

Analysis of the factors influencing the international competitiveness of Chinese textile and garment industry

Yu Zhang *, Dayan Lin

School of Economics and Management, Nanjing University of Science and Technology, Nanjing, China

* Corresponding Author Email: 1070546287@qq.com

Abstract. Textile and garment industry has been an important part of Chinese national economy since ancient times, and is an important export foreign exchange earning industry in China. Due to many adverse factors in the global economic development in recent years, Chinese garment production enterprises are facing great production pressure. From the perspective of international competition pattern, this paper makes a qualitative and quantitative analysis of the current situation and main influencing factors of the export competitiveness of Chinese textile and garment industry by referring to research results in related fields and competitiveness evaluation methods, points out the shortcomings of Chinese textile and garment industry, and proposes countermeasures to improve the competitiveness of Chinese textile and garment industry on the basis of empirical analysis results.

Keywords: Chinese textile and garment Industry; International competitive advantage theory; Multiple linear regression.

1. Introduction

As one of Chinese traditional industries, the textile industry has always been a pillar industry of the national economy. In 2001, after China joined the World Trade Organization (WTO), the quota restrictions on textiles were abolished, and Chinese textile industry economy also developed rapidly. However, while gaining huge profits, the future development of Chinese textile and garment industry is also facing huge challenges. On the one hand, with the continuous deepening and refinement of the international division of labor, countries are becoming more and more specialized in participating in the international division of labor. Compared with developed countries, Chinese product segmentation degree is not high, there is no technical barrier, and the price advantage is mainly formed by cheap labor advantage, and it is still in the low value-added link of the value chain. On the other hand, the export products of Chinese textile and garment industry are typical labor-intensive products, and with the rising prices of chemical fiber, cotton and other raw materials in recent years, the continuous increase of labor costs and environmental protection policies, they are gradually losing their comparative advantages. Therefore, at present, Chinese textile and garment industry is at a turning point in development.

Made in China 2025 proposes to use three 10 years to realize the transformation of China from a manufacturing country to a manufacturing power, and the textile and garment industry is also facing the transformation from "big" to "strong". In order to realize the strategy of textile power, it is necessary to enhance the international competitiveness of Chinese textile and garment industry and cultivate sustainable competitiveness. Therefore, this paper proposes corresponding countermeasures to enhance the competitiveness of Chinese textile and garment industry through the analysis of the factors affecting the international competitiveness of Chinese textile and garment industry at present, so as to realize the upgrading of the international competitive advantage of Chinese textile and garment industry.

The research in this paper can enrich the current research results on the transformation and upgrading of traditional manufacturing industry in China, and has important reference significance for the research on how to innovate traditional manufacturing industry and find new development advantages in the new era. It will help accelerate the construction of a manufacturing power,

accelerate the development of advanced manufacturing, and promote the realization of Made in China 2025 and the goal of a textile power.

2. Literature Review

2.1. Research on international competitiveness

Porter Michael proposed the model of national competitive advantage in his "Competition Trilogy". The core of its concept is that innovation is the source of competitiveness, production conditions, demand conditions, related and supporting industry factors, strategic organization and competitive factors of enterprises, government and opportunities are the main factors that determine whether a country can achieve global success and gain profits in an industry, also known as the "diamond model", which lays an important theoretical foundation for the study of international competitive advantage of the industry. This model is relatively comprehensive for analysis, but the indexing and quantification of these six factors are difficult.

Since then, researchers have conducted more in-depth exploration and research on the competitiveness of international industries, which are roughly at three levels. First of all, the industrial competitiveness of a country is more directly reflected in the profits and market share of enterprises, so these two data can be used for research, which is an indicative indicator. For example, commonly used display indicators: international market share (IMS), revealed comparative advantage index (RCA), trade competition index (TC) and so on. Secondly, the national industrial competitiveness is essentially reflected in the production level of the industry, and the two data of output and productivity can also be used to evaluate the competitiveness of a country (Chen L M et al., 2009). Finally, it is necessary to conduct a comprehensive analysis of various influencing factors of industrial competitiveness to draw a conclusion (Guo Xin et al., 2023; Kambli et al., 2018), this is the most complex way to evaluate industrial competitiveness, and the data corresponding to each influencing factor is not easy to obtain. Therefore, when Chinese researchers analyze industrial competitiveness, they are more inclined to use empirical research to analyze import and export data, considering the availability of data.

2.2. Research on the competitiveness of Chinese textile and garment industry

After entering WTO, the textile quota was cancelled, and the export of Chinese textile and garment industry grew rapidly, becoming the largest export industry, and the theoretical research on industrial competitiveness began to enter the field of view of scholars. In the calculation of the competitiveness of Chinese textile and garment industry, although different calculation methods are adopted, the conclusion is drawn that Chinese textile industry has the strongest competitiveness among big countries, but the export structure still needs to be further optimized (Pan Zhengrong, 2018; Zhu Tong, 2010). In addition, some scholars have proposed that Chinese textile and garment industry has disadvantages in terms of production costs and international competitiveness, the traditional model of factor-driven industrial development is unsustainable, and the industrial development pattern has undergone major changes, and Chinese textile and garment industry needs to find ways to maintain competitiveness as soon as possible (Li Chenyang et al., 2022; Huang Hanquan et al., 2017; Liu Juan, 2016).

On the cultivation of sustainable development competitiveness of Chinese textile and garment industry, scholars have also made a lot of research. They have studied foreign direct investment technology spillover (Li Xiaozhong et al., 2009), industrial clusters (Yuan Yong, 2021), industrial integration (Li Xiaozhong et al., 2018), digital economy (Wang Ruirong, 2018), green innovation (Xiaoyi Z et al., 2023) and other perspectives to study the path to enhance the competitiveness of textile and garment industry.

However, in the above studies on the competitiveness and competitiveness improvement of Chinese textile and garment industry, there are not many literatures that select indicators based on the theory of national competitive advantage. Based on the theory of national competitive advantage and

the development status of Chinese textile and garment industry, this paper combines medium-level indicators with macro-level indicators, domestic and foreign influencing factors, and adopts relatively scientific and reasonable indicators according to the availability of data to conduct an in-depth analysis of influencing factors of the international competitiveness of Chinese textile and garment industry. The feasible methods to enhance the competitiveness of the industry are also discussed. The research in this paper can enrich the current research results on the transformation and upgrading of traditional manufacturing industry in China, and has important reference significance for the research on how to innovate traditional manufacturing industry such as textile and garment in China, find new development advantages in the new era background, and obtain higher value chain profits. It is conducive to accelerating the construction of a manufacturing power, accelerating the development of advanced manufacturing, and promoting the realization of the goal of Made in China 2025 and textile power.

3. Export competitiveness of Chinese textile and garment industry

Chinese accession to the WTO in 2001 provided an opportunity for the development of textile and garment exports, with its International Market Share (IMS) rising year after year and its import and export growing rapidly, reaching a peak of 38.21% in 2015. Since then, IMS of Chinese textile and garment products has shown a declining trend, the main reasons are: the impact of the financial crisis made the economic recovery of various countries slow, weak demand in foreign markets; The production cost of Chinese textile and garment industry has increased year by year, its competitiveness was weakening, and it was facing multi-party competition from Vietnam, Bangladesh, Turkey, Cambodia, India and other countries; China has introduced a series of environmental protection policies. In 2019, affected by the Sino-US trade war, the export cost of some products in the textile and garment industry increased, and the IMS felled to 33.94%. In 2020, the global spread of the coronavirus epidemic, in the face of unprecedented supply and demand pressure and systemic risks, Chinese textile industry has shown strong development resilience, the industry has outstanding performance in the resumption of work and production, and the industry production has accelerated recovery, showing a continuous improvement trend. By 2022, the IMS of Chinese textile and garment products reached 36.08%.

In the past 22 years, China has grown rapidly in terms of quantity, but has China made corresponding achievements in terms of quality? In this paper, the Revealed Comparative Advantage Index (RCA) is used to measure the competitiveness of Chinese textile and garment industry in the global textile and garment industry. As can be seen from Table 1, in the past 22 years, the RCA of Chinese textile and garment industry has declined year by year, from 3.64 in 2001 to 2.68 in 2022. However, in general, the RCA index of Chinese textile and garment industry has been greater than 2.5 for several years, indicating that compared with other countries in the world, Chinese garment industry has significant competitiveness and comparative advantage, and China has strong industry competitiveness. China is in the crucial stage of supply-side structural reform, and the competitiveness of the garment industry has declined under the new normal of the economy.

Table 1. IMS&RCA of Chinese textile and garment industry from 2001 to 2022.

Year	IMS (%)	RCA	Year	IMS (%)	RCA
2001	15.61	3.64	2012	36.51	3.30
2002	17.28	3.45	2013	37.60	3.23
2003	19.43	3.37	2014	37.44	3.04
2004	20.92	3.25	2015	38.21	2.78
2005	23.92	3.30	2016	36.19	2.77
2006	27.18	3.40	2017	35.12	2.75
2007	29.13	3.35	2018	34.32	2.70
2008	30.14	3.41	2019	33.94	2.58
2009	31.50	3.29	2020	37.98	2.59
2010	34.01	3.30	2021	35.61	2.37
2011	34.73	3.36	2022	36.08	2.68

Data source: WTO STATS, calculated by the author.

4. Empirical Analysis

4.1. Variable Selection

4.1.1. Explained variable

Since the IMS and RCA index of Chinese textile and garment industry have small changes, which may lead to a large deviation in the final result, the export value Y of the textile and garment industry is chosen to represent the export competitiveness. The greater the export value, the stronger the export competitiveness.

4.1.2. Explanatory variable

In this paper, the cost of raw materials, demand conditions, gross foreign product, domestic enterprise competition, industry R&D investment, and exchange rate factors are selected as explanatory variables when constructing the regression model. According to the explanatory variables, the following indexes are selected combined with the availability and representativeness of data: Purchasing price index P of textile raw material industry producers; Chinese textile and garment industry's foreign trade dependence DFT , DFT is expressed by the ratio of Chinese textile and garment imports and exports to industrial added value; The gross foreign product (GFP) is chosen to represent the demand of the foreign market. Number of enterprises above designated size in textile and garment industry n ; Foreign direct investment in manufacturing FDI . The above data comes from National Bureau of Statistics, China Statistical Yearbook, Ministry of Industry and Information Technology, WTO STATS, and some of the data were calculated by the author.

4.2. Model Construction

In order to avoid the impact of heteroscedasticity, the logarithm of the above variables is taken to reduce the scale of the variables. After logarithm is taken, the variables are: $\ln Y$, $\ln P$, $\ln DFT$, $\ln GFP$, $\ln N$, $\ln FDI$ and $\ln E$. Therefore, the multiple linear regression equation is established as follows:

$$\ln Y = \alpha_0 + \alpha_1 \ln P + \alpha_2 \ln DFT + \alpha_3 \ln GFP + \alpha_4 \ln N + \alpha_5 \ln FDI + \alpha_6 \ln E + e \quad (1)$$

Where α_0 is the constant term, α_1 to α_6 is the parameter to be estimated, and e is the random error term.

4.3. Model Test

Before the cointegration analysis, the stationarity test of time series data should be carried out first in order to avoid the occurrence of pseudo-regression. In this paper, unit root tests are carried out for sequences by ADF test. After the ADF test results are passed, the E-G two-step method based on regression residuals can be used to conduct the co-integration test to investigate whether the long-term equilibrium can exist among the variables. The co-integration regression model is obtained by using OLS method for the original sequence of first order single integration.

4.4. Empirical Results and Analysis

4.4.1. Estimated results

The ADF test results show that the 6 logarithmic variables are non-stationary first-order single integral variables, and there may be a cointegration relationship. The stationary variable $\ln P$ was removed, and the original sequence of first-order single integrations was cointegrated regression by OLS method. The cointegration regression model obtained was as follows:

$$\ln Y = -13.960150 + 0.876891 * \ln DFT + 2.119939 * \ln GFP + 0.242812 \ln N + 0.405568 * \ln FDI - 0.838113 * \ln E \quad (2)$$

$$\begin{aligned} & (0.196900) \quad (0.327833) \quad (0.101597) \quad (0.192573) \quad (0.421436) \\ t = & (4.453486) \quad (6.466521) \quad (2.389947) \quad (2.106053) \quad (-1.988708) \\ \overline{R^2} = & 0.912730 \quad F = 38.65125 \quad DW = 2.146642 \quad n = 19 \end{aligned}$$

4.4.2. Result analysis

The coefficient of DFT is 0.876891, which is significant at 5% confidence level. The dependence on foreign trade is positively correlated with the international competitiveness of Chinese textile and garment industry. The N coefficients of the gross foreign product (GFP) and the number of enterprises above designated size in the textile and garment industry were 2.119939 and 0.242812, respectively, both of which were significant at the 5% confidence level. This means that the expansion of the industrial scale of Chinese textile and garment industry will inevitably bring external economies of scale. Due to the increase in the number of enterprises in the entire industry and the relatively concentrated industrial layout, industrial clusters can achieve the purpose of expanding the industrial scale, improving the ability to allocate resources, enhancing the level of specialized production, and improving the labor productivity of the entire industry. Thus enhancing the ability of Chinese textile and garment industry to compete with other countries.

The coefficient of FDI in manufacturing industry is 0.405568, which is significant at the 10% confidence level. The R&D investment of the industry is positively correlated with the international competitiveness of Chinese textile and garment industry. In the market economy, a high level of asset conditions can promote the continuous development and growth of industries and enterprises, can win in the fierce competition, and can provide sufficient financial support for the introduction of advanced technology and equipment, which is the fundamental guarantee of technological innovation and is a necessary condition for the adjustment and upgrading of industrial structure. The upgrading and improvement of the industrial structure can improve the competitiveness of the industry in the international market, and become an important driving force for Chinese textile and garment industry to achieve a dominant position in international competition.

The coefficient of exchange rate E is -0.838113, which is significant at the 10% confidence level. The exchange rate is negatively correlated with the international competitiveness of Chinese textile and garment industry. The appreciation of RMB means that the amount of RMB exchanged for the same unit of foreign currency is reduced, that is, the purchasing power of foreign currency in the country is reduced, which is obviously conducive to imports and not conducive to exports. For those import enterprises with huge foreign debts and highly liquid local currency assets, the appreciation of the RMB will broaden the profit space of these enterprises and reduce the pressure of debt. For those export-dependent enterprises with high level of foreign exchange assets and whose product prices are determined by the market, the appreciation of RMB will greatly weaken their international competitiveness. Chinese textile and garment industry is a typical export-dependent enterprise, so the appreciation of RMB will have a serious negative impact on them.

The cointegration regression model reflects the long-term equilibrium relationship between the influence factors and the export value of the textile and garment industry. According to the cointegration regression model of equation (2), foreign market demand makes a greater contribution than other influencing factors. In the long run, every 1 percentage point increase in foreign trade dependence increases the total export value by 0.88 percentage points; For every 1 percentage point increase in gross foreign product, the total export value increased by 2.12 percentage points, while for every 1 percentage point increase in gross foreign product and FDI in manufacturing, the total export value only increased by 0.242812 and 0.242812 respectively. For every 1 percentage point increase in the exchange rate, the value of exports decreases by 0.84 percentage points.

5. Suggestions

5.1. Promote the Upgrading Of Industrial Clusters

The emergence and rapid rise of the phenomenon of textile and garment industry cluster is an important manifestation of the implementation of cross-regional market allocation of various production factors in China's textile and garment industry, market-oriented reform, and update market allocation mode. In order to play the role of industrial clusters, it is necessary to base on the traditional

textile and garment industry or local cotton production, textile technology, brands and other advantageous resources, in the region with a certain industrial economic foundation, to take the textile and garment industry as the leading industry, attract related supporting industries to support the development of the leading industry, and extend the industrial chain from the horizontal, vertical and regional scope. Increase the added value of export products, especially textiles and clothing, and establish an industrial cluster base for the textile and clothing industry. Focus on resource supply and policy support to cultivate core enterprise groups with good development prospects and in the rising development stage, promote the growth of other textile and garment small enterprises with the development of core enterprises, promote technical information exchange and cooperation among enterprises in the region, encourage technology research and development and innovation in the region, and form a modern and powerful industrial cluster.

In China, the garment industry cluster is mainly concentrated in the southeast coastal areas, especially in Jiangsu, Zhejiang and other provinces. These industry girls have independent brands and design capabilities, and how to upgrade these cluster industries to the next step has become a common problem faced by the clothing industry. From "loose" to "fine", from "tired" to "prosperous", in order to enable China's "intelligent" manufacturing to promote the formation of the competitiveness of the textile and garment industry.

5.2. Explore New Overseas Markets

Strengthening the ties between China's textile and garment industry and other countries outside the existing major markets and promoting the diversification of export markets can effectively overcome the drawbacks of too single export market of China's textile and garment industry on the one hand, and help to increase the total export trade of China's textile and garment industry and improve the export structure on the other hand. At present, the "Belt and Road" connects 65 countries along the route, of which the population reaches 4.4 billion, and the total volume of trade imports and exports accounts for 1/4 of the world's total trade, which has a great role in promoting the growth of China's export trade. Textile and garment enterprises "going out" in the "Belt and Road" countries to invest in the establishment of factories, is a beneficial choice for the traditional industry excess capacity output, not only can avoid the relevant trade barriers, further reduce raw material procurement and labor production costs, but also on the basis of the use of local resources, brands and sales network, expand market share. Take the initiative to enter the supply chain and sales terminals in these countries, and form complementary win-win relationships with manufacturers and retailers in these countries to cooperate for development. The Chinese government has provided many preferential policies and financial support for textile and garment export enterprises. Export enterprises should strengthen exchanges and cooperation with different countries and regions in terms of talents, technology, knowledge and trade, speed up the development of new foreign markets, deepen the depth of the development of new markets, expand the breadth and latitude of development.

5.3. Increase R&D Investment

Under the "Four new economy" environment, the export price comparative advantage that previously supported the development competition of China's textile and garment industry is gradually fading, and the industrial competitiveness is more from the high-end of the industrial value chain. On the one hand, we should pay attention to the research and development and upgrading of core textile industry technology and equipment to stimulate innovation ability; On the other hand, with market demand as the fundamental guidance, to achieve market segmentation and precision marketing, scientific and accurate analysis of the market positioning of China's textile and garment industry exports to countries around the world, and close the connection between the supply side and the demand side. Increasing public awareness and strict regulation of environmental issues have an important impact on the green innovation and long-term sustainability of enterprises. Nowadays, people are increasingly aware of environmental protection and tend to choose green products when purchasing goods. At the same time, the government has also issued environmental protection

documents, the 20th report pointed out that "to speed up the green transformation of development mode, the development of green low-carbon industry, accelerate the research and development and promotion of advanced technology of energy saving and carbon reduction, advocate green consumption, and promote the formation of green low-carbon production mode and lifestyle." Domestic textile and garment enterprises should actively respond to the call of the government, comply with consumption and psychology, and take the road of green and sustainable development. Domestic enterprises should show a certain social responsibility, increase R&D investment, and strive in the direction of fabric innovation and production equipment, and enterprises in the industry should not only focus on the production link, but should separate the capital into the research and development link. At the same time, improve the export testing standards of China's textile and garment industry, and strengthen technical and green level monitoring.

5.4. Actively Respond to Exchange Rate Fluctuations

At present, the world economic environment is complex and changeable, uncertainty and various risks are intertwined, increasing the cost of international transactions, and the export trade situation of China's textile and garment industry has become more complicated. In this case, as an export enterprise, it should be able to cope with the risks and losses caused by exchange rate fluctuations, and reduce the transaction risks and shorten the time span of exchange settlement by using various exchange rate hedging tools provided by various financial institutions in China, including foreign exchange futures and options, forward foreign exchange transactions, foreign exchange swaps, forfaiting and negotiation. These financial instruments play a very important role in the process of preventing exchange rate risks. Textile and garment enterprises should comprehensively consider various factors when dealing with exchange rate fluctuations, and select appropriate financial instruments in combination with the actual situation, so as to maximize the return on funds on the basis of controlling risks, so as to reduce the risks and unnecessary losses caused by exchange rate fluctuations. In addition, the choice of reasonable settlement methods requires rapid and safe collection of foreign exchange, so it is necessary to use as many spot L/C or D/P settlement methods as possible, so as to improve China's ability to resist risks and external shocks when participating in international trade, which is particularly important for the highly external dependence of the textile and garment industry.

References

- [1] Porter Michael E. 1990. *The Competitive Advantage of Nations*. Free Press :New York
- [2] Chen L M, Wang X, Rao S Y. Measurement to international competitiveness of China & U.S. manufacturings: Empirical study based on hierarchical view[J]. *China Industrial Economics*, 2009, (6):57-66.
- [3] Guo Xin, Zhang Jingjing, Chi Kangwei, etc. Comparative Study on International Competitive Advantage of Manufacturing Industry between China, USA, Japan and Germany and Related Policy Suggestions [J]. *Bulletin of Chinese Academy of Sciences*, 2023, 38(08):1130-1153.
- [4] Kambli, N.D., Samanta, K.K., Basak, S. et al. Characterization of the corn husk fibre and improvement in its thermal stability by banana pseudostem sap. *Cellulose* 25, 5241–5257 (2018).
- [5] Pan Zhengrong. *Research on Export Competitiveness of Chinese Textile Industry* [D]. University of Science and Technology Beijing, 2015.
- [6] Zhu Tong, Sun Yongqiang. An empirical analysis of export structure and international competitiveness of Chinese textile and garment industry [J]. *Journal of International Trade*, 2010(2):25-31.
- [7] Li Chenyang, Ding Sheng, GAO Bo. Analysis on export competitiveness of textile and garment industry in Jiangsu Province and its influencing factors[J].*Economic Research Guide*,2022(03):147-149.
- [8] Huang Hanquan, Ren Jiqui. The basis and direction of Chinese industrial policy transformation in the new period [J].*Economic Review Journal*, 2017(02):27-32.

- [9] Liu Juan. Research on the export explicit competitiveness of Chinese garment industry [J]. Prices Monthly, 2016(04):47-50.
- [10] Li Xiaozhong. Analysis of technological spillover effect of FDI on Chinese textile and garment industry [J]. Finance & Trade Economics, 2009(7):88-93.
- [11] Yuan Yong. Study on the development process, current situation and strategy of Ningbo textile and garment industry [J]. Journal of Silk, 2021, 58(06):56-62.
- [12] Li Xiaozhong, Huang Rong. Research on enhancing the competitiveness of Chinese textile Industry under the background of Industry 4.0: Based on the perspective of integration of textile industry and electronic information industry [J]. China Soft Science, 2018(02):21-31.
- [13] Wang Ruihong. An empirical analysis of the impact of digital economy on the upgrading of textile industry in Shaoxing [J]. Advanced Textile Technology, 2022, 30(02):118-126.
- [14] Xiaoyi Z, Yang H, Kumar N, Bhutto MH, Kun W, Hu T. Assessing Chinese Textile and Apparel Industry Business Sustainability: The Role of Organization Green Culture, Green Dynamic Capabilities, and Green Innovation in Relation to Environmental Orientation and Business Sustainability[J]. Sustainability, 2023, 15(11):8588.