principal component analysis (PCA) was used for EFA. KMO test and Bartlett's sphericity test were performed before analysis: KMO=0. 944, and Bartlett's sphericity test $p < 0.000$. Sample data were suitable for EFA. The author carried out EFA on 49 environmental characteristics. After referring to the factor variance contribution rate and gravel diagram with eigenvalue greater than 1, the following factors were gradually removed by Caesar's normalized maximum variance method: (1) Firstly, the factors that constituted unstable structures, that was, containing less than 3 items. Elimination started from the entry with the largest load. (2) Secondly, to remove items with a smaller load, starting from the items with the smallest load until the load of all items reached 0.50 or above. (3) Then to remove items with a load of more than 0.45 in two or more items at the same time. (4) Items inconsistent with the meanings of factors, and difficult to combine the meanings expressed by other items into one concept or explain them reasonably.

Only one item was deleted at a time, and factor analysis was performed again once an item was removed. A total of 21 items were removed, and the remaining 28 items were analyzed by factor analysis. The results showed that KMO=0.951, Bartlett's sphericity test $p < 0.000$. By Caesar normalized maximum variance method, 28 items were classified into 6 factors, which could explain 70.495% of the sample variance in total.

4   Study 3: Confirmatory Factor Analysis of Structured Questionnaire

4.1   Purpose

Through EFA, six factors of an implicit characteristics of ideal entrepreneurial environment were obtained, but it was necessary to confirm whether the structure was stable or not. Confirmatory factor analysis (CFA) was performed.

4.2   Methodology

Subjects.

381 questionnaires were collected. Questionnaires were excluded according to the same standards as in Study 2. Totally 249 valid questionnaires were obtained. There were 69 existing entrepreneurs, 29 former entrepreneurs, 54 with entrepreneurial intention and 97 without; 110 male and 139 female; 25 with graduate degree, 155 with undergraduate degree, 69 with high diploma or below; 84 with business education background and 165 without; and 35 post-70s, 95 post-80s and 119 post-90s.

Tools.

Based on the 28 items from EFA, a structured questionnaire was developed, including two parts: environmental characteristics and demographic variables.

Procedures.

Questionnaires were distributed online through www.wjx.cn.

4.3   Result

Reliability Test.

The overall homogeneity reliability was 0.944 after revision, and the split-half reliability was 0.892. The homogeneity reliability and split-half reliability of the six factors were 0.814, 0.865, 0.782, 0.910, 0.887, 0.892 and 0.822, 0.868, 0.730, 0.800, 0.764, 0.874 respectively after revision. Wu (2003)[44] proposed that as a scale with good reliability, the overall reliability should be above 0.80, and the subscale should be above 0.70. It could be seen that the implicit structure of characteristics of an ideal entrepreneurial environment extracted by CFA met the measurement requirements and had good structural reliability.

Construct Validity.

During the revision process, 7 items were removed and 21 items were retained. The adaptability indices were all at a good level: X2/df=1.544, RMSEA=0.047, and GFI=0.909. And the adaptability of the estimated results was good, conforming to the identification rules. The six factors were named as: A market environment, B humanistic atmosphere, C entrepreneurial resources, D supporting network, E professional services and F life support. The road diagram of these six factors with 21 items were shown as follow in Figure 1.
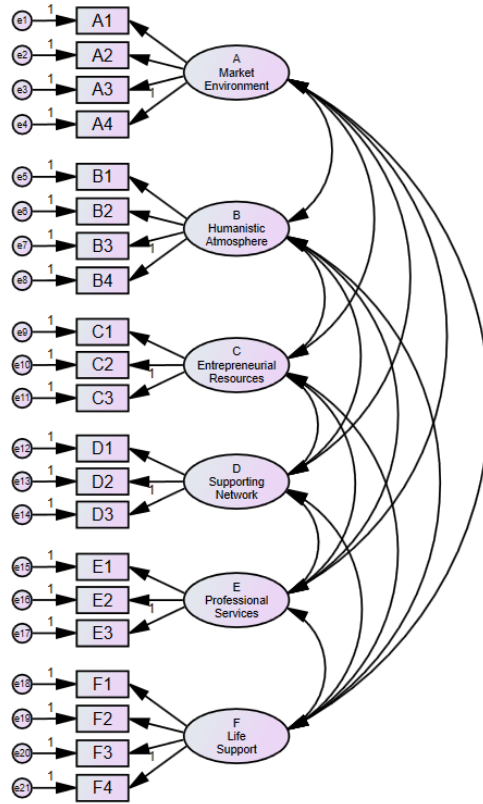
Fig. 1. Road Diagram of Six-factor Model for the Implicit Evaluation of an Ideal Entrepreneurial Environment (21 Items)

Remarks: A_1 Entrepreneurial costs, A_2 Economic conditions, A_3 Political stability, A_4 Regional advantages; B_1 Cultural tolerance, B_2 Friendliness to youths, B_3 Social support, B_4 Respect to talents; C_1 Industrial support, C_2 Financing channels, C_3 Industrial cluster; D_1 Entrepreneurial consultation, D_2 Entrepreneurial training, D_3 Entrepreneurial mentors, E_1 Law services, E_2 Banking services, E_3 Accounting services; F_1 Infrastructure, F_2 Educational support, F_3 Life convenience, F_4 Medical facilities.

Convergence Validity.

Fornell and Larcker (1981)[15] thought that the criteria for judging convergence validity were as follows: (1) The fully standardized factor load of all items was greater than 0.500, and the p-value was significant; (2) Construct reliability (CR) was greater than 0.800; (3) average variance extracted (AVE) was greater than 0.500. The CFA results showed that the fully standardized factor load of 21 items was greater than 0.500 and the p-value was significant; the CR values of five factors were greater than 0.800, and C entrepreneurial resources was close to 0.800: 0.814, 0.867, 0.784, 0.913, 0.888,

0.893. AVE values of six factors were all greater than 0.500: 0.523, 0.619, 0.548, 0.779, 0.727, 0.677. It could be seen that each item could be explained by the corresponding factor. That is, each item converged to the corresponding factor, and the overall convergence validity was good.

Discriminant Validity.

Discriminant validity can be tested by comparing the square root of AVE value with its correlation value. If the square root of AVE value is greater than its correlation value, the discriminant validity is good. As it was shown in Table 1, there were 6 square roots of AVE values and 15 correlation coefficients in the scale. The square roots of AVE values were greater than 13 correlation values and smaller than 2. It had certain discriminant validity as a whole.

Table 1. Discrimination Validity Test of CFA

Factors	AVE	F	E	D	C	B	A
F	0.677	**0.823**					
E	0.727	0.738	**0.853**				
D	0.779	0.569	0.630	**0.883**			
C	0.548	0.650	0.672	0.514	**0.740**		
B	0.619	0.655	0.659	0.597	0.697	**0.787**	
A	0.523	0.642	0.574	0.482	0.847	0.866	**0.723**

Remarks: The bold parts are square roots of AVE.

Overall Analysis.

It could be seen from Table 2 that Dongguan citizens believed that A market environment was the most important factor for the ideal entrepreneurial environment, which was followed by B humanistic atmosphere, C entrepreneurial resources, E professional services, F life support, and D supporting network. A market environment, B humanistic atmosphere, and C entrepreneurial resources exceeded a relatively important level of 4.000, while E professional services, F life support, and D supporting networks ranged from 3.500 to 4.000. In view of specific items, the most important five items were A_3 political stability, A_1 entrepreneurial costs, B_1 cultural tolerance, A_2 economic conditions, and A_4 regional advantages, all belonging to A market environment and B humanistic atmosphere.

Table 2. Evaluation Scores 1

Indicators	Scores	Indicators	Scores	Indicators	Scores
A1	4.345	C2	4.072	F2	3.771
A2	4.285	C3	4.153	F3	3.916
A3	4.394	D1	3.779	F4	4.104
A4	4.269	D2	3.779	A	4.323
B1	4.297	D3	3.743	B	4.116
B2	4.157	E1	3.763	C	4.044
B3	3.968	E2	3.888	D	3.767
B4	4.040	E3	3.996	E	3.882
C1	3.908	F1	3.691	F	3.871

5   Study 4: Empirical Study

5.1   Purpose

The six-factor model of an ideal entrepreneurial environment only reflects the ideal entrepreneurial environment in minds of Dongguan citizens, and there may be differences between the ideal state and actual feelings. In order to understand feelings of Dongguan citizens on the reality of the entrepreneurial environment in Dongguan, an empirical study was conducted.

5.2   Methodology

Subjects.
526 questionnaires were collected. Questionnaires were removed according to the same standards as in Study 2. Totally 361 valid questionnaires were obtained. There were 72 existing entrepreneurs, 56 former entrepreneurs, 82 with entrepreneurial intention and 151 without; 130 male and 231 female; 42 with graduate degree, 209 with undergraduate degree, 110 with high diploma or below; 95 with business education background and 266 without; and 91 post-70s, 167 post-80s and 103 post-90s.

Tool.
The results of CFA survey showed that characteristics of the ideal entrepreneurial environment in minds of Dongguan citizens consisted of 6 factors, including 21 items. According to the survey above, a Likert 5-point scale was compiled. The scale included two parts: environmental characteristics and demographic variables. A comment set was set up for the characteristics of an ideal entrepreneurial environment: 5 very good, 4 relatively good, 3 average, 2 relatively poor and 1 very poor.

Procedures.
Questionnaires were distributed online through www.wjx.cn.

5.3   Results

Reliability Analysis.
The overall Clonbach coefficient was 0.940, and the Gertmann half coefficient was 0.885; the Clonbach coefficient and the Gertmann half-fold coefficient of six factors were above 0.750: 0.774, 0.858, 0.809, 0.894, 0.846, 0.841 and 0.774, 0.865. 0.786. 0.819, 0.757,0.848. On the whole, the questionnaire was reliable and stable.

Validity Analysis.
A second-order structural equation model was established by AMOS according to the modified index. Figure 2 showed that the entrepreneurial environment in views of Dongguan citizens was a comprehensive network system, which was the result of six

factors. The structure validity and convergence validity of the revised implicit evaluation model met the test standards, without any violation of the model identification rules. Except for the AVE value of A market environment, X2/df, RMSEA, GFI of the scale, CR and AVE values of the six factors were all good. After revision, X2/df=2.226, RMSEA=0.058, GFI=0.903; CR=0.780, 0.864, 0.794, 0.898, 0.843, 0.854; AVE=0.473, 0.615, 0.564, 0.746, 0.642, 0.595. Chin (1998)[12] thought that AVE greater than 0.36 was acceptable, and AVE greater than 0.49 was good. The AVE value of A market environment (0.473) exceeded the acceptable standard and approached to the good standard. Therefore, on the whole, 21 items in 6 factors could describe feelings of Dongguan citizens about its entrepreneurial environment well.
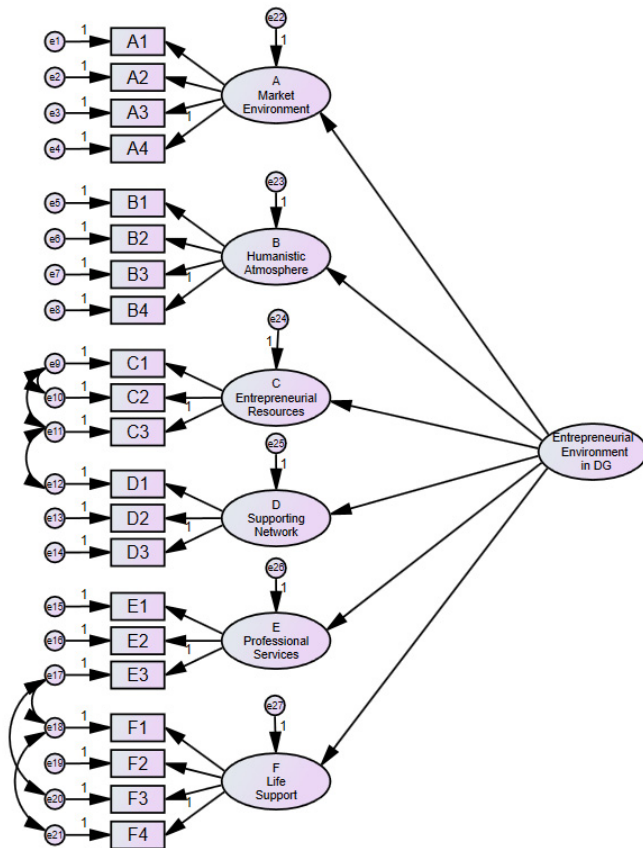

Fig. 2. Implicit Evaluation Model of Entrepreneurial Environment in Dongguan (revised)

Overall Analysis.

Factor load estimation values of 6 factors and 21 items were normalized to determine the fuzzy comprehensive evaluation (FCE) matrix as corresponding degree of membership. The specific steps were as follows: (1) to evaluating 6 factors respectively; (2) the

FCE set of six factors was used as the fuzzy evaluation matrix for the overall evaluation of the entrepreneurial environment in Dongguan; (3) to quantify the FCE set and calculate the comprehensive score.

According to the satisfaction ratio of each index counted by the valid questionnaire, fuzzy evaluation sets of 6 factors, 21 items total fuzzy evaluation set could be obtained. Comprehensive scores could be calculated.

Table 3. Evaluation Scores 2

Indicators	Scores	Indicators	Scores	Indicators	Scores
A1	3.943	C2	3.537	F2	4.167
A2	3.746	C3	3.706	F3	3.721
A3	4.196	D1	3.369	F4	3.933
A4	3.318	D2	3.363	A	3.784
B1	3.879	D3	3.341	B	3.927
B2	3.878	E1	3.636	C	3.704
B3	3.900	E2	3.766	D	3.359
B4	4.046	E3	3.597	E	3.665
C1	3.883	F1	3.643	F	3.870

Dongguan citizens' implicit evaluation of the entrepreneurial environment in the city: "very good, relatively good, average, relatively poor and very poor", had degrees of membership of 0.177, 0.452, 0.312, 0.052 and 0.007 respectively. According to the principle of maximum membership, the entrepreneurial environment in Dongguan was at a relatively good level. The comprehensive score was 3.713. From high to low, satisfaction degrees of the six factors were: B humanistic atmosphere > F life support > A market environment > C entrepreneurial resources > E professional services > D support network. Dongguan citizens had the highest evaluation of B humanistic atmosphere.

Dongguan citizens had the lowest evaluation of D support network, and the "average" degree of membership was 0.458, which was the only factor with "average" degree of membership higher than 0.400. The comprehensive score was only 3.359, which was the only factor with a comprehensive score lower than 3.500. Scores of the three items were all below 3.500: D1 entrepreneurial consultation 3.369, D2 entrepreneurial training 3.363, D3 entrepreneurial mentor 3.341. They were ranked 18th, 19th and 20th among 21 items respectively. The survey showed that the degrees of membership of A market environment were 0.195, 0.464, 0.290, 0.050 and 0.002, respectively. The market environment in Dongguan was at a "relatively good" level as a whole. From the four items of this factors, the most ideal one was A3 political stability, with a comprehensive score of 4.196. It was the highest score among the 21 items. The least ideal item was A4 regional advantage, with a comprehensive score of only 3.318. It was the lowest score among all the 21 items.

6   Discussion

6.1   Overall Model

Combining literature review, interviews and questionnaires, this article explored the implicit structure of entrepreneurial environment in Dongguan. A six-factor implicit evaluation model was obtained. There were four items existing in the six-factor implicit evaluation model and the three widely known entrepreneurial models (Five-Factor model, GEM and MOS): B_3 social support, C_2 financing channels, D_2 entrepreneurial training and F_1 life support. We can conclude that the roles of people and finance in an entrepreneurial environment are generally recognized. This also reminds relevant departments to pay special attention to these four aspects in the process of building an entrepreneurial environment. There are 6 items that do not appear in these three models: A_4 regional advantages, C_1 industrial support, C_3 industrial cluster, F_2 educational support, F_3 convenient life and F_4 medical facilities. A_4 regional advantages will be discussed below. C_1 industrial supporting and C_3 industrial cluster have Dongguan characteristics. Advantages of industrial support in Dongguan are outstanding, especially in the electronic information industry. The comprehensive supporting rate and self-supporting rate of the electronic information industry exceed 90%. It is the core city of the new generation of electronic information, modern light industry textiles, software and information services, cutting-edge new materials, new energy and other industrial clusters in Guangdong Province. There are three national advanced manufacturing clusters in the city. C_1 industrial support and C_3 industrial cluster are very important for start-up enterprises, which can greatly shorten the time from conception to finished products and greatly improve production efficiency. F_2 educational facilities, F_3 convenient life and F_4 medical facilities show timeliness, which to some extent reflects the inherent needs of Dongguan citizens for returning to normal life, enjoying high quality education and medical services since the outbreak of COVID-19. On the whole, the six-factor implicit evaluation model shares similarity with the three models mentioned above in terms of factors and items, and shows regional characteristics at the same time.

6.2   Factors of the Model

The six-factor implicit evaluation model is used to compile a questionnaire to investigate feelings of Dongguan citizens about the entrepreneurial environment in the city. The results show that Dongguan citizens have the highest satisfaction with B humanistic atmosphere and the lowest satisfaction with D support network.

B Humanistic Atmosphere: the Most Satisfactory Factor.
The comprehensive score of B humanistic atmosphere dimension is 3.927, and the scores of the four items are close to a good level (4.000 points). Public data and studies by scholars can confirm its reliability on the side.

B₁ Cultural Tolerance.

In January 2007, the Dongguan Municipal Party Committee and Municipal Government established "be tolerant and pragmatic" as the city spirit. "Be tolerant" reflects Dongguan's open and inclusive attitude. The locals in Dongguan as a whole had high acceptance for new comers (migrant workers in Dongguan), and at the same time affirmed their contributions[39]. According to criteria of urban inclusiveness by Luo Tianhao, former researcher at the Center for Quality of Commercial Science and Technology of the State-owned Assets Supervisory and Administration Commission, Dongguan ranks first in the country: in 2021, Dongguan had a resident population of 10.5368 million, a registered population of 2.7861 million, and a net inflow population of 7.7507 million, accounting for 73.56% of the resident population.

B₂ Friendliness to Youth.

According to *The China Youth Entrepreneurship Development Report* (2021), Dongguan ranked 25th among the 199 cities friendly to youth entrepreneurs. Dongguan was friendly to entrepreneurial youth[32].

B₃ Social Recognition.

In 2019 (China did not participate in the survey from 2020 to 2022), the score of China's entrepreneurial culture and social norms was 6.78 (out of 10), ranking fourth among 54 countries and regions participating in the survey[18]. Both China and Dongguan have strong entrepreneurial atmosphere, and entrepreneurship is widely recognized. On September 10, 2014, Chinese Premier Li Keqiang put forward in his speech at the 8th Summer Davos Forum: "With the east wind of reform and innovation, a new wave of "mass entrepreneurship" and "grassroots entrepreneurship" will be set off all over China". Governments at all levels have successively introduced various policies to promote entrepreneurial activities and cultivate entrepreneurial atmosphere. After years of unremitting efforts, the concept of mass entrepreneurship and innovation has been deeply rooted in the hearts of Chinese people, and the entrepreneurial atmosphere has become stronger and stronger.

B₄ Respect for Talents.

Dongguan Municipal Party Committee and Municipal Government pay great attention to talents and continuously introduce various policies to attract talents to Dongguan. By 2022, Dongguan has 2.83 million talents in total and 100,000 high-level talents. In the 2021 Talent Week, Dongguan put forward the slogan of "Talents, welcome to Dongguan", aiming to reach 3.83 million talents by 2025. Supporting services and policies for talents are introduced, such as "Dongguan Talent Housing Measures (Trial)" (Dongfu [2020] No.49), "Dongguan Talent Plan Supporting Services Implementation Measures" (Dongfu Office [2021] No.54), "Dongguan Characteristic Talents Living Allowance Application Interim Rules" (Dongren Shefa [2022] No.45), etc.

D Support Network: the Least Satisfactory Factor.

The comprehensive score of D support network in Dongguan is 3.359, and scores of the three items are lower than the overall average. Compared to more than 100,000

newly registered industrial and commercial households every year, the number of designated institutions for entrepreneurial training in Dongguan is small. And the construction of entrepreneurial mentors lags behind. All these make it difficult for entrepreneurs and those who have entrepreneurial intention to obtain sufficient entrepreneurship consultation and training services, resulting in the score of D support network being lower than 3.500. By 2021, there were only 9 designated institutions for entrepreneurial training in Dongguan. From 2020 to 2022, Dongguan Science and Technology Enterprise Incubation Association identified 49 entrepreneurial mentors only. The entrepreneurial mentor club is still under preparation. China's situation in this factor is also not optimistic: 4.13 points out of 10 in education and training (social learning stage). Comparing to other factors in China, education and training (social learning stage) ranks 7th out of 11, and education and training (school learning stage) is the bottom among all (GEM, 2019). With the whole country in mind, entrepreneurial education in China has a long way to go.

7   Suggestion

7.1   IPA Result

Combining Table 2 and 3, we can draw an Importance-Performance Analysis (IPA) matrix of entrepreneurial environment in Dongguan, as shown in Figure 3. Area I (high Importance, high Satisfaction) includes seven items: 1 entrepreneurial costs, 2 economic conditions, 3 political stability, 5 cultural tolerance, 6 friendliness to youths, 8 respect to talents and 21 medical facilities. Area II (high satisfaction, low importance) includes four items: 7 social support, 9 industrial support, 16 banking services and 19 educational support. Area III (low satisfaction, low importance) includes seven items: 12 entrepreneurial consultation, 13 entrepreneurial training, 14 entrepreneurial mentors, 15 law services, 17 accounting services, 18 infrastructure and 20 life convenience. Area VI (low satisfaction, high importance) includes three items: 4 regional advantages, 10 financing channels and 11 industrial cluster. Relevant departments can refer to IPA analysis results to distinguish the sequence and directions of efforts. As it can be seen from Figure 3 that relevant departments should focus on 4 regional advantages, 10 financing channels, 11 industrial cluster.
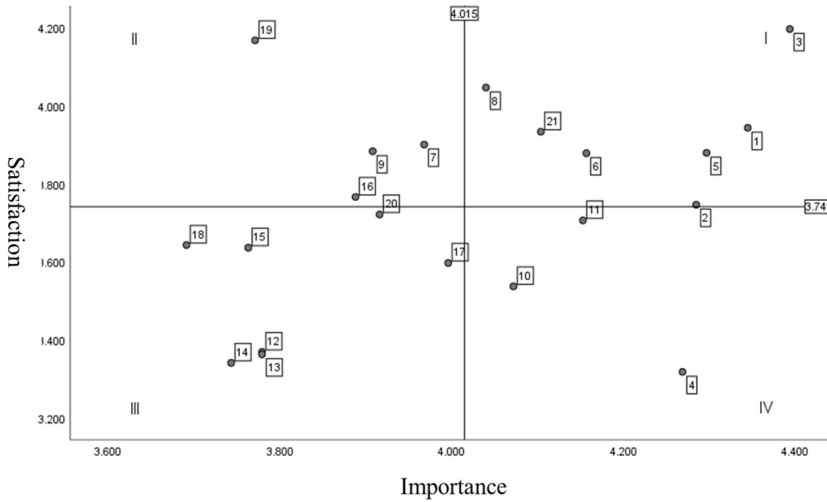
Fig. 3. IPA Analysis on Entrepreneurial Environment in Dongguan

7.2   Regional Advantage: Unique Positioning

A market environment dimension ranked 3rd among the six factors, but A4 regional advantage ranked first from the bottom of all items, with only 3.318 points. With Dongguan as the center, it covers most areas of the Greater Bay Area within 100 kilometers: Hong Kong, Macau, Shenzhen, Guangzhou, Zhuhai, Foshan, Zhongshan, Jiangmen and Huizhou, excluding Zhaoqing. The economic strengths, scientific and technological development as well as talent pool of surrounding cities, especially Shenzhen and Guangzhou, should be taken into consideration. Affected by contrast effect, Dongguan has a low score of regional advantage. The GDP of Dongguan, Shenzhen and Guangzhou in 2021 was 1,085.5; 3,066.5 and 2,823.2 billion yuan respectively. In 2020, the investment in science and technology was 34.209, 151.081 and 77.484 billion yuan respectively. In 2020, the number of permanent residents with junior college degree or above per 100,000 people was 13,241, 28,849 and 27,277 respectively. An (2020)[2] investigated the regional entrepreneurial environment of 21 central cities in Guangdong Province. The results showed that Shenzhen scored 1.74344 points, ranking first; Guangzhou 1.64867 points, ranking second; Dongguan 0.33274 points, ranking third, only 0.00228 points higher than Foshan where ranked fourth. "2022 China Urban Venture Capital Index" (cities with GDP over 500 billion yuan in 2021) showed that Dongguan, Shenzhen and Guangzhou ranked 13th, 3rd and 4th respectively in terms of venture capital capability index and 14th, 3rd and 6th in terms of venture capital active index. China Regional Innovation and Entrepreneurship Index (2021) showed that Dongguan, Shenzhen and Guangzhou rank 10th, 1st and 2nd respectively. *The China Youth Entrepreneurship Development Report (2021)* showed that Dongguan, Shenzhen and Guangzhou rank 25th, 5th and 3rd respectively[32]. Subjective indicators (satisfaction) and objective indicators (entrepreneurship, investment, policies, talents and environ-

ment) of venture capital index show that Dongguan has a good overall market environment, but there is still a gap among Dongguan, Shenzhen and Guangzhou. This is the difference of regional environment, entrepreneurial environment and comprehensive strength of cities. Dongguan needs different positioning. The author suggests that Dongguan should seize the development opportunity of the Greater Bay Area, take advantage of its own industrial advantages, find its own position, and realize cooperation rather than competition in the Greater Bay Area, so as to create a more suitable environment for entrepreneurship and attract more people who have the intentions to start businesses, especially the young.

7.3   Financing Channels: Criteria Adjusting

Financing channels and industrial cluster belong to entrepreneurial resources. Respondents with graduate degree were more satisfied with entrepreneurial resources than those with a degree below undergraduate, which might be related to their own abilities and opportunities to obtain resources. However, it is notable that Dongguan is dominated by people with a degree below undergraduate. Although the potential economic output of a single individual with graduate degree may be higher than those without, but the number of people with a degree below undergraduate is tremendously huge. From perspective of economic aggregate and social stability, it is of practical significance to meet the internal needs of this group. There are more than 100,000 new industrial and commercial households every year in the city. The majority are people with a degree below undergraduate. Therefore, it is recommended that Dongguan should adjust the criteria and terms for applying entrepreneurial funding to cover more and more people with entrepreneurial intentions. For example, to loose the guarantee system by a Dongguan citizen with registered permanent residence.

It is the consensus in entrepreneurship that there are young people, there is hope. It is also why the China Youth Entrepreneurship Development Report mentioned above has attracted much attention. However, according to the empirical study, respondents born in or after 1990 had the lowest satisfaction in the dimension of entrepreneurial resources, which was significantly different from those born in or before 1989. However, entrepreneurial subsidies and funding policies in Dongguan do not pay close attention to the young generation. Although Dongguan has a entrepreneurial subsidy policy for the young, like graduates at different levels, 73.56% (the proportion of net inflow population to resident population) is limited by household registration and other issues, the beneficiary population is not so big. The author suggests that the relevant departments should adjust terms for applying subsidies, funding and loans to a more friendly level. Meanwhile, it is urgent to launch policies addressing to the young to activate entrepreneurial activities.

7.4   Industrial Cluster: Spatial Optimizing

As it is mentioned that industrial cluster in Dongguan is quite strong. It is the core city of 6 industrial clusters in Guangdong province and has 3 national ad advanced manu-

facturing clusters. But there is still room for improvement, especially in the spatial distribution of industrial clusters. Concentrating every link in a industrial chain is recommended. At the same time, wasteful duplication should be avoided.

8   Conclusion

After years of effort, the entrepreneurial environment in Dongguan is at a relatively good level: 3.713 out of 5. The scores of B humanistic atmosphere, F life support and A market environment were higher than the average. According to IPA analysis, regional advantages, financing channels, industrial cluster should be optimized first. Although none of the items of D support network takes priority in that case, but we should keep in mind that education, consultation, training have long term effect. D_1 entrepreneurial consultation, D_2 entrepreneurial mentor and D_3 entrepreneurial training should also need to be dealt with. Relevant departments need to speed up the construction of entrepreneurial mentor clubs to meet the needs of entrepreneurs and those with intention for entrepreneurial knowledge. Due to the limited time, resources and ability, there are still some shortcomings in this article, such as the gender ratio of the interviewees is inconsistent with the latest census ratio in Dongguan. Limited by the author's ability, the coding of entrepreneurial characteristics may not be accurate enough. This article investigates the overall entrepreneurial environment in Dongguan, and in the future, it can investigate the industries, family backgrounds and towns to improve the pertinence and verify the ecological validity of the scale. At the same time, the survey scale should be further optimized to improve reliability and validity.

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