



Construction and Application of the Urban Business Environment Evaluation Index System: A Case Study of Qingdao

Man Li*

Léman Manhattan Preparatory School, New York,10004,America

**Corresponding author. Email:2957963948@qq.com*

Abstract.The urban business environment refers to the sum of various external environmental factors faced by market entities in their production, operation, innovation, and entrepreneurship. This paper constructs an evaluation index system for the urban business environment from the perspectives of government entities, market entities, individuals, and social entities. Based on panel data from Qingdao, Beijing, Shanghai, Chongqing, and Tianjin from 2010 to 2022, quantitative analysis is conducted using the entropy method. The study finds that Qingdao has made significant progress in areas such as healthcare, employment, innovation resources, legal governance, and fiscal transparency. However, there are still gaps compared to top-tier cities like Beijing and Shanghai in terms of cultural environment, administrative efficiency, clean industries, human resources, inclusive finance, and public infrastructure. It is suggested that through multi-party collaboration and concentrated efforts, a top-level design should be provided to optimize the business environment.

Keywords: Qingdao, business environment, evaluation index system, entropy method

1 Introduction

As an important economic center on China's eastern coast, Qingdao has actively optimized its business environment in recent years, driving high-quality development. In 2022, the State Council issued the "Regulations on Optimizing the Business Environment," and Qingdao subsequently launched its "Implementation Plan," focusing on streamlining administrative approvals, strengthening intellectual property protection, enhancing business services, and promoting government digitalization. These efforts have created a favorable investment environment, attracting foreign investment and fostering the growth of local enterprises.

There has been a substantial body of research on the business environment. Hong, Q. proposed establishing a service system for small and medium-sized enterprises (SMEs)[1]. Jiang, T. emphasized improving legal frameworks and capital markets to address financing difficulties[2]. Yu, W., & Deng, T. suggested setting up guarantee funds to support SME loans[3]. Xu, K., & Wang, Y. discussed the financial access and talent quality challenges faced by enterprises[4]. Fan, G., Wang, X., & Zhang, L. developed a marketization index, which was later revised by [5-6].

Li, Z. conducted a comprehensive and authoritative evaluation of the business environment across 290 prefecture-level and higher cities in China, assessing six aspects including government efficiency, human resources, and financial services, setting a benchmark for city-level studies[7]. Nie, H., Han, D., Ma, L., & Zhang, N. developed an index system evaluating government-business relations in Chinese cities from the dimensions of "closeness" and "cleanliness," addressing the gap in existing evaluations regarding government integrity [8]. Internationally, institutions such as the World Bank, the Economist Intelligence Unit (EIU), Global Entrepreneurship Monitor (GEM), and the Organisation for Economic Co-operation and Development (OECD) have established globally influential evaluation systems. The World Bank's evaluation has become an authoritative standard, the EIU covers a broader scope, GEM focuses on the entrepreneurial environment, and the OECD designs indicators based on the business lifecycle.

Scholars both domestically and internationally have explored various perspectives on evaluating the business environment, laying a strong foundation for this study's construction of an urban business environment evaluation index system. However, a comprehensive evaluation at the city level in China remains insufficient, and there is a lack of emphasis on "Chinese characteristics." This paper aims to build an index

system that better aligns with China's national conditions, based on the 13th Five-Year Plan and the requirements of the "Regulations on Optimizing the Business Environment," to provide reference for provinces to optimize their business environments and offer data support for future research. The core research question of this paper is to construct an index system for evaluating the business environment of Chinese cities and apply it to the empirical analysis of Qingdao. This includes addressing the following sub-questions:

- (1) Clarify the concept and basic characteristics of the business environment, and define the evaluation objects and scope.
- (2) Construct an evaluation index system for the business environment. Drawing from relevant domestic and international research and practical experience, design a multi-level index system that includes perspectives from government, market, society, and individuals, covering dimensions such as law, policy, efficiency, service, integrity, innovation, and finance.
- (3) Apply the entropy method to conduct empirical measurement and evaluation using Qingdao as a case study.
- (4) Based on the evaluation results, propose policy recommendations to optimize the business environment in Qingdao and other cities.

2 Concept and Basic Characteristics of the Urban Business Environment

The World Bank defines the business environment as the external conditions faced by enterprises in their operations, primarily focusing on government approvals and services[9]. While this system is scientific, it overemphasizes the number and duration of approvals, overlooking factors such as market size and infrastructure [10]. The "Regulations on Optimizing the Business Environment" integrates the World Bank's definition with China's national context, defining the business environment as the institutional and systemic factors involved in the economic activities of market entities, emphasizing broad coverage [10]. Synthesizing various viewpoints [11] [10], this paper defines the urban business environment as the sum of external environmental factors faced by market entities in production, operation, and innovation, including "hard" environments such as institutions, infrastructure, and public services, as well as "soft" environments such as culture, social credit, and innovation atmosphere. Compared to existing definitions, this paper emphasizes the

systematic and comprehensive nature of the urban business environment, highlighting the dynamic interactions between various elements and entities [11], laying the foundation for constructing a reasonable evaluation system for urban business environments.

3 Construction of the Urban Business Environment Evaluation Index System

3.1 Government Entity Evaluation

In evaluating the urban business environment, the government entity is a crucial subject. The government acts as both the "provider of institutions," shaping the overall business environment of the city through the formulation of laws, regulations, supportive policies, and the provision of public services [11]. Simultaneously, it is also a "participant" in the business environment, directly influencing enterprises' production and operation activities through clean and efficient administrative management and harmonious government-business relations [10]. Therefore, this paper evaluates the government entity from two perspectives: value orientation and specific indicators across six dimensions — legal environment, policy environment, cultural environment, government integrity, administrative efficiency, and government-business relations.

Table 1. Government Entity Evaluation Index System

Evaluation Subject	Evaluation Dimension	Value Orientation	Specific Indicators	Source
Government Entity	Legal Environment	Fairness	Level of judicial civility	Zhang Baosheng et al. (2019)

Government Entity	Policy Environment	Transparenc y	Government transparency	Chinese Academy of Social Sciences (2018)
Government Entity	Cultural Environment	Inclusivene ss	Foreign direct investment	Zhang Baosheng et al. (2019)
Government Entity	Administrat ive Efficiency	Efficiency	Government expenditure	Li Zhijun (2019); Zhang Sanbao et al. (2020)

3.2 Market Entity Evaluation

As the microeconomic entities of urban economic activities, the production and operation status of enterprises largely reflects the quality of a city's business environment [11]. Evaluating the urban business environment from the perspective of enterprises requires attention to the external market environment, innovation ecosystem, financial services, and also an examination of the enterprises' own performance in areas such as competition, innovation, and production [10].

Table 2. Market Entity Evaluation Index System

Evaluation Subject	Evaluation Dimension	Value Orientation	Specific Indicators	Source
Market Entity	Competitive Environment	Openness	Investment in innovation resources	Zhang Sanbao et al. (2020)
Market Entity	Innovation Environment	Quality	Transformation of scientific and technological achievements	Zhang Sanbao et al. (2020)
Market Entity	Human Resources	Efficiency	Number of R&D personnel	Liu Yingkui et al. (2020); Yang Tao (2015)
Market Entity	Financial Services	Inclusiveness	Enterprise loan amounts	Yang Tao (2015); Zhang Sanbao et al. (2020)

3.3 Individual Entity Evaluation

Consumers play a crucial role in the market economy by freely choosing diverse goods and services. The quality of the business environment can be assessed through the size of the consumer market, transaction volume, and the variety of goods available. Urban consumption is divided into general goods and energy-related services, making retail sales and electricity consumption important indicators for measuring consumption scale and development level, reflecting the range of consumer choices and freedom. Stable income relies on a well-matched labor market, and low unemployment rates and full employment are hallmarks of a favorable business environment. This paper evaluates individual entities from four aspects: electricity consumption, retail sales, employment, and unemployment figures.

Table 3. Individual Entity Evaluation Index System

Evaluation Subject	Evaluation Dimension	ValueOrientation	Basis for indicator selection	Specific indicators	Indicator direction
Individual Entity	Energy Services	Diversity	1.Consumer choice of clean energy	Electricity Consumption	+
			2.National policy orientation		
Individual Entity	General Goods	Abundance		Retail sales	+

Individual Entity	Labor Market	Matching		Number of employed persons	+
Individual Entity	Social Develop ment	Stability		Number of unemployed persons	-

3.4 Social Entity Evaluation

When assessing the urban business environment, social factors are critically important, typically including science, technology, and public infrastructure. A favorable business environment requires a sufficient talent pool and well- developed public infrastructure. Adequate talent reserves depend on balanced teaching resources and financial support for education, while comprehensive public infrastructure requires high-quality public service personnel and healthcare institutions. Therefore, this paper evaluates the social entity from four aspects: the number of education professionals, education expenditure, the number of social service professionals, and the number of healthcare institutions

Table 4. Social Entity Evaluation System

Evaluation Subject	Evaluation Dimension	Value Orientation	Specific Indicators	Indicator Direction
Social Entity	Teaching Resources	Balance	Number of education professionals	+

Social Entity	R&D Reserves	Comprehensive	Education expenditure	+
Social Entity	Public Infrastructure	Convenience	Number of social service professionals	+
Social Entity	Public Health	Health	Number of healthcare institutions	+

4 Evaluation of the Business Environment Index System

Based on the previous analysis, this section selects five cities—Qingdao, Beijing, Shanghai, Chongqing, and Tianjin—as the research objects, using panel data from 2010 to 2022. The entropy method is applied to standardize and unify the data, allowing for the calculation of the business environment development levels in these cities. Next, we will analyze the dynamic development process of the business environment in Qingdao and the other cities, from the perspectives of both overall indicators and sub-indicators.

Table 5. Overall Framework of the Business Environment Evaluation Index System

Evaluation Subject	Evaluation Dimension	Value Orientation	Specific Indicators	Indicator Direction
Government Entity	Legal Environment	Fairness	Level of judicial civility	+
Government Entity	Policy Environment	Transparency	Government transparency	+

Government Entity	Cultural Environment	Inclusiveness	Foreign direct investment	+
Government Entity	Administrative Efficiency	Efficiency	Government expenditure	+
Market Entity	Competitive Environment	Openness	Investment in innovation resources(R&D expenditure as a percentage of GDP)	+
Market Entity	Innovation Environment	Quality	Transformation Of technological achievements (number of patents)	+
Market Entity	Human Resources	Efficiency	Number of R&D personnel	+
Market Entity	Financial Services	Inclusiveness	Enterprise loan amounts	+
Individual Entity	Energy Services	Diversity	Electricity consumption	+

Individual Entity	General Goods	Abundance	Retail sales	+
Individual Entity	Labor Market	Matching	Number of employed persons	+
Individual Entity	Labor Market	Matching	Number of unemployed persons	-
Social Entity	Teaching Resources	Balance	Number of education professionals	+
Social Entity	R&D Reserves	Comprehensive	Education expenditure	+
Social Entity	Public Infrastructure	Convenience	Number of social service professionals	+
Social Entity	Public Health	Health	Number of healthcare institutions	+

4.1 Overall Evaluation

The figure below shows the dynamic changes in the business environment index system for five cities—Qingdao, Beijing, Shanghai, Chongqing, and Tianjin—from

2010 to 2022. Overall, Beijing and Shanghai, as top-tier national center cities, not only lead in economic and social aspects but also exhibit a significant gap in the business environment across the four dimensions of government, market, individual, and society compared to other cities. Qingdao should fully recognize this gap and continue to build on the momentum of business environment improvements since 2019 to comprehensively narrow the gap with first-tier cities.

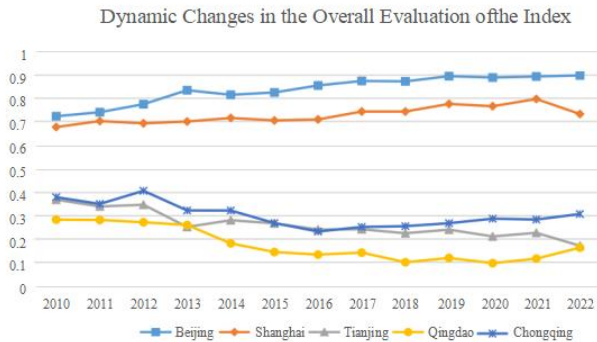


Fig. 1. Dynamic Changes in the Overall Evaluation of the Index System

Note: The overall evaluation results of the index system are based on an indicator system jointly constructed from the four dimensions of government entity, market entity, individual entity, and social entity. These results were standardized and weighted using the entropy method.

4.2 Analysis by Dimension

Government Entity Dimension. Figure 2 illustrates the trend in the government business environment across China's five major cities (Qingdao, Beijing, Shanghai, Tianjin, Chongqing) from 2010 to 2022. Prior to the pandemic, the overall indicators of the five cities showed a fluctuating upward trend, with Shanghai leading in areas such as open systems and negative lists, demonstrating significant governance achievements. Although Qingdao has developed well, it still lags behind first-tier cities like Beijing and Shanghai. The Beijing-Tianjin-Hebei and Yangtze River Delta city clusters significantly outperform Qingdao and Chongqing's regions, but Qingdao has made notable progress in law, policy, culture, and administrative efficiency, showing potential to narrow the gap.

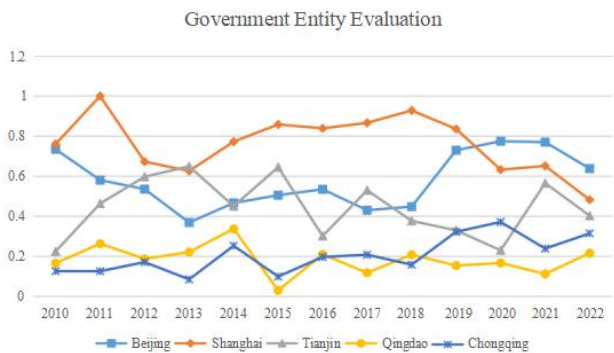


Fig. 2. Annual Dynamic Trend of the Government Entity Evaluation Index System

Market Entity Dimension. Figure 3 shows the dynamic changes in the business environment for market entities across China's five major cities (Beijing, Shanghai, Qingdao, Tianjin, Chongqing) from 2010 to 2022. The market entity indicators for Beijing and Shanghai steadily increased, while Qingdao, Tianjin, and Chongqing saw slight declines. Shanghai leads in attracting high-quality talent and promoting inclusive finance, achieving significant success. Although Qingdao has development potential, it still lags behind Beijing and Shanghai in terms of competitive environment, innovation environment, talent acquisition, and inclusive finance, needing to address these gaps. The Beijing-Tianjin-Hebei and Yangtze River Delta city clusters outperform the regions of Qingdao and Chongqing as a whole. In recent years, the gap between Qingdao and the first-tier cities has widened, making it essential to accelerate progress in areas such as the competitive environment, innovation environment, and talent development. By enhancing development zones and integrating culture and tourism, Qingdao can strengthen its regional advantages and realize its potential to catch up.

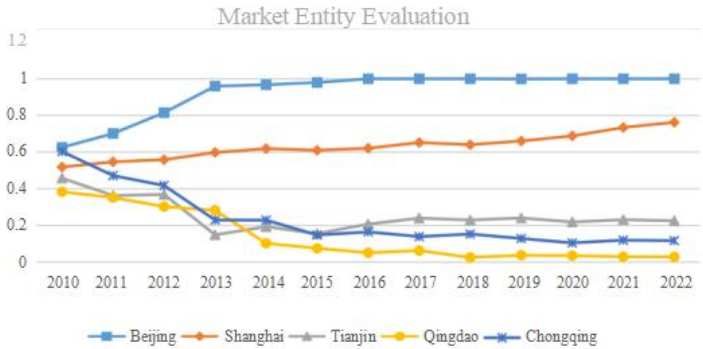


Fig. 3. Annual Dynamic Changes in the Market Entity Evaluation Index System

Individual Entity Dimension. Figure 4 shows the dynamic evolution of the individual entity business environment in China’s five core cities (Beijing, Shanghai, Qingdao, Chongqing, and Tianjin) from 2010 to 2022. Overall, the individual entity indicators for Beijing, Shanghai, Qingdao, and Chongqing have steadily increased, while Tianjin has experienced a slight decline. Beijing and Shanghai lead in social consumption, employment, and social stability, achieving significant results. Although Qingdao shows good potential in brand development, consumer goods, and talent cultivation, it still lags behind Beijing and Shanghai, and further efforts are needed to close this gap. The Beijing-Tianjin-Hebei and Yangtze River Delta regions clearly outperform Qingdao’s Bohai Rim region. Qingdao needs to accelerate its efforts in consumption environment, employment, and brand development to strengthen its influence and strive to become a model city for new consumer industries.

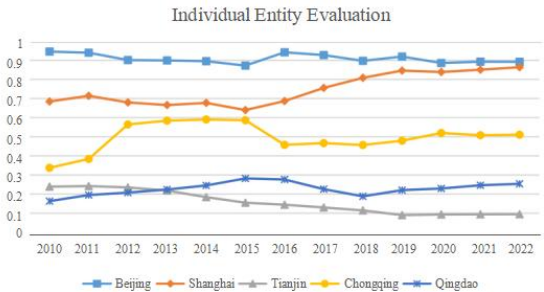


Fig. 4. Annual Dynamic Changes in the Individual Entity Evaluation Index System

Social Entity Dimension. The evaluation index system for the social entity dimension can be constructed based on four aspects: the number of education professionals, education expenditure, and related factors. Figure 5 illustrates the dynamic evolution trend of the social entity in the business environment of China's core cities from 2010 to 2022. Beijing remains a leader in entrepreneurship, employment, social services, and educational development. Chongqing has gradually reached a national leading level through a combination of policies, and Qingdao can draw on its experience. For example, Qingdao could learn from Chongqing's strategies for optimizing port passage efficiency and using carbon emission rights revenue to support environmental projects. Additionally, specific programs supporting university student innovation and entrepreneurship should be implemented, along with deepening innovation and entrepreneurship education, upgrading platforms, and optimizing the ecosystem.

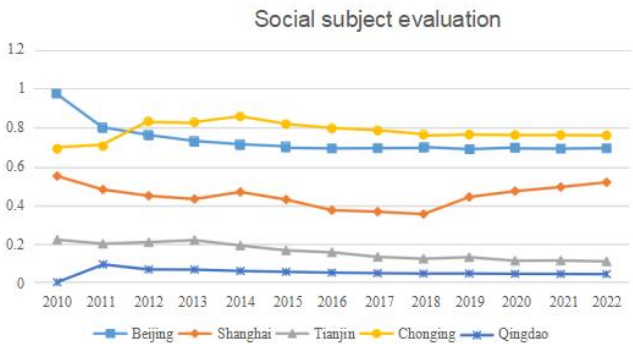


Fig. 5. Annual Dynamic Changes in the Social Entity Evaluation Index System

5 Conclusion

Qingdao has made significant progress in areas such as healthcare, employment, innovation resources, legal governance, and fiscal transparency. However, it still lags behind first-tier cities in cultural environment, administrative efficiency, clean industries, human resources, inclusive finance, and public infrastructure. The government should collaborate to provide top-level planning, optimizing the business

environment to achieve the goals of marketization, legal governance, and internationalization, positioning Qingdao as a model for new urban development.

In terms of government-business relations, Qingdao should strengthen legal governance and fiscal transparency, promote credit restoration and market supervision, protect intellectual property rights, address unfair competition, enhance investment attraction, support key industry chains, and improve financial services for small and medium-sized enterprises.

Regarding resource input, Qingdao should advance its innovation-driven strategy, establish a high-quality technological innovation system, and build an international innovation city. The focus should be on promoting marine science and smart manufacturing innovations, creating a service alliance for listed companies, building financing platforms, and addressing the financing challenges of specialized and innovative enterprises.

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