

Analysis on the Influencing Factors of Agricultural Products Cross-Border e-Commerce Development in Yunnan Province of China

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Abstract: With the rapid development of e-commerce in China and the “one belt and one road” construction, cross-border e-commerce has blowout in China. In recent years, Yunnan Province has vigorously promoted the development of agricultural products cross-border e-commerce from the government level. This paper investigated cross-border e-commerce enterprises and foreign trade enterprises in Yunnan Province, and collected reliable data through expert consultation. Then using the “SWOT + AHP” analysis method, found out the influencing factors of cross-border e-commerce development of agricultural products in Yunnan Province. Results showed that in the development of agricultural products cross-border e-commerce in Yunnan, there are location advantage, policy support and further deepening of economic and trade exchanges with ASEAN three main advantages, and pressure from competitors, weak brand awareness and lack of professional personnel three main constraints. The study provided theoretical reference for e-commerce enterprises and government to promote the development of agricultural e-commerce.

Key words: Agricultural products, cross-border e-commerce, influencing factors, Yunnan province.

1. Introduction

With the rapid development of global e-commerce and the promotion of the government, cross-border e-commerce has become a new form of import and export trade, especially it has broken the time and space constraints of international trade [1]. In recent years, China's cross-border e-commerce is developing rapidly. In 2017, cross-border e-commerce transactions scale reached 7.6 trillion yuan [2]. Yunnan Province borders Myanmar, Laos and Vietnam. And it is also close to many ASEAN countries. At the same time, it has abundant resources of tea, fruit, flowers and other agricultural products, which has natural advantages for the development of agricultural products cross-border e-commerce. In 2015, the Yunnan Provincial Government promulgated the Opinions on Promoting the Development of E-commerce and Cross-border E-commerce, which actively implemented the “three centers”, “three platforms” and “five networks” 335 project of cross-border e-commerce. In 2018, the State Council of China agreed to establish a comprehensive pilot zone for cross-border e-commerce in Kunming. Under the guidance of policy support, it is developing vigorously. In particular, cross-border e-commerce for ASEAN has become a feature of cross-border e-commerce development in Yunnan Province. However, there are still many problems in the development agricultural products cross-border e-commerce of in Yunnan. Such as blind investment by

enterprises, lack of Professional personnel, Inaccurate market positioning restrict the development of agricultural products cross-border e-commerce in Yunnan. Therefore, this paper focuses on the analysis of the factors affecting the development of agricultural products cross-border e-commerce in Yunnan, and further evaluates the extent of the factors, which provides the basis for effective countermeasures and solutions. The research results can provide reference for promoting bilateral economic development and further promoting cross-border e-commerce development of agricultural products in Yunnan.

2. Literature Review

In recent years, agricultural products e-commerce and cross-border e-commerce have become a hot research topic in China. There are many literatures on agricultural products cross-border e-commerce. In the study of the development strategies of cross-border e-commerce for agricultural products in China, Xiaoying Shi [3] pointed out that with the advent of the Internet era, cross-border e-commerce has become a new way of international trade. However, there are some bottlenecks in the process of developing cross-border e-commerce of agricultural products, such as the high cost of cross-border logistics of agricultural products, the low level of relevant logistics services, the backward infrastructure construction of cross-border e-commerce of agricultural products, and the lack of marketing strategy. Hongjing Lu [4] pointed out that under the rapid development of cross-border e-commerce, the development of cross-border e-commerce of agricultural products has great market prospects, and the development of cross-border e-commerce of agricultural products is conducive to the transformation and development of agricultural trade. However, there are some problems in developing cross-border e-commerce of agricultural products. It needs to strengthen the cross-border logistics construction of agricultural products cold chain, pay attention to the brand building of agricultural products, pay attention to the cultivation of cross-border e-commerce professionals, and improve the supervision and maintenance mechanism in agricultural products cross-border e-commerce. Tie Zhao [5] proposed that cross-border e-commerce of agricultural products plays an important role in the import and export trade of agricultural products in China. At the same time, it has some problems, such as imperfect export supporting links, slow progress in the localization of cross-border e-commerce operation, lack of professionals and so on. Zhengjun Xie [6] proposed that the international trade of agricultural products needs to make full use of Internet technology to develop cross-border e-commerce, expand the sales scope of agricultural products, and promote the development of China's agricultural economy. At the same time, it pointed out that there are technical bottlenecks, talent bottlenecks and marketing bottlenecks in the development of agricultural products cross-border e-commerce in China.

In the provincial regional research, Guanxia Suo *et al.* [7] believed that there is no mature cross-border agricultural e-commerce development model in Gansu Province. And it has some problems, such as weak foundation of agricultural e-commerce, imperfect policies, supervision and risk prevention and control, and lack of relevant professionals. And its main problems are weak foundation of agricultural e-commerce, imperfect policies, supervision and risk prevention and control, and lack of relevant professionals. Xiangling Li [8] pointed out that Guangxi is making great efforts to develop cross border e-commerce by taking advantage of its proximity to ASEAN countries and playing a unique role in the construction of "one belt and one road". However, in the process of cross-border e-commerce development in Guangxi, such problems as high logistics costs, cumbersome customs clearance procedures and insufficient enterprise participation restrict its in-depth development. Weixia Shan [9] summarized and analyzed the main problems of cross-border e-commerce development in Yunnan Province, which are small scale of e-commerce, weak industrial foundation, low brand awareness, inadequate logistics industry support and single cross-border e-commerce model. Xuesong Zhao *et al.* [10] analyzed the development status of cross-border e-commerce

in Yunnan Province, and proposed that Yunnan Province has the advantages of location, policy and platform, and characteristic products. Meanwhile, it also has some problems as imperfect supporting infrastructure, insufficient supporting and driving capacity, and lack of cross-border e-commerce professionals.

generally speaking, the current research on cross-border e-commerce of agricultural products in China mainly focuses on the qualitative research of development problems and countermeasures. The development of China's agricultural e-commerce mainly has the problems of high logistics cost, weak brand awareness and lack of professional talents. In these studies, there is a lack of quantitative analysis of influencing factors, and there is no evaluation of existing problems and influencing factors. On the basis of these studies, this paper further analyses the influencing factors in order to make the research results more objective and effective.

3. Methodology

This study intends to take the basic idea of SWOT quantitative analysis method. Using the AHP (analytic hierarchy process) give the weight to the strengths factors, weaknesses factors, opportunities factors and Threats factors in development of agricultural products cross-border e-commerce in Yunnan. The factors were evaluated according to the weight assignment of each influencing factor. The following four step procedure is proposed.

Step 1: By collecting and sorting out the research results of the existing literature, the theoretical basis is formed. Then, this study investigated and consulted 17 cross-border e-commerce enterprises and foreign trade enterprises in Yunnan Province. Based on the analysis of the survey results, this paper summarizes the influencing factors of four first-level indicators of strengths, weaknesses, opportunities and threats in the development of cross-border e-commerce of agricultural products in Yunnan Province, and preliminarily forms the main influencing factors in four aspects.

Step 2: In this study, seven e-commerce experts were invited, including three university scholars and four managers of e-commerce enterprises in Yunnan. The influencing factors of step 1 are scored by the way of meeting discussion. Firstly, the performance of each factor in the industry is scored according to Table 1.

Table 1. Standards of Evaluation Scores

Extremely Obvious	Relatively Obvious	Obvious	Less Obvious	Little Obvious
5	4	3	2	1

Then, the influencing factors of each group were scored by multiple comparison. and the results were scored according to Table 2.

Table 2. Standards of Multiple Comparison Scores

Scaling	Meanings
1	when comparing two factors, they are equally important
3	when comparing two factors, first factor is a little important
5	when comparing two factors, first factor is obviously important.
7	when comparing two factors, first factor is strongly important
9	when comparing two factors, first factor is extremely important
2, 4, 6, 8	median that the above adjacent scaling
Reciprocal	if a_{ij} is the Comparison factor i & j, the Comparison factor j & i is $a_{ji} = 1/a_{ij}$

Through expert discussions, consensus was reached on the scoring. The weight of each influencing factor was calculated by AHP.

Step 3: According to the scores and weights of each influencing factors, the final scores of Strengths, Weaknesses, Opportunities and Threats are determined. the strategic positioning of agricultural products cross-border e-commerce of in Yunnan will be found with the method of geometric gravity center in the SWOT coordinate system [11]. In the coordinate system, the strategic positioning is determined by the center of gravity of the quadrilateral. strategic positioning coordinates Equation (1) is as follows:

$$\rho(x, y) = (\sum x_i / 2, \sum y_i / 2) \quad (1)$$

Meanwhile, in order to observation coordinate regional location conveniently, drawing into the strategic orientation angle, the Equation (2) is as follows

$$\alpha = \arctan(Y/X), \quad 0 \leq \alpha \leq 2\pi \quad (2)$$

Step 4: The final score of each influencing factor is used to measure the degree of its impact on industrial development, and the reasons are analyzed. Use strategic positioning to analyze the potential of industrial development.

4. Finding and Discussion

4.1. Define the Main Influencing Factors

Strengths: Yunnan Province borders Myanmar, Laos and Vietnam. And it is also close to many ASEAN countries. In recent years, under the new situation that China-ASEAN Free Trade Area has been built in an all-round way and Yunnan Province has accelerated the construction of an open “bridgehead” facing the southwest. the prominent geographical advantages, the increasingly perfect transportation logistics system and the promotion of customs clearance facilitation have provided a strong foundation guarantee for the development of e-commerce in Yunnan Province. Driven by the wave of e-commerce development in China, Yunnan Province has seized the opportunity of cross-border e-commerce development and set up Yunnan cross-border e-commerce industrial Park in No. 2 freight forwarder depot of Changshui International Airport. At present, it has built a cross-border e-commerce exhibition experience center, comprehensive service center and supervision center. From 2015 to 2018, 81 counties in Yunnan Province were approved as national demonstration counties of e-commerce in rural areas. In addition, Yunnan characteristic agricultural products have great influence in China. In the main agricultural products of Yunnan Province, the top five online sales are tea, Panax notoginseng, flowers, flower cakes and coffee.

Weaknesses: Although the network penetration rate in Yunnan Province has been increasing, it is still at a relatively low level in the China. The information infrastructure is relatively backward, and the development level of the electronic information industry is insufficient. In terms of logistics, the cost of logistics in Yunnan Province accounted for 19.8% in 2016, which was higher than the national average. Agricultural products resources in Yunnan are rich and diverse, but their scale is low and their brand awareness is weak. For example, Yunnan is the province with the largest coffee planting area and output in China, accounting for more than 99%, but the famous coffee brands in Yunnan are few and have little influence [9]. They can only become raw material suppliers in other regions and countries, and the value of products is far from being reflected. Although the production of some characteristic products is large, but lack of standardized construction and uneven product quality, it lacks competitiveness in the market. In addition, Because the economic development of Yunnan Province is relatively backward in China, farmers' education level is generally low, and they lack basic knowledge of network information technology and e-commerce [12]. Cross-border e-commerce involves not only foreign trade, logistics, e-commerce, finance, marketing,

language and other professionals, but also complex management and technical personnel. Due to the rapid updating of knowledge and technology in cross-border e-commerce industry, schools and society cannot provide corresponding professionals in time, which to some extent restricts the development of cross-border e-commerce in Yunnan Province.

Opportunities: In 2015, the Yunnan Provincial Government promulgated the Opinions on Promoting the Development of E-commerce and Cross-border E-commerce, which actively implemented the “three centers”, “three platforms” and “five networks” 3-3-5 project of cross-border e-commerce. In 2018, the State Council of China agreed to establish a comprehensive pilot zone for cross-border e-commerce in Kunming. In 2020, Yunnan Province will build a cross-border e-commerce online public service platform, cross-border e-commerce off-line Industrial Park platform and cross-border e-commerce information sharing, financial services, intelligent logistics, credit, statistical monitoring system, risk prevention and control system. Since the completion of the China ASEAN Free Trade Area, Yunnan has actively integrated into the "one belt and one road" construction, and has further deepened its economic and trade contacts with ASEAN countries. In July 2017, Chinese ASEAN FTA business website officially launched, which promoted the development and deeper cooperation between Yunnan and ASEAN to wider areas. Meanwhile, in recent years, the average annual economic growth rate of ASEAN has reached 5% [10]. With the economic growth, consumers’ demand for agricultural products has increased.

Table 3. Main Influence Factors in Industrial Development

Project	Influence Factors
Strengthens (S)	S1: Location advantage
	S2: Product features
	S3: Rapid development of e-commerce
Weaknesses (W)	W1: Weak brand awareness
	W2: Low level of standardization
	W3: Imperfect infrastructure
	W4: Lack of professional personnel
Opportunities (O)	O1: Policy support
	O2: Further deepening of economic and trade exchanges with ASEAN
	O3: Increased market demand for agricultural products
Threats (T)	T1: Developmental difference of e-commerce in ASEAN
	T2: Pressure from competitors
	T3: Low logistics efficiency

Threats: Compared with Sichuan and Guangxi provinces, which have better development of cross-border e-commerce in the western region, Yunnan Province has fewer types of cross-border export products and smaller scale. In 2017, cross-border e-commerce transactions in Guangxi reached 42.5 billion-yuan, accounting for about 11% of the total imports and exports of Guangxi, an increase of 28.8% year on year. The scale of cross-border e-commerce transactions in Yunnan Province is only about 5% of that in Guangxi [8]. On the other hand, ASEAN countries are rich in agricultural products resources, and many countries export the same kinds of agricultural products as Yunnan, which brings competition pressure to Yunnan. The differences in the development of ASEAN e-commerce bring challenges to the development of cross-border e-commerce in Yunnan Province. The construction of ASEAN local e-commerce platform lacks

relevant support. Moreover, there are differences in customs conditions and laws among ASEAN countries, and the lack of a unified transit standard makes customs clearance, foreign exchange settlement, tax refund and other procedures cumbersome. In addition, the imperfect logistics system and low efficiency of some ASEAN countries also restrict the development of agricultural e-commerce [13].

Overall, the main influencing factors are shown in the Table 3.

4.2. Analysis of Influencing Factors

According to the expert scoring results, the weight assignment results of the influencing factors are as follow tables:

Table 4. The Strengths of Group Judgment Matrix

S	S1	S2	S3	Weight	CR
S1	1	5	2	0.581	Latent Root =3.004 CI=0.002 RI=0.58 CR=0.003
S2	1/5	1	1/3	0.109	
S3	1/2	3	1	0.309	

Table 5. The Weaknesses of Group Judgment Matrix

W	W1	W2	W3	W4	Weight	CR
W1	1	3	5	2	0.482	Latent Root =4.014 CI=0.005 RI=0.96 CR=0.005
W2	1/3	1	2	1/2	0.158	
W3	1/5	1/2	1	1/3	0.088	
W4	1/2	2	3	1	0.272	

Table 6. The Opportunities of Group Judgment Matrix

O	O1	O2	O3	Weight	CR
O1	1	2	7	0.615	Latent Root =3.003 CI=0.001 RI=0.58 CR=0.002
O2	1/2	1	3	0.292	
O3	1/7	1/3	1	0.092	

Table 7. The Threats of Group Judgment Matrix

T	T1	T2	T3	Weight	CR
T1	1	1/2	5	0.334	Latent Root =3.015 CI=0.007 RI=0.58 CR=0.012
T2	2	1	7	0.591	
T3	1/5	1/7	1	0.075	

From the weighted score of each factor, in the Strengths group, S1: Location advantage and S3: Rapid development of e-commerce factors have significant influence. The score of Product features is only 0.327, and its advantage is not obvious. This is mainly due to the following three reasons. Firstly, the types and quality of some agricultural products in Yunnan are similar to those in ASEAN countries, and their characteristics are not prominent. Secondly, the cultural differences among different countries make the representative agricultural products in Yunnan Province, such as Panax notoginseng and Puer tea, not well recognized in ASEAN countries. Thirdly, product publicity is insufficient. In Weaknesses group, W1: Weak brand awareness and W4: Lack of professional personnel had greater influence, with scores of 1.928 and 1.088. This was consistent with the results of other relevant studies. W2: Low level of standardization has

moderate influence. The main reason is that Yunnan's agricultural products are small-scale and diversified, that is difficult to standardize, moreover some product characteristics cannot establish standardized measurement. W3: Imperfect infrastructure has the lowest influence. This shows that China's investment in poverty alleviation and policy support have achieved certain results, and rural infrastructure construction is constantly strengthening in Yunnan. In Opportunities group, O1: Policy support and O2: Further deepening of economic and trade exchanges with ASEAN have obvious advantages. O3: Increased market demand for agricultural products has the lowest influence. Nowadays, consumers are pursuing high-quality life, and the market demand for high-quality agricultural products is increasing. The quality of agricultural products in Yunnan is uneven, and it is difficult to meet the high-level market requirements. In Threats group, T2: Pressure from competitors has highest influence, then the T1: Developmental difference of e-commerce in ASEAN and T3: Low logistics efficiency. It shows the comprehensive competitiveness of Yunnan's industries is not strong.

Table 8. The Weight Scores of all Factors

SWOT	Factors	Weights	Evaluation Scores	Weighted Scores	Sum of Scores
Strengths	S1	0.581	5	2.905	4.159
	S2	0.109	3	0.327	
	S3	0.309	3	0.927	
Weaknesses	W1	0.482	4	1.928	3.666
	W2	0.158	3	0.474	
	W3	0.088	2	0.176	
	W4	0.272	4	1.088	
Opportunities	O1	0.615	4	2.46	3.904
	O2	0.292	4	1.168	
	O3	0.092	3	0.276	
Threats	T1	0.334	3	1.002	3.591
	T2	0.591	4	2.364	
	T3	0.075	3	0.225	

4.3. Analysis of Strategic Positioning

The SWOT four factors point of the development Agricultural Products Cross-border e-Commerce in Yunnan respectively as that S'(4.159, 0), O'(0, 3.904), W'(-3.666, 0), T'(0, -3.591), According to the strategic location coordinates formula as follows:

$$\rho(x, y) = (\sum x_i / 2, \sum y_i / 2) = (0.247, 0.157)$$

According to the calculation formula of strategic orientation angle as follows:

$$\alpha = \arctan(Y/X) = 32.411^\circ, \pi/4 \leq \alpha \leq \pi/2$$

the strategic location is in the first quadrant. It means that the development of cross-border e-commerce of agricultural products in Yunnan has potential and belongs to the strategic positioning of opportunity. However, from the strategic positioning point value, the comprehensive advantages of its development are

not obvious.

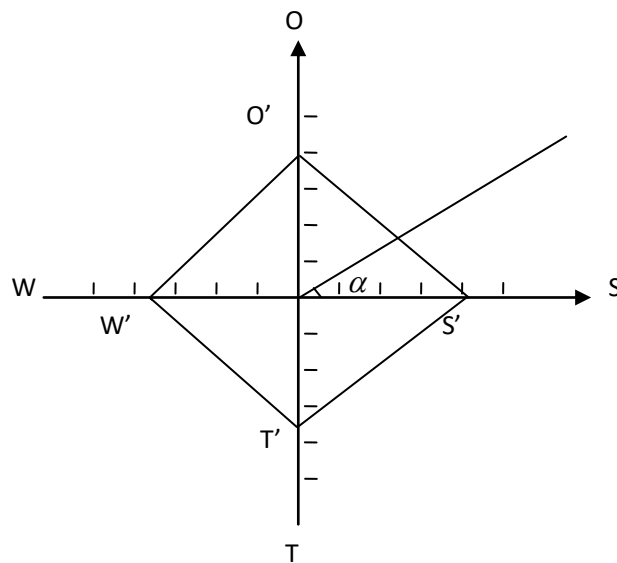


Fig. 1. The SWOT strategic positioning map.

5. Conclusion

Through literature collation and enterprise survey, this paper identifies and analyses 13 factors affecting the development agricultural products of cross-border e-commerce in Yunnan. Among them, location advantage, policy support, further deepening of economic and trade exchanges with ASEAN are the main advantages, pressure from competitors, weak brand awareness and lack of professional personnel are the main constraints. These factors have the most significant impact on industrial development. and Yunnan has potential in developing agricultural products cross-border e-commerce. But the comprehensive competitiveness is not obvious.

Enterprises engaged in cross-border e-commerce of agricultural products in Yunnan need to improve product quality, expand industrial scale and enhance product competitiveness. At the same time, enterprises should attach importance to product publicity, strengthen the brand of agricultural characteristic products, and promote regional agricultural characteristic products. In addition, local enterprises should strengthen docking with foreign enterprises, strengthen research and analysis of foreign markets, broaden their horizons, tap foreign markets and expand foreign business opportunities. The government should grasp the policy orientation and speed up the construction of international logistics channels between Yunnan Province and ASEAN countries, establish an effective introduction mechanism and training system for e-commerce professional personnel, and encourage the construction of e-commerce business incubation parks relying on existing industrial parks, enterprises and universities to train cross-border e-commerce professionals and Inter-disciplinary talent. Finally, the development of agricultural products cross-border e-commerce in Yunnan is still in early stage, and its development path needs further research and exploration.

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