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Measurement of the Development Level of Cross-border E-Commerce in China's Provinces

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Abstract: In the current landscape marked by sluggish traditional foreign trade, Cross-Border E-commerce (CBE) has emerged as a vital conduit for Chinese businesses to engage in international trade. It has played a pivotal role in fostering steady growth and reshaping China's foreign trade sector structure. This research utilizes a dataset spanning from 2014 to 2021, encompassing data from all 31 provinces in China. Employing factor analysis based on 22 sub-indicators categorized into three dimensions—infrastructure, the extent of CBE adoption, and environmental support—it evaluates the level of CBE development across China's provinces. The examination of CBE development levels across Chinese provinces serves a multitude of purposes. Firstly, it facilitates the identification of varying levels and spatial disparities in CBE development across China's diverse regions. Secondly, it enables horizontal comparisons of development levels among these regions. Lastly, it provides a scientific basis for shaping e-commerce policies, taking into account spatial variations and economic development perspectives. Empirical findings unveil a positive overall trend in CBE development across China's provinces. However, significant disparities persist in CBE development levels among different regions. Leading the pack in CBE development are provinces like Guangdong, Beijing, Jiangsu, Zhejiang, and Shandong. In stark contrast, western provinces such as Tibet, Ningxia, and Qinghai lag in this regard. Notably, there is a marked divergence in CBE development levels among the eastern, central, and western regions. Factor analysis further underscores the substantial impact of various factors on CBE development. These encompass the digitalization level of CBE enterprises, the degree of technological innovation, the efficiency of express delivery services, the number of CBE comprehensive pilot zones, and the overall CBE development environment. To elevate CBE development, it is imperative to focus on establishing and developing CBE comprehensive pilot zones, strategically leveraging them as focal points. Additionally, attention should be channeled toward supporting CBE enterprises through the provision of financial, human capital, and technological resources. Furthermore, efforts should concentrate on enhancing the development environment for CBE, emphasizing inter-regional industrial collaboration to harness the complementary strengths of different regions and catalyze further advancements in this sector.
Keywords: Province, Cross-Border E-Commerce, Factor Analysis

1. Introduction

Cross-border e-commerce (CBE), a contemporary facet of international trade, revolves around the utilization of online platforms by businesses and individuals spanning diverse customs territories. This innovative mode of commerce encapsulates the entire trade process, from aggregation to financial settlements and the ultimate delivery of goods and services (Guo Siwei et al., 2018). It represents an evolution of traditional trade practices, catalyzed by the digital age. CBE platforms empower participants from various countries or regions to negotiate prices, execute transactions, oversee logistics, and navigate customs regulations, transcending geographical boundaries. This, in turn, revitalizes trade by simplifying foreign trade procedures and curbing associated expenses (Kim, T. Y. 2017; Wang Xirong et al., 2018).

The swift ascent of CBE in China, fueled by market dynamics, policy initiatives, and other driving forces, has propelled the continuous expansion of its market scope. The global eruption of the COVID-19 pandemic has further expedited the shift from traditional foreign trade to online channels, ushering in fresh growth

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opportunities for CBE. In an era of sluggish traditional foreign trade growth, CBE has risen as a pivotal force propelling China's import and export trade (Kim, T. Y. 2017; Wang Xirong et al., 2018).

Although CBE has garnered considerable scholarly attention as an emerging business model, existing research predominantly centers on constructing evaluation indices tailored to analyzing specific stakeholders within the CBE value chain. These studies often lack a comprehensive evaluation of the entire CBE industry operating within an open business ecosystem. Additionally, much of the existing research assesses the overall competitiveness of the CBE industry at the national level or conducts micro-level inquiries into individual enterprises, offering limited comparative analyses of regional disparities at the sub-national level. This paper, drawing on both domestic and international research findings concerning CBE, places a strong emphasis on data validity and credibility. It formulates indicators encompassing infrastructure, the extent of CBE integration, and the support provided by the business environment. Using factor analysis, it endeavors to furnish a comprehensive and unbiased depiction of the disparities in CBE development across Chinese provinces. This undertaking forms the bedrock for informed decision-making and offers valuable insights, especially from well-developed regions (Kim, T. Y. 2017; Wang Xirong et al., 2018).

2. Literature Review

The assessment of Cross-Border E-commerce (CBE) development typically employs two primary approaches: a single evaluation index and a comprehensive evaluation index system. On a national scale, some studies directly measure CBE development by examining the scale of CBE transactions. For example, Wang Xirong et al. (2018) gauge the overall CBE development level using the scale of CBE import and export transactions. Conversely, Zheng Chunfang et al. (2021) analyze CBE exports to specific countries as a representation of CBE exports and investigate the factors influencing this aspect.

Alternatively, other studies use relevant proxy variables to reflect CBE development. In earlier international research, internet development levels were frequently used as proxies for CBE activity. For instance, Freund and Weinhold (2002) employed internet penetration rates as proxies for internet development to study its impact on service trade, revealing that the internet effectively promotes service trade growth. Similarly, Clarke and Wallsten (2006) found that the level of internet development, approximated by internet penetration rates, positively influences trade between developing and developed countries.

In the context of China, studies with various research objectives have adopted diverse proxy variables. Gao Debu et al. (2019) used measures such as the number of online shoppers and e-commerce penetration to represent CBE development. In a city-level study exploring the relationship between trade facilitation and CBE development, Zhang Xibao et al. (2020) assessed the degree of CBE development using the number of cross-border express shipments.

However, CBE's growth results from collaborative efforts across related industries and sectors, and a single indicator may fall short of fully capturing its comprehensive development. Consequently, there's an increasing focus on constructing evaluation systems to assess CBE development. Edwards et al. (2007) employed three dimensions - Internet development level, institutional environment, and organizational environment - to create an evaluation index system for measuring CBE development in EU countries. Asosheh et al. (2012) developed an evaluation index system for B2B e-commerce infrastructure in Iran, comprising three layers: messaging layer, business process layer, and content layer.

In China, Li Jinye (2021) identified four indices - growth potential, basic resources, trade connectivity, and policy support - to establish an evaluation system for China's CBE development index, examining its impact on export commodity prices. Su Weihua et al. (2017) formulated an evaluation system for comprehensive pilot zones of CBE, considering basic capacity, service support, and development potential. Liu Glance et al. (2020) created a measurement system for China's CBE development level using four indices: CBE policy effectiveness, efforts in constructing new infrastructure facilities, and digitalization level. Yu Juan (2021) assessed the sustainable development level of CBE enterprises in China using 11 secondary indicators across three dimensions: core business, growth potential, and capital investment. Bi Lingyan et al. (2019) conducted factor analysis with financial investment and Internet penetration as variables to investigate the evaluation and clustering of CBE industry competitiveness, discovering varying effects on CBE across different regions.

Given the limited availability of provincial CBE transaction statistics, this study systematically constructs an evaluation system for provincial CBE development levels. It employs factor analysis and cluster analysis to establish an evaluation index system, enabling the comparison of CBE enterprise competitiveness across different regions. The goal is to distill insights from developed regions, identify key issues in CBE development, and foster the industry's healthy and rapid growth. This evaluation system serves as a foundation for informed decision-making and provides invaluable support for the swift development of the CBE industry.

3. Description of the Study Area

3.1 Setting of CBE development evaluation index system

Combining the domestic and foreign research on the evaluation of the development level of CBE, considering the development and actual situation of CBE in China and the availability of data, this paper constructs indicators from three aspects: infrastructure, the degree of CBE application, and environmental support. The details are as follows:

Table 1: Index System of CBE Development Level

	Dimensions	Secondary Indicators	Unit
the Development Level of CBE	Infrastructure	X1 Broadband Subscribers Port of Internet	10000 ports
		X2 Base Stations of Mobile Phones	10000
		X3 Length of Long Distance Optical Cable Lines	km
		X4 Number of Domain Names	10000
		X5 Number of Webpages	10000 pages
	The degree of application of CBE	X6 Computers Used at the End of Period	unit
		X7 Computers used per100 Persons	unit
		X8 Website of All Enterprises	unit
		X9 Website per 100 Enterprises	unit
		X10 Enterprises with E-Commerce Transaction	unit
		X11 Proportion with E-Commerce Transaction	%
		X12 Sales of Enterprises through E-commerce	100 million yuan
		X13Purchases of Enterprises through-Commerce	100 million yuan
	Environmental Support for the Development of CBE	X14 Number of Mobile Phone Subscribers	10000 subscribers
		X15 Population Rate of Mobile Phones	set/100persons
		X16 Mobile Internet Subscribers	10000 subscribers
		X17 Broadband Subscribers of Internet	10000 subscribers
		X18 Express Deliveries	10000 pcs
		X19 Number of CBE Comprehensive Experimental Zone	unit
		X20 Full-time Equivalent of R&D personnel	Man-year
		X21 Expenditure on R&D	10000 yuan
		X22 Granted Patent Applications	piece

Source: Author's collation

The growth of Cross-Border E-commerce (CBE) hinges on the advancement of Internet infrastructure. This study breaks down CBE infrastructure into five key secondary indicators:

Interconnection access points.

- Mobile phone base stations.
- Length of long-distance fiber optic cables.
- Quantity of domain names.
- Number of web pages.
- Higher values in these indicators signify a more conducive environment for CBE development.

The evaluation of CBE adoption primarily assesses the extent of internet utilization by enterprises, adopting an enterprise-centric perspective. This encompasses metrics such as:

- The number of computers in use by enterprises at a specific period's end.
- The ratio of computers per 100 individuals.
- The count of websites owned by enterprises.

- The number of websites per 100 enterprises.
- The number of enterprises engaged in e-commerce transactions.
- The percentage of enterprises participating in e-commerce transactions.
- E-commerce sales figures.
- E-commerce procurement volumes, and more.

These dimensions, covering hardware, software, and specific transaction scales, collectively gauge the degree of CBE application.
Concerning the support environment for CBE, it assembles indicators from four main viewpoints:
User preparedness: Assessing the readiness of CBE users, including mobile phone users, mobile phone penetration rates, mobile Internet user numbers, and Internet broadband access users.
Logistical support: Empirical evidence highlights the strong positive correlation between CBE and logistics. Hence, the number of express shipments serves as an indicator of logistics growth.
Policy backing: Examining the impact of national and local policies on CBE development, including comprehensive CBE pilot zones and other policy directives.
Technological enrichment: Acknowledging the influence of technological innovation on CBE development, indicators such as full-time equivalent research and development personnel, R&D investment, and the number of patents granted within each province are used to assess technological innovation.
Comprehensive CBE pilot zones represent early-stage and comprehensive CBE incubation regions, established with official endorsement following local applications. These zones serve as key policy initiatives aimed at stimulating CBE participation, fostering innovative CBE business models, and advancing foreign trade area reforms. The number of CBE comprehensive pilot zones within each province in this research serves as a proxy variable for policy support, considering both national and local government policies.

Table 2: CBE Pilot Zones Established in China

Time	Approved the Establishment of Comprehensive Cross-Border E-Commerce Pilot Zone
2015.3.7	Hangzhou
2016.1.6	Tianjin, Shanghai, Chongqing, Hefei, Zhengzhou, Guangzhou, Chengdu, Dalian, Ningbo, Qingdao, Shenzhen, Suzhou
2018.7.24	Beijing, Hohhot, Shenyang, Changchun, Harbin, Nanjing, Nanchang, Wuhan, Changsha, Nanning, Haikou, Guiyang, Kunming, Xi'an, Lanzhou, Xiamen, Tangshan, Wuxi, Weihai, Zhuhai, Dongguan, Yiwu
2019.12.24	Shijiazhuang, Taiyuan, Chifeng, Fushun, Hunchun, Suifenhe, Xuzhou, Nantong, Wenzhou, Shaoxing, Wuhu, Fuzhou, Quanzhou, Ganzhou, Jinan, Yantai, Luoyang, Huangshi, Yueyang, Shantou, Foshan, Luzhou, Haidong, Yinchuan
2020.4.27	Xiongan New Area, Datong, Manzhouli, Yingkou, Panjin, Jilin, Heihe, Changzhou, Lianyungang, Huaian, Yancheng, Suqian, Huzhou, Jiaxing, Quzhou, Taizhou, Lishui, Anqing, Zhangzhou, Putian, Longyan, Jiujiang, Dongying, Weifang, Linyi, Nanyang, Yichang, Xiangtan, Chenzhou, Meizhou, Huizhou, Zhongshan, Jiangmen, Zhanjiang, Maoming, Zhaoqing, Chongzuo, Sanya, Deyang, Mianyang, Zunyi, Dehong Dai Jingpo Autonomous
2022.2	Erdos, Yangzhou, Zhenjiang, Taizhou, Jinhua, Zhoushan, Maanshan, Xuancheng, Jingdezhen, Shangrao, Zibo, Rizhao, Xiangyang, Shaoguan, Shanwei, Heyuan, Yangjiang, Qingyuan, Chaozhou, Jieyang, Yunfu, Nanchong, Meishan, Honghe Hani and Yi Autonomous Prefecture, Baoji, Kashgar area, Alashankou

Source: Author's collation
In essence, this article presents a comprehensive evaluation of the CBE industry within an open business ecosystem. It establishes a measurement system consisting of 22 secondary indicators to assess the development level of CBE. The data utilized in this study primarily originate from reputable sources such as the websites of the National Bureau of Statistics, the China Economic Network, the statistical database of the Net Economics Society, and local business offices. The time frame spans from 2014 to 2021.
While these indicators offer insights into different aspects of CBE development, they often exhibit strong correlations and information redundancy. To address this, factor analysis is employed as a multivariate statistical method that reduces dimensionality. It groups multiple indicator variables into a few comprehensive

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and independent factors that encapsulate the majority of the original variables' information. The weights assigned through this method are determined based on the inherent structural relationship among the indicators, derived from data analysis, and remain unaffected by subjective factors. The resulting composite indicators, or factors, are independent of one another and minimize information overlap. This approach does not involve any compromise to the original variables but rather recombines their information to simplify the data. Consequently, the obtained factor variables are more interpretable, enhancing the objectivity and certainty of the analysis and evaluation results. Thus, this study employs factor analysis as the chosen analytical method.

4. Measurement of provincial CBE development level

4.1 KMO and Bartlett's test

To assess the suitability of the evaluation index system for factor analysis, it is imperative to conduct both the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test. The KMO statistic yields a value between 0 and 1, with values closer to 1 signifying a stronger correlation among the variables and greater suitability for factor analysis. Typically, a KMO value exceeding 0.8 is considered indicative of suitability.

Table 3: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.896
Bartlett test of sphericity	9121.572
Degrees of freedom	231
p-value H0: variables are not intercorrelated	0.000

Source: Calculated by STATA

In our dataset, the KMO value stands at 0.896, reinforcing the appropriateness of the data for factor analysis. Bartlett's sphericity test, on the other hand, tests the null hypothesis that the variables are independent, implying that common factors cannot be extracted. According to the STATA test results, the p-value for Bartlett's sphericity test registers at 0, decisively rejecting the null hypothesis. This rejection underscores the data's aptness for factor analysis, affirming the interrelationships among the variables.

4.2 Principal Component Extraction

Next, we decided on the principal components to be extracted based on the variance table. The total variance explained table (Table 4) shows the amount of information extracted from the principal components. From the table, it can be seen that if 4 principal components are extracted, the cumulative variance explained by the 4 principal components is 80.3%, i.e., these 4 principal components contain a total of 80.3% of the original sample information, which covers the original sample information better. The scree plot (Figure 5) also suggests the selection of 4 principal components to represent the original variable information.

Table 4: Total variance interpretation

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	12.1243	8.93251	0.5511	0.5511
Comp2	3.19175	1.87209	0.1451	0.6962
Comp3	1.31966	.314558	0.0600	0.7562
Comp4	1.0051	.235716	0.0457	0.8019
Comp5	.769386	.076043	0.035	0.8368
Comp6	.693343	.039062	0.0315	0.8683
Comp7	.654281	.113196	0.0297	0.8981
……				

Source: Calculated by STATA

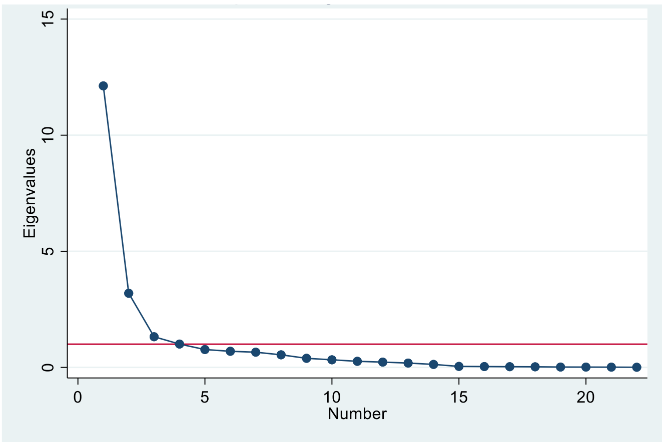

Figure1: Scree plot of eigenvalues after factor

Source: Drawn by STATA

The matrix of component score coefficients, extracted from the four principal components identified earlier, is displayed in Table 5-4. These principal components are mainly composed of factors such as the number of computers in use by enterprises at the end of the period, the number of websites owned by enterprises, the count of enterprises involved in e-commerce transactions, full-time equivalents engaged in research and development (R&D), R&D funding, the number of granted patents, and the volume of web pages, among other variables. These factors exert substantial influence on the CBE scores across various regions.

Table 5: Component Score Coefficients

Variable	Factor1	Factor2	Factor3	Factor4	Uniqueness
x1	0.8995	-0.3219	0.0576	0.0923	0.0754
x2	0.8967	-0.311	0.1865	0.0714	0.0594
x3	0.1683	-0.6087	0.2005	0.4351	0.3716
x4	0.6825	0.327	-0.012	0.2969	0.3391
x5	0.5266	0.7231	0.1413	0.1569	0.1552
x6	0.9448	0.2017	-0.0888	-0.0305	0.0579
x7	0.0582	0.4952	0.4388	-0.2929	0.4731
x8	0.9333	-0.0792	-0.2619	-0.0704	0.0491
x9	0.2735	0.3502	-0.7812	-0.0313	0.1913
x10	0.9614	0.0534	-0.1058	-0.0146	0.0615
x11	0.3562	0.5938	-0.1014	0.2641	0.4406
x12	0.3898	0.4947	0.1364	0.2566	0.5189
x13	0.8095	0.3898	0.0167	0.0484	0.1901
x14	0.6537	-0.295	0.0673	0.3166	0.3809
x15	0.462	0.6564	0.2983	0.0148	0.2665
x16	0.9023	-0.2895	-0.0192	0.1752	0.0709
x17	0.8721	-0.3733	0.0642	0.0959	0.0867
x18	0.852	-0.0317	0.1025	-0.295	0.1756
x19	0.7195	-0.1759	0.3623	-0.31	0.224
x20	0.9185	-0.161	-0.1824	-0.2104	0.0529
x21	0.9204	-0.1571	-0.1675	-0.1745	0.0696
x22	0.9431	-0.0245	0.0232	-0.2458	0.0489

Source: Calculated by STATA

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The computation of the CBE development level score employs a weighting scheme that takes into account the proportion of each principal component's contribution to the cumulative variance. This formula is expressed as follows:

$$CBE\_Score = \sum_{i=1}^{3} \frac{\lambda_i}{q} \cdot F_i$$

Where:

λ_i represents the variance contribution rate of the ith principal component.

q is the cumulative variance contribution rate.

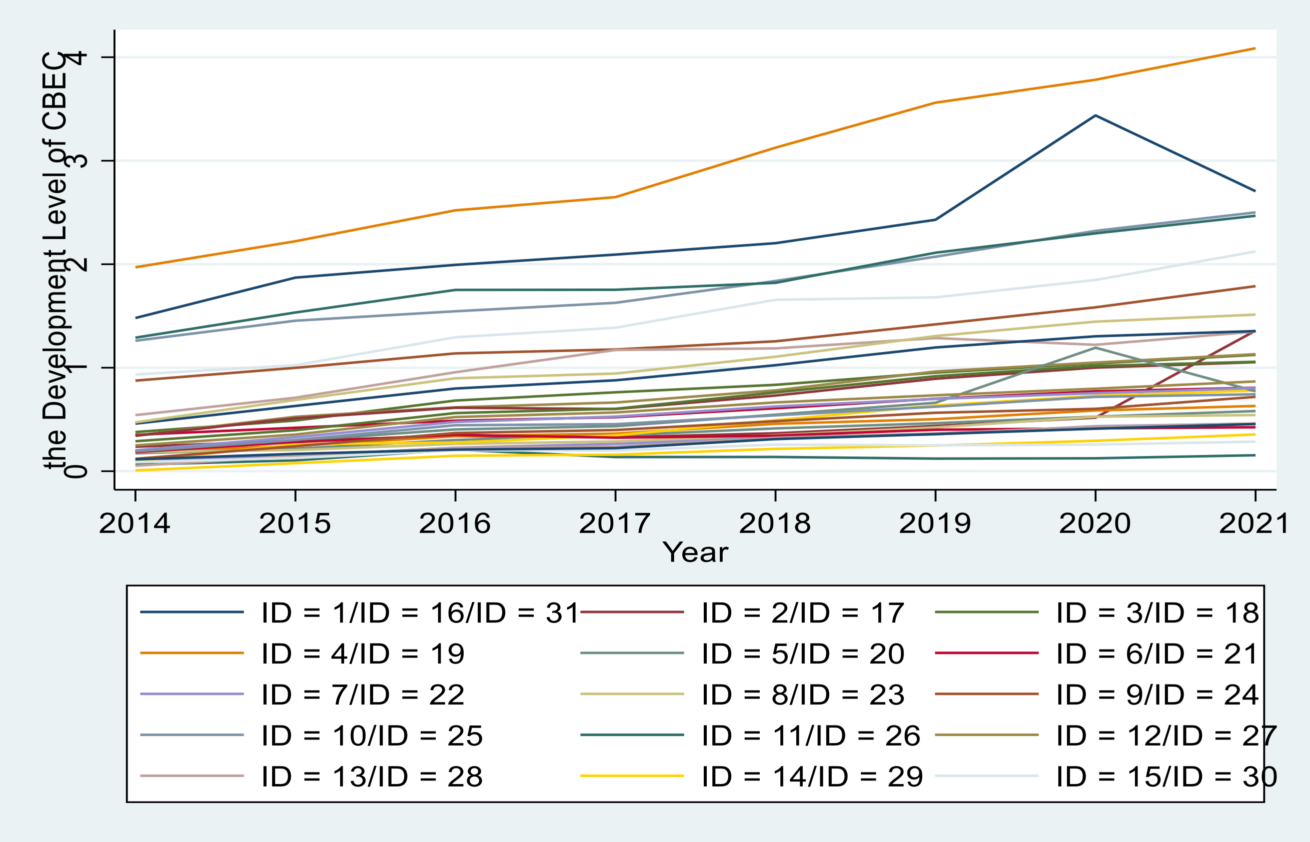
F_i denotes the score of the ith principal component.

Utilizing the above formula, we calculate the comprehensive CBE development level score for each region, and the outcomes are presented in the table. To provide a more visually accessible representation, the authors have included a graph illustrating the trend in CBE development levels across the 31 provinces over time:

Table 6: Provincial CBE Development Level Score

	2014	2015	2016	2017	2018	2019	2020	2021
Beijing	1.480506	1.870864	1.993806	2.093118	2.203425	2.429603	3.438	2.705345
Tianjin	0.236572	0.296012	0.338515	0.328168	0.367238	0.437438	0.517431	1.358572
Hebei	0.379191	0.490095	0.683409	0.76267	0.834932	0.952595	1.040743	1.124434
Shanxi	0.188946	0.245517	0.338328	0.364077	0.458071	0.50278	0.587204	0.630784
Inner Mongolia	0.173029	0.218387	0.302115	0.346209	0.413736	0.464056	0.527699	0.581657
Liaoning	0.351911	0.419964	0.488657	0.52218	0.608111	0.700676	0.772353	0.806486
Jilin	0.10257	0.14846	0.227443	0.264844	0.329017	0.356691	0.435439	0.45944
Heilongjiang	0.185512	0.20476	0.264008	0.288192	0.348952	0.423458	0.526846	0.543269
Shanghai	0.875294	0.99925	1.138807	1.176438	1.25552	1.419232	1.583521	1.788095
Jiangsu	1.260776	1.454381	1.545495	1.627209	1.838611	2.072855	2.322534	2.501016
Zhejiang	1.290644	1.534007	1.751773	1.753193	1.820479	2.11138	2.298629	2.468009
Anhui	0.344605	0.526594	0.617663	0.664279	0.781665	0.963765	1.050206	1.130794
Fujian	0.542185	0.710522	0.956453	1.171672	1.186837	1.286354	1.221834	1.349207
Jiangxi	0.094532	0.261752	0.277205	0.346571	0.492871	0.634674	0.728577	0.779596
Shandong	0.934743	1.024398	1.294524	1.386582	1.656508	1.680221	1.8481	2.123292
Henan	0.460114	0.630761	0.799629	0.878515	1.024455	1.195589	1.303696	1.354442
Hubei	0.342319	0.512608	0.61324	0.601248	0.731215	0.893583	1.001132	1.053848
Hunan	0.289888	0.396177	0.562303	0.603656	0.761274	0.91828	1.016983	1.057464
Guangdong	1.970349	2.222191	2.520905	2.648272	3.126182	3.561143	3.782483	4.087047
Guangxi	0.195764	0.296131	0.404378	0.434947	0.546683	0.661762	1.193487	0.772878
Hainan	0.185315	0.28225	0.351436	0.324124	0.343704	0.400995	0.414792	0.425042
Chongqing	0.202291	0.329289	0.476405	0.528171	0.626149	0.698475	0.754367	0.80382
Sichuan	0.47265	0.689085	0.898535	0.943931	1.106538	1.306213	1.445536	1.513185
Guizhou	0.120227	0.241948	0.369741	0.398303	0.48349	0.565024	0.603428	0.718742
Yunnan	0.193157	0.302412	0.444517	0.454973	0.539811	0.623385	0.718658	0.743526
Tibet	0.063516	0.105366	0.208479	0.13726	0.137818	0.122118	0.125193	0.154658
Shaanxi	0.250058	0.354545	0.524058	0.568112	0.66483	0.733711	0.797779	0.867807
Gansu	0.053295	0.145858	0.226493	0.236728	0.323702	0.36568	0.430456	0.461264
Qinghai	0.007919	0.077502	0.149273	0.160099	0.216634	0.248167	0.294409	0.355461
Ningxia	0.087733	0.128253	0.202588	0.199128	0.257484	0.250203	0.258098	0.285485
Xinjiang	0.114622	0.168331	0.209141	0.223207	0.310529	0.35874	0.411203	0.455901

Source: Calculated by STATA



Source: Drawn by STATA

Correspondence between IDs and provinces in the above chart: 1 Beijing; 2 Tianjin; 3 Hebei; 4 Shanxi; 5 Inner Mongolia; 6 Liaoning; 7 Jilin; 8 Heilongjiang; 9 Shanghai; 10 Jiangsu; 11 Zhejiang; 12 Anhui; 13 Fujian; 14 Jiangxi; 15 Shandong; 16 Henan; 17 Hubei; 18 Hunan; 19 Guangdong; 20 Guangxi; 21 Hainan; 22 Chongqing; 23 Sichuan; 24 Guizhou; 25 Yunnan; 26 Tibet; 27 Shaanxi; 28 Gansu; 29 Qinghai; 30 Ningxia; 31 Xinjiang

Cross-border e-commerce (CBE) is flourishing in China's evolving economic landscape. Although the epidemic has affected some provinces, it has triggered a fundamental shift in business behavior. This transformation, initially seen in consumer preferences, is now permeating the supply side of the market, leading to improved overall efficiency within the e-commerce industry and facilitating the expansion of the CBE industry chain. Given the current growth trajectory of CBE, it is poised to continue its rapid expansion in the foreseeable future. Significant regional disparities exist in the development of CBE. Leading the vanguard of CBE development are provinces such as Guangdong, Beijing, Jiangsu, Zhejiang, and Shandong. These regions boast robust economic foundations and were already advanced in traditional trade, a status further reinforced by the advent of CBE. In contrast, western provinces like Tibet, Ningxia, and Qinghai exhibit lower levels of CBE development. When categorizing all provinces into eastern, central, and western regions, statistical analysis using STATA reveals that CBE development in eastern provinces significantly outpaces central provinces by 0.7829 and markedly surpasses western provinces by 0.9324. Additionally, central provinces exceed western provinces by 0.1494 in terms of CBE development.

Principal component analysis also underscores the pivotal factors influencing CBE development. These factors encompass the count of computers in use by enterprises at the end of the reporting period, the number of websites owned by enterprises, the presence of enterprises engaged in e-commerce transactions, full-time equivalents engaged in research and development (R&D), R&D funding, the count of granted patents, the volume of web pages, express delivery services, and the quality of CBE comprehensive pilot zones, among others. Provinces with less advanced CBE development should prioritize addressing these facets. Specifically, they can use the establishment of CBE comprehensive pilot zones as a focal point to stimulate the growth of the surrounding CBE industry. Moreover, nurturing CBE enterprises during their growth phases by providing financial, human resources, technological, and other forms of support is crucial. Lastly, efforts should be devoted to enhancing the CBE development environment and optimizing logistics, fostering inter-regional collaboration within the CBE industry to harness the complementary strengths of different regions and propel further growth in this sector.

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