The Impact of the Impact of Different National Characteristics Under the Background of Countries Along the Belt and Road on the International Trade of China's Agricultural Products

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Abstract. In the context of the epidemic, the different characteristics of 67 countries along the Belt and Road except China have brought different degrees of influence on China's international trade of agricultural products. This paper selects the characteristic data of the countries along the Belt and Road in 2020, Using principal component analysis, 5 main influencing factors from 12 variables were agricultural productivity factors, national stability factors, domestic inflation factors, price supply and demand factors, geographical distance and strategic factors; The linear regression analysis of 5 factors and the amount of agricultural products exported by China to countries along the Belt and Road route, Among them, the national stability factors have a significant positive impact on China's international trade of agricultural products; Price supply and demand factors, geographical distance and strategic factors have a significant negative impact on China's international trade of agricultural products; In the context of the epidemic, the comprehensive characteristics of different countries have significantly inhibited China's international trade in agricultural products.

Keywords: One Belt and One Road · principal component analysis · international trade of agricultural products · COVID-19

1   Introduction

1.1   Research Background

"Belt and Road" initiative for China and countries along the agricultural trade to build a strong engine, but because in recent years under the influence of COVID-19 outbreak, a huge shift has taken place in China's trade market, China's agricultural exports gradually become depressed, the emergence of this situation of "area" along the countries of agricultural products trade market orderly certain influence, even pose a threat to the world food security. It has been nine years since China proposed the Belt and Road Initiative by 2022. By the end of August 2022, the trade in goods between China and countries along the Belt and Road had totaled about US $12 trillion.

1.2 Study Status

Scholars study the influencing factors of China's agricultural trade mainly from the perspective of institutional policies, profits and some physical factors, and deeply study the trade between China and the Belt and Road countries. CAI Qingru (2020) found that China's export export were due to increased global trade uncertainty, reduced demand and blocked export circulation [1], But also put forward targeted suggestions for this problem. Li Xiande et al. (2020) proposed rational treatment of trade restrictions and continue to deepen effective cooperation between food and agriculture [2]. Yao Huibin and Peng Xinyu (2021) shows that China tends to choose countries with strong management, clear political situation and sound monitoring system [3]. Li Yuxin and Wang Yuxin (2021) found that factors such as overseas direct investment, unequal income level and trade imbalance were harmful factors [4]. Chen Hong (2021) found that the export of China's agricultural products is vulnerable to trade barriers due to the imperfect quality testing system [5]. Yu Yongqing and Yang Xiaoyun (2022) used empirical analysis to further activate the effective impetus of regional economic cooperation and narrow the economic distance between border countries [6]. Using theoretical and empirical analysis, this paper further studies the influence of the aspects of agriculture and rural development, political stability and population growth on China's agricultural trade.

2 Empirical Analysis

2.1 Data Source and Model Design

In addition to China, the characteristic data of 67 countries along the "Belt and Road" in 2020 comes from the Guotaian database, and China's agricultural export data to countries along the "Belt and Road" comes from the UN comtrade database.12 variables were selected as characteristic data of 67 countries in 2020, namely: (1) import value index; (2) grade of political stability percentage; (3) per capita GDP; (4) the proportion of agricultural added value to GDP; (5) non-labor dependency ratio; (6) population density; (7) population growth; (8) rural population; (9) annual inflation rate measured by GDP deflator; (10) geographical distance; (11) air cargo volume and (12) land area.

SPSS software is used to firstly test KMO and Bartlett on the characteristic data of countries along the route and route; after passing the test, principal component analysis method; linear regression method on the export amount of countries along the Belt and Road route to verify the influence. Among them, multiple linear regression model of multiple principal components on China's agricultural export (1); unitary linear regression model of total factors on China's agricultural export (2) is as follows:

$$Y = \beta 0 + \sum_{i=1}^{p} \beta i X i + \mu \tag{1}$$

$$Y = \alpha_0 + \alpha_1 X + \mu \tag{2}$$

Table 1. KMO and Bartlett tests

KMO price		0.623
Bartlett Sphelicity test	Approximate california	216.328
	df	66
	p price	0.000

2.2 KMO and Bartlett for the Test

Principal component analysis was used for the information enrichment study, first analyzing the suitability of the study data. As shown in Table 1: KMO is 0.623, greater than 0.6, which has passed the premise test of principal component analysis; Bartlett sphericity test is significant at 5%, and the above two test results indicate that the study data is suitable for principal component analysis.

2.3 Principal Component Analysis

As shown in Table 2, five principal components were extracted from the 12 country characteristics, the characteristic root value was greater than 1, the variance interpretation rate was 32.073%, 13.571%, 12.466%, 10.636%, 8.525%, and the cumulative variance interpretation rate was 77.272%.

Table 2. Principal component extraction

	characteristic root			Principal component extraction		
	characteristic root	Variance interpretation rate%	accumulate%	characteristic root	Variance interpretation rate%	accumulate%
1	3.849	32.073	32.073	3.849	32.073	32.073
2	1.629	13.571	45.644	1.629	13.571	45.644
3	1.496	12.466	58.110	1.496	12.466	58.110
4	1.276	10.636	68.747	1.276	10.636	68.747
5	1.023	8.525	77.272	1.023	8.525	77.272
6	0.685	5.705	82.976	-	-	-
7	0.561	4.677	87.653	-	-	-
8	0.504	4.196	91.850	-	-	-
9	0.450	3.750	95.599	-	-	-
10	0.234	1.952	97.551	-	-	-
11	0.173	1.440	98.991	-	-	-
12	0.121	1.009	100.000	-	-	-

Table 3. Coefficients of each variable of the principal components

Name	Component				
	1	2	3	4	5
Import value index	0.175	0.118	0.381	−0.552	−0.226
A percent grade of political stability	0.140	0.562	0.238	0.171	0.238
per capita gross domestic product	−0.450	0.000	0.077	0.066	−0.055
Share of agricultural added value in GDP	0.422	−0.003	0.198	0.279	−0.096
Non-labor-force dependency ratio	0.316	−0.050	−0.309	0.190	0.000
density of population	−0.271	0.168	0.083	0.445	−0.409
population growth	0.083	−0.116	0.474	0.341	0.554
The proportion of rural population	0.429	0.025	0.150	0.101	−0.141
Annual inflation rate	0.191	0.106	−0.521	0.313	−0.054
geographical distance	−0.084	0.378	−0.330	−0.234	0.559
Air cargo volume	−0.279	−0.445	0.091	0.206	0.219
acreage	0.288	−0.523	−0.123	−0.169	0.151

As shown in Table 3, In component 1, the coefficient of per capita GDP, rural population proportion and agricultural added value is relatively large, These three indicators play a major role, We can think of the first principal component as a comprehensive index reflecting agricultural productivity; In component 2, Level of political stability, land area, and air cargo volume, And the percentage grade of political stability has a greater impact, Therefore, the second principal component can be regarded as a comprehensive index reflecting the stability of the country; In component 3, Inflation rate, population growth is above the remaining indicators, It can be used as a comprehensive indicator reflecting domestic inflation factors; In component 4, Import value index, population density is greater than the remaining indicators, It can be regarded as a comprehensive index reflecting the price supply and demand factors; In component 5, Geographic distance, population growth is greater than the remaining indicators, It can be regarded as a comprehensive indicator reflecting the geographical and strategic needs.

2.4 Linear Regression

According to the regression model of formula (1) and (2) and combined with the principal component analysis results, the export data of China's agricultural products in 2020 to countries along the "Belt and Road" is returned. The regression analysis results are as follows:

The VIF test in the third column of Table 4 shows that there is no multicollinearity between the five principal components, and a regression analysis can be performed. According to the second column in Table 4, the regression coefficient of national stability factors is 0.387, which has a significant positive influence on the total export of Chinese agricultural products; the regression coefficient of price supply and demand factors is

Table 4. Point factor regression analysis.

variable	regression coefficient	95% CI	VIF	variable	regression coefficient	95% CI	VIF
constant	18.667** (100.349)	18.303 ~ 19.032	-	constant	18.667** (66.010)	18.113 ~ 19.221	-
Agricultural productivity factors	-0.213 (-1.146)	-0.577 ~ 0.151	1.000	The factor sum	-0.950** (-2.952)	-1.581 ~ -0.319	1.000
National stability factors	0.387* (2.324)	0.061 ~ 0.713	1.000				
Domestic inflation	-0.253 (-1.645)	-0.554 ~ 0.048	1.000				
Price supply and demand factors	-1.209** (-8.206)	-1.498 ~ -0.920	1.000				
Geographic distance and strategic factors	-0.242* (-2.524)	-0.430 ~ -0.054	1.000				
sample capacity	47			47			
R^2	0.670			0.162			
adjust R^2	0.629			0.144			
F price	F (5,41) = 16.626,p = 0.000			F (1,45) = 8.712,p = 0.005			

Note: * $p < 0.05$ * * $p < 0.01$, with t value in parentheses; dependent variable: Ln _ Total exports of Chinese agricultural products to countries along the Belt and Road.

-1.209, with significant negative influence on the total export of Chinese agricultural products to countries along the Belt and Road (hereinafter referred to as the total export of Chinese agricultural products). The regression coefficient value of geographical distance and strategic factors is -0.242, which will have a significant negative impact on the total export volume of China's agricultural products. Agricultural productivity factors, domestic inflation factors will not have a significant impact on China's total agricultural exports.

According to the sixth column of Table 4, the regression coefficient value of the sum of factors is -0.950, which has a significant negative impact on the total export volume of agricultural products in China.

3 Conclusion and Recommendations

This paper collects the characteristic data of countries along the Belt and Road in 2020, uses the principal component analysis method to extract the main national characteristic data, and conducts the regression analysis on the export amount of countries along the

Belt and Road. The principal component molecular method extracted 5 main influencing factors from the 12 variables: agricultural productivity factors, national stability factors, domestic inflation factors, price supply and demand factors, geographical distance and strategic factors. The national stability factors have a significant positive impact on China's agricultural export; the price supply and demand factors, geographical distance and strategic factors have a significant negative impact on China's agricultural export; and the comprehensive characteristics of different countries have a significant negative impact on China's international agricultural trade in the background of the epidemic.

The "Belt and Road" trade network is vast, in addition to the neighboring Asian countries Thailand, Mongolia, South Korea and Japan, but also other countries such as Arabia, Egypt, Turkey and other African countries across the Indian Ocean, and Ukraine, Belarus, Bulgaria and other cross-continental European countries. Such cases of geographical distance will become one of the focus of the national trade, and establish a perfect transportation network for "Belt and Road" trade countries will be very important, strong sea, land and air transportation network will bring huge benefits to international trade, and land air transportation system, and for node and sea sea transportation system, set advantage integration fill other countries, strengthen countries, improve transportation efficiency, discuss specific countermeasures.

As the dominant policy of "area" in China, and on the new crown epidemic prevention and control policy has made great achievements, to ensure "area" the surrounding countries of agricultural trade smoothly, China should actively against the collective outbreak, coordinated action, since February 2020, China with surrounding countries for multiple gun control high-level meeting, how to take measures to prevent and control the spread of the discussion. The grim situation of the epidemic has been "area" surrounding countries agricultural production and trade cooperation caused great influence, in addition to strengthen the epidemic prevention and control and communication in the field of agricultural production, more should establish a regional agricultural coordination guarantee mechanism, countries timely release of agricultural supply information, strengthen mutual agricultural investment and agricultural trade policy openness and transparency, and actively persuade propaganda, avoid the outbreak of excessive tension fear caused by hoarding and buying the phenomenon of important agricultural products.

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