

Retraction

Retracted: Analysis of Multiple Linear Regression Algorithm for High Quality Development Factors of Cross-Border E-Commerce

Journal of Sensors

Received 19 December 2023; Accepted 19 December 2023; Published 20 December 2023

Copyright © 2023 Journal of Sensors. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Manipulated or compromised peer review

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] H. Fang, "Analysis of Multiple Linear Regression Algorithm for High Quality Development Factors of Cross-Border E-Commerce," *Journal of Sensors*, vol. 2022, Article ID 4020607, 11 pages, 2022.

Research Article

Analysis of Multiple Linear Regression Algorithm for High Quality Development Factors of Cross-Border E-Commerce

Haojun Fang 

Wuxi Vocational College of Science and Technology, Wuxi 214028, China

Correspondence should be addressed to Haojun Fang; fhj@wxsc.edu.cn

Received 19 August 2022; Accepted 16 September 2022; Published 29 September 2022

Academic Editor: Yaxiang Fan

Copyright © 2022 Haojun Fang. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

With the in-depth development of Internet technology as well as information technology, the continuous popularization of computers in China, and the increasingly obvious economic globalization, the world's economies are becoming more and more closely connected. Cross-border e-commerce has been developed better. In China, with the deep and continuous development of China's reform and opening up, as well as the continuous improvement of our country's science and technology level, the continuous improvement of people's living standards and the internationalization of our country's enterprises are getting stronger. E-commerce in China has also been developed significantly. According to the statistics of China's National Bureau of Statistics and relevant scientific research institutions, since China entered the modernization, China's cross-border e-commerce are multiplying the high-speed growth state, especially after China's entry into the WTO, China's cross-border e-commerce business is growing rapidly, in the process of China's cross-border e-commerce development, compared with imports, exports are taking the absolute dominant position. Therefore, the quality of goods in China, the implementation of standards and related laws and regulations and policies, then become a relatively core part of cross-border e-commerce. Among all the core parts, the quality of goods is undoubtedly the most core part. Under the supervision of our national departments and law-making and other factors, the regulator of the e-commerce platform is the main body of commodity quality supervision. Therefore, the managers of e-commerce platforms are of vital importance to promote the development of e-commerce platforms. In this paper, in line with the principle of promoting the high-quality development of cross-border e-commerce in the prospect of high-quality development of China's e-commerce platform, a series of multivariate linear models on the development of e-commerce platform carry out the analysis of China's high-quality development of e-commerce. The main body of China's e-commerce, the country, as well as consumers, producers, and other optimization analysis is from the overall analysis of China's e-commerce platform development status. The current problems of China's e-commerce platform, according to this to carry out the overall planning, put forward the countermeasure suggestions studied in this paper.

1. Introduction

In the process of this paper, we find that Hong Kong's cross-border e-commerce has developed unexpectedly well under this epidemic and the current situation of reverse globalization in the United States. It may be because of his own resilience and potential, as well as the strong support from our inland, that Hong Kong's cross-border e-commerce has such a superior development path. But after the current epidemic since 2020, the transaction scale of China's cross-border e-commerce has shrunk to a great extent than before the epidemic. Now, China's cross-border e-commerce is facing various difficulties such as high competitive pressure as well

as weak awareness of rules, weak legal awareness, and related, for example, stricter regulatory measures on Amazon platform, and even higher logistics costs in China [1]. Since the outbreak of the new crown epidemic, global trade has shrunk to a great extent, and although logistics has also been affected to a certain extent, it is just such an epidemic that brings great prospects for the development of cross-border e-commerce [2]. According to the National Bureau of Statistics as well as the Ministry of Commerce, in the first year of the epidemic outbreak in China, the scale of cross-border e-commerce in China was surprisingly high at US\$10 trillion, which increased by more than 10% [3]. Only in the first half of the first year of the outbreak, the

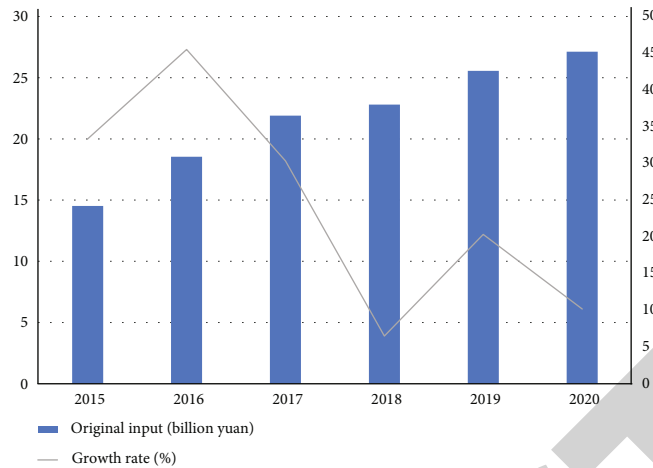


FIGURE 1: China's investment in the construction of cross-border e-commerce information.

scale of cross-border e-commerce in China has exceeded 5 trillion, which is far higher than the predicted level of the relevant departments in China [4]. During our next five-year planning process, China decided to set the scale of cross-border e-commerce at over \$20 trillion. This target is due to the continuous technological progress, the continuous improvement of legal norms, and the continuous improvement of production capacity in our country, which is the confidence in our overall great power advantage. Of course, in my current country has had a long development, and our country's technology level has been higher, networked. The level is also higher, the level of modernization is higher, and our legal system is more robust, so we have an increasing advantage. But with the outbreak of the epidemic, our country has entered the postepidemic era. In this era, we have to focus on improving the level of offline real economy, so there is another negative impact on the development of cross-border e-commerce. Therefore, we have to further improve the level of seniority and further study the double-loop strategy to improve our foreign trade [5]. China has invested in the construction of cross-border e-commerce information, as shown in Figure 1.

2. Research Background

After China entered the epidemic period, the development of China's cross-border e-commerce is not because the global market demand is relatively large, but still because of the strong support of China's policy, not only the industrial chain, supply chain stability policy, but also includes China's double-cycle strategy, all of which provide strong policy support for the further development of China's cross-border point on [6]. Under the epidemic, China's State Council led the Ministry of Commerce as well as the Customs Department and other joint departments to issue a series of relevant documents and preferential policies to reduce the logistics costs, tax costs, and other transportation costs of China's cross-border e-commerce, providing long-term support for the development of China's cross-border e-commerce. China has also established more than one

hundred business free trade zones to carry out commercial trade to promote the further development of cross-border e-commerce as a way to drive the local economy and expand the international market for China's cross-border e-commerce [7]. Of course, after the introduction of some relevant policies in China, all kinds of e-commerce platforms also gradually sum up their advantages to continuously adapt to the current policy and provide a higher level of platform. Based on the policies of 9610 and 1210 in China, the relevant cross-border e-commerce operation models of 9710 and 9810 have been added [8].

Under the influence of the epidemic, the habits of the vast majority of the population have undergone significant changes. With the advent of the epidemic era, people began to seek high-quality products and higher brand requirements. During the epidemic, Chinese sellers mostly dominated the market for cross-border e-commerce services in terms of delivery and low prices. However, with more and more competitors entering the industry, sellers no longer have an advantage in the distribution model, and those using the branded sperm line have a better advantage. Anchor has aggressively rebranded itself to quickly capture the leading market share in the Amazon region. The annual revenue growth rate exceeds 30%, creating a tremendous growth opportunity [9]. In 2021, the Amazon platform provides great help to merchants in brand building and helps them to establish their brands quickly. In its annual report for 2021, it released a report on sellers. The report found that more than 90 percent of Chinese sellers are interested in building their brands on Amazon, and more than three-quarters are confident and experienced in building their brands on Amazon. According to an Amazon study, many new brands and new users come to Amazon each year, but many also go out [10]. Many salespeople struggle to survive in the process of building their brands. This shows that brand building has a huge advantage for multinational companies in the postepidemic era. Chinese sellers with quality products and services will have more incentive to grow if they seize the opportunity of branding [11].

The 2019 coronavirus epidemic has led to economic stagnation overseas and a lack of demand in overseas

markets. China is the first country to enter the postepidemic era with rapid growth of multinational e-commerce companies. However, due to the epidemic, transportation time was long, logistics were congested, and logistics were difficult and slow. As a result, the delivery period of many goods has been extended [12]. Considering the current logistical challenges, the establishment of offshore warehousing has become a growth opportunity for many Chinese sellers. Setting up offshore warehousing means establishing warehouses in the destination country to solve the problem of long and timely delivery and warehousing for the first and last shipments. Setting up a foreign-owned warehouse locally also keeps up with local developments and is beneficial to the long-term development of the company. The Fourteenth Five-Year Plan for E-Commerce Development (National Policy 2021) calls for openness and win-win cooperation to support the construction of overseas warehouses. However, the cost of setting up warehouses overseas is huge, and it is difficult for small and medium-sized companies to reach this goal. Currently, companies can jointly set up overseas warehouses to jointly solve the current logistical warehousing problem and seize the opportunity to achieve more effective development together [13].

This policy aims to facilitate the development of cross-border e-commerce. In the past, Chinese cross-border electrical companies relied too much on third-party platforms. However, more and more companies are starting to operate independently from third-party platforms. Many companies have started to develop independent websites, social media, real-time transactions, and other sales channels. Independent websites have become an alternative to the new trend for many companies [14]. Establishing an independent e-commerce website can avoid the many rules of the platform, facilitate brand building and customer care, and contribute to the long-term stability of the company. Currently, more and more multinational e-commerce companies are in the stage of exploring independent websites. In the postepidemic period, new trends in cross-border e-commerce development include the establishment of independent e-commerce websites, the development of private mobility models, and multiplatform behavioral models [15]. China's cross-border e-commerce transaction volume and growth rate from 2015 to 2020 are as shown in Figure 2.

3. Materials and Methods

3.1. Basic Theory

3.1.1. Cross-Border E-Commerce. Cross-border e-commerce, as the name implies, is a business model based on electronic information technology and Internet technology formed on the basis of cross-border borders. The online business mode within a country or a region is called e-commerce, so it gives rise to the concept of cross-border e-commerce in the cross-region or cross-country e-commerce operation mode. Cross-border e-commerce has advantages over traditional cross-border trade as well as traditional e-commerce that other business modes do not have. First of all, it is established under the background of global economic globalization,

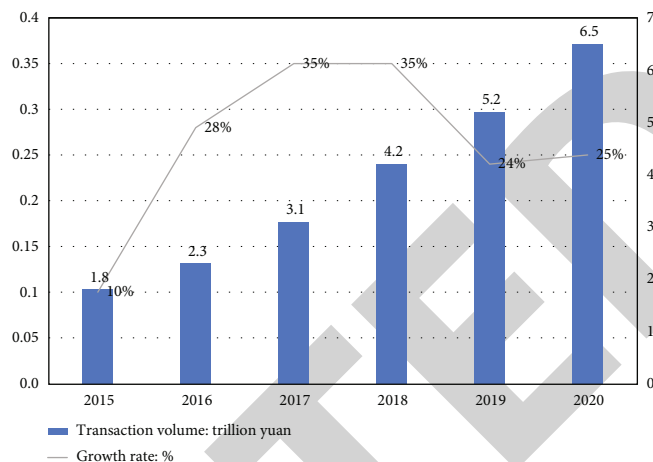


FIGURE 2: China's cross-border e-commerce transaction volume and growth rate 2015-2020.

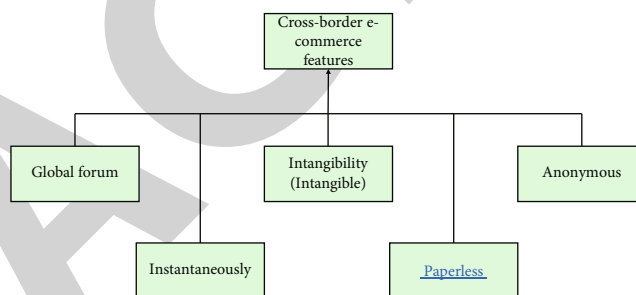


FIGURE 3: Cross-border e-commerce characteristics.

promotes the development of economic globalization, and bridges the economic and trade ties between countries as well as the related cultural customs and civilization exchanges. There are many models of cross-border e-commerce, of course, our common cross-border e-commerce is the B2b model based on the third-party platform. There are also some of our more common B2C models as well as c2c models and even later evolved b2b2c models [16]. Cross-border e-commerce characteristics are as shown in Figure 3.

In the author's research on the collation of relevant types of literature, it was found that no research on the quality development of cross-border e-commerce in China was conducted using multiple linear regression algorithm modeling. Well, the analysis of that means that for that type of model is still relatively small. The research on cross-border e-commerce, which is less in the related economics field, is still mainly distributed in e-commerce research and research on laws and regulations and industrial economy, and even foreign trade and English language have a long research on cross-border e-commerce. However, there are relatively few studies on modeling cross-border e-commerce based on the establishment of multiple linear regression models, so this paper encounters great difficulties in modeling. This paper has to finely consider each factor related to the development of cross-border e-commerce and calculate their correlation coefficients and the statistical estimation of their parameters [17]. Several main aspects of the current situation of cross-border e-commerce in China and its related

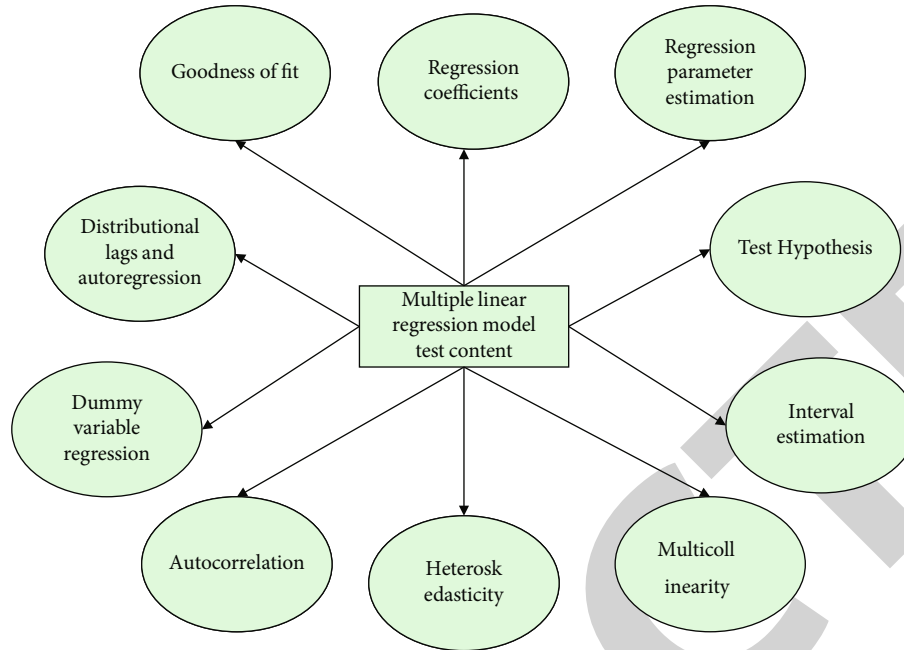


FIGURE 4: Multiple linear regression model test content.

important factors were carefully selected for an in-depth analysis, the current situation of cross-border e-commerce development in China was examined, and relevant suggestions and outlooks were put forward for the current situation of development in China [18].

3.1.2. Multiple Linear Regression. The multiple linear regression model algorithm is based on a multiple linear regression model. Multicomponent linear regression considers any practical statistical, mathematical or economic problem [19]. In practical applications, the correlation analysis of independent variables often includes many variables that are usually more closely related to many of them. Therefore, many variables are introduced in linear regression to build multivariate linear regression models.

In our general regression analysis, such as linear regression, there is only one term, one variable, but only one independent variable to explain the cause, the so-called probabilistic linear regression model. Thus, if there are multiple variables, there are multiple independent variables to explain multiple factors [20]. This can be explained by several variables. I point out the linear relationship between them, and that is all there is to the linear regression model.

Given the high quality of cross-border e-commerce, several factors should be considered in this study, but not just one of them. Therefore, in order to conduct a relevant study, a multiple linear regression model algorithm must be introduced. In addition to regression analysis, multiple colinear, variance, and autocorrelation analyses are required. The multiple linear regression model for the test content is shown in Figure 4.

3.2. Research Method. In this paper, the research method of multiple linear regression model is used to simulate the correlation of various linear regression models. The specific

modeling is shown below. The specific flow of the algorithm is as shown in Figure 5.

Considering the limitations of the algorithm, scholars at home and abroad have proposed a series of improvement schemes. The multiple linear regression model has a certain purpose, so the scheduling algorithm is naturally more efficient. In order to improve the performance of the multiple linear regression model, the Zaire method introduces parent node information in the multiple linear regression model, which reduces the number of expansion nodes and scheduling time. In the early 19th century, the field of econometrics developed multiple linear regression models, developed new node control criteria, improved search efficiency, smoothed paths, and found paths that matched the motion characteristics of the robot.

Such algorithms, first of all, perform a clustering analysis of the data by some algorithm, thus obtaining the central part of the hidden neural network, and then use the results of this step to perform calculations to figure out the width value of the number. The specific width values are calculated as follows.

$$\sigma_j = \frac{c_{xy}}{\sqrt{2h}}. \quad (1)$$

In the c_{xy} formula, start calculating the maximum distance to the centroid, and h the specific is the number of nodes.

After the input data is analyzed in the implied layer with the output layer for the relevant data, the output x_i of the first node j of the input sample in the implied layer is calculated by the following equation.

$$\phi(x_i, j) = \exp\left(-\frac{1}{2\sigma_j^2} x_i - c_i\right). \quad (2)$$

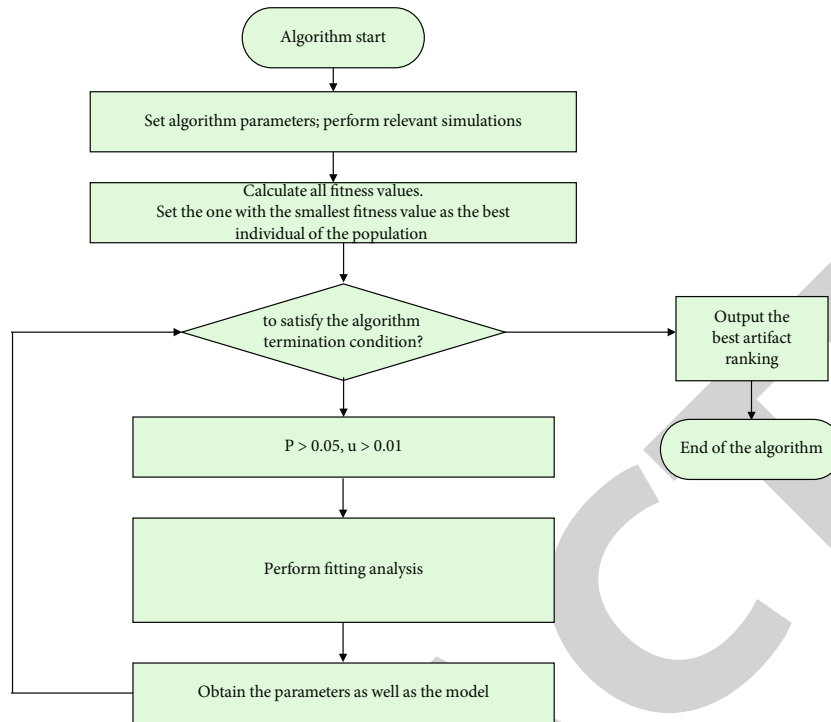


FIGURE 5: Algorithm specific flow.

In the formula, c_j is the centroid of the node in the first layer; the σ_j is the width value of the node in the first layer.

The output of x_i the first node of j the input sample in the output layer is calculated by the following equation.

$$y_m = \varphi(\phi(x_i, j) * w_m). \quad (3)$$

In the w_m formula, the node is associated with the involved weights; φ is the function of the involved weights.

Let (Ω, ζ, P) be a conceptual space, and x is the set of all wandering variables on the space involved. The risk measure ρ is a mapping x from a x_ρ subset of R to the real numbers, denoted as $\rho : X \in x_\rho \leftrightarrow \rho(X) \in R$.

First define the g function called distortion function, if $g : [0, 1] \rightarrow [0, 1]$, it is a monotone nondecreasing function and satisfies $g(0) = 0, g(1) = 1$.

Next, define the $\rho_g : x \rightarrow R$ risk measure: often called distortion risk measure, if $\rho_g(X)$, it satisfies

$$\rho_g(X) := \int_{-\infty}^0 \lg(S_X(x) - 1) dx + \int_0^{\infty} g(S_X(x)) dx, X \in x. \quad (4)$$

Here is g the distortion function, which $S_X(x) = P(X > x)$ is X the tail distribution.

The X assumption is that the total risk faced $f : [0, \infty) \rightarrow [0, \infty)$ by the insurer $f(X)$ is the partition function, representing the insurer transferring part of the risk faced by itself to the reinsurer. The reinsurers charge the insurer for the insurance premiums to supplement the risks they bear because they assume a portion of the insurer's risks. In this

paper, we assume that the reinsurance cost criterion has the following form.

$$\mu_r(f(X)) = \int_0^{\infty} r(S_{f(x)}(x)) dx, \quad (5)$$

where $S_{f(x)}$ is $f(X)$ the tail distribution $r : [0, \infty) \rightarrow [0, \infty)$ about and is a monotone nondecreasing $r(0) = 0$ function with. Without loss of generality, we assume r that it is not a function that is zero almost everywhere, and that the total risk an insurer has to face is the residual risk it will face plus the cost required to transfer the risk. Expressed in the formula, it can be expressed as

$$T_f(X) = X - f(X) + \mu_r(f(X)). \quad (6)$$

This paper also provides a detailed step-by-step analysis of the specific fitting process of the multiple linear regression model, as shown in Figure 6.

4. Results and Discussion

4.1. The Current Situation of Cross-Border E-Commerce and Its Problems

4.1.1. The Current Situation of Cross-Border E-Commerce.

The spread of the new crown pneumonia epidemic at the end of 2019 led to a rapid decline in the world economy. At the end of 2019, the epidemic swept through countries rapidly, and the whole world was not able to avoid the New Crown epidemic. Although our country is the most active and advanced country in epidemic prevention and

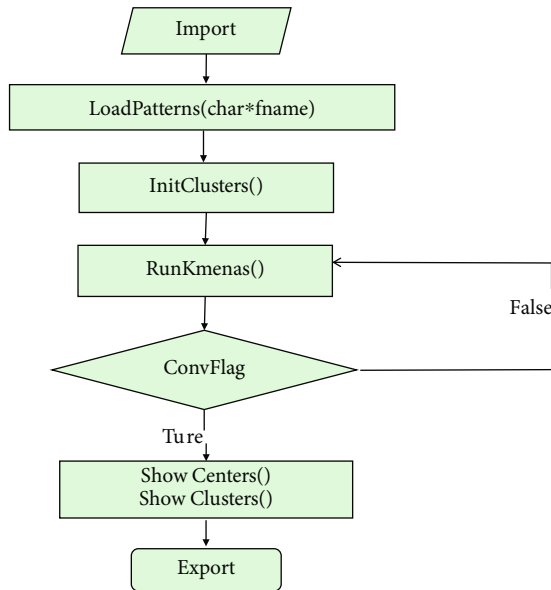


FIGURE 6: Multiple linear regression model specific fitting process.

control as well as treatment, the prevention and control are the most strict. However, since China entered the postepidemic era, our industry chain, supply chain, and supply levels were greatly affected, and people's willingness to consume was greatly affected. Although our country quickly adjusted the relevant strategies and carried out large-scale monetary policy regulation, the overall regulation strength of our country was only able to maintain the domestic cycle level. For the rapid spread of the epidemic abroad, the international industry chain, supply chain and supply, and other disruptions in demand reduction, China is still not able to respond in a timely manner. Many foreign trade enterprises have fallen into a rather difficult dilemma. The development of cross-border e-commerce in China has been further hit. However, with the global vaccination, the spread of the epidemic is still relatively rampant, but has been more effective control, to better achieve the stability of the industrial chain, supply chain, etc. According to data from the Ministry of Commerce, the National Bureau of Statistics and the General Administration of Customs, China's total foreign trade exports in the middle of 2018-2020 show a rising trend, and the total rise is relatively large. It has an annual growth ratio of more than 5%. During this period, the foreign trade exports brought by cross-border e-commerce in China exceeded 20% of the total exports, which accounted for a great proportion in China's foreign trade exports and had a very important impact on China's foreign trade, as shown in Figure 7.

The number of cross-border e-commerce users has surged. Under the influence of the epidemic, not only the cross-border e-commerce in China has surged but also the online stores in China have increased to a great extent. Due to the wind control, China's cross-border e-commerce increase more extremely, although China's domestic e-commerce laws and regulations and related norms are more perfect, but the process of China's foreign trade, the relevant

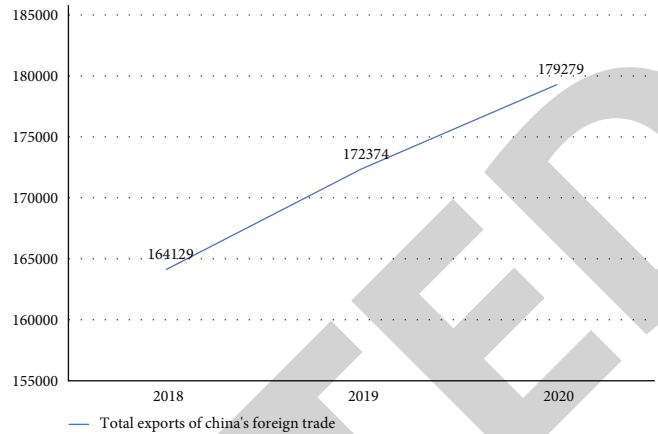


FIGURE 7: China's foreign trade exports in 2018~2020.

rules do not align well with the international. Under the influence of the epidemic, China not only increased the number of cross-border e-commerce users but also the number of related business staff, not only the employment of the store platform increased more, and the number of relevant customs and business departments in China's monitoring team is also climbing, according to the statistics of our relevant departments, our users increased by more than 20%, which is an unprecedented situation, the number of advocates increased by more than ten million. Our relevant platform staff as well as new employment in the stores have also increased by as much as 200,000. After the epidemic, it is clear that cross-border e-commerce in China has become a dark horse, far away from the impact of the real economy. It had a huge impact on our economy, and of course during the rapid development of cross-border e-commerce, China also gradually accepted some other western consumer holidays, such as Black Friday and some other consumer holidays, and our 618 and Double 11 consumer holidays were also integrated into western shopping. With the impact of the epidemic, China's cross-border e-commerce interactions with foreign countries gradually stepped into the normalization stage, as shown in Figure 8.

4.1.2. Problems of Cross-Border E-Commerce. Increased pressure of industry competition. Faced with the increasingly fierce competition in international commerce today, the impact of the new crown epidemic has caused further setbacks in the development of international commerce. Although international commerce is further frustrated, but cross-border e-commerce on the long-term development. Especially after countries developed the vaccine, the popularity of the vaccine made the world's epidemic has been effectively controlled, although the control is not obvious enough in foreign countries. But during this period, cross-border e-commerce has been better developed. Compared with traditional international business models, e-commerce has advantages that traditional business models do not have. Its dissemination of information and its huge scale and strong support from various countries have helped a lot in the development of e-commerce in the world. Our party

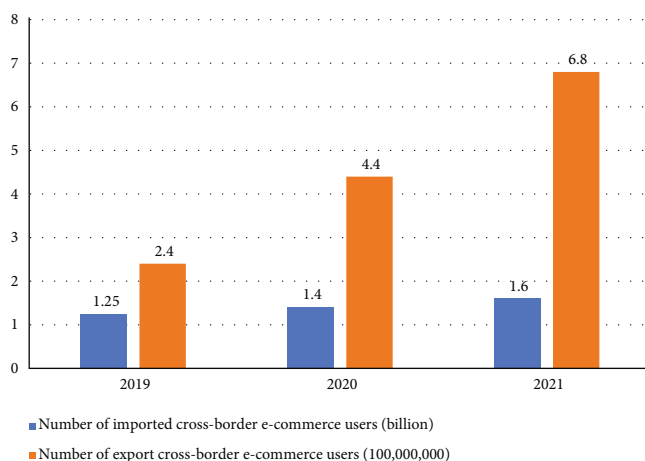


FIGURE 8: Number of cross-border e-commerce users in China's import and export in the first half of 2019~2021.

and government have given great policy support to our e-commerce platform as well as e-commerce work-related personnel stores and related factory ends. Since cross-border e-commerce attracts many people's employment and has huge employment potential in the production end, sales end, and logistics end, our party and government attach great importance to it. The development of cross-border e-commerce gives cross-border e-commerce with to great policy support. Even for nondomestic platforms, such as Alibaba and Jingdong, platforms other than these platforms, such as Amazon and other platforms, have considerable strength support. Although compared to Amazon, China's Alibaba and Jingdong's e-commerce platform development is slower, and authority and visibility are relatively low, but China's platform has a longer-term development. Let us start with the store sellers again. During the epidemic in China, the number of stores in China's cross-border e-commerce increased by 1 million, of which 70% of merchants opened such cross-border business stores for the first time. It can be concluded that in the postepidemic era, China's cross-border e-commerce industry is constantly flooded with new competitors, and the competition in the industry is getting fiercer.

Stricter platform rules. In response to the sudden outbreak of the epidemic, many cross-border e-commerce sellers were unable to make timely deliveries and stock preparations, and cross-border e-commerce platforms introduced a series of support policies during the epidemic, such as Amazon, eBay, Speedy Trading, and other cross-border platforms opened a "holiday mode" for some sellers affected by the epidemic, which means merchants can delay order processing and delivery during this period. With the global spread of the new vaccine, the epidemic was brought under control, and all major factories resumed work and production. After entering the postepidemic era, cross-border e-commerce platforms introduced stricter platform rules than during the epidemic in order to rectify the e-commerce order. In addition to the Amazon platform, other e-commerce platforms have also cracked down on seller violations. As can be seen from the data, the platform rules con-

tinue to be regulated in the postepidemic era, resulting in large losses for many Chinese cross-border e-commerce enterprises, many of which have fallen into development difficulties.

Increased international logistics and transportation costs. The arrival of the epidemic has opened up a path of development for cross-border e-commerce, but along the way cross-border e-commerce enterprises are faced with the huge problem of logistics. All aspects of international logistics are affected by uncertain factors, and time and economic costs are increasing. The arrival of the postepidemic era has also ushered in a new spring for Chinese sellers, who have started to ship, replenish and prepare their goods, further increasing the flow of international goods overnight, resulting in bursting of warehouses. The price has been several times higher than at the beginning of the epidemic. The price of iron transportation has also remained high, while the price of sea transportation has increased less, but the cost of time has been increasing. <http://hugo.com/> research data launched in December 2020 shows that in 2020, 47% of sellers' logistics costs increased by more than 50%, and 17% of sellers' logistics costs increased by up to 100% or more. The soaring freight costs have kept cross-border e-commerce enterprises under attack, and they have to face other logistics problems such as difficult transport, difficult distribution, and increased storage fees, leading to a continuous decline in their product profits. How to reduce the cost of international logistics and transportation has become a major problem that cross-border e-commerce enterprises need to solve in the postepidemic era.

4.2. Causes of Export Cross-Border E-Commerce Problems.

According to the division of unqualified elements, export cross-border e-commerce unqualified goods include two categories: one is the appearance of unqualified, that is, unqualified logo class, and the other is the quality of unqualified, that is, inferior products. The main causes of commodity quality problems are analyzed as follows.

- (1) *Low Market Access Threshold.* Cross-border e-commerce without special professional entry qualification requirements. Low start-up costs and continuous influx of new businesses. In addition to the traditional cross-border participants, small and medium-sized enterprises and even small workshops and individuals are actively involved. According to the data of Wisdom Research Consulting, 60.3% of sellers in China's export cross-border e-commerce will have annual sales of less than USD 5 million in 2021, and the market concentration is low. In the export cross-border e-commerce market environment with small sales and a large number of sellers, it is easy to trigger low-level competition, and price "fighting" becomes one of the main selling points, while low price is often accompanied by low quality, and low quality often gives rise to counterfeit and shoddy products, especially before the implementation of the E-Commerce Law in 2019, export cross-border e-commerce "barbaric

growth,” breeding the wind of counterfeiting, and selling counterfeit goods, promoting “bad money expelling good money”

- (2) *Differences in Commodity Quality Standards and Inspection Scales.* Cross-border export commodities face the problem of applicability of quality standards. China’s requirements for commodity quality, safety, health, environmental protection, labeling, and other aspects of the target market countries, there are differences, or even significant differences. Countries on commodity-related standards or technical specifications requirements are also inconsistent. Lack of regulations and institutional support for cross-border export commodity regulation. In 2022, the Ministry of Commerce and other departments have begun to study policy initiatives to facilitate the return and exchange of goods for cross-border e-commerce exports
- (3) *A Unified Quality Inspection and Supervision Platform Has Not Been Established.* Cross-border e-commerce trade is fragmented, with small batches, lots, a wide range of sourcing channels, and diverse sales patterns. Export cross-border e-commerce orders fragmentation, inspection and quarantine departments are difficult to implement the inspection in accordance with the provisions of the current “Import and Export Commodity Inspection Law,” making the risk of commodity quality and safety significantly increased. The national unified export commodity quality supervision and management platform has not been established, no full-caliber data. Cross-border e-commerce platforms have not been fully docked to the inspection and quarantine information management system, making the risk assessment of cross-border goods and supervision effect is affected to a certain extent, fake, defective products can take advantage of “transformed” genuine products. Some e-commerce platforms are not strict in the review of sellers, supply chains, and suppliers. Illegal merchants from commodity packaging to invoices, from anticounterfeit signs to logistics and other forgery chain, increasing the risk of commodity quality
- (4) *Commodity Traceability System Is Not Perfect.* Commodity traceability is difficult, and counterfeit goods are easy to flourish. According to the traditional process, the export of cross-border e-commerce from the purchase to sales that are links may appear fake goods. Some e-commerce companies are from the brand distributor to buy goods, the source of goods is not formal, and there may be counterfeit goods. Commodities cannot be traced, but also increased the difficulty of recovery. The problem has drawn the attention of the AQSIQ, which issued a document in 2015 to build a quality traceability system for cross-border e-commerce and then issued a document in 2017 to build a unified traceability infor-

mation platform. Some localities are already taking action, but a unified national traceability system for export goods has not yet been established. In 2018, Shenzhen Customs established a traceability system for cross-border e-commerce commodities; in 2019, Fuzhou Customs’ global quality traceability system went online; in 2020, the Guangdong Provincial Department of Commerce issued a document to support the construction of a traceability system for import and export commodities

- (5) *The Awareness of Trademark and Other Intellectual Property Rights Protection Is Not Strong.* The importance of intellectual property rights to cross-border export commodities is self-evident. The weak awareness of intellectual property rights of some enterprises, coupled with the lack of understanding of patents of competing products, has led to an increased risk of intellectual property disputes. According to customs statistics, customs seized 17,800 batches and 1,995,700 pieces of suspected infringing goods of cross-border e-commerce in 2021, mainly infringing trademark rights, which accounted for 23.25% and 18.11% of enforcement in noncargo channels, respectively, almost doubled from 11.69% and 9.93% in 2020. Commodity trademark use is not legal, noncompliance, logo mark, and other packaging are not qualified and can damage the quality of goods. Cross-border e-commerce is borderless, and the flow of cross-border goods may pass through multiple countries or regions. Some enterprises have infringement violations, production, and sale of counterfeit and shoddy goods, and other illegal and noncompliant behaviors are contrary to intellectual property protection. The incidents of Amazon blocking and Paypal freezing accounts show that solving the problems of legality and compliance has become the top priority for export cross-border e-commerce

4.3. Countermeasure Suggestions for the Development of Cross-Border E-Commerce

- (1) *Improve Industry Self-Regulation and Management Ability, and Enhance the Quality of Goods.* Play the role of self-regulatory function of industry organizations and strengthen the construction of self-regulatory capacity of export cross-border e-commerce industry. Industry organizations can advocate industry integrity commitment system, implement industry access system, etc., set up role models, summarize and promote experience, strengthen discipline, strengthen self-discipline through collective action, keep quality, and create a benign ecology. At present, the national organization of cross-border e-commerce industry has not yet been established, and the head enterprises of export cross-border e-commerce should reflect the industry’s role, shoulder social responsibility, and promote

the establishment of a national industry organization. At present, it can play the role of industry organizations such as the Cross-border E-Commerce Working Committee of the Chinese Institute of Electronics, provincial and municipal cross-border e-commerce industry associations and chambers of commerce in industry self-regulation, and urge e-commerce enterprises to improve the quality of goods. In addition, we can learn from the operation mode of the American Chamber of Commerce and set up chambers of commerce in foreign countries to provide members with foreign laws and regulations, policy consultation, agent intellectual property rights and dispute handling services, and assist members in applying for and protecting intellectual property rights abroad

- (2) *Strengthen the Protection of Intellectual Property Rights and Guarantee the Quality of Goods.* Intellectual property rights compliance is a necessary and urgent requirement for China's export cross-border e-commerce. Not to infringe, actively defend rights, and use intellectual property legally and compliantly, export cross-border e-commerce can develop healthily. Some enterprises do not have a strong awareness of intellectual property protection, are not familiar with overseas laws and judicial practice, and do not know enough about the risk of losing overseas disputes. In addition to establishing their own legal awareness, e-commerce platforms should also focus on reviewing and evaluating the IPR professional capacity of sellers, strengthening the protection of trademarks and other IPR, and encouraging the creation of independent brands. As intellectual property rights have a strong regional, the intellectual property rights obtained in China in other countries is not able to get the relevant recognition, so China's enterprises import and export at the same time, to timely report to the customs part of the relevant intellectual property rights to get the relevant protection. Of course, when exporting products with high technological content, enterprises must choose carefully and must apply for patents and trace and protect the relevant intellectual property rights under the support of local laws and policies. Know in advance the market targeted by the enterprise, whether it has intellectual property protection and the degree of protection or even relevant patent knowledge, are to learn, take risk prevention measures, and can ask local lawyers and other professionals as legal agents to prevent infringement
- (3) *Build a Commodity Traceability System Supported by Quality Inspection Agencies.* Commodity quality is the lifeline for the healthy development of export cross-border e-commerce. Enterprises are the core of commodity quality traceability system, and in order to make consumers buy with confidence, e-commerce platforms should establish a commodity traceability system with the participation of quality inspection agencies. Sellers, suppliers, and manufacturers voluntarily access the traceability system and apply for testing and certification in order to trace the source. The "GBI Global Selection Platform" is a government-enterprise service platform jointly established by the China Academy of Inspection and Quarantine Science and other institutions under the guidance of the China Association of Business Economics, and its third-party traceability system "Global Commodity Traceability System" is authoritative, credible, and representative. The system adopts "Inspection and Quarantine Traceability" anticounterfeit traceability mark + QR code and other technologies to achieve the traceability of goods. After connecting to the system, the code is assigned to the certified goods, and one thing is one code. Consumers can scan the QR code of commodity package and compare the code to identify the authenticity and inquire about the quality information such as commodity and brand name, market entry time, and commodity source. Access to the system of goods certified to become quality assured products, not only to reduce the cost of testing enterprise products, shorten the testing process, effective prevention of product forgery but also access to multichannel supply chain services, selected for the platform's international brand recommendation directory can enter more than 200 countries procurement platform. At present, the system has been piloted in Shandong Province, Yunnan Province, and other places
- (4) *Improve Credit Evaluation Management.* The e-commerce platform can refer to AEO certification, against the national standards for credit evaluation norms for merchants on cross-border e-commerce platforms, and sellers' credit evaluation management. The collection of relevant data is reflecting the credit information of the seller, the data into the corresponding score, the total score as a credit and risk evaluation grading basis, and the development of incentives and penalties, according to the score of regular upgrading, supplemented by withdrawal and elimination mechanism. Credit and risk evaluation level in the e-commerce platform, as a reference basis for consumers to buy goods, to force sellers to strengthen control of the source of goods, strict quality of goods
- (5) *Play the Role of Consumer Supervision of the Quality of Goods.* The E-commerce Law, "supervision and management of network transactions" requires e-commerce enterprises to establish a way for consumers to evaluate goods. Consumer supervision is an external factor to improve the quality of goods, but also one of the effective ways. Consumers have a close relationship with the quality of goods, and feedback information on the quality of goods is

direct and efficient. E-commerce platforms should ensure smooth channels for consumers to evaluate commodities, develop a perfect information feedback incentive mechanism, encourage consumers to evaluate commodity quality and other situations, provide timely feedback, and make regular return visits to promote quality supervision through consumer feedback on commodity quality in order to improve the quality of exported cross-border commodities

5. Conclusion

The e-commerce platform is responsible for checking and supervising the platform commodity information, focusing on the implementation of this main responsibility, analyzing its causes, and choosing the corresponding methodological analysis countermeasures, which has wide practical significance and positive contemporary significance and is conducive to promoting the healthy development of China's export cross-border e-commerce ecology. Based on the perspective of promoting the high-quality development of cross-border e-commerce, this paper constructs a multiple linear regression model between e-commerce platforms and platform sellers regarding the inspection of commodities and the provision of commodity quality, studies the strategies chosen by each of the two sides of cross-border e-commerce game subjects under various possible scenarios, analyzes the relevant factors affecting their strategy choices, and proposes corresponding countermeasures for e-commerce enterprises.

Therefore, this paper studies the analysis of multiple linear regression algorithm on the factors of high-quality development of cross-border e-commerce, starting from the multiple linear regression model, and conducts an in-depth study of the current situation to analyze the problems: first, the entry threshold of cross-border e-commerce is relatively low; second, there are differences in commodity quality standards and inspection scales; again, a unified quality inspection and supervision and management platform has not been established; again, the commodity traceability system is not; finally, the awareness of trademark and other intellectual property protection is not strong. And a profound study of the problem and put forward countermeasures to promote the high-quality development of cross-border e-commerce: first, improve the industry's self-regulation and management ability to improve the quality of goods; second, strengthen the protection of intellectual property rights to protect the quality of goods; again, build a commodity traceability system supported by quality inspection agencies; and finally, play the role of consumer supervision of commodity quality.

Data Availability

The dataset is available upon request.

Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] F. Han, "Cross-border e-commerce logistics mode innovation and development trend," *International Journal of Computational and Engineering*, vol. 7, no. 4, 2022.
- [2] L. Wen, "Development analysis of cross-border e-commerce logistics based on big data technology under safety law protection," *International Journal of Information Systems in the Service Sector (IJISSS)*, vol. 14, no. 2, pp. 1–4, 2022.
- [3] A. Liu, M. Osewe, Y. Shi, X. Zhen, and Y. Wu, "Cross-border e-commerce development and challenges in China: a systematic literature review," *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 17, no. 1, pp. 69–88, 2022.
- [4] M. X. Zhao, "Current situation and countermeasures of cross-border e-commerce development of foreign trade enterprises," *International Journal of Computational and Engineering*, vol. 6, no. 4, 2021.
- [5] L. Wang, "The collaborative development path of cross-border e-commerce and logistics in the data environment," *Journal of Frontiers in Engineering Technology*, vol. 1, no. 1, pp. 23–26, 2021.
- [6] J. Liu and N. Zhang, "The development path of cross-border e-commerce enterprises in the post-epidemic era," *International Journal of Social Sciences in Universities*, vol. 4, no. 3, 2021.
- [7] T. Xiaojing, "Research on the development of computer cross border e-commerce from the perspective of international trade," *Journal of Physics: Conference Series*, vol. 1992, no. 2, article 022060, 2021.
- [8] Y. Xi, "Research on the development of cross-border e-commerce of small and medium sized foreign trade enterprises in Guangdong Province," *International Journal of Computational and Engineering*, vol. 6, no. 1, 2021.
- [9] Q. Li, "Research on the transformation and upgrading of small and medium foreign trade enterprises from the perspective of crossborder e-commerce development," *Creativity and Innovation*, vol. 4, no. 3, 2021.
- [10] W. Xia and C. Baoyu, "Cross-border e-commerce marketing development model based on big data," *Journal of Physics: Conference Series*, vol. 1744, no. 4, article 042184, 2021.
- [11] C. He and W. He, "An empirical analysis of the level of cross-border e-commerce development on China's export trade: 11 countries in Southeast Asia as an example," *Journal Of Simulation*, vol. 9, no. 1, p. 65, 2021.
- [12] H. Zhong, S. Zhang, W. Song, and Z. Zhang, "Impact of international trade on cross-border e-commerce development: an empirical study based on the evidence from Ningbo city in China," *International Journal of Technology, Policy and Management*, vol. 21, no. 2, pp. 140–156, 2021.
- [13] H. Ding and C. Mo, "Research on the coupling development path of cross border logistics and cross border e-commerce," *International Journal of Computational and Engineering*, vol. 5, no. 4, 2020.
- [14] L. Wang, "The impact of cross-border e-commerce development on China's international trade and economic development," *International Journal of New Developments in Education*, vol. 2, no. 6, 2020.
- [15] J. Ling and S. Yang, "Research on the development of e-commerce of luxury brands in China," *Journal of International Education and Development*, vol. 4, no. 8, 2020.
- [16] M. A. Aqlan, "Research on the status quo and countermeasures of cross-border e-commerce development in Arab

- countries,” *Open Journal of Business and Management*, vol. 8, no. 4, pp. 1536–1542, 2020.
- [17] H. Kong, “Research on the synergic development path between cross-border e-commerce and cross-border logistics in China,” *International Journal of Education and Teaching Research*, vol. 1, no. 2, 2020.
- [18] S. Haohan and C. Jun, “Empirical research of business development potentiality of cross border e commerce between China and the belt & road countries,” *Finance*, vol. 6, no. 3, p. p1, 2020.
- [19] J. Miao, “Research on the difficulties and countermeasures of cross-border e-commerce logistics development,” *International Journal of Education and Economics*, vol. 3, no. 1, 2020.
- [20] Y. Panova and X. Hongsheng, “Expansion of cross-border e-commerce through digital enterprise development,” *International Journal of Business Performance and Supply Chain Modelling*, vol. 10, no. 4, pp. 339–368, 2019.