

## Original Paper

# Research on the Efficiency and Potential of China's Textile Export Trade to ASEAN Countries

Hui Yao<sup>1</sup> & Baimei Yang\*

<sup>1</sup> School of Business, Shanghai Dianji University, Shanghai 201306, China

\* Corresponding author, Baimei Yang, female, holds a Doctor of Management degree, and is an associate professor at the School of Business, Shanghai Dianji University, Shanghai 201306, China

Received: July 8, 2025

Accepted: July 24, 2025

Online Published: August 4, 2025

doi:10.22158/jepf.v11n3p126

URL: <http://dx.doi.org/10.22158/jepf.v11n3p126>

### Abstract

*Based on the time-varying stochastic frontier gravity model, calculate the efficiency, potential, and expansion space of China's textile export trade to ASEAN countries from 2010 to 2023. The research results indicate that among the non efficiency items of trade, ASEAN's foreign trade dependence, exchange rate, and trade freedom have a significant positive impact on trade; Monetary freedom and political stability have a significant negative impact. There are differences in China's export efficiency to different countries, with high export efficiency to Cambodia and Singapore, while relatively low export efficiency to countries such as Laos, Thailand, and Brunei. From the perspective of expanding trade space, the future should focus on strengthening the development of markets such as Brunei, Indonesia, Laos, and the Philippines. To this end, it is necessary to fully unleash China's trade potential with relevant countries through measures such as deepening infrastructure construction and enhancing bilateral and multilateral openness.*

### Keywords

*Textiles, Stochastic frontier gravitation model, Trade inefficiency model, Trade efficiency, Trade potentialities*

## 1. Introduction

In recent years, against the backdrop of profound adjustments in the global economic landscape, the trade volume between China and ASEAN has continued to expand, and the trade structure has been constantly optimized. The two sides have achieved fruitful results in multiple fields such as trade, investment, and infrastructure. The construction of the China-ASEAN Free Trade Area has injected strong impetus into the economic and trade cooperation between the two sides and has become an important engine for

promoting regional economic integration. In October 2024, China and ASEAN successfully concluded the substantive negotiations on the 3.0 version of the Free Trade Area. This landmark achievement marks a new stage of higher-level and deeper cooperation between the two sides. The 3.0 version of the Free Trade Area not only further deepens cooperation in traditional trade areas but also comprehensively covers emerging fields such as the digital economy, green economy, and supply chain connectivity. It is committed to promoting trade and investment liberalization and facilitation, creating a more open, fair, and transparent market environment for enterprises on both sides, and exploring broader cooperation potential and space.

Textile trade, as an important component of China-ASEAN trade, plays a key role in the economic and trade exchanges between the two sides. China has a complete and mature textile industry chain, with each link from raw material supply, production and processing to product sales closely connected and developing in a coordinated manner. Meanwhile, China possesses strong technical strength and production capacity in the textile manufacturing sector, capable of producing a wide range of high-quality and competitively priced textiles to meet the demands of different countries and regions. ASEAN countries, with their abundant labor resources, growing market demand and increasingly improved industrial support, have become one of the important export destinations for China's textiles. The two sides have strong complementarity in textile trade, and the cooperation prospects are very broad. This study will apply the stochastic frontier gravity model, combined with the actual situation of China-ASEAN textile trade, to deeply analyze the influencing factors and mechanism of China's textile export trade efficiency and potential to ASEAN countries. This not only helps to enrich and improve the relevant theoretical system of international trade efficiency and potential, providing new perspectives and methodological references for subsequent research, but also further expands the depth and breadth of research in the textile trade field, promoting continuous innovation and development in theoretical research in this area.

## 2. Literature Review

The current academic research on China's textile trade mainly focuses on the export competitiveness of Chinese textiles in the international market. The research results of Lu Yanping and Xiao Haifeng (2020) show that Chinese textiles have a relatively prominent competitive advantage in the US market, and the continuous increase in the demand for textiles in the US market constitutes a key driving force for the growth of China's textile exports to the US. Wang Li and Huang Feiyi (2021) revealed through empirical research that Chinese textiles have shown significant competitive advantages in the international market. Wang Ruyu and Xiao Haifeng (2022) used the modified constant market share model (CMS model) and concluded that the overall competitiveness of Chinese textiles has declined in recent years, while the overall and specific textile competitiveness effects of ASEAN have both increased. Ding Feng and Yao Xinchao (2018) compared and analyzed the competitiveness of China and the major textile and garment exporting countries along the "Belt and Road" under the framework of the "Belt and Road Initiative",

and identified the advantages of each country based on the SITC classification, providing a basis for China to formulate differentiated trade policies. Zhang rui(2024)analyzes China's textile exports to RCEP member countries from 2010 to 2021, revealing that the promotional effect of export competitiveness remained relatively limited in markets such as Japan, South Korea, and New Zealand, while significantly driving export growth in ASEAN countries and Australia. Le Kai di (2020) empirically demonstrated through the stochastic frontier gravity model that China's textile and garment trade exports to seven Asian and African countries and six European countries from 2007 to 2019 showed a three-stage regular change; the competitiveness of China's textile and garment products in the six European countries was higher than that in the seven Asian and African countries.

Research on the trade efficiency and potential between China and other countries or organizations is also quite abundant. Ye Maosheng and Xia Jiechang (2025) employed a time-varying stochastic frontier gravity model and found that due to smaller institutional and cultural differences, China's textile export growth potential to Southeast Asian countries is large; while the potential is restricted due to greater differences with European and American countries. Yin Hua and Hu Jiaqi (2025) proposed that because of the existence of trade inefficiency, the trade volume between China and BRICS partner countries deviates from the potential trade volume to varying degrees. Besides natural factors, it also includes the influence of human factors such as the signing of RTAs, tariff barriers of partner countries, and infrastructure construction on trade efficiency. Wang Yali and Hu Xixi (2024) empirically demonstrated that the comprehensive logistics performance, political stability, and economic freedom of RCEP countries all have a negative impact on the trade inefficiency term, which can effectively enhance China's vegetable export efficiency to RCEP countries, and the potential for vegetable exports still awaits exploration. Li Ming et al. (2021) conducted an analysis using a stochastic frontier gravity model and discovered that the trade efficiency of agricultural products between China and the member countries of the Regional Comprehensive Economic Partnership (RCEP) exhibits distinctive characteristics. And it is concluded that China has great potential for exporting agricultural products to these member states. Dipesh et al. (2022) employed this method to study the current trade situation of two types of oil and pepper oil in three regions of Nepal, and they believed that the trade potential of the three oils was huge and yet to be developed. They also proposed suggestions such as developing efficient processing technologies. Alamri YA et al. used the gravity model to calculate the trade potential of jujube exports from Saudi Arabia to Middle Eastern countries and found that the export trade potential to the Middle East was 83.37%. This study provided suggestions for further improving the jujube trade.

From this, it can be seen that scholars mainly take different products of China and other countries as the research objects, but the analysis of trade efficiency and potential between China and ASEAN is relatively scarce. Based on this, this paper collects panel data of China and ASEAN countries from 2010 to 2023, builds a time-varying stochastic frontier gravity model, and introduces a trade inefficiency term, aiming to measure and deeply analyze the trade efficiency and potential of China's textile exports to ASEAN, as well as to explore the impact of different variables on the two. This research not only aims

to promote the stable development of China's textile export trade, but also expects to contribute positive forces to the deepening process of regional economic integration in the Asia-Pacific region.

### 3. Model Construction and Data Description

#### (1) Model Construction

Meeusen and Van (1977) were the first to propose the stochastic frontier approach, decomposing the error term into a random disturbance term  $v$  and an inefficiency term  $\mu$ . By conducting an in-depth analysis of the inefficiency term, it is possible to further derive export efficiency and trade potential. Based on this research, and referring to the research approach of Zhou Shudong and Zheng Jian (2018), the following model is constructed:

$$Y_{ijt} = f(X_{ijt}, \beta) \exp(v_{ijt} - u_{ijt}) \quad (1)$$

$$Y_{ijt}^* = f(X_{ijt}, \beta) \exp(v_{ijt}) \quad (2)$$

$$TE_{ijt} = Y_{ijt}/Y_{ijt}^* = \exp(-u_{ijt}) \quad (3)$$

$$u_{ijt} = \{\exp[-\eta(t - T)]\}u_{ij} \quad (4)$$

Taking the logarithm of Equation (1) yields:

$$\ln Y_{ijt} = \ln f(X_{ijt}, \beta) + v_{ijt} - u_{ijt}, \quad u_{ijt} \geq 0 \quad (5)$$

In the formula, let  $Y_{ijt}$  and  $Y_{ijt}^*$  respectively the export volume of country  $i$  to country  $j$  and the trade potential value in period  $t$ .  $Y_{ijt}^*$  is the maximum trade volume that could be achieved at period  $t$ .  $v_{ijt}$  is a random error term that follows a normal distribution.  $u_{ijt}$  is a trade inefficiency term that follows a truncated normal distribution.  $TE_{ijt}$  represents the trade efficiency between the two countries in period  $t$ . Equation (4) represents a time-varying inefficiency function, where  $\eta$  is the parameter to be estimated. When  $\eta=0$ , a time-invariant model is established; otherwise, it is time-varying. This paper adopts a one-step approach to construct the following inefficiency model:

$$u_{ijt} = \delta Z_{ijt} + \varepsilon_{ijt} \quad (6)$$

Substituting into equation (5) gives:

$$\ln Y_{ijt} = \ln f(X_{ijt}, \beta) + v_{ijt} - (\delta Z_{ijt} + \varepsilon_{ijt}) \quad (7)$$

Let  $\delta$  be the parameter to be estimated,  $\varepsilon_{ijt}$  be the random disturbance term, and  $Z_{ijt}$  be the variable that affects trade efficiency.

When  $\delta > 0$ , the independent variable has a negative effect on trade efficiency; when  $\delta < 0$ , it has a positive effect. Based on this, the stochastic frontier gravity model is set up as follows:

$$\ln EX_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln PGDP_{jt} + \ln DIS_{ijt} + v_{ijt} - u_{ijt} \quad (8)$$

In the formula,  $i$  and  $j$  represent China and ASEAN countries respectively,  $t$  stands for the year,  $\beta$  is the parameter to be estimated,  $EX_{ijt}$  is the total export value of textiles from China to ASEAN countries (represented by the sum of products under HS codes 50-63),  $GDP_{it}$  and  $GDP_{jt}$  are the gross domestic products of China and ASEAN countries respectively,  $PGDP_{jt}$  is the per capita gross domestic product of ASEAN countries, and  $DIS_{ijt}$  is the distance between the capitals of the two countries.

In addition, based on the research ideas of scholars such as Yang Jiandi (2023), Wang Chong (2023), Li Jialin et al. (2023), and Guo Liancheng and Zuo Yun (2021), the following trade inefficiency model is

established:

$$u_{ijt} = \delta_0 + \delta_1 OPEN_{ijt} + \delta_2 EXCH_{jt} + \delta_3 MF_{jt} + \delta_4 TF_{jt} + \delta_5 PS_{jt} + \varepsilon_{ijt} \quad (9)$$

Among them,  $u_{ijt}$  represents the estimated value of inefficiency. For the explanations of each variable and the data sources, please refer to Table 1.

## (2) Data Description

**Table 1. Theoretical Explanation of Variables, Data Sources, and Expected Signs**

Variable	Definition	Data source	Expected symbol
$GDP_{it}$	GDP of country $i$ , a measure of a country's economic size (current US dollars)	World Bank	+
$GDP_{jt}$	GDP of country $j$ , a measure of a country's economic size (current US dollars)	World Bank	+
$DIS_{ij}$	Representing the geographical distance between country $i$ and country $j$ , reflecting transportation costs.	CPEII Geographical Database	—
$PGDP_{jt}$	Representing the per capita GDP of country $j$ , which measures the overall labor productivity and production capacity of a country.	World Bank	+
$OPEN_{jt}$	The higher the foreign trade dependence of country $j$ , the more conducive it is to enhancing the international market capacity of its textiles.	World Bank	—
$EXCH_{jt}$	Representing the average annual exchange rate of foreign currencies against the US dollar. The depreciation of the currency of the importing country is not conducive to imports	International Monetary Fund (IMF) database	—
$MF_{jt}$	Representing the currency flexibility of country $j$ , reflecting the stability of prices in the importing country and the market's role in determining prices.	Heritage Foundation	—
$TF_{jt}$	Representing the trade freedom degree of country $j$ , measuring the extent to which a country or region restricts the import and export of goods and services.	Heritage Foundation	—
$PS_{jt}$	The index indicating the political stability of country $j$ is such that the higher it is, the more it can promote trade development.	Heritage Foundation	—

## 4. Empirical Results and Model Estimation

## (1) Estimation of Time-Varying Stochastic Frontier Gravity Model

In the evaluation of trade models, the rationality test of the inefficiency term  $uijt$  is crucial. When there is no trade inefficiency, the traditional model and the stochastic frontier gravity model perform comparably. This paper employs the likelihood ratio test to verify two hypotheses: whether trade inefficiency exists; and whether the inefficiency term varies over time. As shown in Table 2, the LR statistics for both hypotheses exceed the critical value at the 5% significance level, thus the null hypotheses are rejected. This confirms The trade inefficiency term exists and is time-varying. Therefore, it is reasonable to adopt the stochastic frontier gravity model and its time-varying form to analyze trade efficiency, and the estimation results can provide reliable basis for research.

**Table 2. Results of Hypothesis Testing**

Null hypothesis	Log-likelihood value of the constrained model	Unconstrained model value	LR statistic	5% critic value	Inspection conclusion
There is no trade inefficiency term.	-202.73	-104.78	195.9	5.14	Refuse
The trade inefficiency term does not change over time	-104.78	-103.1	3.38	2.71	Refuse

To avoid multicollinearity among the explanatory variables, the variance inflation factor (VIF) of each variable was calculated. The results showed that all VIF values were below 5, indicating a low degree of multicollinearity among the explanatory variables and a reasonable model specification. Based on the time-varying model analysis results: Firstly, both  $\eta$  and  $\gamma$  passed the 1% significance level test. Secondly, the  $\gamma$  value was 0.99, close to 1, indicating the existence of trade inefficiency, and the significant difference between the actual trade volume and the export potential value originated from the artificial trade inefficiency. Additionally, the coefficient of  $\eta$  in the time-varying model was negative, suggesting that trade resistance increased over time and the trade environment was poor.

Further analysis of the time-varying model results in Table 3 reveals the following: (1) The empirical results show that China's GDP has a positive relationship with its textile exports to ASEAN at the 1% significance level. Specifically, for every 1% increase in China's GDP, China's textile exports to ASEAN will increase by 0.79%. This data strongly reflects the continuous expansion of China's economic scale, providing stronger production capacity and market competitiveness for textile exports, thereby promoting the growth of textile export volume. (2) At the same time, the GDP growth of ASEAN countries also has a significant positive impact on China's textile exports. Specifically, for every 1% increase in ASEAN countries' GDP, China's textile exports to them will increase by 0.41%. This indicates that as the economic levels of ASEAN countries continue to rise, their domestic consumption capacity and import demand are also gradually increasing, thereby driving the growth of China's textile exports

to ASEAN. (3) However, the empirical analysis also reveals the impact of geographical distance between the two countries on China's textile exports. The results show that the geographical distance between the two countries has a significant negative impact on China's textile exports. This means that the farther ASEAN countries are from China, the higher the transportation costs will be, which to some extent hinders China's textile exports to ASEAN, highlighting the important role of geographical factors in international trade.

**Table 3. Estimation Results of the Stochastic Frontier Gravity Model**

variable	Time-invariant model		Time-varying model	
	coefficient	t-value	coefficient	t-value
Constant	2.83	0.12	16.52**	2.07
GDPit	0.43**	2.65	0.79***	5.32
GDPjt	1.08***	5.41	0.41***	3.66
DIS	-1.16	-0.79	-1.98***	-4.77
PGDPjt	-0.36*	-1.78	0.17	0.65
$\sigma^2$	1.18**	2.08	17.28**	2.04
$\gamma$	0.84***	10.27	0.99***	167.56
$\mu$	1.95***	2.78	-8.27	-1.49
$\eta$			-0.01***	-2.20
Log-likelihood value	-151.80		-123.32	
LR statistic	350.06		407.02	

Note. \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels respectively.

## (2) Estimation of Trade Inefficiency Terms

This paper adopts the "one-step method" proposed by Battese and Coelli to analyze the factors influencing efficiency. The estimated results of trade inefficiency are presented in Table 4. The  $\gamma$  value is 0.93, which is significantly close to 1, once again demonstrating the rationality of using this model. In this empirical analysis, we have obtained the following key results: (1) The variable  $OPEN_{jt}$  shows a negative relationship at the 1% significance level, indicating that an increase in the degree of openness has a positive effect on reducing trade inefficiency and enhancing overall trade efficiency. Specifically, a higher degree of openness means that the country is more actively integrated into the international trade system, participating in global division of labor and cooperation, which helps optimize resource allocation and reduce trade barriers and frictions. (2) The variable  $EXCH_{jt}$  also shows a negative relationship at the 1% significance level, suggesting that the appreciation of the importing country's currency has a positive effect on China's textile exports. When the currency of the importing country appreciates, the price of Chinese textiles in the importing country's market relatively decreases, thereby

enhancing price competitiveness and facilitating export expansion. (3) However, the coefficient of the variable  $MF_{jt}$  is 0.08 at the 1% significance level, contrary to the expected sign. This indicates that the increase in the monetary level has not promoted China's textile exports to ASEAN as expected, but has instead posed certain obstacles. This might be due to the open and free economic system environment attracting more similar products to flood the market, intensifying market competition and thereby affecting the share of Chinese textiles in the ASEAN market. (4) The variable  $TF_{jt}$  shows a significant negative correlation at the 1% significance level, which actually reflects the positive impact of trade liberalization on China's textile export trade. That is, the improvement of the degree of trade liberalization creates a more relaxed and convenient environment for China's textile exports, contributing to an increase in export volume. (5) Finally, the variable  $PS_{jt}$  shows a positive relationship at the 1% significance level, but contrary to the expected sign. This suggests that the political stability of ASEAN countries to some extent hinders trade development. Although political stability usually benefits the optimization of the economic and trade environment and the maintenance of policy continuity, an overly stable political environment may also lead to a lack of market vitality and innovation, or in some cases, political unrest and other uncontrollable factors can directly affect China's textile exports.

**Table 4. Estimation Results of the Trade Inefficiency Model**

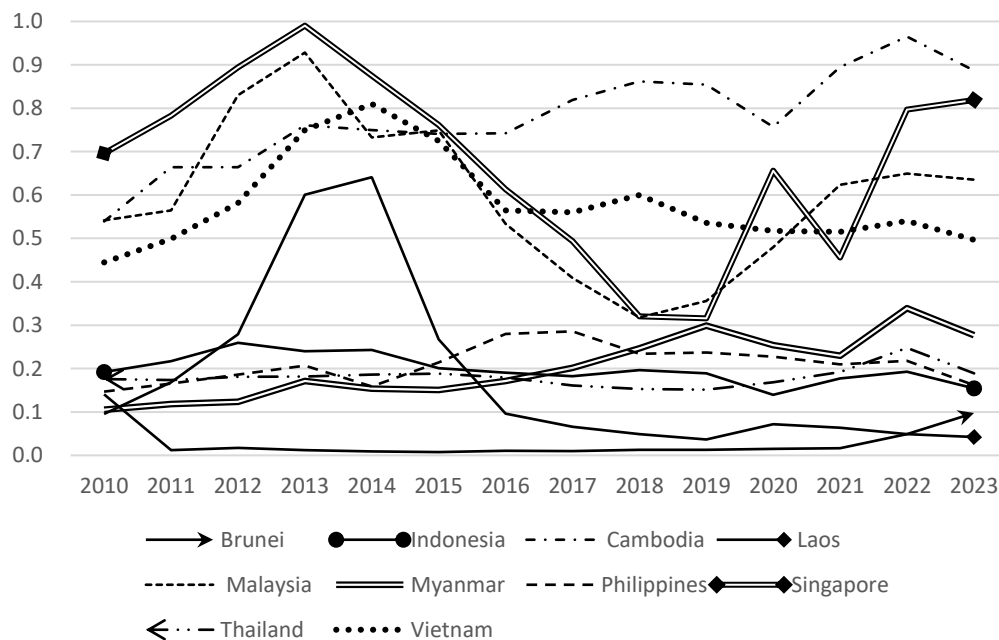
variable	Stochastic frontier gravity model		variable	Trade inefficiency model	
	coefficient	t-value		coefficient	t-value
Constant	2.42***	2.89	Constant	7.80***	4.62
GDP <sub>it</sub>	0.81***	5.62	OPEN <sub>jt</sub>	-0.05***	-21.00
GDP <sub>jt</sub>	0.63***	8.89	EXCH <sub>jt</sub>	-0.01***	-3.68
DIS	-0.28***	-3.69	MF	0.08***	4.74
PGDP <sub>jt</sub>	-1.23***	-4.92	TF	-0.12***	-7.15
			PS	2.62***	11.65
$\sigma^2$	2.10***	12.10			
$\gamma$	0.93***	38.33			
Log-likelihood value	-305.6951				
LR statistic	90.84				

*Note.* \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels respectively.

### (3) Analysis of China's Export Efficiency to ASEAN Member States

Figure 1 shows that the efficiency of China's textile exports to ASEAN countries has fluctuated from 2010 to 2023. Except for a few years, the export efficiency of Cambodia, Singapore, Malaysia and Vietnam has remained above 0.5, indicating that the trade barriers between China and these four countries

are relatively small. The efficiency of Singapore and Malaysia reached their peaks in 2010-2015, at 0.99 and 0.928 respectively, but then declined. The efficiency of Cambodia's textile exports showed a growth trend over the decade, rising from 0.539 in 2010 to 0.887 in 2023. However, the export efficiency of China to the Philippines, Myanmar, Indonesia, Brunei and Laos was below 0.5, suggesting that the trade barriers with these countries are relatively high. The efficiency of Thailand was relatively stable, but with little overall change, indicating the stability of China's textile exports to Thailand. The export efficiency to some countries remains low. For instance, China's export efficiency to Laos has been extremely low, remaining below 0.1 from 2011 to 2023.



**Figure 1. Export Efficiency of China to ASEAN Countries from 2010 to 2023**

#### (4) Estimation of China's Trade Potential and Expansion Space with ASEAN Member States

In terms of trade potential, Vietnam (36.05 billion US dollars), Indonesia (34.6 billion US dollars), and the Philippines (30.8381 billion US dollars) are firmly in the "first echelon". The trade volumes of the three countries have reached 17.914 billion, 5.273 billion, and 4.99 billion US dollars respectively, but the export expansion space still has 101.2%, 548.6%, and 517.6%. This indicates that although China's exports to Vietnam have reached a considerable scale, Vietnam's huge domestic demand market and re-export advantages have not been fully unleashed; while the absolute export volumes of Indonesia and the Philippines are far lower than that of Vietnam, due to the demographic dividend, the rapidly growing demand for clothing, and the tariff benefits brought by the RCEP cumulative rules, the "potential gap" is actually larger.

Thailand (21.73 billion US dollars) and Myanmar (10.4 billion US dollars) ranked fourth and fifth respectively. Thailand has a complete industrial chain from chemical fibers to weaving and dyeing and

finishing. However, due to the rising labor costs and increasingly strict environmental regulations, Chinese enterprises can help Thai enterprises upgrade their equipment and reduce energy consumption through the "technology export + digital factory" model, thereby turning Thailand into an ASEAN processing hub for high-end functional fabrics. Besides continuously optimizing the bilateral trade environment and tapping the existing potential space, China can further extend the export potential through technological innovation and management upgrading.

The export potential to Cambodia, Singapore, Laos and Brunei is the smallest, but the export expansion space of Laos and Brunei is the largest, both exceeding 900%. Therefore, the Chinese government should proactively provide financial, technological and project support to these countries to help their textile enterprises develop. Besides, economic scale has a significant impact on the trade expansion space. In 2023, the trade expansion space of Indonesia, the Philippines and Thailand, which have larger economic scales, all exceeded 400%.

**Table 5. Trade Potential between China and ASEAN Countries in 2023**

Country	Trade volume (billion US dollars)	Trade potential (billion US dollars)	Rank	Export expansion space
Brunei	0.497	5.093	10	924.095%
Indonesia	52.730	342.024	2	548.636%
Cambodia	44.086	49.729	7	12.798%
Laos	1.276	30.401	9	2282.126%
Malaysia	65.731	103.423	6	57.343%
Myanmar	28.806	104.032	5	261.141%
Philippines	49.934	308.381	3	517.574%
Singapore	36.460	44.502	8	22.056%
Thailand	41.005	217.271	4	429.861%
Vietnam	179.138	360.500	1	101.241%

## 5. Conclusion and Relevant Suggestions

Based on the sample data of China's textile trade exports to ASEAN countries from 2010 to 2023, this paper uses the stochastic frontier gravity model to calculate the trade efficiency and potential of China's trade with ASEAN. The following conclusions are drawn: First, the textile exports of China and ASEAN countries are significantly positively correlated with the economic scale of both countries, but negatively correlated with the distance between them. The per capita GDP of ASEAN countries has little impact on textile exports. Second, the increase in ASEAN countries' foreign trade dependence, exchange rate, and trade freedom will hinder trade inefficiency and be conducive to improving the efficiency of China's textile exports. However, the increase in monetary freedom and political stability will lead to higher

inefficiency and have a negative impact on export efficiency. Third, in terms of trade efficiency and potential, China's textile exports to Cambodia are the most efficient. China should further improve the export efficiency to other ASEAN countries. In 2023, China's trade potential with Vietnam, Indonesia, the Philippines, and Thailand is the largest, followed by Myanmar, Malaysia, Cambodia, and Singapore, while the trade potential with Laos and Brunei is the lowest. There is also huge room for expansion in textile trade exports with these two countries. Based on the conclusions, the following suggestions are put forward:

(1) At the strategic level, Against the backdrop of accelerated regional economic integration and the profound restructuring of global industrial and supply chains, China needs to reassess the strategic significance of the China-ASEAN Free Trade Area from a higher perspective. As a key hub for regional economic cooperation, China should take the lead and assume the responsibility of guiding the process. Through policy communication, rule alignment, and mechanism innovation, it should promote the ASEAN Economic Community to a higher level. Specifically, on the basis of zero-tariff policies, it can explore rule coordination in new areas such as digital economy and green trade to facilitate the deep integration of technology, capital, and markets between the two sides. In the current international situation fraught with multiple uncertainties, deepening the construction of the free trade area can not only enhance bilateral economic resilience through trade creation and investment diversion effects, but also provide public goods for regional countries through platforms such as the Belt and Road Initiative, promoting the building of an open, inclusive, mutually beneficial and win-win community with a shared future for mankind, and jointly addressing global challenges such as climate change and public health.

(2) Raise the level of opening up to the outside world. Empirical analysis shows that issues such as currency exchange restrictions and insufficient policy stability in some ASEAN countries have become key factors hindering the efficiency of textile trade. This calls for both sides to take institutional opening up as a breakthrough point and promote the upgrading of trade and investment facilitation. ASEAN countries need to further reduce non-tariff barriers such as administrative approval, establish a market-oriented exchange rate formation mechanism, and lower transaction costs through regional currency cooperation. China can assist ASEAN in improving trade facilitation infrastructure, such as jointly building cross-border payment systems and promoting the electronicization of certificates of origin.

(3) Enhance infrastructure construction. In the field of transportation infrastructure, the member states of ASEAN should work together to improve the quality of infrastructure. For those countries that are relatively far apart, it is necessary to strengthen the construction of interconnection and intercommunication to reduce the cost of logistics and transportation and improve the efficiency of logistics and transportation, especially to assist the relatively less developed countries in improving their infrastructure. There is still room for improvement in the export efficiency of China to ASEAN. China can actively participate in the railway construction of Vietnam and Myanmar, take advantage of its geographical advantages, and assist the ASEAN countries with weak infrastructure such as ports and airports to improve their facilities. This is of great significance to reducing the resistance of China's textile

exports to ASEAN and releasing the export potential.

## References

- Alamri, Y. A., Alnafissa, M. A., Kotb, A., Alagsam, F., Aldakhil, A. I., Alfadil, I. E., Al-Qunaibet, M. H., & Alaagib, S. (2024). Estimating the Expected Commercial Potential of Saudi Date Exports to Middle Eastern Countries Using the Gravity Model. *Sustainability*, 16(6), 2552.
- Battese, G. E., & Coelli, T. J. (1995). A model for technical inefficiency effects in a stochastic frontier production function for panel data. *Empirical economics*, 20, 325-332.
- Ding Feng, & Yao Xinchao. (2018). Comparative analysis on the export competitiveness between China and major five textile manufacturing countries along OBOR. *Journal of International Economic Cooperation*, 2018(04), 51-56.
- Dipesh, P., Raj, B. S., Kanta, C. S., et al. (2022). Trade potentiality of oils extracted from *Prunus davidiana* (wild apricot), *Sapindus mukorossi* (soapnut) and *Zanthoxylum armatum* (Nepalese pepper) in Kailash Sacred Landscape, Nepal. *Environmental Challenges*, 2022(100), 490.
- Guo, L. C., & Zuo, Y. (2021). Research on trading efficiency between China and countries of Eurasian Economic Union and potentials: based on stochastic frontier gravity model. *Inquiry into Economic Issues*, 3(2021), 100-110.
- Le Kaidi, Zhang Yafei, & Zhang Lijie. (2020). Study on Competitiveness and Complementarity of Chinese Textile Trade—Based on analysis of data from seven countries in Asia and Africa and six countries in Europe. *Price: Theory & Practice*, 2020(09), 152-155+180. <http://do.org/10.19851/j.cnki.CN111010/F.2020.09.420>
- Li, J. L., Jiang, H., & Chen, Q. H. (2023). Study on the Trade Efficiency between the Taiwan Region and Members of the Indo-Pacific Economic Framework. *Taiwan Studies*, 2023(05), 89-97.
- Li, M., Yu, Y., & Xu, Y. Y. (2021). The efficiency and potential of China's agricultural products exports to RCEP member countries—Analysis based on stochastic frontier gravity model. *World Agric*, 8, 33-43.
- Lu, Y. P., & ao, H. F. (2020). Factors of the fluctuation of China-US textile trade: based on modified CMS model. *Journal of China Agricultural University*, 25(6), 154-164.
- Meeusen, W., & Van, B. J. (1977). Efficiency estimation from Cobb-Douglas production function composed error. *International economic review*, 8(2), 435-444.
- Wang Chong. (2023). Trade efficiency and potential measurement between China and CPTPP countries—Based on time-varying stochastic frontier gravity model. *Prices Monthly*, 2023(03), 49-56.
- Wang L., & Huang, F.yi. (2021). Research on the international competitiveness of textile trade between China and Bangladesh, India and Myanmar and its influence—Based on the framework of BCIM. *Prices Monthly*, 2021(12), 44-51.
- Wang Ruyu, & Xiao Haifeng. (2022). The Influence of Demand, Structure and Competitiveness on the

- Fluctuation of Textile Exports from China and ASEAN to the US—An Analysis Based on Modified CMS Model. *World Agriculture*, (01), 51-61.
- Wang Ya-Li, & Hu Qian-qian. (2024). Influencing factors and export efficiency of vegetable exports from China to RCEP countries based on stochastic frontier gravity model. *Journal of Southern Agriculture*, 55(11), 3487-3496.
- Yang Jiandi. (2023). The Impact of Infrastructure Interconnection on International Trade between China and ASEAN Countries. *Journal of Commercial Economics*, (23), 150-153.
- Ye Maosheng, & Xia Jiechang. (2025). A Comparative Study on the Impact of Industrial Security Factors on the Trade of China's Traditional and High-Tech Industries: The Case of Exports of Textiles and Clothing and Electronic Information Products. *Asia-pacific Economic Review*, (02), 131-149.
- Yin Hua, & Hu Jia-qi. (2025). Research on trade efficiency and trade potential between China and BRICS partner countries after membership expansion. *Prices Monthly*, (04), 65-75.
- Zhang Rui. (2024). *Growth Factors Analysis of China's Textile Exports to RCEP Member Countries Based on CMS Mod.* Hebei University of Economics and Business. <http://do.org/10.27106/d.cnki.ghbj.2024.000485>
- Zhou, S. D., & Zheng, J. (2018). Trade efficiency between China and RCEP partners and its determinants: empirical analysis based on stochastic frontier gravity model. *Inq Econ News*, 7, 89-97.