Research Article

Influencing Factors Identification and the Correlation Analysis of Business Environment in the Guangdong-Hong Kong-Macao Greater Bay

Yuli Yu,[1,2] Haitao Yao [2] and Wanhua Zhuang[1,2]

[1]*Zhuhai College of Science and Technology, Zhuhai, Guangdong 519041, China*
[2]*Business School of Macau University of Science and Technology, Macau 999078, China*

Correspondence should be addressed to Haitao Yao; 2109853wbb30001@student.must.edu.mo

The outline of the development plan issued by CPC Central Committee and the State Council for the Guangdong Hong Kong Macao Bay Area clearly pointed out that the Guangdong-Hong Kong-Macao Bay Area should be built into a vibrant world-class urban agglomeration, an international science and technology innovation center, an important support for the construction of the "the Belt and Road," and a demonstration area for in-depth cooperation between the mainland and Hong Kong and Macao; and a high-quality life circle suitable for living, working, and traveling should be created to become a model of high-quality sustainable development. In order to develop the Guangdong-Hong Kong-Macao Bay Area, it is extremely important to enhance the regional business environment. This paper focuses on five influencing factors: policy support, talent guarantee, market supervision, financial support, and cultural promotion. Based on one-way ANOVA and Cobb Douglas function, this paper makes an empirical study on the two important node cities of Zhuhai and Macao. The results show that (1) different factors have different degrees of significant impact on the regional business environment, among which the industry type has the greatest impact, and the duration of enterprise registration has the least impact; (2) when the factors act alone, there is a significant positive correlation between the evaluation dimensions, but most of the correlation degrees are not much different. Finance and talents are the weaknesses of the business environment in the two cities. (3) When the factors are combined, different factors have significant differences in different regions. Zhuhai mainly benefits from policy support, while Macao mainly benefits from market supervision. (4) Regional integration can produce significant association relationship, among which cultural promotion is an important factor. These five important factors have been effectively identified, which have played a leading role in the further design and development direction of the Guangdong-Hong Kong-Macao Bay Area in the future and have an extremely important enlightenment for the study of the business environment in this region.

1. Introduction

The construction and sustainable development of the Guangdong-Hong Kong-Macao Bay Area are an important strategic decision at the national level. In February, 2019, the CPC Central Committee and the State Council issued the outline of the development plan for the Guangdong Hong Kong Macao Bay Area, which clearly pointed out that the Guangdong-Hong Kong-Macao Bay Area should be built into a vibrant world-class urban agglomeration, an international science and technology innovation center, an

important support for the construction of the "the Belt and Road," and a demonstration area for in-depth cooperation between the mainland and Hong Kong and Macao; and a high-quality life circle suitable for living, working, and traveling should be created to become a model of high-quality sustainable development. The new strategic positioning requires the greater Bay Area cities to be equipped with a good regional business environment to provide all-round and deep support for high-quality business, from trade circulation to high-tech from cultural creativity to service industry. A good regional business environment is

conducive to the rapid and high-quality growth of enterprises and can effectively enhance the core competitiveness of the city. It is an important embodiment and foundation of the economic strength of Guangdong-Hong Kong-Macao Great Bay area. However, the business environment of cities in the Guangdong-Hong Kong-Macao Greater Bay Area is quite different. Important node cities play different roles in the development of the Greater Bay Area, and important node cities play different roles in the development of the Greater Bay area. For example, Hong Kong needs to consolidate and enhance its status as an international financial, shipping, trade center, and international aviation hub. It should promote high-end and high-growth development in finance, commerce, logistics, and professional services and build itself into a more competitive international metropolis. Guangzhou should give full play to the leading role of a national central city and a comprehensive gateway city, comprehensively enhance its functions as an international business center and a comprehensive transportation hub, cultivate and enhance its functions as a scientific, educational, and cultural center, and strive to build itself into an international metropolis. Shenzhen should give full play to the leading role of the special economic zone, the national economic center city, and the national innovation city, accelerate the construction of a modern and international city, and strive to become a city of innovation and creativity with world influence. In order to fully stimulate the economic vitality of the Guangdong-Hong Kong-Macao Greater Bay Area and continuously optimize the regional economy, it is particularly important to explore the influencing factors of the regional business environment of important node cities.

2. Literature Review

"Business environment" was first proposed by the "doing business" project of the International Finance Corporation of the world bank group. It refers to the sum of all kinds of surroundings and conditions accompanying the whole process of enterprise activities. It is a systematic project for designing economic and social reform and opening to the outside world in many fields. Since the World Bank first released the Doing Business Report in 2003, it has taken 17 years to objectively measure the business environment of 190 economies, providing objective basis, comparison, and reference for each economy to create a good business environment. However, due to the differences in the political and economic systems of countries around the world, the World Bank's measurement indicators cannot effectively match the actual situation of countries and regions [1]. In recent years, under the initiative of the central government to improve the "rule of law, internationalization, and facilitation" business environment, local governments at all levels in China have actively explored ways to optimize the business environment in line with local development realities. First, the World Bank business is used as a template to intercept some evaluation indicators in line with the current situation of local economic development. Second, with the help of the intellectual support of institutions of higher learning, scientific research institutions and other units carry out in-depth cooperation for comprehensive evaluation. Therefore, many domestic scholars have put forward different research directions on the influencing factors of business environment. Yang [2] used factor analysis to measure the business environment of Shandong, Jiangsu, Zhejiang, and Guangdong provinces from three first-level perspective of market environment, policy and government environment, and legal environment. Wu and Zhang [3] constructed 10 first-level indicators, including overall evaluation, government efficiency, administrative approval, market supervision, legal environment, credit environment, financial environment (financing environment), human resources environment, social environment, and infrastructure environment from the three dimensions of overall perception, government environment perception, and factor environment perception. Peng and Ma [4] selected four first-class indicators, that is, demand identification, service capability, service function, and service supply as evaluation dimensions. Yan [5] built a business environment satisfaction evaluation model based on five first-class indicators, including government policies, talent protection, market supervision, legal environment, and financial support. Peng et al. [6] selected 23 indicators from the four aspects of economic environment, market environment, basic environment, and supporting environment to build an evaluation index system for regional business environment.

Many scholars have done the research on business environment and satisfaction evaluation, but the application of evaluation system in Guangdong-Hong Kong-Macao Greater Bay Area is pretty new and meaningful. Based on the research results of the world bank and domestic and foreign scholars on the business environment, this paper focuses on five soft environment aspects: policy support, talent security, market supervision, financial support, and cultural promotion. The policy support includes the compliance of policy objectives, the degree of government information disclosure, and the government's response to demands. Talent security includes talent cultivation, supporting services and apartment housing. Market regulation includes regulation of code of conduct, reasonable frequency of regulation, and attention to fairness of conduct. Financial support includes the financial base, the number of financial institutions, and the fit of financial services. Cultural promotion includes the atmosphere of innovation and vitality, the level of opening to the outside world, cultural industries, or cultural brands.

3. Research Methodology

3.1. Basic Information about Sample Data. The outline of the Guangdong-Hong Kong-Macao Great Bay Area Planning clearly points out that it is necessary to "give play to the leading role of the strong alliance between Hong Kong and Shenzhen, Guangzhou and Foshan, and Macao and Zhuhai" and give Hong Kong and Shenzhen, Guangzhou and Foshan, and Macao and Zhuhai very high political standards. However, in reality, the weight of this pole is obviously insufficient, and the degree of economic connectivity and integration is far less than the other two poles. In order to solve this objective

contradiction in theory, based on the research foundation of the 2020 Guangdong Province innovation and strengthening school project (Research on the path of Zhuhai Macao coordinated optimization of business environment), this paper analyzes the influencing factors based on the statistical data of the regional business environment of Australia Zhuhai one pole. The specific results are shown in Table 1.

It can be seen from Table 1 that the data source comes from the middle-level and above employees of enterprises registered in Zhuhai or Macao. The degree of business integration between the two cities is low, and only 22.6% of enterprises have business intersection. The proportion of private enterprises and small- and medium-sized enterprises is large, indicating that the two cities have strong market activity. As a transportation hub city, the proportion of Commerce and trade circulation industry (such as wholesale, retail, transportation, warehousing, leasing, and business services) is relatively high, up to 28.2%. In addition, the scale of new enterprises in the two cities is not very prominent, there are few mature enterprises, and growth enterprises account for a large proportion.

3.2. Sample Data Reliability and Validity Tests.
Due to the research on the source of statistical data, reliability and validity tests were carried out on the sample data in order to objectively test the sample data to truly reflect the degree of variables and ensure that scientifically refined measurement dimensions further fit the reality and maintain the stability of the test. The results are shown in Table 2, in which the KMO values are greater than 0.7, and the significance level of Bartlett sphere test is less than 0.05, which meets the validation criteria and has good validity. The commonly used alpha reliability coefficient method is adopted in the study, and each reliability value is greater than 0.8, which shows that the scale has high reliability and can meet the research requirements.

3.3. Research Methods.
The logical analysis of the objective data of the regional business environment assessment system has been highly respected, but the research based on the perception of market players is not good. Under the socialist market economic system, the market is the distributor of social resources. Considering the regional business environment, enterprise satisfaction should be an important part of the evaluation system. In order to measure the perception of market participants, this paper uses the customer satisfaction studied by American scholar Cardozo for reference and introduces enterprise satisfaction as the dependent variable, which is defined as the measurement of the gap between the actual feeling and expectation of market participants on the regional business environment. And this paper considers whether the regional business environment will continue to improve. In this paper, one-way ANOVA and Cobb Douglas function are used as research methods.

3.3.1. One-Way Analysis of Variance.
When other factors are fixed and unchanged, the one-way variance only considers whether there is a significant difference in the mean value of dependent variables at different levels of a single factor and set in the test of the equality of K overall mean values:

$H_0: \mu_1 = \mu_2 = \cdots = \mu_k H_\alpha$: the means of k populations are not all equal.

The rejection rule is P-valued method: if so $P\text{-}\leq\alpha$, reject H_0.

Using one-way ANOVA, we aim to explore the ratio of the systematic deviation of a control factor to six measurement dimensions and the randomness deviation that cannot be explained by this factor and then derive the characteristics of whether there is a significant difference.

3.3.2. Cobb-Douglas Function.
In order to objectively calculate the degree of influence of five measurement dimensions on the regional business environment, this paper constructs a regional business environment influencing factor model based on the transformation of the Cobb-Douglas function of the new economic growth theory. For the convenience of research, it is referred to as business environment (DB), policy support (PS), talent security (TG), market supervision (MS), financial support (FS), and cultural promotion (CS).

$DB = \mu PS^\alpha TG^\beta MS^\varepsilon FS^\theta CS^\lambda$. To eliminate the effects of heteroscedasticity, a logarithm can be obtained on both sides of the above equation:

$$
\begin{aligned}
Ln(DB) = {} & \ln(\mu) + \alpha \ln(PS) + \beta \ln(TG) + \varepsilon\ln(MS) \\
& + \theta\ln(FS) + \lambda\ln(CS).
\end{aligned} \tag{1}
$$

Among them, μ is the on-standardized coefficients $\alpha, \beta, \varepsilon, \theta, \lambda$ are the flexibility coefficients of policy support, talent security, market supervision, financial support, and cultural promotion.

4. Result

4.1. One-Factor ANOVA Analysis of Personal Position, Registered City of Enterprise, and Business Transactions.
As shown in Table 3, in addition to cultural promotion, individual positions have significant differences in evaluation for the remaining five dimensions. Among them, the legal representative has the highest evaluation in several dimensions, followed by senior managers and the lowest middle managers. The legal representative and the senior managers have a more macro environment, and the difference between the two is also small. The middle managers have a weaker feeling about the 5 dimensions due to the limitations of the position. The strong commonality of cultural promotion has resulted in no significant differences found in different functions. The registered enterprises in the two cities have significant differences in the five evaluation dimensions, among which the perception of policy support and talent protection of registered enterprises in Zhuhai is higher, while the perception of registered enterprises in Macao in terms of market supervision, cultural promotion, and financial support is higher. Regarding balanced comprehensive factors, there is no significant difference in the

TABLE 1: Descriptive statistical analysis.

	Frequency	Proportion (%)
Position		
Middle managers	191	48.6
Top management	148	37.7
Legal representative	54	13.7
The city where the business is registered		
Zhuhai	225	57.3
Macau	168	42.7
The intersection of business in the two cities		
Yes	89	22.6
No	304	77.4
Nature of the company		
State-owned (including state-controlled) enterprises	16	4.1
Collective (including collective holding) enterprises	20	5.1
Company Limited by Shares	111	28.2
Limited liability company	151	38.4
Individual private enterprises	58	14.8
Hong Kong, Macao and Taiwan investment enterprises	19	4.8
Foreign-invested enterprises	13	3.3
other	5	1.3
Enterprise size		
Big business	58	14.8
Medium-sized businesses	121	30.8
Small business	125	31.8
Microenterprise	89	22.6
The industry of the company		
Agriculture, forestry, animal husbandry, fisheries	13	3.3
Manufacture	36	9.2
Construction	29	7.4
Wholesale trade	25	6.4
Retail	32	8.1
Transportation	22	5.6
Warehousing	14	3.6
Postal industry	10	2.5
Accommodation industry	20	5.1
Catering industry	36	9.2
Information transmission industry	20	5.1
Software and information technology services	27	6.9
Real estate development and operation	29	7.4
Realty management	15	3.8
Leasing and business services	18	4.6
Other unspecified industries	47	12.0
The length of time the company is registered		
Within 1 year (inclusive)	46	11.7
1–3 (inclusive) years	114	29
3–5 years	108	27.5
5–10 years	87	22.1
More than 10 years	38	9.7

TABLE 2: Sample reliability validity test.

	Approximate chi-square	degree of freedom	Significance	KMO	Clone Bach's alpha	The number of items
Government support	708.877	3	0.000	0.749	0.896	3
Talent guarantee	579.813	3	0.000	0.73	0.868	3
Market regulation	587.567	3	0.000	0.713	0.865	3
Financial support	530.979	3	0.000	0.728	0.856	3
Cultural promotion	688.103	3	0.000	0.75	0.893	3
Business environment	412.923	3	0.000	0.711	0.818	3

TABLE 3: One-factor ANOVA table for individual positions, registered cities, and business dealings.

Category	Specific projects	Policy support	Talent guarantee	Market regulation	Financial support	Cultural promotion	Business environment
Personal position (evaluation mean)	Middle managers	9.9424	9.4660	10.0785	9.1414	9.8010	9.8901
	Top management	10.3514	9.0000	10.3514	9.2635	10.0203	10.0676
	Legal representative	11.2963	10.8889	11.5000	9.6667	11.2963	11.5741
	Total	10.2824	9.4860	10.3766	9.2595	10.0891	10.1883
Significance		0.000	0.000	0.000	0.000	0.147	0.000
City of incorporation (evaluation mean)	Zhuhai	10.4756	9.8578	10.2267	9.0489	9.9067	10.2444
	Macau	10.0238	8.9881	10.5774	9.5417	10.3333	10.1131
	Total	10.2824	9.4860	10.3766	9.2595	10.0891	10.1883
Significance		0.013	0.000	0.034	0.005	0.018	0.351
There are business contacts between Zhuhai and Macao (evaluation mean)	Yes	11.2584	9.7865	11.2247	9.3034	10.2697	10.7079
	No	9.9967	9.3980	10.1283	9.2467	10.0362	10.0362
	Total	10.2824	9.4860	10.3766	9.2595	10.0891	10.1883
Significance		0.000	0.089	0.000	0.787	0.273	0.000

perception of the business environment of registered enterprises in the two cities, which shows that there is complementarity between the influencing factors of the business environment, and each has different urban advantages. There are significant differences in the business environment of business intersection concentration, and the specific performance of policy support and market supervision is the biggest difference between the business environment of Zhuhai and Macao. Enterprises with business dealings can feel different policy environments and market environments, and their average evaluation is significantly higher than that of a single city.

4.2. One-Way ANOVA of Industry Types. Table 4 shows that the degree of difference in the business environment of different types of enterprises is very prominent. Among the policy support, transportation, retail, leasing and business, and other commercial circulation industries have higher average evaluation values. The two governments allowed them to give full play to their location and geographical advantages and carry out many effective measures to promote the development of circulation formats. In addition, high-tech industries such as software and information technology service industries in Zhuhai and Macao are embracing new development opportunities. At the same time, the industrial structure of the two cities has shifted to the tertiary industry, the proportion of the primary industry is extremely low, and the average evaluation of the primary and secondary industries ranks last. In the talent guarantee, the government has given greater efforts to emerging industries such as software and information technology service industries, and emerging industries has achieved good results. In contrast, industries such as industry, agriculture, and postal and express delivery industry are difficult to attract higher-level talents due to the low entry threshold, and the talent guarantee is at a relatively backward level. In market supervision, in addition to high-tech and other key industries, in the catering and accommodation industry,

because it involves the vital interests of the people, the regulatory behavior and frequency are more scientific and reasonable, and the average evaluation is higher. Among the financial support, leasing and business services have a relatively close relationship with finance, and the average evaluation value is higher. Due to the relatively weak financial foundation of Zhuhai and Macao, the evaluation of other industries is not prominent. In the promotion of culture, the two cities are both tourist cities, and catering, accommodation, and other export-oriented economy attract the strongest feelings of foreign floating populations, reaching more than 11.1, and software and information technology service industry and other key industries are also the focus of culture attraction of the two cities. In general, the average business environment evaluation of the catering and accommodation industry, which is mainly affected by tourists, and the key supported commercial circulation and high-tech industries is significantly different from that of other industries, and the average price of the primary and secondary industries is the lowest.

4.3. One-Factor ANOVA Analysis of the Nature of the Enterprise, Size of the Enterprise, and Length of Enterprise Registration. In the nature of enterprises, except for talent security and financial support, the other evaluation dimensions are significantly different (see Table 5). The developed private economy of the two cities is mainly expressed in the form of limited liability companies and individual private enterprises, and the policy inclination is relatively large. The investment enterprises in Hong Kong, Macao, and Taiwan are emerging in an endless stream, and the governments of the two places have paid close attention to them. Comparatively speaking, the two cities pay more attention to competition guarantees and give the private economy and other different types of enterprises an "open, just, and fair" market environment. The average market supervision evaluation of the private economy and other different types of enterprises is higher. In the promotion of

TABLE 4: One-Way ANOVA table for industry types.

Category	Specific projects	Policy support	Talent guarantee	Market regulation	Financial support	Cultural promotion	Business environment
Industry type (evaluation mean)	Agriculture, forestry, animal husbandry, fisheries	8.7692	7.3846	8.9231	8.5385	8.6154	8.8462
	Manufacture	8.7500	8.6667	9.3056	7.7222	8.8611	8.8056
	Construction	10.3448	9.3448	10.2414	9.2414	9.6552	10.2069
	Wholesale trade	10.1200	9.1600	9.9600	9.4400	9.7600	9.8400
	Retail	10.3438	10.0625	10.6875	9.0625	10.1563	10.4063
	Transportation	11.8636	9.0455	10.7727	9.5455	10.4545	10.4545
	Warehousing	10.2143	9.1429	10.4286	9.0714	10.2857	10.1429
	Postal industry	9.2000	8.5000	10.1000	9.4000	10.0000	9.9000
	Accommodation industry	10.6500	8.6000	10.8000	9.8500	11.1000	10.7500
	Catering industry	10.3889	10.3056	10.6667	9.6944	11.1111	10.7222
	Information transmission industry	10.5500	9.6000	10.6000	9.9000	10.3500	10.2500
	Software and information technology services	11.1852	11.0741	10.7407	9.3333	10.8148	10.8148
	Real estate development and operation	10.5172	9.8966	10.6897	9.0345	10.0000	10.4828
	Realty management	10.4000	8.7333	10.1333	9.2667	10.2667	10.0667
	Leasing and business services	10.3889	9.5556	10.5556	10.6111	9.8889	10.1111
	Other unspecified industries	10.2979	9.8298	10.6596	9.2979	9.9574	10.4468
	Total	10.2824	9.4860	10.3766	9.2595	10.0891	10.1883
Significance		0.000	0.000	0.001	0.000	0.000	0.000

culture, the private economy and other different types of enterprises are more in line with market demand, more likely to be affected by cultural appeal, and the average evaluation is higher. Overall, the business environment of the two cities is more friendly to the private economy and has a higher evaluation. At the same time, the proportion of the state-owned economy and the collective economy is low, and the perception and evaluation of policies, markets, and cultures are at a low level. From the scale of enterprises in Table 5, it can be seen that, in addition to financial support and cultural promotion, there are significant differences in policy support, talent protection, market supervision, and business environment. The average policy evaluation of small and micro enterprises is high, which is in line with the policy orientation of the two cities. The number of large enterprises is small, and the government also pays special attention. In recent years, the two cities of Zhuhai and Macao have vigorously introduced foreign populations and do a good job in supporting talents. The cultivation of talents and housing guarantee of large enterprises have been effectively alleviated. The talent requirements of small and micro enterprises are not high, which coincides with the demographic characteristics of strong mobility. At a result, the average talent evaluation of large and small and micro enterprises is higher than that of medium-sized enterprises. In market supervision, small and micro enterprises are mostly emerging industries. The market environment in Zhuhai and Macao is more tolerant, and the average evaluation of small and micro enterprises is also higher than that of large and medium-sized enterprises. In general, the business environment of Zhuhai and Macao cities pays more attention to small and micro enterprises, and the average evaluation value is higher. Due to industrial supporting facilities and industrial cluster effects, the perception and evaluation of large and medium-sized enterprises need to be improved. In the duration of registration, there were no significant differences in other evaluation factors except for cultural promotion and business environment. Factors such as cultural atmosphere, openness level, and cultural industry support require time to experience. The longer the enterprise exists, the stronger the perception of culture will be, and the higher the average evaluation of cultural role will be.

5. Analysis and Discussion on Different Influencing Factors on Regional Business Environment

As can be seen from the above, there is a significant influence relationship between the five influencing factors and the business environment, showing different role status between different categories. However, how correlated are any two influencing factors? It is a problem that must be faced squarely to explore the internal logical relationship between influencing factors. Further, it is necessary to explore the common role between the five influencing factors and the business environment, and to find out the role of different factors on the business environment. Based on this, the following is an analysis of the interaction between individual factors and the interaction of combined factors.

5.1. Degree of Individual Action. Table 6 analyzes the correlation of the overall data of Zhuhai and Macao, and it can be obtained that (1) there is a significant positive correlation between the six evaluation dimensions, of which the

TABLE 5: One-factor ANOVA table of the nature of the enterprise, the size of the enterprise, and the duration of the enterprise registration.

Category	Specific projects	Policy support	Talent guarantee	Market regulation	Financial support	Cultural promotion	Business environment
Nature of the enterprise (evaluation mean)	State-owned (including state-controlled) enterprises	9.1875	9.0000	9.3750	8.5000	8.9375	9.0625
	Collective (including collective holding) enterprises	8.5500	8.8500	9.1500	8.7500	9.3000	9.1000
	Corporation	10.0360	9.2252	9.9820	9.0090	9.7568	9.7477
	Limited liability company	10.7947	9.7748	10.8344	9.5762	10.4503	10.6887
	Individual private enterprises	10.2931	9.6552	10.7069	9.3448	10.3966	10.5517
	Hong Kong, Macao and Taiwan investment enterprises	10.4737	9.0000	10.2632	9.0526	9.8947	10.0000
	Foreign-invested enterprises	10.0000	9.7692	10.0769	9.4615	9.9231	9.9231
	Other	10.6000	9.8000	10.8000	9.0000	11.0000	10.0000
	Total	10.2824	9.4860	10.3766	9.2595	10.0891	10.1883
Significance		0.000	0.136	0.000	0.077	0.001	0.000
Enterprise size (average evaluation)	Big businesses	10.2241	9.5000	10.0862	9.4138	9.9655	9.9483
	Medium-sized businesses	9.9339	9.0248	10.0744	8.9339	9.8430	9.8099
	Small business	10.4000	9.6800	10.5920	9.4560	10.1920	10.4560
	Microenterprise	10.6292	9.8315	10.6742	9.3258	10.3596	10.4831
	Total	10.2824	9.4860	10.3766	9.2595	10.0891	10.1883
Significance		0.036	0.009	0.010	0.093	0.161	0.000
Business registration time (average evaluation)	Within 1 year (inclusive)	9.9348	9.6087	10.2174	9.6087	9.8043	10.0217
	1–3 (inclusive) years	10.1930	9.2281	10.1667	9.0702	9.7632	9.9912
	3–5 (inclusive) years	10.4907	9.4444	10.2778	8.9815	9.6759	10.0278
	5–10 (inclusive) years	10.2759	9.4598	10.7586	9.5517	10.6322	10.5977
	More than 10 years	10.3947	10.2895	10.6053	9.5263	11.3421	10.5000
	Total	10.2824	9.4860	10.3766	9.2595	10.0891	10.1883
Significance		0.459	0.056	0.080	0.053	0.000	0.007

optimization effect of building a soft environment and enhancing cultural strength on the business environment is becoming prominent. The business environment is affected by market supervision, policy support, and cultural promotion, and the correlation coefficient is above 0.6. The policies of Zhuhai and Macao are highly transparent, highly in line with market demand. Market supervision is relatively strong and pays attention to norms, and the cultural commonality of "openness and inclusiveness" plays a role in the penetration and aggregation of soft power, which is significantly improving the level of business environment. (2) Due to the current situation of financial foundation and the current situation of talents, it is difficult to give full play to the effectiveness of policies in the short term. The correlation coefficient between policy support and financial support and talent security is about 0.3, and the financial foundation of the two cities is relatively weak. The economic volume cannot support a more developed financial scale, and the policy dividend is difficult to see immediately in the short term. At the same time, the population size of the two cities has long been at the end of the Guangdong-Hong Kong-Macao Greater Bay Area urban agglomeration, the talent base is inherently insufficient, the attractiveness and advantages of talents are not obvious, and the high housing prices in the two cities are also an important loss of talent security.

Further, Table 7 compares the correlation between the variables of the two cities, and the following can be obtained: (1) there is a significant positive correlation between the six evaluation dimensions of the two cities of Zhuhai and Macao. The data show that the correlation degree of most of the evaluation dimensions is not much different. (2) In addition to market supervision, Zhuhai's degree of correlation between policy support and other dimensions is higher than that of Macao, especially the degree of correlation between policy support and talent protection, which shows that the Zhuhai government's policy effect in talent protection is stronger, and the implementation of the "Talent Plan" effectively attracts, trains, and serves all kinds of high-level and high-skilled talents. Macao's long-term talent supply is insufficient, and talent protection lacks a spatial foundation. (3) In addition to policy support, Macao's degree of correlation between market supervision and other dimensions is higher than that of Zhuhai, which reflects that Macao's industrial supervision, corporate credit, safety production, and other regulatory behaviors are more standardized, and more attention is paid to the frequency and level of supervision. Zhuhai's market supervision is dominated by traditional means, and the supervision method of "strong government and weak society" limits the level of supervision to a certain extent.

TABLE 6: Correlation analysis of the overall variables.

		Policy support	Talent guarantee	Market regulation	Financial support	Cultural promotion	Business environment
Policy support	Pearson correlation Significance (bilateral)	1					
Talent guarantee	Pearson correlation Significance (bilateral)	0.325** 0.000	1				
Market regulation	Pearson correlation Significance (bilateral)	0.516** 0.000	0.402** 0.000	1			
Financial support	Pearson correlation Significance (bilateral)	0.386** 0.000	0.228** 0.000	0.481** 0.000	1		
Cultural promotion	Pearson correlation Significance (bilateral)	0.426** 0.000	0.344** 0.000	0.537** 0.000	0.487** 0.000	1	
Business environment	Pearson correlation Significance (bilateral)	0.644** 0.000	0.518** 0.000	0.677** 0.000	0.495** 0.000	0.662** 0.000	1

TABLE 7: The correlation analysis between variables was conducted in Zhuhai and Macao.

		City	Policy support	Talent guarantee	Market regulation	Financial support	Cultural promotion	Business environment
Policy support	Pearson correlation Significance (bilateral)	Zhuhai Macau Zhuhai Macau	1 1					
Talent guarantee	Pearson correlation Significance (bilateral)	Zhuhai Macau Zhuhai Macau	0.466** 0.292** 0.000 0.000	1 1				
Market regulation	Pearson correlation Significance (bilateral)	Zhuhai Macau Zhuhai Macau	0.478** 0.565** 0.000 0.000	0.478** 0.490** 0.000 0.000	1 1			
Financial support	Pearson correlation Significance (bilateral)	Zhuhai Macau Zhuhai Macau	0.438** 0.317** 0.000 0.000	0.383** 0.384** 0.000 0.000	0.455** 0.505** 0.000 0.000	1 1		
Cultural promotion	Pearson correlation Significance (bilateral)	Zhuhai Macau Zhuhai Macau	0.494** 0.331** 0.000 0.000	0.488** 0.395** 0.000 0.000	0.516** 0.556** 0.000 0.000	0.421** 0.538** 0.000 0.000	1 1	
Business environment	Pearson correlation Significance (bilateral)	Zhuhai Macau Zhuhai Macau	0.682** 0.601** 0.000 0.000	0.617** 0.500** 0.000 0.000	0.637** 0.747** 0.000 0.000	0.455** 0.599** 0.000 0.000	0.677** 0.663** 0.000 0.000	1 1

注: N(Zhuhai) = 225, N(Macau) = 168, ** indicates the significant correlation at level .01 (bilateral).

TABLE 8: Regression estimation of the Cobb-Douglas function model is carried out in the two cities.

City	Model		Nonstandardized coefficients		t	Significance	Tolerance	Coefficient of variance expansion	R^2	Durbin Watson
			Regression coefficients	Standard error						
Zhuhai	1	(Constant)	4.667	0.402	11.597	0.000	1	1	0.465	2.058
		Policy support	0.543	0.039	13.933	0.000				
	2	(Constant)	3.03	0.383	7.914	0.000				
		Policy support	0.366	0.038	9.638	0.000	0.756	1.324	0.618	
		Cultural promotion	0.349	0.037	9.413	0.000	0.756	1.324		
	3	(Constant)	2.147	0.387	5.54	0.000				
		Policy support	0.301	0.037	8.102	0.000	0.688	1.455	0.669	
		Cultural promotion	0.269	0.037	7.251	0.000	0.654	1.528		
		Market regulation	0.228	0.039	5.861	0.000	0.668	1.497		
	4	(Constant)	1.555	0.392	3.966	0.000				
		Policy support	0.263	0.036	7.204	0.000	0.652	1.533	0.699	
		Cultural promotion	0.228	0.037	6.217	0.000	0.615	1.625		
		Market regulation	0.186	0.038	4.869	0.000	0.631	1.584		
		Talent guarantee	0.179	0.039	4.638	0.000	0.657	1.522		
Macau	1	(Constant)	3.061	0.497	6.164	0.000	1	1	0.558	1.896
		Market regulation	0.674	0.047	14.482	0.000				
	2	(Constant)	1.939	0.478	4.055	0.000				
		Market regulation	0.495	0.05	9.852	0.000	0.691	1.446	0.647	
		Cultural promotion	0.29	0.045	6.443	0.000	0.691	1.446		
	3	(Constant)	1.36	0.465	2.926	0.004				
		Market regulation	0.369	0.054	6.831	0.000	0.528	1.894	0.691	
		Cultural promotion	0.285	0.042	6.74	0.000	0.691	1.447		
		Policy support	0.188	0.039	4.804	0.000	0.68	1.471		
	4	(Constant)	0.963	0.461	2.088	0.038				
		Market regulation	0.321	0.054	5.981	0.000	0.497	2.013	0.714	
		Cultural promotion	0.228	0.044	5.22	0.000	0.603	1.659		
		Policy support	0.183	0.038	4.837	0.000	0.679	1.473		
		Financial support	0.158	0.043	3.661	0.000	0.648	1.542		

Table 9: The two cities work together on regression estimation of the Cobb-Douglas function model.

Model		Nonstandardized coefficients		t	Significance	Collinear statistics		R^2	Durbin Watson
		Regression system	Standard error			Tolerance	Coefficient of variance expansion		
1	(Constant)	4.217	0.332	12.711	0.000			0.459	
	Market regulation	0.575	0.032	18.214	0.000	1.000	1.000		
2	(Constant)	2.896	0.316	9.172	0.000			0.584	
	Market regulation	0.384	0.033	11.681	0.000	0.711	1.405		
	Cultural promotion	0.328	0.030	10.837	0.000	0.711	1.405		
3	(Constant)	2.000	0.301	6.640	0.000			0.661	
	Market regulation	0.271	0.032	8.443	0.000	0.611	1.637		
	Cultural promotion	0.274	0.028	9.789	0.000	0.681	1.468		1.999
	Policy support	0.254	0.027	9.352	0.000	0.702	1.424		
4	(Constant)	1.510	0.297	5.087	0.000			0.693	
	Market regulation	0.228	0.031	7.284	0.000	0.583	1.717		
	Cultural promotion	0.250	0.027	9.283	0.000	0.668	1.497		
	Policy support	0.234	0.026	8.978	0.000	0.692	1.445		
	Talent guarantee	0.146	0.023	6.409	0.000	0.804	1.244		
5	(Constant)	1.386	0.302	4.592	0.000			0.696	
	Market regulation	0.213	0.032	6.631	0.000	0.550	1.817		
	Cultural promotion	0.234	0.028	8.363	0.000	0.614	1.628		
	Policy support	0.227	0.026	8.672	0.000	0.680	1.470		
	Talent guarantee	0.147	0.023	6.482	0.000	0.803	1.245		
	Financial support	0.055	0.027	2.036	0.042	0.683	1.463		

5.2. Degree of Joint Action. Table 8 uses the Wald stepwise regression method to test the coefficients of the Cobb-Douglas function model and estimate the regression in two cities. The Durbin-Watson coefficient is at (1, 3), the tolerance >0.1, the variance expansion coefficient is <10, the basic default random error term does not have autocorrelation, and the regression analysis does not exist in multi-collinearity. The measurement shows that the index selection is scientific, reasonable, and suitable for multiple regression analysis.

The goodness of fit of the Zhuhai model was 0.699, and the F-value was 127.569, indicating that the linear correlation was significant. In the model, "financial support" was not significantly correlated with the business environment when it was correlated with other variables. It was not detected in the model, and the other factors were 0.000 in the regression. Based on this, the multiple regression model of Zhuhai is derived:

$$Ln(DB) = 1.555 + 0.263 \ln(PS) + 0.179 \ln(TG) + 0.86 \ln(MS) + 0.228 \ln(CS). \tag{2}$$

Convert it to the Cobb-*Douglas* function as $DB = 4.735 PS^{0.263} TG^{0.179} MS^{0.186} CS^{0.228}$

Similarly, "talent guarantee" did *not* enter the Macao model test, and the Cobb-Douglas function of the Macau model was $DB = 2.62 PS^{0.183} MS^{0.321} FS^{0.158} CS^{0.228}$

Further, Table 9 performs the Coefficient Test and Regression Estimation of the Cobb-Douglas function model for common data of Zhuhai and Macao, and the Cobb-Douglas function of Zhuhai and Macao can be obtained as follows:

$$DB = 4 PS^{0.227} TG^{0.147} MS^{0.231} FS^{0.055} CS^{0.234}. \tag{3}$$

From the above three Cobb-Douglas functions, it can be compared that (1) the financial support has not been combined with other factors to affect the business environment in Zhuhai. This further reflects the uneven and insufficient situation of Zhuhai's overall financial industry, and the problem of incongruity with the development of the real economy is more prominent. When the other four factors jointly act on Zhuhai's business environment, the flexibility coefficient of policy support is the highest, and the rest are cultural promotion, market supervision, and talent protection. (2) The failure of talent security to have a joint effect with other factors affecting Macao's business environment is related to Macao's talent dilemma, the shortage of population supply, and the single skill structure, and the introduction of mainland talents has been in a "contradictory" situation for a long time. When the other four factors are combined to act on Macao's business environment, the elasticity coefficient of market supervision is the highest, and the rest are cultural promotion, policy support, and financial support. (3) When the five factors jointly act on the business environment of Zhuhai and Macao, they can produce significant correlations, and the elasticity coefficient of Chinese promotion is the highest, and the rest are policy support, market supervision, talent security, and financial support.

6. Conclusions and Recommendations

In order to explore the influencing factors of the regional business environment, this paper focuses on the five aspects of policy support, talent security, market supervision, financial support, and cultural promotion, and it takes Zhuhai and Macao registered enterprises for empirical analysis. The following conclusions are drawn: first, five factors in different categories have different degrees of significant impact on the regional business environment, among which the industry type has the greatest impact (both significant). In addition to cultural promotion, personal position also has a significant impact. The registered city of enterprises does not significantly affect the business environment, but it has the complementary effect of influencing factors overall. The significant impact of business exchanges between Zhuhai and Macao on the business environment is reflected in the policy support and market supervision. The nature and scale of the enterprise are not significantly affected by some factors. Apart from cultural promotion, the duration of registration does not significantly affect the business environment. Second, there is a significant positive correlation between the six evaluation dimensions of Zhuhai and Macao. There is no significant difference in the correlation degree of most evaluation dimensions. However, the correlation degree of policy support and other dimensions in Zhuhai is higher than that of Macao, and the correlation degree of market regulation and other dimensions in Macao is higher than that of Zhuhai. In the joint effect, financial support failed to have a joint effect with other factors to affect the business environment in Zhuhai, and talent security failed to combine with other factors to affect the business environment in Macao. Thirdly, the five factors have a significant impact on the regional circulation business environment of Zhuhai and Macao, among which the biggest impact of Zhuhai is policy support (the largest elasticity coefficient), the smallest impact is financial support (no significant correlation), the largest impact of Macao is market supervision (the largest elasticity coefficient), and the smallest impact is talent security (no significant correlation). The integration of Zhuhai and Macao can produce a significant correlation. The greatest impact is cultural promotion (the largest elasticity coefficient), and the smallest impact is financial support (the smallest elasticity coefficient).

Based on this, this paper puts forward the following suggestions: (1) according to the industrial characteristics

and enterprise types of the important node cities in Guangdong, Hong Kong, and Macao, this paper proposes political measures for different factors affecting the region's business environment, especially paying attention to the specific needs of different industry types, and comprehensively optimizes the regional business environment from the perspectives of policy, talent, market, finance, and culture to ensure the sustainable and high-quality development of the Greater Bay Area. (2) Objectively evaluate and introduce the element resource differences of important node cities in Guangdong-Hong-Kong and Macao Great Bay Area, build a fusion platform for regional business environment through multiparty cooperation, launch a "one-to-one," "one to many," or even "many to many" communication and coordination mechanism, and implement a new path of binding development of regional economy. (3) Seek the complementary effect of resources between the important node cities in Guangdong-Hong-Kong and Macao Great Bay Area, build a multiagent policy cooperation operation mechanism, enrich the new connotation of talent attraction and cultivation among cities, promote the construction of joint guarantee market mechanism, carry out a new model of multinode financial coordinated development, and work together to enhance the cultural soft power of the important node cities in Guangdong-Hong Kong-Macao Bay area, so as to achieve the sustainable and high-quality development of Guangdong-Hong Kong-Macao Bay area.

The research was made based on two cities, Zhuhai and Macao, and we hope to have more data on more cities in Guangdong-Hong Kong-Macao Bay area to make the analysis more accurate and adaptable [7–11].

Data Availability

Data could be accessed by request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

References

[1] J. Yoon and S. Joung, "Environmental self-identity and purchasing ecofriendly products," *Journal of Logistics, Informatics and Service Science*, vol. 8, no. 1, pp. 82–99, 2021.

[2] T. Yang, "Research on the construction of business environment assessment index system -- Based on the comparative analysis of Shandong, Jiangsu, Zhejiang and Guangdong," *Business economics research*, vol. 13, pp. 110–112, 2015.

[3] L. Wu and G. Zhang, "Construction of business environment assessment framework based on subjective perception of market subjects -- Comments on the business environment assessment model of the world bank," *Contemporary Economic Management*, vol. 40, no. 6, pp. 91–95, 2018.

[4] X. Peng and R. Ma, *Optimization of government business environment and construction of its evaluation index system*, vol. 11, pp. 96–99, Academic research, Shanghai, 2018.

[5] Z. Yan, *Study on Satisfaction and Influencing Factors of Business Environment in Districts and Counties -- Based on the Practice of Xiangshan County*, pp. 17–30, Dissertation of Zhejiang University, Ningbo, 2019.

[6] D. Peng, Bo Chen, and Z. Liu, "Construction and application of regional business environment assessment index system -- Taking the Yangtze River economic belt as an example," *Finance and Economics*, vol. 05, pp. 35–45, 2019.

[7] H. Rachidi and M. El Mohajir, "Improving SMEs' performance using innovative knowledge and financial system designed from the Moroccan business environment," *African Journal of Science, Technology, Innovation and Development*, vol. 13, no. 1, pp. 15–30, 2021.

[8] K. Li, "Speech at the National Teleconference on Deepening the Reform of "deregulation, Management and Service" and Optimizing the Business Environment," *People's daily*, pp. 09–30, 2020.

[9] R. E. Rasi and D. Hatami, "Environmental risk and innovation in supply chain: analysis of influence of supply chain agility," *Journal of System and Management Sciences*, vol. 9, no. 3, pp. 1–25, 2019.

[10] Q. Sun and H. Chen, "Determinants, impact effects and evaluation indexes of China's regional business environment -- A study based on mimic model," *Financial Research*, vol. 6, pp. 22–37, 2020.

[11] J. Wang, Z. Li, and X. Sun, "Empirical analysis on the influence of business environment on foreign direct investment inflow based on the panel data on 26 countries," *International Journal of Sustainable Development and Planning*, vol. 15, no. 8, pp. 1223–1230, 2020.