Research on the Status and Transformation of Jiangsu’s Petrochemical Industry Trade in the New Era

Haiying Dong*
Department of Economics and Management, Nanjing Polytechnic Institute, Nanjing, China

*Corresponding author e-mail: dhaiying83@sina.com

Abstract. The development of Jiangsu’s petrochemical industry trade was analyzed. The scale of Jiangsu’s petrochemical trade remained stable and the trade was in a deficit state. The overall industry had a trade competition disadvantage, but the competitiveness was increasing year by year. Jiangsu should actively promote the transformation and upgrading by docking the needs of the Belt and Road, promoting enterprises to go global, focusing on building a new petrochemical industry, and promoting industrial standards to international standards, relying on the Internet to expand online channels and cultivating composite international talents.

1. Introduction

The petrochemical industry is an important part of the chemical industry and plays an important role in the national economy. It is one of China's basic industries and pillar industries. Jiangsu is a major petrochemical province in China. It is one of the most important areas in China with the highest level of petrochemical industry and the most advanced production and management level. Petrochemical trade has always played an important role in China's foreign trade. In 2017, China's petrochemical trade volume reached 212.5 billion US dollars. After years of development, the scale of petrochemical industry trade in Jiangsu Province has continued to expand. Entering a new era, and new requirements for the internationalization of enterprises have been put forward. Jiangsu must promote the petrochemical industry to go out and focus on promoting trade transformation and upgrading.

According to the classification of international trade standards, the research scope of the petrochemical industry includes: 1. organic chemicals; 2. inorganic chemicals; 3. dyes, dips and coloring materials; 4. Pharmaceuticals; 5. essential oils, spices and washing products; 6. Fertilizer; 7. Primary shape plastics; 8. Non-primary shape plastics; 9. Other chemical raw materials and products; 10. Rubber products. The trade data in this article is derived from China Statistical Yearbook and the Jiangsu Statistical Yearbook in 2010 -2017.

2. Analysis of the status of Jiangsu’s petrochemical industry trade

2.1. The volume of foreign trade has fluctuated, but the overall situation has remained stable, and trade has been in a state of deficit.

In 2010-2017, although there was a certain fluctuation in the volume of foreign trade, the overall situation remained stable. The average value remained at around US$60.9 billion. Exports continued...
to rise. Exports increased from US$18.4 billion in 2010 to 28 billion in 2017. The growth rate was by as much as 52%; imports fell from 2014, from $40 billion in 2014 to $34.6 billion in 2017. In the two years of 2015 and 2016, affected by the global economic downturn, the volume of import and export trade has declined. Among petrochemical products, the export of organic chemicals showed an upward trend, and the exports of other products remained stable. In terms of imports, imports of organic chemicals showed a downward trend and the rest of the products remained stable. Similar to the overall state of China's petrochemical trade, Jiangsu petrochemical industry trade is also in a deficit state, but the inverse difference is shrinking year by year. In 2010-2017, the deficit fell from -13 billion US dollars to -6.6 billion US dollars. The trade deficit mainly comes from organic chemicals, pharmaceuticals, primary shape plastics, non-primary plastics and other chemical raw materials and products. See Figure 1.

![Figure 1. Petrochemical trade situation.](image1)

2.2. *Import and export commodities structure is stable and the concentration is high. Organic chemicals are the main products of import and export.*

In 2010-2017, organic chemicals are the main products of Jiangsu’s petrochemical trade. The trade volume ranks first and has an absolute export advantage. In 2017, exports were 10.34 billion US dollars, accounting for 36.9%, and the each of the rest of the products was less than 4 billion US
dollars. Regardless of other chemical raw materials and products, the export value of non-primary plastics, pharmaceuticals and primary-shaped plastics ranked second to fourth, accounting for 9.4%, 9.1% and 8.8% respectively. The export of fertilizers was the lowest, accounting for only 1.5%. Imports of organic chemicals are also ranked first. In 2017, Import amount reached US$16.88 billion, accounting for 48.7% of the total, accounting for almost half of the imports of petrochemical products. The proportion of primary plastics, non-primary plastics and pharmaceuticals was 16.3%, 10.3% and 7.8%, respectively, and the lowest proportion of imports was fertilizer. See Figure 2.

2.3. The overall of the petrochemical industry has a trade competition disadvantage, but it is increasing year by year.

Jiangsu has an important position in China’s petrochemical trade. The domestic market share in 2016 and 2017 was 18.3% and 17.43%, respectively, reaching one-fifth of the share. Jiangsu's petrochemical industry's overall trade competitiveness index is less than zero, showing a competitive disadvantage, but its competitiveness is increasing year by year, from -0.26 in 2010 to -0.1 in 2017. From the classification of products, the average TC index of fertilizer is 0.65, which has the strongest competitive advantage, followed by rubber products, essential oils, spices and washings products, dyes, dips and coloring materials and inorganic chemicals, and the competitiveness remains stable, and the average TC index is 0.42, 0.35, 0.27, and 0.04, respectively, and showed weaker trade competitiveness. The average TC index of primary shape plastics, non-primary plastics and pharmaceuticals were -0.3, -0.29 and -0.05, respectively. The competitiveness of non-primary plastics continued to rise and the competitiveness of the remaining products remained stable. See Figure 3.

2.4. The investment abroad the petrochemical industry showed a strong growth trend, and there was a big difference in the amount of investment between industries.

Jiangsu’s petrochemical enterprises actively implement the “going out” strategy, implement international cooperation, set up factories in major raw materials or product consumption areas, and optimize production area allocation. Jiangsu’s Petrochemical Industry investment abroad has increased year by year, from $94.84 million in 2010 to $153.419 million in 2017, an increase of 15 times. There

![Figure 3. Petrochemical Industry’s Trade Competitiveness Index (TC Index).](image)
is a big difference in the amount of investment between industries. In 2017, it was sorted from high to low, followed by chemical raw materials and chemical manufacturing, petroleum processing and coking and nuclear fuel processing, pharmaceutical manufacturing, plastic products, rubber products, and chemical fiber manufacturing. The amount of investment abroad was 987.13 million US dollars, 263.37 million US dollars, 202.21 million US dollars, 68.86 million US dollars, 6.68 million US dollars and 6.15 million US dollars.

3. The problems of Jiangsu’s petrochemical trade

3.1. The added value of products is low, and the export ratio of resource-intensive products is significant.

The petrochemical trade in Jiangsu Province has always been in a trade deficit state, with imports exceeding the export volume. Although Jiangsu's petrochemical industry trade is growing steadily, and trade scale and market share are also among the best in the country, the overall trade competitiveness is weak. The competitiveness of each classified product is quite different. The largest scale export products have the weakest trade competitiveness. Exports of organic chemicals, primary-shape plastics, non-primary plastics and pharmaceutical products rank among the top four but trade competitiveness ranks in the last four. The products with large export scale are mainly concentrated in the upstream of the industrial chain of raw material supply. They are mostly in the low-end and middle-end levels in the international industrial value chain. They are resource-based products with low added value and low refinement rate. There are problems such as low product level and high-end products mainly relying on imports.

3.2. The industry standard is out of touch with the international market, and the product lacks market competitiveness.

Developed countries have strict technical standards for the production and import of petrochemical industries. Developed countries such as Europe and the United States often increase the testing standards for foreign chemical products in the name of environmental protection, which has caused difficulties in exporting petrochemical products from developing countries. The US Lacey Act Amendment and the EU's REACH Regulations have all a major impact on Jiangsu's petrochemical industry exports [1]. Due to the limitations of equipment and technology in China's petrochemical industry, there is a certain gap between petrochemical industry standards and international standards, and products lack international market competitiveness. Chinese enterprises should actively promote industrial standards to move closer to international standards, promote green development, and enhance the ability of products to enter the international market.

3.3. The company lacks composite international talents with both professional competence and international marketing capabilities.

The development of international trade is inseparable from the compound international talents with both professional ability and international marketing ability. Due to the industry specificity of petrochemical enterprises, there is a lack of compound international talents who are familiar with international operations. Most of the employees in China's petrochemical enterprises have a single professional background. Professionals who are proficient in pure technology lack business abilities such as international vision, international market development ability, trade operation capability and cross-cultural communication ability. Those who are good at international marketing ability lack professional technical ability in products, and the introduction and technical maintenance cannot be supplied, which hinders the pace of enterprises to explore the international market.
4. Strategies for the transformation and upgrading of Jiangsu’s petrochemical industry trade

4.1. Docking the Belt and Road, expanding international capacity cooperation and promoting enterprises to “go out”.

In 2015, the State Council issued the “Guiding Opinions on Promoting International Capacity and Equipment Manufacturing Cooperation”, clearly proposing 12 key industries such as steel, non-ferrous metals, building materials, railways, electric power, and chemical industry etc. as key points to promote international capacity cooperation. “The Belt and Road” countries are the world's most important oil and gas resources enrichment area and petrochemical industry area. The economic development level of the countries along the line is different, the petrochemical facilities are relatively old, the technical level is low, and the demand for upgrading and upgrading is strong [2]. The broad market space provides many opportunities for China's petrochemical enterprises to “go global”, relying on the implementation of the national “One Belt and One Road” construction to promote the “going out” of Jiangsu’s petrochemical equipment, technology, brands, standards and services. It is conducive to promoting industrial structure optimization and trade transformation and upgrading, and improving the international competitiveness of enterprises.

4.2. Focus on building a new petrochemical industry and guiding the industry products toward the middle and high quality products added value.

Product added value is the key to improving competitiveness and optimizing the export structure. On the one hand, focusing on building a new petrochemical industry, the development of the industry will ultimately depend on endogenous motivation to enhance the international competitiveness of the industry. The state should expand investment in industries such as green environmental protection and strategic emerging industries accelerate independent technological innovation [3]. On the other hand, the government should rationally plan the industrial layout and focus on guiding the development of products from low-end to mid-to-high end. Jiangsu’s Petrochemical industry structure is relatively simple and scattered. The government and industry should do a top-level design, shut down the backward industries with high pollution, high energy consumption and low production capacity, and guide the industry to high-end, refined, green products. Focus on the development of new high-tech industries such as new chemical materials, high-end fine chemicals and new technologies in biology.

4.3. Promoting the integration of petrochemical industry regulations with international standards and improving the internationalization level of products

The adoption of international standards and international practices is an important condition for enterprises to be in line with international standards and participate in international competition. Entering a new era, chemical trade facilitation and management standardization have become a trend. Internationally laws and regulations have been introduced, such as the Globally Harmonized System of Classification and Labelling (GHS), Chemical Safety Instructions (MSDS), and a series of chemical management regulations promulgated by the European Union, the United States, Japan, South Korea and other countries and regions [4]. Jiangsu’s petrochemical enterprises should strengthen research and study of such international laws and regulations, step up the establishment of a management mechanism to adapt to new chemical regulations, and promote the integration of quality standards with international standards, focusing on design development, process design, supplier evaluation, procurement and production.

4.4. Relying on big data technology and the Internet, integrating online and offline channels to jointly explore the international market

Make full use of big data technology, obtain information on the development of international petrochemical market, understand the macro-micro environmental changes and market demand information of the international petrochemical market, conduct market forecasting, develop international markets in a targeted manner, and expand export markets. With the popularization of the
Internet and mobile Internet and the rapid development of cross-border payment technology, cross-border e-commerce shows the advantages of convenience, low cost and high efficiency. Foreign trade enterprises can use the online trading platform to achieve the purpose of trading on the basis of traditional channels, which can enhance the advantages of enterprises in terms of capital, brand and cost. Enterprises should vigorously develop online trade, expand exports, increase international market share, and ease the trade deficit situation in Jiangsu.

4.5. Cultivate international talents that adapt to the global operation of enterprises and provide a strong guarantee for trade development

The company should make full use of the advantages of Jiangsu’s education, formulate an international petrochemical industry talent training plan, and train a group of talents with international business philosophy. First of all, the company selects personnel from inside to go to universities at home and abroad for further study, or visits to enterprises in developed countries, and cultivates a group of comprehensive international management personnel who are familiar with international markets, business rules, investment and financing management and project management [5]. Secondly, Enterprises increase cooperation with higher education institutions, adopt order-based education methods, and cultivate new forces that meet the needs of enterprises. Finally, Enterprises should vigorously introduce international talents, adopt more flexible ways to introduce foreign experts and overseas intelligence.

References
[1] Haiying Dong, Jianrong Zhu. Analysis of International Competitiveness of Jiangsu Chemical Trade [J]. Open Guide, 2014 (4): 89-91.
[2] Zesheng Sun. Analysis of the Competitiveness of Petrochemical Industry Trade in the Major Countries of the “Belt and Road” [J]. International Petroleum Economy, 2017 (1): 85-92.
[3] Haiying Dong. Comparative Study on International Competitiveness of Sino-US Chemical Products [J]. Journal of Wuxi Institute of Commerce and Technology, 2015 (5): 15-20.
[4] Guogang Jiang. Cultivation and promotion of Jiangsu's petrochemical industry's green competitiveness [J]. Petroleum and Petrochemical Green Low Carbon, 2018 (2): 1-5.
[5] Jianping Ma. Adjustment and transformation of Jiangsu petrochemical industry and upgrading [J]. China Petroleum and Chemical Economic Analysis, 2016 (11): 9-12.