

# Research on the Trade Potential of Chinese Carpet

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**Abstract.** Chinese carpet export has a long history, and the current political and economic environment of the world is complex and changeable, and the economies of various countries have been affected to a certain extent. Therefore, by studying the export status of Chinese carpet and tapping the export potential of Chinese carpet, we can better promote China's economic growth under complex circumstances. This paper focuses on the export status of Chinese carpet, export trading partners and the international competitive advantage of Chinese carpet, and analyzes the factors affecting the export of Chinese carpet by establishing a trade gravity model, and estimates the export potential of Chinese carpet. On the basis of the research, the paper gives policy suggestions from the two perspectives of government and enterprise respectively.

**Keywords:** export potential; carpet; trade gravity model.

## 1. Introduction

As one of China's traditional advantageous industries, the textile industry is not only very important for China's economic development, but also holds a significant position worldwide. According to statistics, the processing volume of household textiles in China exceeds 40% of the global total, and China's textile industry has invested abroad all over the world. Moreover, China's textile trade has generated a huge trade surplus, which has become an important channel for China to increase foreign exchange and accumulate funds. However, as a traditional advantageous industry, the textile industry has been greatly impacted in recent years. The global political and economic environment has deteriorated, and the trade relationship between China and the United States has increased trade uncertainty. This means that China's textile industry is facing enormous challenges. Carpets are one of the most important textile products. Chinese carpet exports have a long history and are favored by Western markets, with a high level of popularity. The carpet manufacturing industry has also become one of the most dynamic fields in contemporary China's textile industry, making significant contributions to the textile industry and China's economic growth. Therefore, analyzing the current export situation of Chinese carpets, studying their trade potential, and fully exploring this dynamic field will help further promote the development of the textile industry, thereby promoting economic growth.

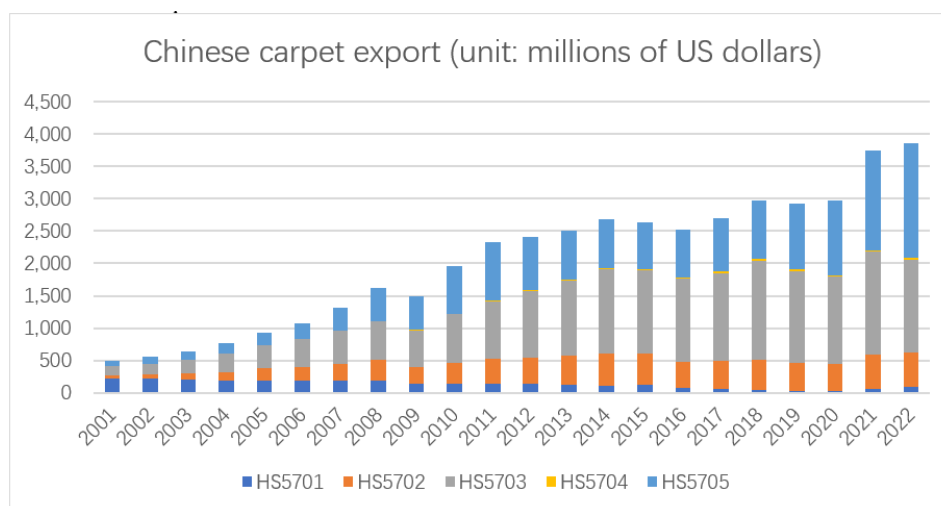
This article aims to study the trade potential of Chinese carpets. According to HS code classification, Chapter 57-Carpets and other floor covering products of textile materials are selected as the research object. On the basis of understanding the current situation of Chinese carpet exports, this article will use the gravity model to analyze the export potential and influencing factors of Chinese carpets, and provide targeted policy recommendations to better tap into the export potential of Chinese carpets and promote the growth of the textile industry and national economy.

## 2. Current Situation of Chinese Carpet Trade

### 2.1. Export Scale of Chinese Carpets

According to Figure 1, it can be seen that since 2001, China's carpet exports to the outside world have shown a continuous upward trend, from a total export value of \$490 million in 2001 to a total export value of \$3.853 billion in 2022, achieving a huge growth. From 2008 to 2009, the global

financial crisis broke out, posing challenges to global economic development. As a result, China was also affected, and its export volume slightly decreased, but then quickly rebounded. The COVID-19 broke out in 2019, rapidly affecting global economic development. Many countries' manufacturing and service industries have been severely affected. During this period, China had good control, factories resumed work in a timely manner, and the manufacturing industry quickly recovered after a brief blow, so carpet exports were only slightly affected. By 2021, China has maintained a strong export momentum, with total carpet exports increasing by 26.47% compared to 2020, achieving a significant increase. The total export volume of carpets in 2022 still maintained an upward trend, an increase of 2.8% compared to 2021.



**Fig 1.** China's total carpet exports from 2001 to 2022 (data sources: UN Comtrade, China Customs)

## 2.2. Trading Partners of Chinese Carpet

According to UN Comtrade statistics, in 2021, the total export value of Chinese carpets reached 3.749 billion US dollars, accounting for 20.3% of the world's total export value. The United States, Japan, Malaysia, Saudi Arabia, Vietnam, Germany, Australia, the United Kingdom, Iraq, and the United Arab Emirates are the top ten countries with significant carpet exports from China. Among them, the United States ranks first with a total export value of 723 million US dollars, accounting for 19.29% of China's total carpet exports. Next is Japan, with a total export value of 391 million US dollars, accounting for 10.43%. The third is Malaysia, with an export value of 246 million US dollars, accounting for 5.56%.

In 2022, the total export value of Chinese carpets reached 3.853 billion US dollars. According to Figure 2, the top ten countries in China's carpet export volume in 2022 are the United States, Japan, Malaysia, Saudi Arabia, Iraq, Australia, Vietnam, Germany, Thailand, and the United Arab Emirates. The United States remains the largest exporter of Chinese carpets, with a total export value of 705 million US dollars, accounting for 18.29% of China's total carpet exports. Japan is the second largest exporter, with an export value of 377 million US dollars, accounting for 9.78%, and exports to Malaysia of 230 million US dollars, accounting for 5.97%.

It can be seen that from 2021 to 2022, China's carpet exports increased by 2.77%, while the total export volume and proportion to the United States, Japan, and Malaysia decreased. The main trading partners of Chinese carpets remain basically unchanged, and the carpet trade volume between China and Southeast Asian countries has increased.

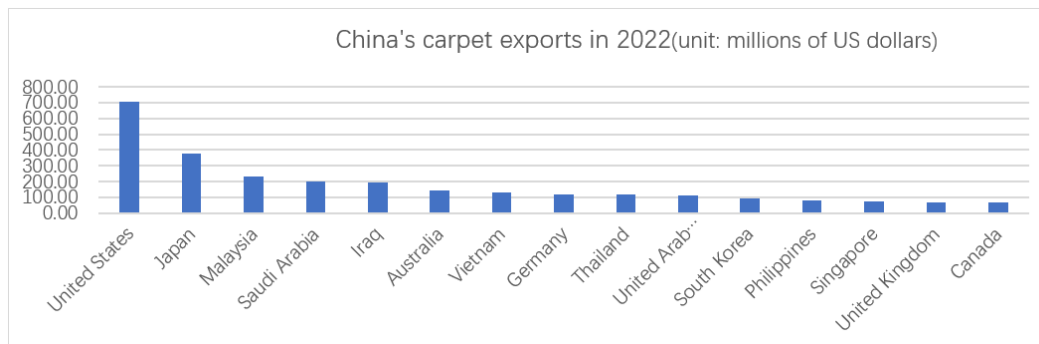


Fig 2. China's carpet export trade partners in 2022 (data sources: China Customs)

### 2.3. Current Competitive Advantages of Chinese Carpet Exports

#### 2.3.1 Comparison of International Market Share

International Market Share (MOR) represents the proportion of a country's exports of a certain product to the world's total exports of that product, and is an indicator that reflects the competitiveness and competitive position of a commodity in the international market [1]. The calculation formula is:

$$MOR_{ij} = X_{ij}/X_{wj} \tag{1}$$

$MOR_{ij}$  is the international market share of j goods in country i,  $X_{ij}$  is the export value of j goods in country i,  $X_{wj}$  represents the total world exports of j products. The international market share is directly proportional to international competitiveness. The higher the international market share, the stronger the international competitiveness, and vice versa.

Table 1. International Market Share of Carpets by Country from 2016 to 2021 (Data Source: UN Comtrade)

	2016	2017	2018	2019	2020	2021
China	0.169	0.170	0.182	0.190	0.202	0.203
Türkiye	0.129	0.137	0.139	0.166	0.179	0.175
India	0.116	0.110	0.107	0.112	0.116	0.123
Belgium	0.109	0.104	0.099	0.098	0.094	0.088
Netherlands	0.074	0.075	0.079	0.079	0.076	0.075
United States	0.065	0.063	0.060	0.059	0.053	0.042
Germany	0.042	0.040	0.040	0.040	0.037	0.033
Egypt	0.021	0.020	0.019	0.020	0.027	0.025
United Kingdom	0.020	0.020	0.022	0.023	0.020	0.015

As shown in Table 1, the international market share of Chinese carpets ranks first in the world and has maintained a growing trend. In 2021, the international market share of Chinese carpets has exceeded 20%, indicating that Chinese carpets have strong international competitiveness in the international market. The international market share of carpet in Türkiye is second only to that in China, with a small gap and a strong upward trend. By 2021, its international market share has reached 17.5%. The international market share of Indian carpets ranks third, with fluctuations in recent years and an upward trend, both exceeding 10%. In addition, other countries with large carpet exports, such as Belgium, the Netherlands, and the United States, have relatively small market share of no more than 10%.

#### 2.3.2 Comparison of Trade Competitive Index

The Trade Competitive Advantage Index (TC) represents the proportion of the import and export volume of a certain industry or product in a country's total import and export volume [2]. The calculation formula is:

$$TC_{ij} = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij}) \quad (2)$$

In this equation,  $TC_{ij}$  is the trade competitive advantage index of  $j$  products in country  $i$ , while  $X_{ij}$  and  $M_{ij}$  represents the export value and import value of  $j$  products in country  $i$ . If  $TC_{ij}$  is a positive number, it indicates that the  $j$  products of country  $i$  have high production

efficiency and have a competitive advantage in international trade, and the larger the value, the greater the competitive advantage. If  $TC_{ij}$  is a negative number, it indicates that the  $j$  products of country  $i$  do not have a competitive advantage. If  $TC_{ij} = 0$ , it indicates that the product of country  $j$  is in a neutral competitive advantage.

**Table 2.** Competitive Index of Carpet Trade in Various Countries from 2016 to 2021 (Data Source: UN Comtrade)

	2016	2017	2018	2019	2020	2021
China	0.897	0.906	0.913	0.921	0.948	0.943
Türkiye	0.934	0.947	0.950	0.955	0.967	0.966
India	0.903	0.889	0.869	0.854	0.898	0.915
Belgium	0.777	0.788	0.779	0.780	0.780	0.694
Netherlands	0.546	0.526	0.554	0.548	0.552	0.469
United States	-0.482	-0.488	-0.538	-0.541	-0.600	-0.689
Germany	-0.326	-0.320	-0.310	-0.318	-0.371	-0.345
Egypt	0.759	0.741	0.565	0.482	0.594	0.635
United Kingdom	-0.594	-0.564	-0.530	-0.530	-0.537	-0.646

As shown in Table 2, the carpet trade competitive index of China, Türkiye, India, Belgium, the Netherlands and Egypt is greater than 0, which means they have a competitive advantage. However, the carpet trade competitive index of the United States, the United Kingdom and Germany is less than 0, which indicates that their carpets do not have a competitive advantage. The competitive advantage index of carpet trade in Türkiye is greater than 0 and closer to 1, and is growing year by year. It can be seen that Türkiye's carpets have very strong international competitiveness in the international market. The competitive advantage index of China's carpet trade is the second, and it is growing year by year. The gap between China and Türkiye is getting smaller and smaller.

In summary, Chinese carpets are highly popular in the international market, with a market share of over 20%, ranking first. But there are still competitors, such as Türkiye, India, Belgium and other countries. Therefore, it is still necessary to further increase the export volume of Chinese carpets and enhance their international competitiveness.

### 3. Empirical Analysis of the Trade Potential of Chinese Carpets

#### 3.1. Model Design and Variable Selection

This article will study the export potential of Chinese carpets. To study export potential, we need to establish a Gravity model of trade. The Gravity model of trade was first introduced into the field of international trade by Tinbergen and Poyhonen, who believed that bilateral trade flows between the two countries were proportional to their respective economic scale and inversely proportional to the distance between the two countries [3]. The basic form of this model is:

$$Trade_{ij} = \alpha \times \frac{GDP_i \times GDP_j}{Dist_{ij}} \quad (3)$$

With the development of the Gravity model of trade, more and more scholars add explanatory variables on the basis of model one to better explain the problem. On the basis of the initial model, this article will add variables such as the degree of trade openness, as well as dummy variables such

as whether the two countries are adjacent and whether the country is a member of RCEP. The constructed model is as follows:

$$\ln Trade_{ci} = \alpha_0 + \alpha_1 \ln GDP_{ct} + \alpha_2 \ln GDP_{it} + \alpha_3 \ln Dist_{ci} + \alpha_4 Open_{ti} + \alpha_5 BD_{ci} + \alpha_6 RCEP_i + u_i \quad (4)$$

In this equation,  $Trade_{ci}$  is the total trade volume between China and various countries;  $GDP_{ct}$  and  $GDP_{it}$  represents GDP of China and country i during the period t respectively;  $Dist_{ci}$  represents the geographical distance between China and country i;  $BD_{ci}$  and  $RCEP_i$  are all dummy variables, indicating whether country i borders China and whether country i has joined RCEP.  $Open_{ti}$  represents the degree of trade openness of country i, calculated as follows:

$$Open_{ti} = \frac{EX_{ti} + IM_{ti}}{GDP_{ti}} \quad (5)$$

Among them,  $EX_{ti}$  represents the trade export volume of country i during the t period,  $IM_{ti}$  represents the trade import volume of country i during the period t.  $\alpha_0$  is a constant term,  $\alpha_i (i=1,2,\dots,7)$  is the regression coefficient of the explanatory variable, and  $u_i$  is the random error term.

### 3.2. Empirical Analysis

This paper selects 15 countries with large carpet trade volume in the world, such as Türkiye, Belgium, India, the United States, Germany, Japan and other countries, and collects the carpet trade data of these countries from 2016 to 2020 as samples for research.

Then, Multicollinearity test, Homoscedasticity and heteroscedasticity test, F-test and Hausmann test were performed on the above data, and it was finally shown that there was no Multicollinearity or Homoscedasticity and heteroscedasticity in the model. When selecting the model, it was found that the random effects model was superior to the fixed effects model and the mixed OLS model, so the random effects model was chosen as the final model. And under the random effects model, at a significance level of 0.1%, both the GDP of country i and whether country i has joined RCEP have passed the test as explanatory variables; At a significance level of 1%, the degree of trade openness of country i passed the test.

Based on the regression results of the random effects model, we can obtain the estimated equation for the trade potential of China's carpet trade as follows:

$$\ln Trade_{ci} = -7.000 + 0.219 \ln GDP_{ct} + 0.902 \ln GDP_{itj} + 0.184 \ln Dist_{ci} + 0.240 Open_{ti} + 0.120 BD_{ci} + 0.515 RCEP_i \quad (6)$$

### 3.3. Analysis of China's Carpet Trade Potential

After building the Gravity model of trade, we can better estimate the export potential of Chinese carpets, that is, we can get the trade potential coefficient by comparing the actual value of trade volume with the simulated value. If the coefficient is less than 0.8, we think that the trade potential is huge and belongs to the huge potential; If this coefficient is between 0.8-1.2, it is considered that the potential needs to be explored and belongs to the potential development type; If it is greater than 1.2, it is considered insufficient potential and belongs to potential reshaping [4]. According to the above Gravity model of trade, the carpet trade potential of each country is estimated as shown in Table 3.

**Table 3.** Potential coefficient of carpet trade between China and other countries

country	2016	2017	2018	2019	2020
Belgium	1.0104	0.9980	1.0022	0.9991	1.0074
India	0.9929	0.9925	0.9914	0.9845	0.9566
Japan	1.0027	1.0040	1.0044	1.0031	1.0032
Netherlands	1.0023	1.0005	1.0067	1.0019	1.0071
United States	1.0137	1.0159	1.0204	1.0041	1.0069
United Kingdom	1.0119	1.0090	1.0080	1.0088	1.0149
Vietnam	1.0141	1.0046	1.0103	1.0221	1.0265
Thailand	0.9837	0.9794	0.9785	0.9879	0.9928
Germany	0.9821	0.9782	0.9782	0.9886	0.9932
Türkiye	1.0113	0.9992	1.0012	1.0029	0.9942
France	0.9742	0.9763	0.9763	0.9780	0.9782
Egypt	1.0132	1.0159	1.0049	1.0084	1.0322
Poland	1.0032	1.0143	1.0088	1.0165	1.0177
Canada	0.9887	0.9958	0.9966	0.9889	0.9981
Australia	1.0018	0.9977	0.9922	0.9871	0.9925

From Table 3, it can be seen that the potential coefficients of carpet trade between China and the 15 countries in the table are all concentrated between 0.8-1.2. This indicates that China's carpet export trade belongs to the type of potential development, and the export potential has not been fully explored. There is still great development space, and it is necessary to pay attention to exploring factors that can promote carpet exports.

## 4. Conclusion and Policy Recommendations

### 4.1. Conclusion

(1) According to empirical research, the economic development level of importing countries has a significant impact on China's carpet export trade. The higher the economic development level of importing countries, the greater the carpet trade volume between China and that country.

(2) The accession of importing countries to the RCEP organization has a significant positive impact on China's carpet export trade. If both countries belong to the same trade organization, they can better enjoy the trade convenience and trade preferences brought by the trade organization to member countries, which has a certain promoting effect on China's carpet exports.

(3) If China borders with importing countries, the export trade of Chinese carpets will increase. The two countries are adjacent and have a small geographical distance, which significantly reduces transportation costs and facilitates trade exchanges. The higher the degree of trade openness of the importing country, the less trade barriers between China and that country, and the greater the trade volume of carpet between China and that country. The level of economic development in China also has a certain impact on the export volume of Chinese carpets. The higher the level of economic development in China, the stronger the manufacturing capacity of Chinese carpets, and the larger the export volume of carpets.

### 4.2. Policy Recommendations

(1) Actively participate in trade organizations, promote the signing of trade agreements, and improve the level of trade facilitation. Only by actively promoting trade negotiations, trade negotiations, and trade policy signing within these trade organizations can we better enjoy trade preferences and utilize the convenience and advantages brought by policies to strengthen carpet trade.

(2) Strengthen trade exchanges with neighboring countries, strengthen infrastructure construction, and reduce transportation costs. We need to actively promote infrastructure cooperation with

neighboring countries, provide stable and smooth roads for goods trade between the two countries, improve trade facilitation, and naturally increase carpet trade.

(3) Strengthen economic cooperation with other countries and strive to achieve a win-win situation for both countries. Therefore, China must adhere to actively formulating and signing trade agreements with African countries, and explore the African market. We also need to consolidate and maintain economic cooperation with developed countries such as the United States, Japan, and the United Kingdom, strengthen in-depth economic cooperation with developing countries such as Thailand, India, and Vietnam, comprehensively improve the level of economic cooperation, promote GDP growth, and ultimately promote the growth of carpet exports.

(4) We will always adhere to opening up to the outside world, promote high-level opening up, reduce various tariff and non-tariff barriers, and maximize trade liberalization.

## References

- [1] Nie Ling. Comparative study on international competitiveness of creative products trade in BRIC countries [J]. *International Trade Issues*, 2013, (02): 111-122.
- [2] Sang Feifei. Analysis of Shaoxing textile industry export status and international competitiveness [J]. *Productivity Research*, 2020(01): 102-106.
- [3] Wang Jingjing, Zhu Guanghui, Deng Yujia, Zhang Qingping. Current situation and potential evaluation of agricultural trade between Xinjiang and Kazakhstan: An empirical study based on trade gravity model [J]. *Agricultural Resources and Regionalization*, 2021, 42(11): 72-84.
- [4] Yin Jinxin. Research on trade potential between China and ASEAN: An empirical study based on gravity model [J]. *Modernization of Shopping Malls*, 2022(06): 84-86.