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The Influencing Factors Model of Cross-Border E-commerce Development:

A Theoretical Analysis^{*}

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Abstract: Cross-border e-commerce (CBEC) is the future trend of cross-border trade. Although China is at the forefront of CBEC development, its transaction volume is still not satisfactory. The purpose of this paper is to study factors influencing the development of CBEC industry from the macro-environment perspective. First, we commented and summarized relevant literature at home and abroad about business ecosystem and factors determining the development of CBEC, then proposed a model of factors influencing CBEC development by combining business ecosystem theory with PEST framework, followed by interpretation and discussion. The model consists of core species, key species, supporting species, parasitic species in the CBEC ecosystem, and they are affected by external environmental factors from political, economic, social and technological perspectives.

Keywords: cross-border e-commerce, influencing factors, e-commerce ecosystem, PEST

1. INTRODUCTION

Cross-border e-commerce (CBEC) is regarded as a new type of trade combined with electronic commerce (e-commerce) and cross-border trade. With the development of the Internet, information technology and social economy, cross-border e-commerce is developing rapidly. Amazon, eBay, Made-in-China, and Alibaba are the early explorers of CBEC. However, Chen & Yang^[1] argued that there was no leading company in CBEC in the current application situation.

In recent years, China has strongly advocated the “Internet Plus” plan of action and positively pursued the Belt and Road Initiative to encourage “Encourage people to do business creatively and drive innovation”. Accordingly, investment in CBEC is flourishing and booming, and all kinds of traditional e-commerce businesses, foreign trade enterprises, express delivery companies are taking active participation. As a new way of trade, CBEC can promote the development of small and medium-sized enterprises (SMEs), improve the level of opening up, encourage the optimization and upgrading of the industrial structure, give full play of female talent, and benefit the economic development in poor areas practically^[2]. Cross-border B2B e-commerce is still the mainstream of business mode, but cross-border B2C, C2C and O2O e-commerce have gradually grown.

Cross-border e-commerce can cover a wide range of global markets, as Lewis & Cockrill^[3] suggested that where there is Internet, there is within the online commercial boundaries. According to the PayPal Cross-Border Consumer Research 2016, China is the most popular cross-border online shopping site for online shoppers worldwide. According to China E-Commerce Report 2016 by People's Republic of China Ministry of Commerce, China's total import and export trade volume in 2016 was 24.33 trillion yuan with a year-on-year decrease of 0.9 percent, and in the meanwhile, the domestic e-commerce transaction volume in China was 26.1 trillion yuan with a year-on-year growth of 19.8 percent. And as reported by China E-Commerce Research Center's 2016 E-Commerce Market Data Monitoring Report, China's cross-border e-commerce volume in 2016 was 6.7 trillion yuan, up 24 percent. In contrast to these three data, there is a big gap between cross-border e-commerce transactions and international trade volume, national e-commerce transactions, so that we assumed that the development space of cross-border e-commerce in China is really huge.

However, the reality is that although there are constant practice attempts and theoretical studies in the field of cross-border e-commerce in China, the development of cross-border e-commerce still lags behind that of traditional e-commerce. As a result, the following three questions arise: What are the participants in CBEC? What factors affect CBEC development? And which is drivers or impediments of CBEC? Despite recent progress in CBEC research, what is main factors influencing CBEC remains to be deeply explored. We aim to comb main literatures to identify the factors model influencing CBEC and pave the way for its further development for future research. A brief summary of some of the relevant literature in business ecosystem and influencing factors of CBEC is presented in Section 2. Section 3 gives a concrete factors model and explains its details on factors of CBEC development. Finally, Section 4 concludes the paper and suggests directions for future research.

2. LITERATURE REVIEW

2.1 E-COMMERCE ECOSYSTEM

Ecosystem theory was first introduced in natural studies, by Tansley (1935). Then Moore ^[4] applied it to business, and proposed business ecosystem. That is, there was a kind of dynamic competition symbiotic relationship among ecological members, whose sustainable competition advantage coming from innovation. Ding & Wu ^[5] discussed the relationship between core enterprise and business ecosystems through case study, and proposed two kinds of symbiotic strategy model: mutualism symbiosis and predation symbiosis. Similarly, we speculate that in the context of cross-border e-commerce, there will be a symbiotic ecosystem with similar dynamic balance.

In recent years, business ecosystem theory has been introduced into the field of e-commerce and an e-commerce ecosystem has been proposed. The e-commerce ecosystem is a new product of the integration of traditional business and Internet technology. It specifically refers to a series of closely-related organizations and individuals, transcending the constraints of time and space, using the Internet as a platform for competition and communication to complement each other and share resources ^{[6]-[7]}. The development of core e-commerce companies, the need for self-propagation and evolution of various species, the joining of favorable policies, and the attraction of a large number of value-added service providers have prompted e-commerce to evolve from a single site to a multi-species e-commerce ecosystem ^[6]. The characteristics of e-business ecosystem are (1) high system renewal, (2) absolute leadership of the core enterprise, (3) ambiguous system boundaries, (4) threatened by external environment. Scholars at home and abroad have conducted exploratory research, and a few studies have introduced network structures for quantitative analysis. Hu ^[6] examined members of e-commerce ecosystem, pointed out that e-commerce ecosystem is composed of leading species, key species, supporting species and parasitic species, and lastly divided the evolution process of e-commerce ecosystem into four phases: development, expansion, coordination and evolution. Combined with the complex networks theory, Gao et al. ^[7] analyzed e-commerce ecosystem's network structure and evolution process. Taking two e-commerce villages in China as an example, Leong et al. ^[8] studied the development and obstacles of the rural e-commerce ecosystem.

2.2 CBEC DEVELOPMENT INFLUENCING FACTORS

A considerable number of studies have been carried out to examine the factors affecting the development of cross-border e-commerce from the perspective of macro environment and the basic process of realizing CBEC. To sum up the literature, we divide the factors that affect the development of CBEC into three levels: macro, meso and micro (Table 1, 2 and 3). The macro perspective is the main way to analyze the factors at the national level, while mesoscopic views are mainly about business and industry perspectives, and microscopic aspects are

conducted from the viewpoint of consumers, especially some psychological factors. As shown in Table 1, a large amount of studies use PEST framework to analyze the national environment. The research on the mid-point of view is to study the main elements of the development of CBEC, such as cross-border logistics, customs clearance, cross-border payment, international marketing^[15]. At the micro level, trust is the most important research topic, which is also a classic research direction in e-commerce.

Table 1. Factors influencing the development of CBEC in macro perspectives

Author	Research Theme	Influencing Factors to CBEC
Farhoomand et al.	Barriers to GEC	PESTEL
Bingi et al.	GEC challenges	PEST
Javalgi & Ramsey	GEC	Political, legal, commercial, social and cultural, tech infrastructure
Gibbs et al.	GEC diffusion	Global, national environment, national policy
XiaoboXu	EC adoption	Information infrastructure and demographics
Cyr et al.	E-readiness	National cultural values and corruption
Zhu et al.	GEC adoption	Policy, legal, social, cultural environment, GDP per capita
Kshetri et al.	E-retailing	Broadband penetration, retail spending trends, traditional alternatives, economic freedom, GDP per capita, e-retail spending
Liu et al.	CBEC development	System, technology, market environment
Kawa & Zdrenka	Integrator in CBEC	Transportation costs, delivery time & quality, foreign language, payment currency & terms, free trade agreements, returns and standardization
Boyd et al.	Obstacles to international EC	Language, currency differences, customs and inspection fees, customs agreements, access
Kim et al.	CBEC demand	Geographical distance, delivery time and shipping costs, subjective distance, institutional distance
Cho & Lee	Overseas direct purchase	Logistics connectivity, customs efficiency, regulatory quality and globalization

Table 2. Factors influencing the development of CBEC in meso perspectives

Author	Research Theme	Influencing Factors to CBEC
Lewis & Cockrill	E-readiness	Financial resources, staff support and skills
Bingi et al.	GEC challenges	Access to tech, availability of appropriate skills, organizational core competencies, top management commitment
ZHAO et al.	CBEC Capability of manufacturing SMEs	Internet marketing, cross-border logistics, cross-border payments, electronic customs clearance
Gomez-Herrera et al.	CBEC trade flow	Distance, transportation costs, language, borders, legal system or colonial context, quality of governance
Liu et al.	CBEC development	Industry competition and cooperation, cross-border realization of intermediaries, business capabilities
Wang et al.	EC international logistics performance	Laws and regulations, cross-border payments, electronic clearance and technology application level
Deng et al.	Export sales	Firm tenure, product price; product diversity
Ai et al.	Cross-border logistics performance	Cross-border marketing, cross-border payments, customs clearance, laws and regulations

Table 3. Factors influencing the development of CBEC in micro perspectives

Author	Research Theme	Influencing Factors to CBEC
Boyd et al.	Obstacles to international EC	Consumer responsibility impact
Cyr et al.	E-readiness	Trust and website availability
Chen et al.	Customer loyalty in B2B EC	System, information, service, process and collaboration quality

Notes: GEC is on behalf of global e-commerce. PESTEL is on the basis of PEST, plus environmental and legal factors. CBEC is on behalf of cross-border e-commerce. SMEs is on half of small and medium-enterprises.

3. INFLUENCING FACTORS MODEL OF CBEC DEVELOPMENT AND INTERPRETATION

To investigate the factors of cross-border e-commerce development, some existing literatures on the influencing factors of CBEC were reviewed. The main purpose of this paper is to promote the CBEC development in China from the perspective of strategic management. PEST is an effective theoretical framework for strategic management research and a widely-used tool in business strategy analysis, which is suitable for macro-environmental analysis. In order to explore all the members of the cross-border e-commerce industry and its influencing factors, the theoretical model was developed to the PEST framework and e-commerce ecosystem theory in Figure 1 to solve the three research questions mentioned in Section 1.

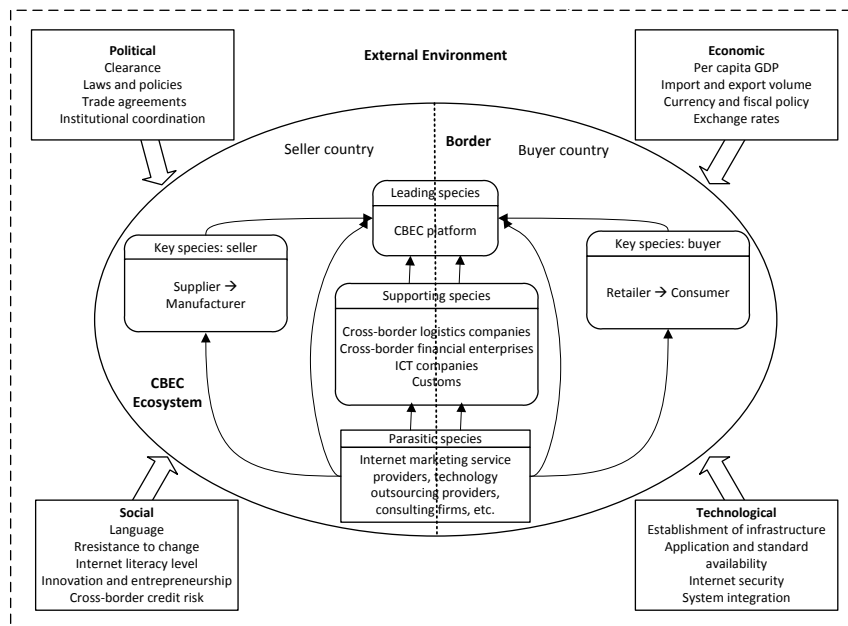


Figure 1. Theoretical model

3.1 CBEC ECOSYSTEM

Cross-border e-commerce is the result of the integration of e-commerce and international trade. Similar to the e-business ecosystem^[6], there are also leading species, key species, supporting species and parasitic species in the CBEC ecosystem.

Leading species of CBEC ecosystem is the CBEC platform that connects the cross-border transactions of key species, provides sellers with a broad market, and buyers with product, payment, and logistics information. It is responsible for the allocation of resources of the entire system and at the core of the ecosystem. It can be B2B, B2C or C2C cross-border e-commerce platforms, such as Amazon, eBay or DHgate, etc. The birth of a CBEC platform marks the advent of a cross-border e-commerce era. The leading species is at the core of the ecosystem, and communicates information among species. Alibaba is a relatively typical example. As Jack Ma, the founder of Alibaba Group, said: "We are not operating a company, but an ecosystem, a new economy that has been built up with new technologies and new ideas and is still growing and evolving by hundreds of millions of consumers, retailers, manufacturers, service providers and investors all over the world."

Key species are companies or individuals involved in cross-border trade through CBEC platforms, i.e. buyers and sellers of cross-border online shopping, such as foreign trade companies and their suppliers, multi-national buyers and consumers, etc. Buyers have demand pulling power and sellers have market driving force. Both of them are the power source for CBEC ecosystem. They demand for lower prices, better services, more products, and more convenient purchases. The key species of CBEC come from domestic e-commerce and international trade, but some of them are not good at CBEC and need extra services for parasitic species and

shopping guidance for leading species. The development of CBEC provides development opportunities for the majority of SMEs, but also provides consumers with more shopping options.

Supporting species are organizations, responsible for realizing logistics and capital flow between buyers and sellers, such as cross-border logistics companies (including international express delivery), cross-border payment companies and customs, etc. Supporting populations existed before the emergence of cross-border e-commerce, but these organizations have evolved in the context of cross-border e-commerce. Cross-border logistics companies actively implement order tracking services. Besides, cross-border payment companies have realized the online flow of funds. And customs is actively implementing electronic customs clearance to achieve trade facilitation. They are crucial to whether cross-border e-commerce can be realized and whether it can be realized quickly, which is an important factor in determining the cross-border shopping experience of consumers.

Parasitic species are organizations that provide comprehensive support and value-added service to other species, such as translation firms, certification bodies, consulting firms, marketing firms and training companies, etc., which can facilitate the implementation of CBEC effectively. Parasitic species exist with the proliferation of other populations, and they are huge in number and variety. The CBEC platform has gathered all kinds of businesses, how to make sellers' products or services stand out among a large number of competitors, how do buyers find their own satisfied products in the vast amount of products and how does the platform expand its influence? They all lead to the emergence of parasitic species. A lot of value-added service providers provide various convenient and efficient third-party services for other species. It enhances consumers' cross-border shopping satisfaction.

Each species has its own specialization and plays an indispensable role in an effective cross-border e-commerce process. At the same time, there are also companies infiltrating each other and invading other species. In the Internet age, "cross-border" competition has become a norm. Any industry is at risk of being eroded or even replaced at any time. An innovation may subvert a whole industry. This potential threat, once translated into reality, means the subversion of the business model and the reshuffling of the market landscape [29]. However, there is no full-fledged leader in CBEC ecosystem at present. Alibaba, Amazon, Paypal and other companies are in full swing to open up the global market. The competition within CBEC ecosystem members still continues. For example, platform companies develop cross-border logistics and payment services, and cross-border logistics companies develop cross-border e-commerce services. Within the species, each company also has its own core competitiveness and can complement each other, but there is more intense peer competition. For example, C2C vertical electricity supplier, Meilishuo and Social electricity provider, Mogujie make a merge. The ecological members of CBEC closely relate to each other, evolve together, compete with each other and promote jointly.

3.2 EXTERNAL ENVIRONMENT OF CBEC

Through the summary of factors affecting CBEC in Section 2 and with reference to the importance order noted by Farhoomand et al. [9] from the technical, economic, political, social aspects, we make a summary about factors determining the development of CBEC, which is the causal condition proposed by Liu et al. [14].

Technically, the influencing factors of CBEC development include the establishment of infrastructure, the availability of applications and standards, Internet security and system integration. The establishment of infrastructure is a vital indicator of e-readiness [2]. The technology advancement of CBEC logistics, payment, information communication and data analysis can greatly improve the speed, safety, effectiveness and convenience of CBEC and indeed reduce a lot of operating costs [27]. Wang et al. [25] believed that the level of electronic clearance and application of technology was a mediating factor affecting the performance of

international logistics. According to the PayPal Cross-Border Consumer Research 2016, free postage and the security of cross-border payment are main factors influencing cross-border online shopping, which shows great importance of cross-border logistics and payment. Trinity of service: information flow, capital flow and logistics, provides great support to cross-border e-commerce development. Nevertheless, different countries have different standards, so it is difficult to integrate the system and quite insufficiency for comprehensive information service platform.

In terms of economy, factors affecting CBEC are GDP per capita, import and export volume, monetary and fiscal policies^[9], and exchange rates^[9]. GDP^[8] and income^[18] are considered to be control variables, and the demographics is always adopted together with GDP and income as GDP per capita^{[6]-[14]}, by which most of economic indicators are measured^{[9]-[7]}. It is generally believed that cross-border e-commerce is a new form of foreign trade transformation and upgrading. It is inferred that import and export volume, monetary and fiscal policies and exchange rates, which are the most important indicators in international trade, will also affect CBEC development. In the previous work, Farhoomand et al.^[9] noted the impact of monetary, fiscal policies and exchange rates on the development of cross-border e-commerce.

Politically, the factors influencing the development of CBEC include customs clearance, laws and policies, trade agreements and institutional coordination. Customs clearance is a critical part of the basic flow of CBEC. Its process and technology absolutely influence the speed of customs clearance and ultimately affect the realization of cross-border logistics^[27]. Zhao & Yang^[19] believed that electronic customs clearance was an essential factor influencing the CBEC capability of small and medium-sized manufacturing enterprises. Laws and policies have always been influential factors in macro environment analysis, and a major measurement for e-readiness and e-commerce development^[2]. According to laws and policies, Customs, Industry and Commerce, Tax and other departments carry out CBEC regulatory activities to maintain interests of market participants and promote the development of CBEC^[25]. Directly or indirectly, laws and policies affect CBEC logistics, payment, customs clearance and other activities in CBEC. Institutional theory^[18] and two market theories give full consideration to the institutional distance between two countries and legal differences between online and offline transactions, which can greatly affect the development of CBEC^{[25]-[28]}. Further, Zhu et al.^[12] studied specific indicators to measure the policy environment^[10] and the legal environment. Government preferential policy is the facilitating factor for the development of CBEC. Chen et al.^[1] also studied the supportive policies of the government, and found that as a business innovation, CBEC played an intermediary role among supporting innovation policies and business performance, especially its institutional innovation and business model innovation. The trade agreement, mainly concerned with tariffs and legal issues, is a factor to be considered in traditional international trade and also an essential element affecting the development of CBEC^[16]. Institutional coordination^[4], involving the law^{[12]-[27]}, taxation, regulation and other aspects, is not only about the coordination within the country itself, but also about the coordination among the same agencies in different countries.

Socially speaking, influencing factors include language, resistance to changes, Internet literacy level, innovation and entrepreneurship and cross-border credit risk. Linguistic differences are considered to be great obstacles to the development of CBEC^{[9]-[6]-[12]-[28]}. Countries that use English as their language have an enormous advantage in this respect, and four-fifths of Hong Kong respondents in an interview conducted by Farhoomand et al.^[9] supposed that boycotting changes is one of the most powerful obstacles to global economic cooperation. Furthermore, Gomez-Herrera et al.^[24] found that the impact of language are significant in their research. The level of Internet literacy is represented by literacy levels, IT skills levels and education levels^{[6]-[8]}. The country's attitude towards innovation and entrepreneurship affect the development of CBEC^[12], and innovation and entrepreneurship are relevant to the performance of CBEC enterprises^[1]. Cross-border credit

risk^[11] exists in traditional international trade, but in the context of CBEC, cheating costs are so lower that the credit risk could be greater. Cultural factors such as language difference, resistance to changes and cross-border credit risk can be recognized as huge obstacles or impediments to the development of CBEC.

4. CONCLUSIONS

In this paper, after analyzing the cross-border e-commerce ecosystem, and expounding in detail the external environment such as politics, economy, culture and technology that affect the development of CBEC, we propose a model of influencing factors of cross-border e-commerce. Through promoting factors such as preferential policies and other promotional efforts to push the development of cross-border e-commerce, and striving to overcome such obstacles as language, resistance to changes and cross-border credit risk, we strongly advise as many government departments as possible to make joint effort to change the external environment. It does good to attract new or former marginal business ecosystem members^[4].

This paper does not validate the model. In the future research, we recommend that researchers could consider conducting quantitative research to explore the dimensions raised in the model. We feel that the available methods are econometric models, multivariate statistical models or structural equation models. Empirical research on influencing factors is of great value to the development of CBEC for both theoretical research and social practice.

Future work can also take a comparative study of multiple markets to understand the role of cultural differences in the development of cross-border e-commerce. Most studies on the development of CBEC in China are limited to the domestic scope and lack of research across multiple countries.

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