

Analysis of the Impact of Technical Trade Barriers on the Export of Toys—Based on Analysis of Zhejiang, China

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Technical barriers to trade, as a non-tariff barrier, have an increasing impact on the international market. As a major province in toy exports, Zhejiang Province's toy export trade is therefore greatly hindered. This article aims to explore the impact of technical trade barriers on toy exports in Zhejiang Province and analyze countermeasures. Through literature review and some empirical analysis, it is found that technical trade barriers have greatly promoted the development of Zhejiang's toy industry; however, they have also subjected it to impacts and pressures such as cost and technology. In response to the impact of technical trade barriers on toy exports, this article proposes corresponding countermeasures to avoid such barriers: firstly, establish a quality management system that complies with export product regulations to ensure that the products produced can meet international requirements and standards; secondly, reduce dependence on overseas markets; then enhance one's own technology, and strengthen product innovation, in order to enhance the international competitiveness of the product and oneself; in addition, we should also explore diversified markets and expand the sales channels and coverage of our products.

Keywords: technical trade barriers, Zhejiang Province, export of toys, countermeasure analysis

Research Background

With the continuous development of economic globalization, international economic trade is becoming increasingly frequent, which not only brings development to the economies of various countries but also faces challenges. As a non-tariff barrier, technical trade barriers have brought great obstacles to China's entry into foreign markets. As the world's largest toy production and export country, Zhejiang Province, as the second largest toy production and export province in China, has been greatly impacted by technological trade barriers.

Due to the fact that the advantage of Zhejiang Province's toy industry in the international market is more reflected in abundant and cheap labor resources, and its own technology and innovation capabilities are still very lacking, when foreign countries set up technical trade barriers to protect their own markets and industries and promote foreign trade, Zhejiang Province's toy export enterprises often encounter the impact of technical trade barriers due to their low technological content and lack of innovation.

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Development of Toy Industry in Zhejiang Province

As an important production and export base for China's toy industry, Zhejiang Province's toy industry occupies an important position in domestic and international markets with its unique development advantages and characteristics. Its development features are mainly reflected in industrial clusters, brand building, environmental innovation, and e-commerce. These characteristics not only support the sustainable development of Zhejiang Province's toy industry, but also enhance its competitiveness in the international market and expand its international market.

Development Features

Industrial clustering. The toy enterprises in Zhejiang Province have a large scale and a relatively complete industrial chain, showing obvious regional clustering characteristics. Among them, Yunhe County, Lishui City, Zhejiang Province is known as the "Made-in-China toy city", which is mainly composed of wooden toys; Yongjia Qiaoxia Town, Wenzhou City, Zhejiang Province, is known as the "Capital of Teaching Toys in China" and is renowned for its teaching tools; Jinhua City, Zhejiang Province is a compulsory toy industry belt and a national toy distribution center, mainly producing plastic, plush, and inflatable toys; Ningbo City, Zhejiang Province is a children's stroller industry cluster, mainly producing toys such as children's vehicles. These all reflect the cluster effect of the toy industry in Zhejiang Province.

Brand building. The toy industry in Zhejiang Province has focused on brand building. With the intensification of competition in the toy market, those toy enterprises have started to create their own unique brands and gradually move their brands towards the international market.

Environmental innovation. While entering the international market, enterprises in Zhejiang Province have established trade barriers abroad and responded to the national sustainable development strategy, paying more and more attention to product quality and environmental protection. While using environmentally friendly, safe, and pollution-free materials, they have improved their own toy manufacturing and innovative technology, enabling toys to achieve higher quality development.

Integrated Online and Offline Sales Model. After the outbreak of the COVID-19 in 2020, the traditional way of toy import and export trade was hit hard. However, during this period, the scale of cross-border e-commerce import and export transactions also expanded rapidly, and cross-border e-commerce transactions ushered in explosive growth. As the e-commerce capital of Zhejiang, the advantages of e-commerce were perfectly reflected at this time. Zhejiang toy enterprises expanded their sales channels through the cross-border e-commerce platform, realizing the dual combination of online sales and offline sales.

Development Advantages

The vigorous development of the toy industry in Zhejiang Province is attributed to its outstanding development advantages. These development advantages not only promote the rapid development of its toy industry, but also enhance the overall competitiveness of toy industry, laying a good foundation for the sustainable development of the toy industry.

Industrial cluster effect. There are numerous toy enterprises in Zhejiang Province. These enterprises have formed a complete toy industry and supply chain by clustering in the same region. Due to their clustering, their logistics transportation costs are relatively low and logistics efficiency is high compared to enterprises in other regions. This allows the products produced by enterprises to be transported to the market and reach consumers more quickly. In addition, the industrial agglomeration effect also brings professional talents together, promoting

the flow and exchange of talents. The exchange and cooperation of these professional talents promote the technological level and innovation ability of enterprises, and enhance the market competitiveness of enterprises and the toy industry.

Market development capability. In the domestic market, toy companies in Zhejiang Province enhance their brand awareness through marketing methods and continuously research and innovate to launch competitive new products. Zhejiang toy companies can accurately grasp the needs of consumers and meet their needs, providing products with uniqueness and attractiveness. On this basis, toy enterprises actively participate in various exhibitions and promotion activities, improve their brand awareness through advertising and promotions, and expand their market share in the domestic market.

In foreign markets, toy companies directly sell their products to various parts of the world by cross-border e-commerce, which not only expands product exposure and market share, but also greatly reduces sales costs. In addition, toy companies actively participate in international toy exhibitions, showcase their products and technologies, and actively establish contacts and cooperation with foreign buyers, by which has successfully expanded its market share overseas, and improved brand awareness and sales volume.

Current Situation of Toy Exports in Zhejiang Province

Toy Export Scale of Zhejiang Province

As one of the important toy production bases in China, Zhejiang Province has a significant competitive advantage in the toy industry in the export field. According to data from the Zhejiang Bureau of Statistics and the Zhejiang Ministry of Commerce, the total export value of toy products in Zhejiang Province increased from 8.223 billion yuan in 2013 to 25.521 billion yuan in 2022.

From Figure 1, it can be seen that the export value of toys in Zhejiang Province is increasing every year, and the growth rate is changing from fast to slow.

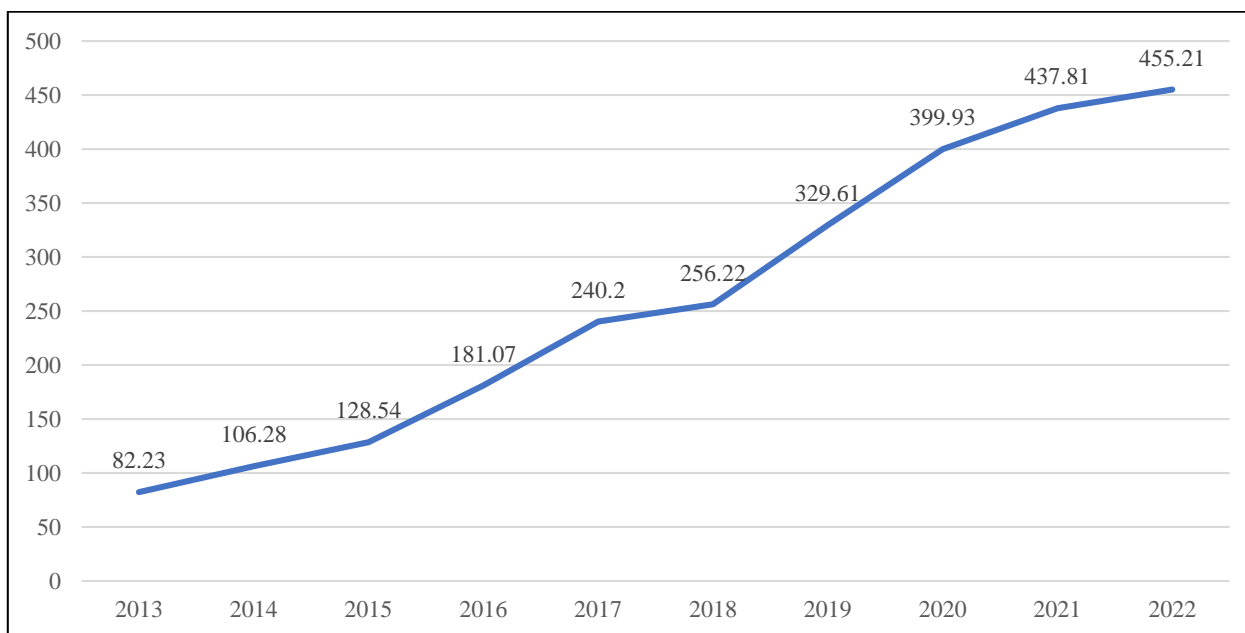


Figure 1. Toy export value of Zhejiang Province from 2013 to 2022 (Unit: 100 million yuan).

Data source: Zhejiang Bureau of Statistics, Zhejiang Ministry of Commerce.

From the data in Figure 2, it can be seen that toy enterprises in Zhejiang Province have a large share in the national export market, and their proportion has been continuously increasing over the past decade. From these export market shares, it can be seen that its toy industry plays an important role in the entire Chinese toy industry, making a huge contribution to China's toy exports. However, the proportion of toys in 2021 and 2022 has decreased compared to before. The impact of the COVID-19 pandemic from 2020 to 2022 has dealt a heavy blow to the toy industry during this period. Toy companies have encountered various difficulties one after another, such as crazy increases in raw material procurement prices, significant increases in product shipping costs, delayed or cancelled orders from foreign toy partners, and home quarantine measures implemented by various countries, which have led to difficulties in toy sales and operations for enterprises. As a result, the export scale of toys in Zhejiang Province has also decreased.

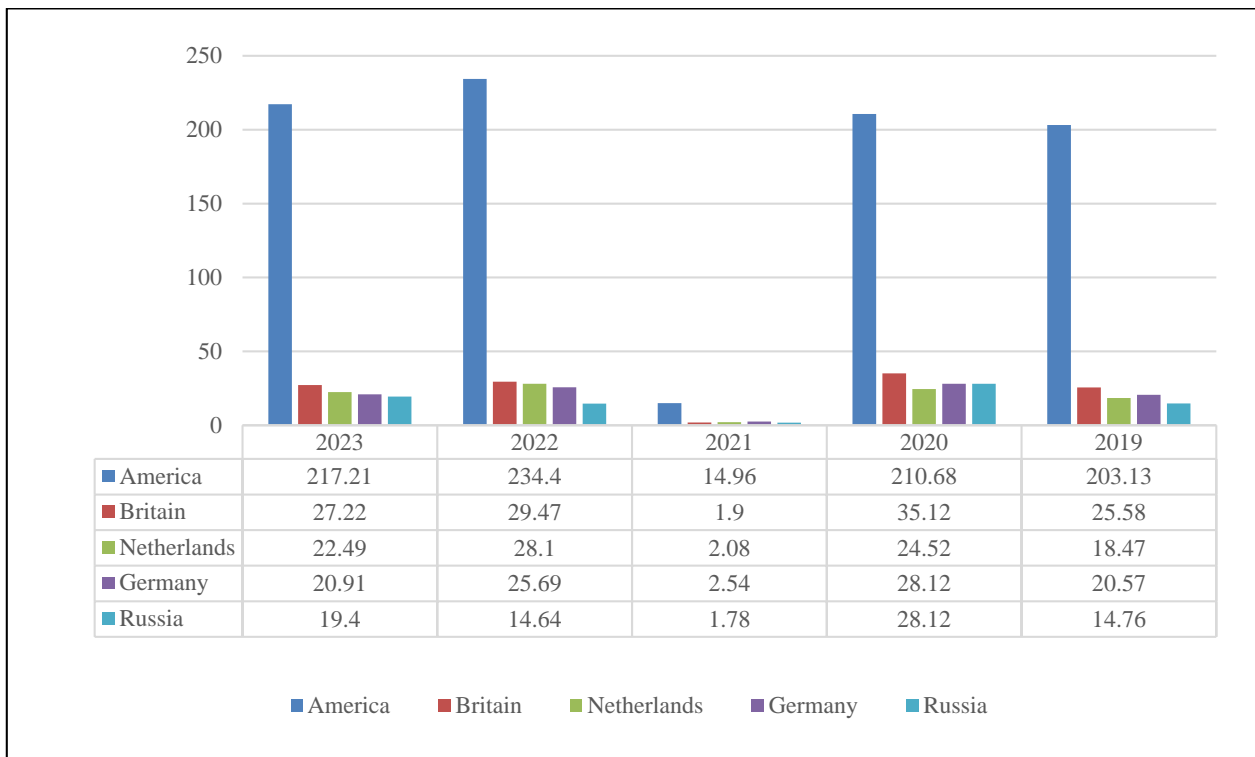


Figure 2. Toy exports from China and Zhejiang Province from 2013 to 2022.

Data sources: National Bureau of Statistics, Zhejiang Provincial Bureau of Statistics, Zhejiang Provincial Ministry of Commerce.

Major Toy Export Countries of Zhejiang

According to data from the General Administration of Customs of the People's Republic of China, the main markets for toy exports in Zhejiang in recent years have been developed countries in Europe and America. In terms of the amount of toys consumed in Zhejiang's export market, North America, Western Europe, and Australia rank among the top in terms of imports, with these countries accounting for 69% of the total toy market share in Zhejiang.

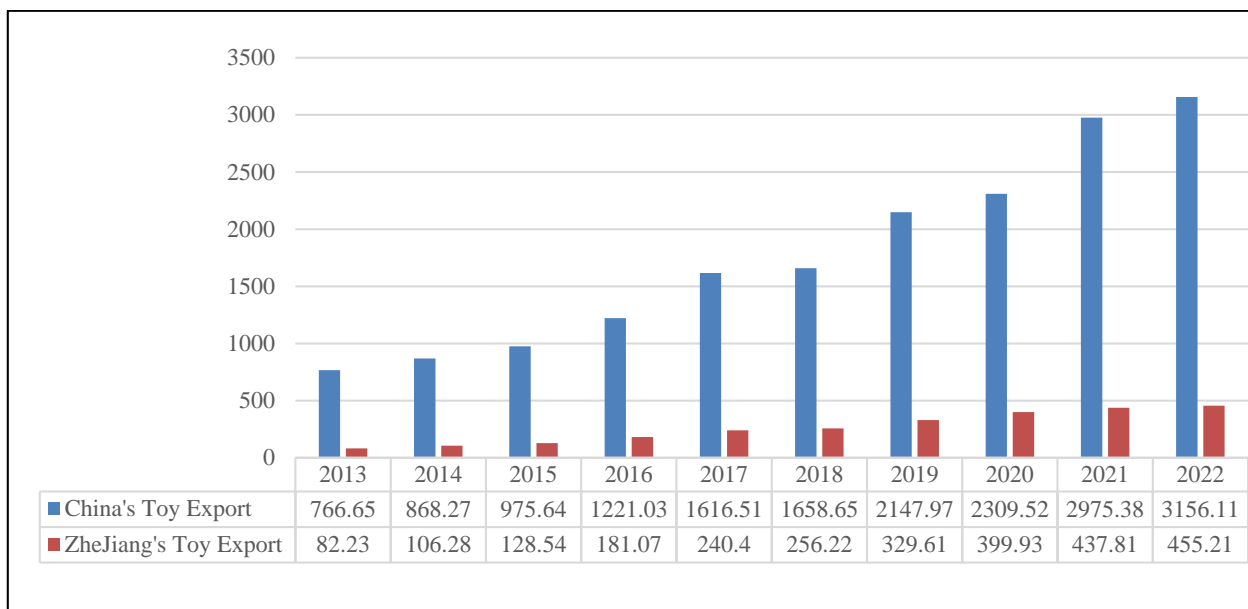


Figure 3. Top five countries in toy export value of Zhejiang Province from 2019 to 2023 (Unit: 100 million yuan).
Data source: Compiled by the General Administration of Customs of the People's Republic of China.

Toys Competitiveness of Zhejiang Province

As a major exporter of toys in China, Zhejiang Province's rich production and manufacturing experience, complete industrial chain, and innovative capabilities have made its toy exports widely popular worldwide.

Analysis of Revealed Comparative Advantage Index (RCA)

The Revealed Comparative Advantage index (RCA) refers to the ratio of a country's total exports of a certain commodity to its total exports of all commodities, compared to the world's total exports of that commodity. It is often used to analyze a country's export competitive advantage of a certain commodity, and its calculation formula is as follows:

$$RCA = \frac{X_{ac}/X_{ad}}{X_{bc}/X_{bd}}$$

Among them, X_{ac} represents the total export value of product c in country a, X_{ad} represents the total export value of all products in country a, X_{bc} represents the total export value of product c in the world, and X_{bd} represents the total export value of all products in the world. When $RCA > 2.5$, it indicates that the product has a strong competitive advantage; when $1.25 < RCA < 2.5$, it indicates that the product has a strong competitive advantage; when $0.8 < RCA < 1.25$, it indicates that the competitive advantage of the product is not significant; when $RCA < 0.8$, it indicates that the competitive advantage of the product is weak.

Table 1

Total World Commodity Exports and Toy Exports From 2018 to 2022 (in Millions of US Dollars)

Export volume	2018	2019	2020	2021	2022
Total exports	19,550,115	19,017,309	17,653,512	22,366,019	24,926,251
Toy exports	20,868.961	22,355.817	63,165.145	78,980.795	62,366.087

Table 2

Total Commodity Exports and Toy Exports in Zhejiang Province From 2018 to 2022 (Unit: 10,000 Yuan)

Export volume	2018	2019	2020	2021	2022
Total exports	211,745,029	230,763,226	251,705,615	301,199,409	343,197,076
Toy exports	2,562,201	3,296,166	3,999,267	4,378,108	4,552,154

According to the data in Tables 1 and 2, the RCA index for toy exports in Zhejiang Province from 2018 to 2022 is calculated as follows:

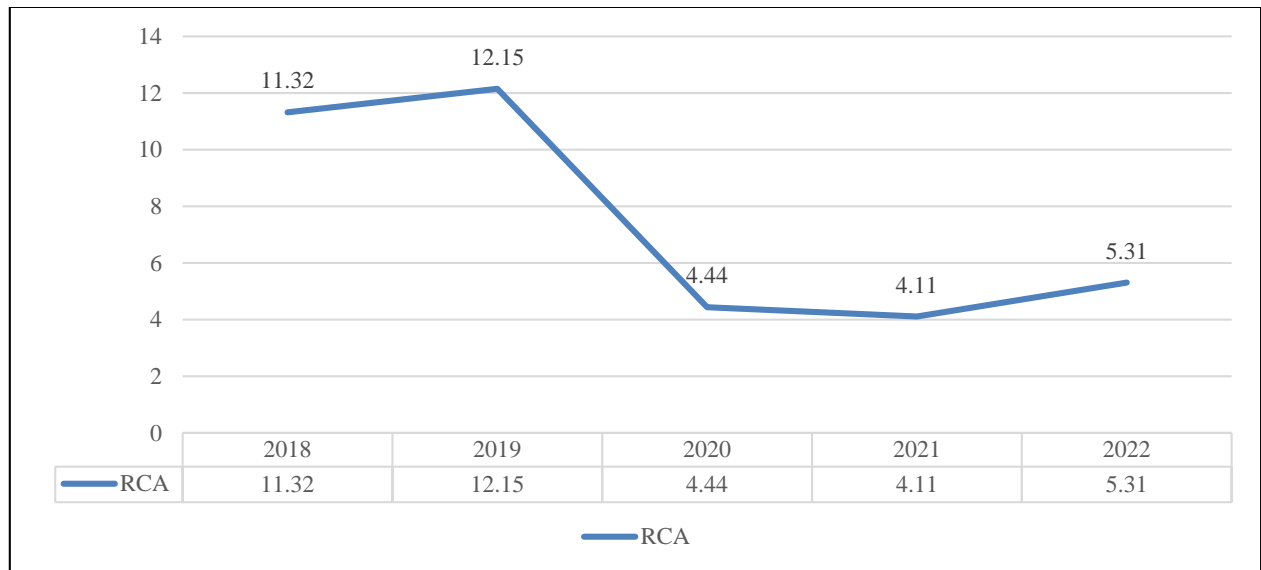


Figure 4. RCA index of toy exports in Zhejiang Province from 2018 to 2022.

From Figure 4, it can be seen that during the period of 2018-2022, the RCA index of toy exports in Zhejiang Province was all greater than 2.5, indicating that its toys have a strong competitive advantage internationally. However, due to the impact of the epidemic, the RCA index began to decline from 2019 to 2020, and the export competitiveness of the toys decreased compared to before, until it began to rise again in 2022.

Analysis of International Market Share Index (MS)

International market share refers to the proportion of a country's total exports to the world's total exports, and also includes the proportion of a country's exports of a certain type of product to the total exports of that commodity in the world. It is generally used to reflect the changes in the international competitiveness of a certain product or industry in a country. An increase in proportion represents an increase in competitiveness, while a decrease in proportion represents a decrease in competitiveness. The calculation formula is as follows:

$$MS = X_{ij}/X_{yj}$$

Among them, X_{ij} represents the total export value of j products in country i , and X_{yj} represents the total export value of j products in the world. According to the data in Tables 1 and 2, the MS index of toy exports in Zhejiang Province from 2018 to 2022 is calculated as follows:

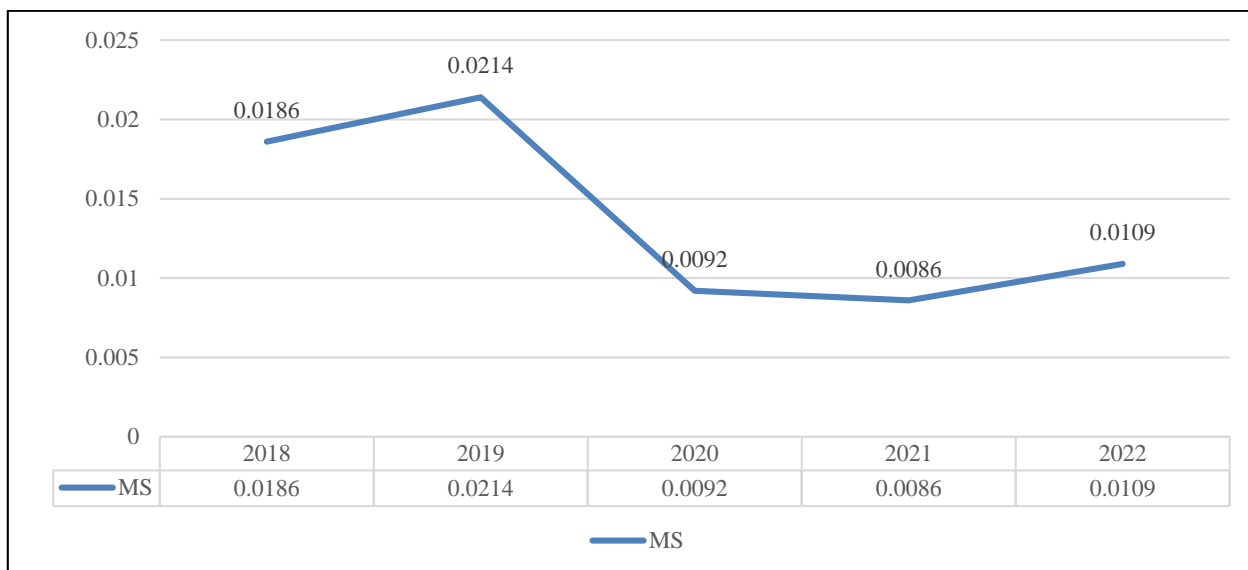


Figure 5. MS Index of toy exports in Zhejiang Province from 2018 to 2022.

From Figure 5, it can be seen that the MS index of toy exports in Zhejiang Province was on the rise from 2018 to 2019. During this period from 2019 to 2021, the MS index decreased significantly and rebounded slightly in 2022. From this data, it can be seen that the international competitiveness of toy exports in Zhejiang Province is declining, and it was not until 2022 that the export competitiveness began to show an increasing trend.

Through the analysis of RCA index and MS index, the results consistently indicate that although toy exports in Zhejiang Province have been impacted by technical trade barriers, they still have strong competitiveness.

The Impact of Technical Trade Barriers on Zhejiang Province's Toy Industry

Positive Impact

Technical trade barriers not only promote the transformation and upgrading of toy enterprises, but also open up broader markets.

Promote the transformation and upgrading of toy enterprises. Faced with technical trade barriers implemented internationally, toy companies need to produce and manufacture products that meet safety and technical quality requirements in accordance with relevant laws and regulations. This encourages toy companies to continuously innovate and improve their products and technology, improve product quality, and achieve higher levels, thereby promoting their transformation and upgrading.

Expand international markets. The toy companies have improved the technical content and safety quality of their products through technological innovation to meet technical standards and safety requirements. Products that meet technical trade barriers generally have higher safety and quality standards, which means that the competitiveness of products produced and manufactured in the international market is superior, making it easier to expand the international market and achieve market growth.

Negative Impacts

Technical trade barriers bring both opportunities and challenges to the development of the toy industry. Their negative effects are mainly reflected in increasing the operating costs of toy enterprises, intensifying competition in the toy market, and increasing risks in toy export trade.

Increase operating costs. Technical trade barriers generally establish corresponding technical standards and requirements, which include material safety, manufacturing processes, and intellectual property rights, which requires enterprises to increase research and development investment, switch to new materials that comply with international standards, conduct new research and design on exported products, maintain and renovate production lines, and test and update production equipment, while enterprises also need to spend money on testing and certification of exported products. These measures mean that toy companies in Zhejiang Province will have to spend huge costs to observe this standard and requirement in order to ensure that their products meet the standards and requirements of the export market and can successfully export.

Intensify market competition. The technical standards and requirements set by technical trade barriers drive domestic toy companies to increase investment in research and development, continuously improve their innovation capabilities and product quality, and enhance their competitiveness. However, some technical trade barriers restrict the use of certain designs and technologies, leading to more severe homogenization of toy products in the market, which makes market competition more intense. And restrictions on certain materials and specific technologies in some regions and countries have led to restrictions on the export market of toys, and some manufacturers can only compete in limited markets, which undoubtedly makes market competition more intense. In addition, technical trade barriers limit the variety and quantity of imported products, reducing their share in the international market and leading to increasingly fierce competition among toy manufacturers.

Increase trade risks. Due to the intellectual property protection, certification requirements, and specific material and technical standards set by certain regions and countries for toy products to enter these markets, toy manufacturers that cannot meet these standards are unable to enter these markets, resulting in restricted export channels and significantly increased trade risks. In addition, technical trade barriers lead to changes in product certification standards and technical standards, which require toy manufacturers to adjust their product supply chains and production processes to meet the requirements of importing countries. However, these adjustments generally require costs and time, so the trade risks of exports are greatly increased in this adjustment process.

Countermeasure Analysis

Optimize the Supply Chain

Faced with a series of cost increases caused by technological trade barriers, toy companies in Zhejiang Province should first analyze their existing supply chain, such as logistics distribution, raw material procurement, etc., determine which production process is causing the problem, and then solve the identified problems or bottlenecks. Enterprises should regularly evaluate the performance of the supply chain, continuously optimize the supply chain, identify problems, and make timely improvements to improve production efficiency and reduce operating costs.

Actively Explore Diversified Markets

The international situation is complex and changing, and the global economic recovery is weak. Overseas countries have set up numerous technical trade barriers for China's toy exports, which has greatly affected the sales of toy exports in Zhejiang Province to a certain extent. As one of the economically developed regions in China, Zhejiang Province has a huge consumer market. Therefore, its toy companies can promote their products through e-commerce platforms, toy exhibitions, and multimedia platforms, expand brand awareness, attract domestic consumers, and expand the domestic market. In addition to trade cooperation with traditional European

and American markets, the companies can also establish offices in target markets through cooperation with distributors and agents in Asia, Europe, Latin America, and other regions, deeply understand local customs, culture, laws, and regulations, and launch toy products that meet local requirements. In addition, it can also leverage its e-commerce advantages to expand e-commerce channels, settle in major e-commerce platforms such as Amazon, Alibaba, etc., open up diversified channels for sales, and expand product coverage.

Improve Technology and Strengthen Product Innovation

Zhejiang toy enterprises should strengthen their investment in product production research and development, introduce high-end technical talents to improve their technical level and carry out product innovation; and, close attention should be paid to market demand, and new products that meet consumer needs and interests should be launched according to changes in the international market, such as blind boxes, LEGO, and smart toys that are popular among young people today, and brand building should be strengthened; in addition, product quality management should be strengthened, and a dedicated product quality management supervision team should be established to ensure that the products produced meet domestic and foreign technical standards and quality requirements.

Establish a Quality Management System That Complies With Export Product Regulations

In the face of foreign countries using technical trade barriers to restrict exports, toy companies in Zhejiang Province should understand the safety laws and regulations set up by overseas export markets for toy exports, such as the EU's Toy Safety Directive, understand the situation of toy exports being prohibited and recalled, timely pay attention to relevant toy industry news, and strictly follow the requirements of the regulations for production.

To sum up, firstly, enterprises should optimize their supply chain, improve their production efficiency, and reduce operating costs; secondly, actively explore diversified markets and reduce dependence on overseas markets. In addition, technological research and innovation should be strengthened to enhance brand awareness and product competitiveness. Finally, enterprises should strengthen their understanding of relevant regulations in the toy export market and establish a sound product quality management system to ensure compliance with international standards and quality requirements.

Conclusion

With the advancement of globalization, trade globalization has become increasingly close. As a non-tariff barrier measure, technological trade barriers are widely adopted, which has caused great restrictions on China, a toy exporting country, especially strict restrictions from developed countries led by the European Union. Toy companies in Zhejiang Province have also been affected to a certain extent. This article provides a brief analysis of the current situation and problems in the toy industry in Zhejiang Province, and provides a detailed introduction and analysis of the technological trade barriers faced by the toy enterprises. By organizing the reported data on toy exports in Zhejiang Province, the reasons for the obstacles faced by toy exports were analyzed. In addition, the RCA index and MS index in toy exports were obtained to analyze that toys of Zhejiang have extremely strong competitiveness. Finally, this article proposes countermeasures: Before production, toy companies in Zhejiang Province should establish a sound product quality management system and first establish quality standards for toy production; secondly, establish a dedicated quality management team to involve everyone in the enterprise in quality management work, enhance the safety and risk awareness of production employees, and help them

establish the concept of product quality first; in addition, enterprises should implement strict management of raw material procurement, conduct irregular sampling inspections, and ensure that the production of raw materials meets international standards; finally, enterprises should implement strict inspection systems for the finished products produced to ensure that the final products meet safety and quality requirements. By adopting these measures, toy export enterprises in Zhejiang Province can better cope with the challenges brought by technological trade barriers, enhance their international competitiveness, and better go global.

References

- Cheng, N. (2023). Analysis of factors influencing Zhejiang Province's trade export volume. *Jiangsu Commercial Forum*, 40(2), 56-58
- Feng, Y. M. (2021). Analysis of the problems and countermeasures of China's children's toy benchmarking international export. *Practice in Foreign Economic Relations and Trade*, 39(7), 53-57.
- Han, W. J., Sun, T. N., Li, D., & Sun, D. Z. (2022). Analysis of the export status and development prospects of traditional toy industry under the new situation and business model. *Standard & Quality of Light Industry*, 35(4), 105-107.
- Kim, K. (2022). Adoption of technical barriers to trade and the quality of exports: Empirical analysis on the machinery sector. *International Journal of Trade, Economics and Finance*, 13(1), 1-6.
- Kwong, C. W., Mak, S. L., & Li, C. H. (2020). The exploration of a technical model for toy factories in China to deal with European and US toy safety requirements. *International Journal of Business, Humanities and Technology (IJBHT)*, 10(2), 26-37.
- Lin, H. (2022). How "Made in Zhejiang" responds to technical trade measures of central and eastern European countries. *Hangzhou*, 20(11), 40-41.
- Liang, H. K. (2022). Analysis of current focus in the toy industry. *Toy Industry*, 19(10), 26-27.
- Lu, Q., & Hu, H. F. (2021). Quality analysis of cross border e-commerce exported toys. *Toy Industry*, 18(4), 68-69.
- Ma, Y. (2022). The road of toy export "Epidemic" strives to overcome difficulties. *Toy Industry*, 19(11), 13-15.
- Mahdi Ghodsi, M. (2018). Determinants of specific trade concerns raised on technical barriers to trade EU versus non-EU. *Empirica*, 45(1), 83-128.
- Wang, X. Y., Liu, J. M., Zhang, M. Q., & Wang, W. Y. (2023). The impact of technical barriers to trade on China's electronics industry exports. *Academic Journal of Business & Management*, 5(7), 44-47.
- Wei, H., Tu, Y., & Zhou, P. (2023). Technical barriers to trade and export performance: Comparing exiting and staying firms. *Economic Modelling*, 126, 106439.
- Yang, C. (2020). Exploring the new trends of technological trade barriers and their impact on China's manufacturing industry. *Business News*, 38(16), 175+177.
- Yan, K. H., Hu, Y., & Guo, Y. (2020). The impact of RMB exchange rate risk on China's toy exports. *Modern Business*, 15(12), 42-44.
- Zhou, M. W., & Yu, J. (December 20, 2021). How "Made in Zhejiang" goes global. *China National Times*, p. 4.