Empirical Analysis of E-business Credit Assessment from the Perspective of Cross-border Negotiation

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Abstract
In recent years, the rapid development of electronic commerce in China, to many industries brought great impact and influence, forcing them to constantly upgrade. This paper makes an empirical analysis of E-business credit assessment from the perspective of cross-border negotiation. By selecting the reasonable index, we set up index system of credit evaluation, determined the weight of each index refer to the relevant credit standards, and then using fuzzy comprehensive evaluation method to build credit evaluation model. Credit evaluation system is an indispensable part in cross-border e-commerce; its construction can reduce transaction risk, improve the efficiency of the transaction, and bring great benefits for the sustainable development of cross-border E-commerce.

Keywords: E-business credit, Evaluation model, Big data, Bonded export

1. INTRODUCTION

In recent years, with the rapid development of cross-border e-commerce in China, the B2B, B2C export transactions accounting for about 90% of the dominant position. Cross-border electronic commerce export enterprises as the main body, affected by cross-border electronic commerce network virtual and open, more extreme in the information asymmetry problem under the environment of facing more uncertainty, which led to a series of credit problems, limiting the further improvement of cross-border electronic commerce credit system (Dariusz, 2015; Abreu, 2015). And credit evaluation system as an important part of the credit system, to the cross-border export enterprises as the main body to build the evaluation system is very necessary (Jamaluddin, 2013). The study will be a breakthrough in the development of cross-border e-commerce, reflecting the research with the foundation and realistic. Cross-border e-commerce is extension of the domestic electronic commerce in time and space, the transaction subject to expand to different countries and regions, trading platform for electronic business, payment and settlement, and the international activities in the cross-border logistics support (Mesut, 2014; Lei, 2015). In this context, cross-border e-commerce has a variety of features; the most significant is its global, virtual, timeliness and rapid evolution. In recent years, the rapid development of electronic commerce in China, to many industries brought great impact and influence, forcing them to constantly upgrade. Following the B2B cross-border e-commerce boom, foreign trade B2C quickly shouted as the bright younger generation. This cross-border e-commerce business in the sale of goods to the global market, make links from the original 28 has been reduced to 8 now, greatly simplifies the whole process, make a difference in the way my old trade, optimize, and further promote China's foreign trade transformation and upgrading.

At present, China's cross-border e-commerce is in a new stage of development, the total size of a breakthrough, and gradually from the "quantity" to the development of the "quality" of the development. But in general it is still in the primary stage, in the process of sustainable development, there are still many constraints. As is known to all, is different from the traditional business activities, cross-border electronic commerce is a new business model, it is based on network virtual and open, often accompanied by large participants in the credit, uncertainty, hindering its development. In the whole process of cross-border e-commerce transactions, in addition to face the problem of cross-border logistics, customs and the payment of foreign exchange risk, fraud, false trading, sell fake and inferior commodities etc. behavior is endless, increasing the risk of cross-border e-commerce transactions, the credit problem is to restrict the industry to move forward is one of the important factors (Nicole, 2001; Mesut, 2011). And in the practice of cross-border electronic commerce, because of different national or regional laws and regulations and policies related to, or there are different, credit standards not yet unified, resulting in the credit management system of all countries are mutually separated, it is difficult to play a due role in the field. In addition, the credit system construction and management are more perfect in Europe and the United States and other countries, China's credit management system is far behind. At the same time, in our country the current cross-border e-commerce transactions mainly in foreign sales of export enterprises mainly, and these enterprises are often faced with a series of credit problems, lack of perfect e-commerce credit management system, foreign enterprise credit consciousness is weak, the credit is not standardized, social credit intermediary services backward and lack of effective legal safeguard mechanism of rewards and punishments, and the consequences caused by the problems mentioned above is the enterprise cannot well adapt to the current complex cross-border trading environment, there are many risk development
process. Observation of the domestic cross-border electronic business platform and pilot industrial park, in terms of credit construction related to the credit rating of this content is still in the blank. Credit evaluation system as cross-border e-commerce credit system construction of the indispensable part of, its construction can reduce transaction risk, improve the efficiency of the transaction, for the sustainable development of China's cross-border e-commerce bring great benefits.

Figure 1. China's cross-border business transactions

2. CROSS BORDER E-COMMERCE

2.1. Cross-border e-commerce legislation

National Development and Reform Commission, the Ministry of Commerce, the General Administration of customs, the people's Bank and other departments to actively develop a series of laws and regulations and policies on cross-border e-commerce related issues. Although there is no special laws and regulations to regulate e-commerce and cross-border e-commerce transactions in the credit issues, but a lot of laws and regulations are included in this regard. With the continuous advancement of these legislative procedures, the development of cross-border e-commerce credit has played a certain role in the protection, providing a good environment. Specifically, for credit issues related to the relevant laws and regulations are summarized as follows:

1) December 13, 2007, the Ministry of Commerce released the Ministry of Commerce on promoting the views of the specification and development of e-commerce ”, is committed to promote the healthy development of online trading norms, strengthen the standardization of online transactions, reduce transaction risk.

2) June 24, 2010, the Ministry of Commerce promulgated the “guidelines on promoting the healthy development of online shopping”, regulate the trading environment, trading main body, trading behavior and so on;

3) September 15, 2010, the people's Bank of China issued the "rules for the implementation of the pilot management measures for the RMB settlement of cross-border trade transactions", and is committed to promoting the development of cross-border e-commerce;

4) June 1, 2012, the State Administration for Industry and Commerce issued the "online commodity trading and service regulation", involving consumers, operators, service providers, trading platforms and other main body;

5) February 17, 2013, the State Administration of foreign exchange promulgated the "Payment institutions cross-border e-commerce foreign exchange payment business pilot guidance”;

6) August 29, 2013, Ministry of Commerce, the national development and Reform Commission and other nine ministries promulgated the "support on the implementation of the views of the relevant policies on cross-border e-commerce retail outlet, and the problems occurred in the development of cross-border e-commerce put forward six measures, and put forward some suggestions to the establishment of e-commerce export credit system. The purpose is to improve the credit system and the market order.

7) 2013, the Ministry of Commerce promulgated the "opinions on promoting the implementation of e-commerce applications", referred to the need to accelerate cross-border e-commerce logistics, payment, supervision, integrity and other supporting system;

8) General Administration of Customs on September 2015 released the "provisions on strengthen cross-border electronic commerce purchase of imported bonded supervision function, non-pilot cities cross-border trade e-commerce services shall carry out shopping bonded import business. Currently imported kind of cross-border electricity supplier for the parcel tax rate is far lower than the general cargo trade integrated rate and also has a certain cost advantage in procurement and logistics, so compared to the general trade in goods in favorable competitive position.
The development of electronic commerce has promoted the legislation of Internet trade, and the emergence and growth of cross-border e-commerce has led to the increase of cross-border trade legislation. Although our country related cross-border e-commerce laws and regulations are still relatively few in number, but the domestic electronic commerce legislation relatively has become mature, these laws and regulations related to cross-border e-commerce, including the standardized management of network and information security, logistics, online transactions and electronic payment, prompting the standardization of transactions. Cross-border e-commerce as an important branch of e-commerce and an extension of the domestic and constantly improve the legal environment from different aspects of the credit settlement and credit evaluation system to provide a guarantee.

2.2. New opportunities for development

From the domestic point of view, in recent years China's foreign import and export trade volume has been showing a growing trend, cross-border e-commerce as an important part of China's foreign trade, the proportion increased year by year, the influence is expanding. In China's foreign trade growth rate of decline in the situation, cross-border e-commerce transactions are showing rapid growth trend.

From abroad, in 2014 PayPal and Nelson report data show that the United States in 2014 the world's total cross-border online shopping in the total amount of consumption in the first place, followed by the United Kingdom and Germany. And according to the forecast, future 5 years the fastest cross-border online shopping consumption growth of gross national top three are Brazil, Australia and the United Kingdom, of which Brazil will at an average annual growth rate of 45% exclusive turtle head. In addition, from 2015 to 2018, the European e-commerce growth alarming, maintained at more than two digits, while the growth rate of cross-border e-commerce is to reach 21%, much higher than the average speed.

On the other hand, foreign enterprises and individual consumers of China's cross-border e-commerce output of product demand is very large. 34.1 million American consumers of cross-border online shopping goods from China in 2015, the total transaction E to the 497 billion yuan, in the first row; the second and third respectively in the UK and Australia, according to Nielsen report, 2015, their consumption 74 billion RMB and 52 billion yuan. The report predicts that by 2018 the U.S. consumer demand for Chinese goods will be doubled,
through cross-border e-commerce transactions will increase to 98 billion 100 million yuan, still occupy the first place. In addition, the report is also expected to 2018, Brazil consumers will become an important participant in the cross-border e-commerce transactions in China, the total cross-border transactions will increase to 11 billion 400 million yuan, an increase of nearly 7 times.

Under the favorable domestic and international economic situation, the scale of cross-border e-commerce transactions in China is expanding, and the future demand will increase. The master discourse right, China is bound to pay more attention to how to regulate the cross-border electronic commerce development the strict slope, especially credit norms, otherwise it is easy to lose the advantages and was to catch up to other countries. In the construction of cross-border e-commerce credit system, the core part is to establish a sound credit evaluation system, the current point of view, a good economic situation to provide an opportunity for its construction.

3. CONSTRUCTION OF CROSS-BORDER E-COMMERCE CREDIT EVALUATION SYSTEM

3.1. Cross border e-commerce technology support

Various aspects of cross-border e-commerce cannot be separated from the technology, to further solve the credit problems, to regulate their development, and to establish a more perfect credit evaluation system is to need a good technical environment. Based on the characteristics of cross-border e-commerce development in China and the development of related technologies, the technical support for the construction of the credit evaluation system is analyzed from three aspects.

- **Big data technology**: In cross-border electronic commerce transactions, tend to produce large amounts of data, and the data type is very much, relates to the commodity information, transaction information, distribution of information and so on, if the information used for analysis, you can create valuable information, including in transactions, transactions and transactions after the credit information. Massive information processing is not easy, but rely on big data can be successfully completed. In recent years, with the rapid development of China's Internet banking, big data more and more people are familiar with, and gradually applied in the credit system, which will provide great convenience for the establishment of cross-border e-commerce credit evaluation database.

- **Platform technology**: Cross border e-commerce in China mainly rely on several major platforms, the rapid growth of the number of cross-border business and a sharp increase in the volume of transactions, to bring a certain amount of pressure on the platform. Therefore, like Alibaba platform are in continuous technological upgrading, strengthen network security, in a certain extent reduces the probability of occurrence of cross-border e-commerce credit problems, and improve the cross-border e-commerce credit transactions.

- **Authentication technology**: Such as China Telecom CA security authentication system, China Financial Certification Center for e-commerce enterprises to provide enterprise certification, server certificate, etc., to improve the credit and recognition of these enterprises. At the same time in cross-border payments, the third party certification payment technology has also played an important role, greatly improving the trust of foreign customers on the cross-border electricity suppliers in china. In 2013, Alipay, caifutong and other 17 third party payment companies won the first cross-border e-commerce foreign exchange payment business pilot qualifications, provides convenience for cross-border transactions in payment, payment and other aspects to improve cross-border e-commerce enterprises in China's credit.

Domestic e-commerce has experienced many years of development, has become increasingly mature. At the same time, in this process also gradually explore the establishment of a set of credit evaluation system, the formation of the corresponding level of development of the standard. Observe the domestic e-commerce credit evaluation system, found that it is mainly concentrated in this type of C2C, with Taobao network as the representative, while other types are relatively small. And in general there are some obvious defects, mainly for several aspects: transaction evaluation cannot guarantee the authenticity; credit rating and credit index system is not comprehensive enough, too simple; single credit evaluation model; weight caused by an irrational unilateral factors to the letter with the evaluation effect; does not take into account the seller initial credit problems and so on.

<table>
<thead>
<tr>
<th><strong>Table 1 Credit evaluation system</strong></th>
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<tbody>
<tr>
<td><strong>System constitution</strong></td>
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<td><strong>Credit evaluation</strong></td>
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<td><strong>Store score</strong></td>
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3.2. Credit evaluation system construction

Credit evaluation system is an organic whole formed by a series of and risk evaluation of the evaluation system, evaluation index system, evaluation methods and evaluation standards, including the six aspects of credit evaluation elements and index, grade, standard, method and weight. Specific to the cross-border e-commerce, credit evaluation system is refers to under the supervision and management of the management platform, after the completion of the transaction in a certain period, foreign traders to the transaction and other information considered, evaluated, also credit evaluation database were also collected information related to other aspects of cross-border e-commerce enterprises, will be all of the above information feedback to the information processing center. Information processing center is in some way will be transformed as the index, the analysis processing conversion of enterprises (the seller) the comprehensive credit score, the score to reflect the credit status, and other outside of the user's transaction to provide reference.

In cross-border e-commerce transactions, the purchase behavior of overseas customers on cross-border e-commerce platform is affected by many factors. Using the theory of reasoned action point of view to explain, that is, the buyer in the implementation of the purchase behavior of this, one of the prerequisite for the behavior is to the seller credit evaluation, which is to judge the seller is reliable, integrity, but also including such as cross-border trading environment, transaction security for judgment. And in factors all influence buyer attitudes, including their subjective feeling and environment, and give the objective impression, cross-border electronic commerce enterprise in every time after the transaction obtained dynamic credit evaluation and enterprise credit record originally is for them is of great reference value,. In the great frictional will affect their behavior. These two categories of indicators can be used as a benchmark for offshore buyers, the seller's credit, including products, services, logistics, and other information to help. Based on this information, the buyer will have their own evaluation of the credit of the seller, to form their own attitude, such as "to buy the product of this enterprise is a wise / foolish idea". Furthermore, another prerequisite is subjective norm, in reference to the
above information, by others to buy or not to buy the behavior, the impact of the own decision-making behavior, can act as "can affect behavior I people think I should make the decision" and so on. Generally speaking, the theory of rational behavior can be explained as the foreign buyer through the dynamic credit evaluation of the seller and the seller's previous credit records to judge, and then make some kind of behavior. No doubt, these two aspects of information is an important factor in the impact of cross-border e-commerce credit evaluation system, is indispensable, helping to improve the foreign buyer to seller trust, prompting more potential customers actual purchase behavior.

4. EMPIRICAL ANALYSIS

4.1. Index selection

First of all, as a business, production and business activities are the survival of the. When it is in the market economy, it is all kinds of economic relations to maintain its development. And all kinds of economic relations is essentially a credit relationship, one of the prerequisites is to have a clear subject, that is, to allow the transaction to clearly understand the object of the transaction. A formal legal business, in addition to providing basic information, but also must take into account both internal and external. To pay attention to the management of internal and external attention to market conditions. Under these conditions are met, only to show that the company has with others to establish a credit relationship between the primary qualification, and the credit status of exactly how we don't know and need to do further understanding of analysis in other ways. And because the business is engaged in cross-border e-commerce transactions, so the business situation must include cross-border e-commerce related content, in order to determine the cross-border e-commerce as a judge of the credit index. Secondly, the three major rating agencies in the world and China's credit rating agencies to carry out the work of rating, the understanding and evaluation of the credit status of the enterprise, mainly through the analysis of its financial condition, it can be said that, the financial condition is the soul of the business activities of enterprises and related enterprises can normal, sustainable operation continues. And the integration of multi-disciplinary knowledge, rating agencies in the selection of indicators tend to profitability, operating capacity, solvency and development capabilities and other indicators. Its solvency, for example, according to the Global Credit Rating principle, the economic base will affect the enterprise's debt paying ability, and economic foundation is a social relation of credit, so in the final analysis, affect the credit debt paying ability, and the level of debt paying ability and reflects the credit is good or bad.

The dynamic credit status of cross-border transactions is mainly divided into cross-border trading information indicators, cross-border service quality indicators and cross-border transaction security indicators. It refers to in the transaction process products, contracts and transaction information, including kinds of products, certification, price and quantity, the amount of contract, breach of the terms of the cross-border transaction information index, trading mode, frequency, success rate, cumulative amount, new customer growth rate and old customers back rate, and other factors. These factors in a dynamic way to present the situation of cross-border transactions of enterprises, is conducive to the timely detection of trading credit problems. Cross border service quality indicators in the transaction process is to provide a variety of services to the buyer, online services, including web site communication, complaint handling, etc., the line services include logistics and insurance services, etc.. Specifically, subdivision to reply to a customer's time, the use of language, order processing time, order fulfillment, the number of complaints, complaints handling time of complaint, the processing results, logistics distribution, logistics company, order tracking, cross-border insurance service provider, returned goods compensation measures and damage / loss compensation method of a number of indicators, to reflect the cross-border e-commerce enterprises in the services reflect the credit. Cross border transaction security indicators related to information security and payment security two aspects of information. Reflect information security index cross-border trading platform of information security, for user privacy policy and user information leakage and payment security index is payment technology, cross-border payments service providers and the payment of technical support.

4.2. Credit evaluation model

The basic idea of the fuzzy comprehensive evaluation method is to use the degree to replace or does not belong to, the concept of fuzzy qualitative to be quantified. The first step is to determine the object to be evaluated indicators (factors) collection evaluation set; the second step is a key step, need to determine the weight of each factor and their membership. On the basis of the obtained fuzzy judgment matrix, the fuzzy evaluation matrix and factor weight vector of fuzzy arithmetic and normalization, fuzzy comprehensive evaluation results are obtained. In addition, the fuzzy comprehensive evaluation method has a notable feature: each index is evaluated one by one, so that it can get a value, and this value is unique, not affected by the collection of the object.

First, to cross-border e-commerce credit evaluation index system as the foundation, indexes can be divided into four categories, namely cross-border operation parameters (a), cross-border trading dynamic credit index
(b), financial information index (c) and the former credit index (d). According to the multiple evaluation indexes, we need to construct the judgment matrix according to the relationship between the lower and the upper layer, and the value of the matrix element reflects the subjective judgment of the relative importance of each element.

\[
\begin{pmatrix}
X_1 & X_{11} & X_{12} & \cdots & X_{1n} \\
X_2 & X_{21} & X_{22} & \cdots & X_{2n} \\
\vdots & \vdots & \vdots & \ddots & \vdots \\
X_m & X_{m1} & X_{m2} & \cdots & X_{mn}
\end{pmatrix}
\]  

(1)

We take the case of cross-border operations, for example, to obtain the A1, A2, A3 each of the weights, the need to build a judgment matrix, specific as follows:

\[
S = \begin{pmatrix}
A & A_1 & A_2 & A_3 \\
A_1 & 1 & 1/a & 1/b \\
A_2 & a & 1 & 1/c \\
A_3 & b & c & 1
\end{pmatrix}
\]  

(2)

Where a is the ratio of importance between internal management and enterprise based in each case, is a cross-border market situation and enterprise based touch the ratio of importance between both, C is the ratio of importance between cross-border market conditions and internal management status both. According to the judgment matrix, we can use the method to solve the weight coefficient of each index. According to the judgment matrix, we can use the method to solve the weight coefficient of each index.

1. Calculate the product of each element of the N in the S root mean square.

\[
\bar{z}_i = n \sqrt[n]{\prod_{j=1}^{n} \alpha_{ij}}
\]  

(3)

2. Carry on the standardized processing \(\bar{z} = \left[ \frac{1}{\bar{z}_1}, \frac{1}{\bar{z}_2}, \ldots, \frac{1}{\bar{z}_n} \right]^T\)

3. In order to make the result more reliable and accurate, need to determine the consistency of the matrix test, this time need to calculate the consistency index

\[
CI = \frac{\lambda_{\text{max}} - n}{n - 1}
\]  

(4)

4. Finally calculate the consistency ratio RI, CR is the average random consistency index. When CR is less than 0.10, it shows that the results obtained by using the above mentioned method are consistent with the result that the weight coefficient is reasonable. If otherwise, you also need to constantly adjust the judgment moment, until the CR is less than 0.10.

4.3. Cross border e-commerce credit evaluation

To construct a fuzzy comprehensive evaluation model for all levels. At the same time, by the third grade indexes of fuzzy matrix to calculate, by us at the level of analysis method of weight (i.e. percentage in the corresponding indicators at the second level for all three indicators), the third grade indexes of fuzzy matrix multiplication and can get secondary indexes on the evaluation set V of the membership.

\[
R_A = \begin{pmatrix}
Q_1 \\
Q_2 \\
Q_3
\end{pmatrix}
\]  

(5)

In the same way, we can get the degree of membership of the first level index layer on the evaluation level set V again by the method mentioned above:

\[
E_A = \left( e_{A1}, e_{A2}, \ldots, e_{A9} \right)
\]  

(6)

Construction of cross-border e-commerce credit evaluation model, in the analysis and calculation, we only get the indicators of cross-border e-commerce credit level of membership, but did not know the proportion of their respective. Therefore, the four indicators of the credit rating of the weight vector:

\[
Z = \left( z_A, z_B, z_C, z_D \right)
\]  

(7)

And the weight coefficient of the sum is 1. The final evaluation result can be obtained by multiplying the weight and the corresponding index membership degree:
\[ \bar{W} = (\bar{e}_1, \bar{e}_2, \cdots, \bar{e}_9) \]  

For the evaluation set \( V \), because we use the method of three and nine, different levels respectively correspond to the different score, based on the principle of reasonable and simple, we adopt every level of the average value to aid construction of cross-border e-commerce credit evaluation model, comprehensive scoring. The average scores of the 9 levels were 95, 85, 75, 65, 55, 45, 35, 25, 10, respectively. Combined with the above analysis, we finally get a credit evaluation model based on fuzzy comprehensive evaluation theory.

### Table 2: Electronic commerce enterprise credit grade

<table>
<thead>
<tr>
<th>credit rating</th>
<th>Fractional interval</th>
<th>Credit status</th>
<th>Meaning</th>
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</thead>
<tbody>
<tr>
<td>AAA</td>
<td>91-100</td>
<td>Excellent credit</td>
<td>High credit</td>
</tr>
<tr>
<td>AA</td>
<td>81-90</td>
<td>Credit advantage</td>
<td>High credit</td>
</tr>
<tr>
<td>A</td>
<td>71-80</td>
<td>Good credit</td>
<td>Good credit</td>
</tr>
<tr>
<td>BBB</td>
<td>61-70</td>
<td>General credit</td>
<td>General credit</td>
</tr>
<tr>
<td>BB</td>
<td>51-60</td>
<td>Poor credit</td>
<td>Poor credit</td>
</tr>
<tr>
<td>B</td>
<td>41-50</td>
<td>Poor credit</td>
<td>Poor credit</td>
</tr>
<tr>
<td>CCC</td>
<td>31-40</td>
<td>Credit is bad</td>
<td>Poor credit</td>
</tr>
<tr>
<td>CC</td>
<td>21-30</td>
<td>Bad credit</td>
<td>Bad credit</td>
</tr>
<tr>
<td>C</td>
<td>0-20</td>
<td>No credit</td>
<td>No credit</td>
</tr>
</tbody>
</table>

### 5. CONCLUSIONS

Credit problem is chronic and stubborn cross-border electronic commerce and has not yet established a complete credit evaluation system to regulate its development. The analysis based on China's cross-border e-commerce credit evaluation of the status quo, according to the relevant principles of economics to guide the selection of Credit Metrics and in accordance with the requirements of the credit evaluation system of the six part, selecting the reasonable index, setting up index system, refer to the relevant credit standards determined the weight of each index, using fuzzy comprehensive evaluation method to build credit evaluation model. For cross-border e-commerce credit evaluation system for the core part of one credit evaluation index system and the credit evaluation model of two parts content, detailed analysis and research, focuses on the index and the model construction process, further understanding and understanding cross-border e-commerce credit evaluation system, and plays a role in the improvement of. At the same time, this paper in the construction of cross-border e-commerce credit evaluation system in the process of discovery when it comes to on the basis of this factor of cross-border, the credit evaluation system of construction is more and more complex and difficult, especially in the domestic credit environment, credit rating services, national or regional differentiation, and information flow.

### REFERENCES


