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Retraction

Retracted: Research on the International Trade Performance Evaluation of Cross-Border e-Commerce Based on the Deep Neural Network Model

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] J. Shen, "Research on the International Trade Performance Evaluation of Cross-Border e-Commerce Based on the Deep Neural Network Model," *Journal of Sensors*, vol. 2022, Article ID 3006907, 9 pages, 2022.

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Research Article

Research on the International Trade Performance Evaluation of Cross-Border e-Commerce Based on the Deep Neural Network Model

Jianjun Shen

Business School of Sanda University, Shanghai 201209, China

Correspondence should be addressed to Jianjun Shen; jjshen@sandau.edu.cn

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The rapid development of e-commerce international trade has driven the rapid growth of the economic system of international trade enterprises. This also means that industry competition is gradually intensifying, which also makes performance evaluation the key to cross-border e-commerce international trade. At present, my country's research on the performance evaluation of cross-border e-commerce international trade is in a blank state. Therefore, this paper takes the international trade performance evaluation of cross-border e-commerce as the research object and, based on the deep neural network model, develops a cross-border international trade performance evaluation model, changes trade strategies, and improves trade performance. This paper first analyzes various neural network models, such as artificial neural network, "BP" neuron model, and LSTM neural network. This paper summarizes a deep neural network model that is conducive to the development of cross-border e-commerce and points out the problems in the current performance evaluation of cross-border e-commerce international trade: the e-commerce market supervision system is not perfect; the second is the inconsistent evaluation indicators; the third is the evaluation system. There are some differences with the actual. Finally, this paper puts forward relevant suggestions for the performance evaluation of cross-border e-commerce international trade and points out the advantages and disadvantages of various neural networks, as well as their roles in cross-border e-commerce performance evaluation, and compares these neural networks through experiments. Experiments show that among these neural network models, the deep neural network model is the best and has the highest accuracy and stability in e-commerce trade performance evaluation. In the later stage, we will improve the global logistics system, strengthen the application of big data technology, and improve the overall performance of global operations. First, a set of indicators is designed to evaluate the performance of e-commerce systems, using the enterprise key factor model concept. In addition, this evaluation method is different from the commonly used expert evaluation method and physical evaluation method in evaluating the construction quality, cost, education and growth ability, and performance level of the international business system of cross-border e-commerce.

1. Introduction

The purpose of this study is to develop a deep neural network model to evaluate the performance of cross-border e-commerce trade, which will be used in Asian and European trade environments. The model uses image data for analysis to assess the development prospects of common types of cross-border e-commerce. In addition, the model features efficient learning, two-stage matching, and multiple quick links of parallel levels to accurately locate the judging criteria [1]. Every once in a while, researchers make model improvements to deep learning models. Currently, as these models become more popular in commerce, fairness is a major challenge for deep learning models. This paper mainly analyzes the fairness of the model to solve the judgment fairness of the model in business. This paper considers optimization algorithms and models for deep neural networks and chooses a hybrid approach to solve the optimization problem [2]. By studying the sampling problem in neutral network learning, a selective learning method using multilevel tables is proposed, a BP neural network model is established, and the model is modified and optimized. After a series of

experiments, the experiments show that the calculation process of this method is simpler, faster, and more accurate than other models [2]. In this paper, we propose a novel graph drawing framework, Deep Neural Networks for Drawing Networks. Our method uses graph convolutional networks to learn the model [3]. The analysis confirms that distance-related transaction costs are much lower than direct transactions of the same product; however, language-related business costs increase. We are exploring options available to policymakers to facilitate cross-border e-commerce in the EU digital marketplace [4]. This article provides a technical summary of the latest economic research on cross-border e-commerce in Europe and beyond, including results on the topic. It compares the differences in cross-border trade both geographically and by performance. It also examines the economic benefits of a gradual shift from offline shopping to online shopping and explores potential sources of increased customer service resulting from this change [5]. At this stage, the international trade of e-commerce is developing rapidly, and the logistics and transportation industry is gradually optimized with the development of cross-border e-commerce. At present, the main means of cross-border commodity transportation include international transportation ships, international emergency transfer stations, coastal warehouses, international logistics lines, border warehouses, interconnected areas, and interconnected logistics facilities. To promote the development of cross-border logistics in the future, it is necessary to promote the integrated development of regional e-commerce and cross-border logistics and use the cross-border integration model to update logistics [6]. This article addresses the general and simple general form of a for-profit business. Entrepreneurship is driven by a large economy within a company. Due to the size of the economy, the market is not very competitive. However, it can be demonstrated that even in countries with taste, technology, and product availability, trade and commercial interests arise [7]. This paper focuses on differentiated means of production and builds models that generate international returns to scale and uses this model to explore the relationship between international returns, traditional country returns to scale and factor endowment theory of international trade [8]. For more than 40 years, a cross-country empirical analysis of global trade flows has shown that the equivalent of logistics is e-commerce. In particular, the impact of free trade agreements (FTAs) on trade flows has led to the rapid growth of e-commerce. However, cross-border e-commerce faces the same economic constraints as previous research in the tax industry. But in terms of potential, the bilateral trade between cross-border e-commerce we see will double after 10 years of free trade agreements [9]. This book addresses trade theory, emphasizing that trade equilibria are general rather than local and are often best modeled using dual or envelope functions. This resulted in a succinct treatment of the standard theory, clarified some errors and confusions, and produced some new deviations [10]. Value orientation is the deep structure of local government performance appraisal system and the spirit of local government performance appraisal. It has a significant impact on the stability and reform of the local government performance appraisal system, as well as the guidance and guidance of local government performance appraisal practices. When formulating a local government performance appraisal system, it is important to have a clear understanding of the direction of change in the direction of cost appraisal. It is also necessary to establish, improve, and integrate the rating indicator system according to the new valuation direction [11]. In practice, some companies still use job completion as the only measure of project performance. This practice may be fine for some companies using job completion to measure performance, but for others, using job completion as the only measure of project performance can lead to overruns and overbudgets on industrial projects [12]. This article describes a computerized performance evaluation system developed by the United States Foreign Trade Institute. Describe the background and experience of system development research, with reference to many experimental studies to demonstrate its suitability for various research purposes [13]. Since the 1980s, cross-border trade has increased the use of performance indicators and, as a result, states have created a more efficient, effective and accountable public sector for better oversight and management. Therefore, a multidimensional, inclusive performance measurement system based on organizational strategies such as balance scores is proposed that goes beyond traditional financial measures. This performance appraisal system is also considered to be a unique new comprehensive system [14].

2. Deep Neural Network

2.1. Deep Neural Network Type. Neural networks are powerful deep learning models capable of synthesizing large amounts of data in seconds. There are many types of neural networks that help us in our day-to-day activities. Commonly used neural network models include perceptron, recurrent neural network (RNN), artificial neural network, BP neural network, and LSTM neural network structure. Among them, perceptone is the simplest structure of the neural network. Also known as the single-layer neural network, this model has only two layers: the hidden layer and the product layer, while a recurrent neural network consists of two types of neural networks: one is a neural network; the other is a repetitive neural network, which uses the same network structure, forming a deeper and deeper network. RNNs can handle recurring problems like time series etc. RNNs have the power of "memory" to "end" based on the data between them; the nature of exchange networks is that they are suitable for structured data processing. The BP neural network is a learning process, which contains two keys: preinformation and preinformation propagation. Secondly, the BP neural network has multiple neurons. These neurons are responsible for receiving information in its accumulation layer and passing it to the middle layer. This process is called preinformation; the middle layer summarizes the received information and transmits it to the middle layer. Responsible for information processing and exchange, this process is called preinformation dissemination. The information transmitted by the middle layer to each neuron is further

processed to complete the learning forward propagation process, and then, the information processing results are adjusted by gradually reducing the error of the weight of each layer until the set standard value is reached and then presented to the outside world. Among them, the process of adjusting the weight of each layer is also the process of optimizing the neural network. It is a multilayer deep neural network with a recurrent algorithm that can loop over the input information when needed until a set value is reached. At present, it is one of the commonly used neural network models and one of the most classic traditional neural network algorithms. It has certain limitations, but BP networks can learn and store large amounts of input and output sample data without executing mathematical equations that have already been processed. Secondly, the BP neural network can perform error analysis according to the results obtained from the training and the expected results and then gradually adjust to a model whose product is consistent with the expected results.

2.2. Artificial Neural Network. An artificial neural network refers to the modeling of the human brain network in information processing. By integrating a large number of neural networks, it has intelligent functions such as mutual understanding, memory of friends, and organizational information. The basic component of an artificial neural network is the mechanical unit, the neurons, which has two functions: excitation and inhibition, learning and forgetfulness, all characterized by algorithmic mechanisms. The specific structure is shown in Figure 1.

In Figure 1, x_1 represents the ith input information of the neuron, f represents the activation function, and o represents the information transmitted by the neuron to the next neuron, that is, the current neuron output. The working principle of neurons is as

$$o_i = f\left(\sum_{j=1}^{n} \omega_{ij} x_j - \theta\right). \tag{1}$$

2.3. The "BP" Neuron Model. Neuronal models are the simplest neural networks. Its characteristics and benefits are often shown in several aspects: first, there is a good self-awareness and adaptation activities. According to the input network of the neural network, after a period of training and education, the network structure dimension can be automatically adjusted to produce the desired product. Training and improvement are the embodiment of the self-organization and adaptability of neural networks. Second, it finds the best high-speed solution. Neuronal networks are characterized by large-scale comparison systems and are very fast. The third is the storage and organization work. Structural computations enable neural networks to store a variety of information distributed over all network connectivity scales. When it requires access to stored knowledge, it uses an associative approach to recall it with information incentives. Fourth is the power of indirect mapping. Logically designed neural networks can automatically generate basic rules by studying the input and output samples of the

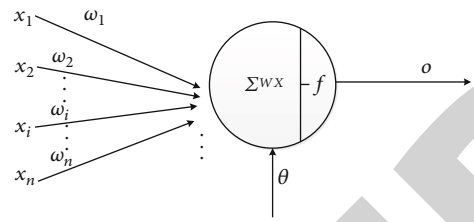

Figure 1: Internal neuronal structure diagram.

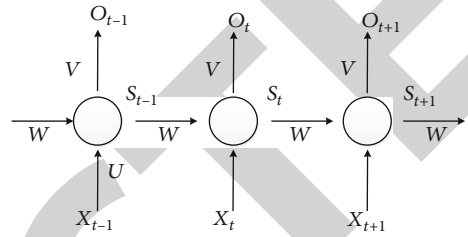

Figure 2: Basic structure of the RNN.

system to measure any complex and indirect mapping of random objects. In conclusion, the comprehensive evaluation is often very complex and dynamic, and the interaction between the various indicators points to a strong and indirect relationship. Given the above cognitive features and the capabilities of artificial neural networks, it provides a powerful tool to solve indirect problems and therefore provides a comprehensive index evaluation process based on artificial neural networks.

2.4. Recurrent Neural Network RNN. Traditional artificial networks have many problems, because different series of input and output can have different lengths; the layers of artificial networks are separated, that is, different positions in the sequence cannot share attributes. To address these problems, recurrent neural networks have been proposed, and Figure 2 shows the basic structure of the RNN.

Among them, X_t represents the input layer, which is used to store the timing information input in the sequence. The calculation formulas of O_t and E are as follows:

$$S_t = f_1(w * S_{t-1} + U * X_t), \tag{2}$$

$$O_t = f_2(V * S_t), \tag{3}$$

where f is the active function. Because O_t is a product sequence, its value is determined by the hidden layer S_t at this time, and S_t is determined by the current input and the previous hidden layer S_{t-1}, and it can be inferred that the current output exists. t is determined by the previous sequence, which jointly determines all hidden layers, which can be understood as the RNN has a memory function in the previous input.

3. Construction of Neural Network Algorithm and Performance Evaluation Model

3.1. The LSTM Neural Network Algorithm. The LSTM network information transmission is usually achieved by forward propagation and backpropagation. The details are as follows:

(1) Initial transmission, calculate the gate triangle, cell state vector, and output of each neuron:

(1) The information

$$f_t = \sigma\left(w_f^T S_{t-1} + u_f^T x_t + b_f\right) \tag{4}$$

(2) The input gate determines the cell status to be updated:

$$i_t = \sigma\left(w_t^T S_{t-1} + u_t^T x_t + b_t\right), \tag{5}$$

$$c_t = \tanh\left(w_c^T S_{t-1} + u_c^T x_t + b_c\right) \tag{6}$$

(3) Update the unit memory state to realize the integration of long-term memory and current memory:

$$c_t = f_t c_{t-1} + i_t c_t \tag{7}$$

(4) Output gate output result:

$$o_t = \sigma\left(w_o^T S_{t-1} + u_o^T x_t + b_o\right), \tag{8}$$

$$s_t = o_t \times \tanh\left(c_t\right) \tag{9}$$

(2) Backpropagation, including two characteristics: one is the propagation of time, that is, the word error is calculated every minute from the current moment, and the other is the propagation of the error words in the upper layer. Finally, the size of each scale is calculated based on the corresponding error words:

(1) Calculate the error terms for each neuron:

$$\delta h_t = \frac{\partial E}{\partial h_t}, \tag{10}$$

$$\delta c_t = \sigma(o_t)\left(1 - \tanh^2 c_t\right)\delta h_t, \tag{11}$$

$$\delta c_{t-1} = \sigma(f_t)\delta c_t, \tag{12}$$

$$\delta o_t = o_t(1 - o_t)\tanh\left(c_t\right)\delta h_t, \tag{13}$$

$$\delta i_t = i_t(1 - i_t)\tanh\left(u_t\right)\delta c_t, \tag{14}$$

$$\delta f_t = f_t(1 - f_t)c_{t-1})\delta c_t, \tag{15}$$

$$\delta x_t = \delta i_t W_{xi} + \delta f_t W_{xf} + \delta o_t W_{xo} + \delta c_t W_{xu} \tag{16}$$

(2) Get the updated weight gradient according to the error term, as an example, the rest is the same *i*:

$$\begin{aligned} \delta W_{xi} &= \delta i_t x_t, \\ \delta W_{hi} &= \delta i_t h_{t-1}, \\ \delta b_t &= \delta i_t \end{aligned} \tag{17}$$

3.2. Artificial Swarm Algorithm. The artificial bee colony (ABC) algorithm is proposed based on the behavior of bee colony social group, which usually consists of two core elements, bee environment and food source (nectar source). The nectar amount in the nectar source is used to represent the optimal value of the solution, so the nectar source with more nectar amount means high efficiency, and the corresponding solution is very good. The location of the nectar source (feasible solution) can be represented by a vector $x_i = (x_{i1}, x_{i2}, \cdots, x_{iD})$, and the fitness value of each nectar source represents the quality of the solution. When the number of search bees and accompanying bees is consistent with the number of nectar sources, the algorithm generates an initial solution, and the solution value is calculated by

$$X_i^d = X_{\min}^d + \text{rand}\,(0, 1) \times \left(X_{\max}^d - X_{\min}^d\right), \tag{18}$$

where $X_{\max}^d$ and $X_{\min}^d$ represent the upper and lower bounds of the space; $i = 1, 2, \cdots, SN$; $d = 1, 2, \cdots, D$ and rand $(0, 1)$ is a random value within $[0, 1]$.

After startup, the guide bee starts to search for the nectar source in the Gen cycle until the condition is met, that is, the accuracy of the error set or the maximum frequency. First, guide the bees to search the area near random nectar, the search process is carried out according to

$$v_{id} = v_{id} + \lambda\left(x_{id} - x_{jd}\right). \tag{19}$$

When the optimal value corresponding to the new space is better than the historical optimal solution, the leader bee will use the greedy algorithm to update the memory solution and keep the optimal solution. The fit_i value (solution quality) of the exercise is calculated by

$$\text{fit}_i = \begin{cases} \dfrac{1}{1 + f_i}, & f_i > 0, \\ 1 + \text{abs}(f_i), & f_i < 0. \end{cases} \tag{20}$$

In the formula, $i = 1, 2, \cdots, SN$, $j = 1, 2, \cdots, SN$, where $j(i \neq j)$ is randomly generated; $d = 1, 2, \cdots, D$, λ are random numbers uniformly distributed in $[-1, 1]$, which determine the disturbance amplitude; and i is an objective function to solve the problem f_i.

3.3. Evaluation Model Construction. Based on the basic network structure of LSTM, this paper uses the above artificial bee ant algorithm to optimize the neural network and then obtains the optimal value of the global dimension according to the objective function set and assigns it to the neuron. This neural network model can improve the overall assessment obtained by accurately assessing the international trade performance of cross-border e-commerce. The objective function formula is as follows:

$$\text{loss} = \frac{\sum (y_i - y_{\text{true}})^2}{n}. \tag{21}$$

Among them, y_i is the model evaluation value, y_{true} is the actual value, loss is the target loss value, and n is the sample size. Equation ((21)) shows that the lower the value, the more accurately the resulting value increases, which means that the sample value is much higher. The key implementation steps of the network-based business performance evaluation method are as follows: (1) data preparation, sample data training, and experimental data, (2) LSTM neural network online, (3) introduction to artificial colonization algorithm, and (4) food sources, calculating each random food source movement value. The fitness function formula is as follows:

$$\text{fitness} = \begin{cases} \dfrac{1}{1 + \text{loss}}, & f_1 > 0, \\ 1 + \text{abs}(\text{loss}), & f_1 < 0. \end{cases} \tag{22}$$

Algorithm iterative optimization: (6) save optimal network parameters, determine final evaluation structure, replicate and evaluate business performance, and deliver results. The LSTM neural network consists of three parts: (1) forget gate layer: decide what information to discard from the cell state, which is determined by the input at the current moment and the output at the previous moment; (2) cell state: determine and update new information to the cell state at the current moment; and (3) output gate layer: determine the output at this moment based on the current cell state. LSTM is a relatively large neuron.

3.4. Model Evaluation. The method of measuring the accuracy of the nervous system is to teach the network model and train the model data and then use the trained method to calculate the sample data to obtain the network evaluation value and compare the evaluation value with the model error. There are many error evaluation methods for the results of this paper, such as relative error, average error, and root mean error. This paper uses the following error to represent the rate of data change; the formula is as follows:

Table 1: Name and abbreviation of each enterprise.

Name	The abbreviated form of a name
Suning	1
Chongqing Department Store	2
Better Step by Step	3
The Oriental Pearl TV Tower	4
Yonghui Superstores	5
YTO Express	6
Huang's Group	7
China Trade Logistics	8
Superstar Technology	9
Chengdu Hongqi Chain Co.	10

(a) Mean absolute error

$$\text{MAE} = \frac{1}{N}\sum_{i=1}^{N} |y_i - y_{\text{true}}| \tag{23}$$

(b) Mean deviation error

$$\text{MBE} = \frac{1}{N}\sum_{i=1}^{N} |y_i - \bar{y}_{\text{true}}| \tag{24}$$

(c) Root mean square error:

$$\text{RMSE} = \sqrt{\frac{1}{N}\sum_{i=1}^{N} |y_i - \bar{y}_{\text{true}}|} \tag{25}$$

In the above formula, y_i represents the product value of the network, true represents the true value of the depth of each transaction, N represents the total data, and i represents the ith sample.

4. The Application of the Performance Evaluation Model

4.1. Selection of Evaluation Objects and Evaluation Indicators. This paper randomly selects cross-border e-commerce enterprises that have been listed in a certain place for several years as the research object. In order to verify the comparison of the evaluation results and eliminate the companies with incomplete index data, the 10 companies in this list are finally selected as the sample data, as shown in Table 1.

As shown in the table above, we have developed a business economy profitability assessment system, following the requirements of establishing a modern business system. Based on the research on cross-border e-commerce

Table 2: Performance evaluation index system.

Target layer	Level 1 indicators	Secondary indicators	Indicator type	Index referred to as
Cross-border electricity Commercial listed enterprises Business performance evaluation Price index system	Profitability	Rate of return on total assets Net profit ratio of total assets Return on equity	Forward pointer	$X1, X2$
	Debt paying ability	Current ratio Quick ratio	Moderate indicators	$X3$
	Service power	Turnover of total capital Shareholder equity turnover rate	Forward pointer	$X5$
	Growth ability	Increase rate of business revenue Total asset growth rate	Forward pointer	$X6$

Table 3: The original data of 10 cross-border e-commerce listed enterprises in 2016.

Enterprise	$X1$	$X2$	$X3$	$X5$	$X6$
1	1.00	1.04	6.39	1.72	0.89
2	0.87	1.38	1.86	1.10	0.72
3	4.51	4.27	11.77	1.00	0.78
4	2.26	2.66	4.04	3.27	3.26
5	2.60	1.65	9.26	0.86	0.64
6	4.88	4.74	8.07	1.50	0.78
7	1.88	1.86	2.10	8.20	7.89
8	0.73	0.80	1.97	0.47	0.29
9	2.02	1.29	4.71	0.83	0.31
10	5.55	5.47	7.82	1.97	1.97

performance indicators and combined with the integrity and accessibility of the data, 11 indicators were finally selected as the original evaluation data and classified according to profit, performance, and growth, respectively. Cross-border e-commerce business listed in the operation and management performance appraisal system has been established, which can fully reflect the business performance level of the enterprise, as shown in Table 2.

4.2. Data Source and Processing. The research object of this paper is cross-border e-commerce transactions in the list of Chinese enterprises in recent years, and the data comes from public data and enterprise network data. Among these, some of the raw data in 2016 are shown in Table 3.

For data comparison, the sample data were aligned in equal direction, balancing and eliminating the measurements so that the indicators were arranged by orders of magnitude, followed by causal analysis. Figure 3 shows some of the raw data after standardization in 2019.

Combining Table 1 and Figure 1, we can find that the distribution of capacity points in each of the 10 companies is very diverse. Besides the sixth company, few companies have significant and balanced performance compared to the four ability levels, and there are weaknesses below general strength or special ability. The high scores are also some companies with low performance ability. This fully shows that the top 10 cross-border e-commerce enterprises have

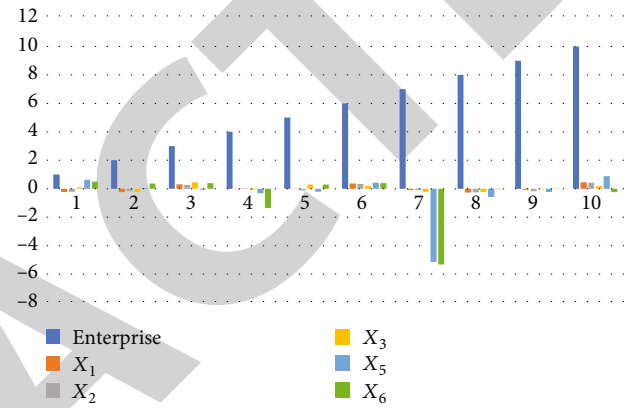

Figure 3: Part of the standardized data of 10 cross-border e-commerce listed enterprises in 2016.

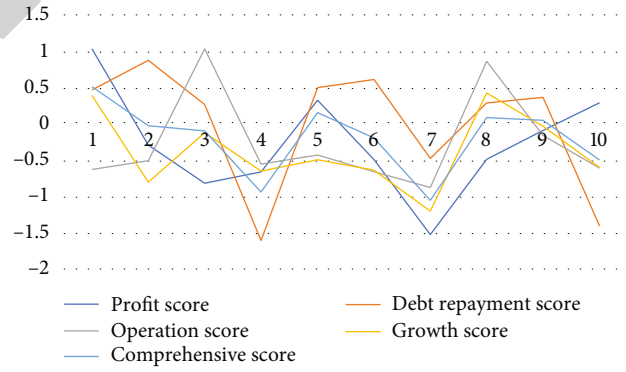

Figure 4: Performance score of 10 cross-border e-commerce enterprises in 2016.

unequal development capacity, significant differences, and shortcomings in performance capacity.

After compiling the data, four ability scores and full scores were obtained for each company. The ability scores and scores of the top 10 e-commerce cross-border enterprises in 2016 are shown in Figure 4.

Due to the different evaluation data, it is divided into multiple levels, so the evaluation indicators of cross-border e-commerce in Figure 4 have positive and negative results. It is not difficult to see that many companies are in a low position, which also shows that there are many problems in the current

Table 4: Factor analysis moderation test.

	Characteristic root	Variance explained rate (%)	Accumulation (%)
1	3.719	33.812	33.812
2	2.915	26.5	60.312
3	1.449	13.117	73.488
4	1.227	11.152	84.64

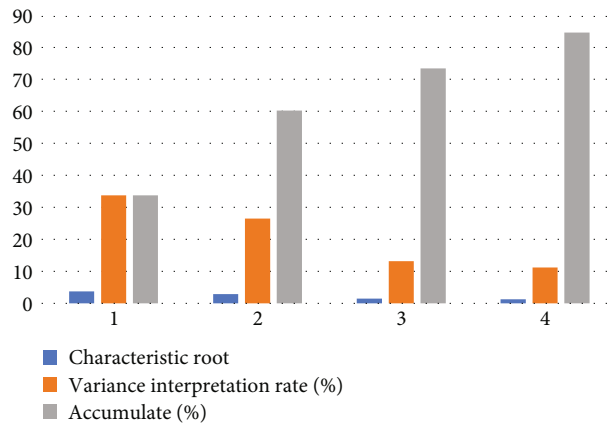

Figure 5: Total variance interpretation rate.

cross-border e-commerce. This paper will be gradually improved through the performance evaluation system.

4.3. Moderate Sex Test. To test whether factor analysis could be performed, KMO and Bartlett tests were performed on the compiled data. The test results obtained are shown in Table 4. 1, 2, 3, and 4 in Table 3 represent the four elements of the performance evaluation index system of cross-border e-commerce listed companies, respectively. Among them, 1 represents profitability, 2 represents solvency, 3 represents operating ability, and 4 represents growth ability. By calculation in this table, the test factor analysis suitability of the evaluation system is obtained.

It can be seen from Table 4 that the lower the variance explained rate, the higher its accumulation. This shows that the four elements are moderate under the test of KMO and Bartlett. According to the test results, we can get the results shown in Figure 5 below.

From the sum of variance described in Figure 2, the factor analysis reduces the data amount. In addition to the sum of variance described, the number of common factors can be reasonably determined by combining the gravel diagram. Figure 6 shows the gravel diagram for the specific general problems.

It is obvious from the figure that the curve change trend of the characteristic root of the first four factors is relatively steep, starting from the fifth point, the eigenvalue also changes significantly, with the next value all less than 1. Change becomes very, very equal. Therefore, in summary, the presented points show a lot of raw data, and there is information loss; these four key elements can be used to replace the original business performance indicators.

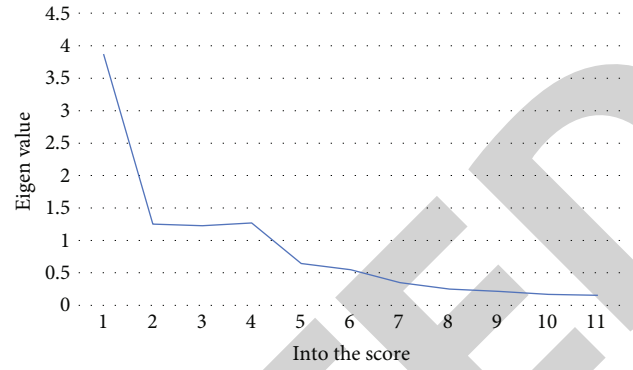

Figure 6: Crushed stone chart of index factors.

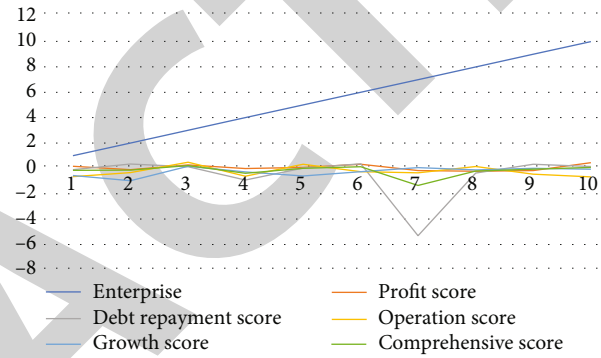

Figure 7: Scores of 10 cross-border e-commerce listed enterprises in 2016.

4.4. Neural Network Performance Evaluation. The internal structure of the neural network is affected by the number of objects in the input layer. If the number of objects is large, the network structure will become more rigid, thereby increasing the compression pressure. Therefore, this paper adopts the method of point analysis to reduce the size of the original data, obtain several complete indicators, and use the obtained power point of the network input value and the result of the complete performance of the network output target to achieve the purpose of simplifying the network calculation. Using factor analysis, find out the profitability, solutions, operations and growth of 10 points in the 2016 e-commerce list (40 power points are replaced by well-trained e-commerce cross-functional performance) and analyze the 2016 10 companies operating performance evaluation framework. Figure 7 shows the complete scores of the 10 companies' capability and network product evaluation on four points.

According to the results of Figure 1, although among the 10 sample companies selected in this paper, the overall performance results of 4 companies were greater than 0, the overall performance results of the remaining 6 companies were less than 0, with only 3 companies. For companies with better operating performance, in general, most companies' comprehensive score is not high. We ranked the 10 listed cross-border e-commerce listed enterprises, and the details are shown in Table 5.

Table 5: Rankings of 10 cross-border e-commerce listed companies.

Enterprise	Profit ranking	Debt repayment ranking	Operating ranking	Growth ranking	Comprehensive ranking
1	4	7	9	8	7
2	7	2	5	10	6
3	3	5	1	1	1
4	6	9	8	7	9
5	5	6	2	9	4
6	2	1	4	6	2
7	10	10	6	2	10
8	9	8	3	5	8
9	8	3	7	3	5
10	1	4	10	4	3

In the above performance appraisal, it can be seen that there are significant differences in the performance scores of the head companies and the tail companies. Compared with the average level of industry performance, it also fully reflects the existence of cross-border e-commerce enterprises whose overall performance level is significantly lower than or higher than the average level. In general, the overall operation performance of China's cross-border e-commerce business is moderate at the present stage, and there are still many development areas.

4.5. Comparison of Performance Evaluation under Different Neural Networks. This paper develops a high-performance technical management performance evaluation system based on the neural network; adopts deep neural network, artificial neural network, and BP neural network to comprehensively evaluate the management performance of 5 random companies among the above 10 companies; and then compares the three pros and cons of neural networks. Taking the above 10 companies as analysis samples, the overall business performance of 5 randomly selected technology companies is evaluated. The specific evaluation results are as follows: 1, 2, 3, 4, and 5 in Figure 8 represent the five companies in the research data of this paper, respectively. 1 stands for Suning Tesco, 2 stands for Chongqing Department Store, 4 stands for Huamao Logistics, and 5 stands for Superstar Technology.

From the above figure, it can be seen that the fluctuation of the artificial neural network and BP neural network is relatively large, and the deep neural network is relatively stable, and BP algorithm is a typical algorithm for traditional training of multilayer networks. In fact, this method is not ideal. Deep structures (involving multiple layers of nonlinear processing units) are ubiquitous in nonconvex objective cost functions. In addition, it can be seen that the accuracy rate of the measured deep network is relatively high and stable, and the evaluation results are basically objective and accurate, which is the most suitable for the performance evaluation of cross-border e-commerce international trade in this study.

To sum up, in actual operation, by determining the evaluation criteria and selecting the best value in the industry, it is possible to compare and analyze similar enterprises to determine the level of business performance in the industry. The deep neural network method avoids the influence of the subject matter that naturally determines the standard value and scale of the evaluation process and establishes a comprehensive and objective business performance evaluation system through self-study and self-efficacy—experience and strong tolerance. Deep neural network evaluation results are precise. Compared with other methods, the deep neural network system has the following advantages: (1) The structure of the neural network can be determined by self-study in the laboratory participating in the comparison, and it is repeated according to the optimal training requirements, and the structure of the neural network is continuously improved until it achieves a stable relative condition; therefore, using this method eliminates many human factors and is suitable for the purpose of verifying economic results. (2) The error is small, and the systematic error can meet any correct standard. (3) The dynamic performance is good. It can improve over time and contribute to sample growth comparisons, and it can learn further and actively follow comparisons. Therefore, this method has a unique application value.

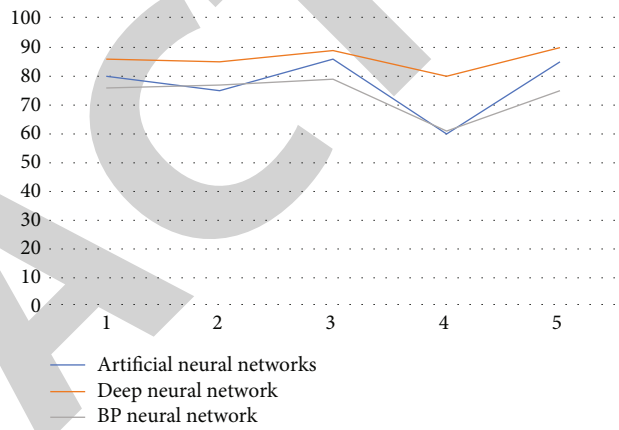

Figure 8: Comparison of performance advantages and disadvantages of 5 companies under different neural networks.

5. Conclusion

Through data collection and logical analysis, this paper finds that the economic capacity, educational and creative potential of cross-border ecommerce, and product competition

have a significant impact on cross-border e-commerce performance. The information collected in this paper comes from the rapidly developing e-commerce industries such as cosmetics and mother and baby. With the development of cross-border e-commerce in full swing, this paper puts forward the following two suggestions to improve the performance of cross-border e-commerce: (1) the government should vigorously support business development. Cross-border e-commerce relevant laws and regulations must be improved, to provide support for cross-border e-commerce enterprises. Since cross-border e-commerce involves different countries and regions, if counterfeit goods are included in the supply of cross-border e-commerce, it will have a negative impact on cross-border e-commerce and even affect various industries. Therefore, the government should speed up the pace of international development and review the performance rating system to create a more competitive market environment. (2) International trade e-commerce operators should develop their own financial capabilities, innovation potential, and good performance. Cross-border e-commerce international trade performance evaluation has a guiding role in future international strategic choices. It is necessary to continuously improve the productivity of enterprises, actively cooperate with other enterprises, and operate bad competitive products, actively create an educational and creative working environment, and cultivate the enthusiasm of employees. Cross-border e-commerce should formulate business development strategies based on the whole supply chain and constantly improve the business performance appraisal process. The study found that performance evaluation in this aspect has prospects for expansion in the research direction: first, for some qualitative indicators, this paper still relies on expert scoring and other methods. Logical results of quantitative indicators are obtained. Second, this method considers each element in the system in a model, which cannot reflect that the system performance is the result of a comprehensive balance of the performance of multiple elements, that is, the result may reflect the local efficiency of the system but cannot reflect the system performance. The defects are to be improved. (3) The method relies on a large number of training samples, and how it can be applied to small-sample systems remains to be considered.

Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declared that he/she has no conflicts of interest regarding this work.

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