

A study of China's Nonwovens Industry Based on the SCP Paradigm

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Abstract: As a raw material in the textile industry, nonwovens mainly include masks, protective clothing, surgical gowns, etc. in the final products of medical and hygiene products. The arrival of the new crown epidemic has made the demand for such products soar. Therefore, the nonwovens industry is also gaining huge attention in the short term. Based on the research context of the Structure-Conduct-Performance paradigm, the nonwovens industry in China was studied. Firstly, the development status of Chinese nonwovens industry was analyzed, and then the market concentration, product differentiation and entry and exit barriers of Chinese nonwovens industry were analyzed, and it is concluded that Chinese nonwovens industry is a competitive market structure. Then on this basis, the market behavior and market performance of enterprises in the competitive market structure were discussed. Finally, based on the above research, put forward targeted suggestions for the long-term development of Chinese nonwovens industry.

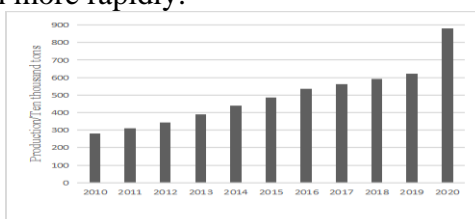
1. Introduction

In the context of the new crown epidemic, the market size and market demand for nonwovens in China reached the maximum in the past decade in 2020, and the profitability of the whole industry has also increased significantly. As the world's largest producer and consumer of nonwovens, China's market structure, market behavior and market performance of China's nonwovens industry must be studied and analyzed in order for China's nonwovens industry to achieve long term development. Therefore, based on the structural paradigm of S-C-P, this paper determines that China's nonwovens industry belongs to the competitive market structure through the interplay between market concentration, product differentiation, and barriers to entry and exit calculated by the sales of the top ten listed enterprises in China's nonwovens industry, and on this basis, further analyzes the market behaviors of China's nonwovens industry such as advertising behavior, sponsorship behavior and market performance through profitability and technological progress. Finally, based on the analysis of China's nonwovens S-C-P, corresponding suggestions are made to China's nonwovens enterprises.

2. Overview of Nonwovens Industry Development in Domestic Market

2.1 Nonwoven production in China

As shown in Figure 1, the production of nonwovens in China has been increasing year by year from 2010 to 2019, and the production of nonwovens in China was 2,795,000 tons in 2010, rising to 8,788,000 tons in 2020, with a growth rate of 214.4%. Starting from 2016, the growth rate of China's nonwoven production is smaller than the previous years. In 2020 affected by the new crown, the production of nonwovens reached the highest value in the last decade. Overall, the production of nonwovens in China has grown more rapidly.

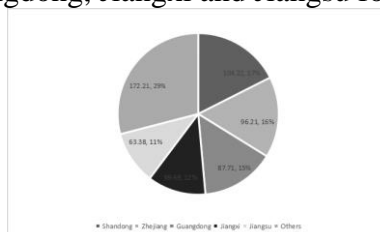


Data source: China Technical Textiles Association

Figure 1: Nonwoven Fabric Production in China, 2010-2020 (Unit: Million Tonnes)

2.2 Regional distribution of nonwovens production in China

As shown in Figure 2, China's nonwoven production is mainly distributed in Shandong, Zhejiang, Guangdong, Jiangxi, Jiangsu and other places. Among them, from the distribution regions of China's nonwovens in 2018, we can see that Shandong Province is the main region of nonwovens production in China, with a production volume of 1,042,200 tons, accounting for 17.57% of China's nonwovens production volume. This is followed by Zhejiang Province with a production of 962,100 tons, accounting for 16.22%. Guangdong, Jiangxi and Jiangsu followed in the ranking.

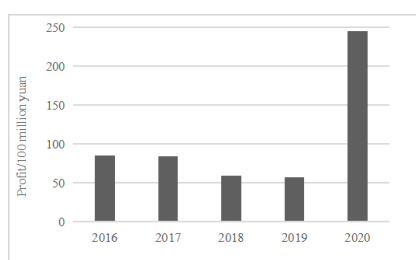


Data source: China Technical Textiles Association

Figure 2: Regional distribution of nonwovens production in China in 2018 (in million tons)

2.3 Economic efficiency of China's above-scale nonwoven enterprises

As shown in Figure 3, According to the profits of China's above-scale nonwoven enterprises from 2016 to 2020, it can be seen that the profits of China's above-scale nonwoven enterprises have been showing a downward trend from 2016 to 2019, from 8.49 billion yuan in 2016 to 5.69 billion yuan in 2019, a decline of 33%, ushering in an explosive growth period for the nonwoven industry in 2020, when China The profit of nonwoven enterprises above the scale is as high as 24.52 billion yuan.



Data source: China Technical Textiles Association

Figure 3: Profits of Nonwovens Enterprises above Scale in China, 2016-2020 (Unit: RMB Billion)

3. Analysis of the market structure of China's nonwovens industry

3.1 Market concentration

By vertically comparing the market share of each listed company in China's nonwovens industry from 2016-2020, we can see how the market concentration in China's nonwovens industry is. This paper is calculated by taking the market shares of the top four and top eight listed nonwovens companies in China in terms of sales from 2016-2020 and (as shown in Table 1). Based on the concentration indicator, the top four combined market shares of China's nonwovens industry in 2016-2020 are calculated values are 5.11%, 7.4%, 8.13%, 8.66%, and 13.83%, respectively; the top eight combined market share values are 6.69%, 9.53%, 10.60%, 11.04% and 16.70%. It can be seen that the market concentration of China's nonwovens industry is very low.

Table 1: Market share of listed nonwovens companies in China, 2017-2020

2016		2017		2018		2019		2020	
Company Name	Market share (%)	Company Name	Market share (%)	Company Name	Market share (%)	Company Name	Market share (%)	Company Name	Market share (%)
stable medical care	2.57	stable medical care	3.51	stable medical care	3.58	stable medical care	4.00	stable medical care	8.97
Huafeng Microfiber	1.47	Huafeng Microfiber	2.51	Huafeng Microfiber	2.86	Huafeng Microfiber	2.81	Huafeng Microfiber	2.30
Yanjiang shares	0.61	Yanjiang shares	0.74	Nuobang Corporation	0.88	Nuobang Corporation	0.95	Nuobang Corporation	1.43
Beijingdayuan	0.46	Beijingdayuan	0.64	Jinchun shares	0.81	Yanjiang shares	0.90	Yanjiang shares	1.13
Xinlong Co.	0.50	Xinlong Co.	0.63	Beijingdayuan	0.76	Beijingdayuan	0.73	Xinlong Co.	0.98
Nuobang Corporation	0.54	Nuobang Corporation	0.62	Yanjiang shares	0.71	Jinchun shares	0.72	Jinchun shares	0.78
Jinchun shares	0.36	Jinchun shares	0.61	Xinlong Co.	0.69	Xinlong Co.	0.63	Beijingdayuan	0.62
Spun by Sheng	0.18	Spun by Sheng	0.27	Spun by Sheng	0.31	Spun by Sheng	0.30	Spun by Sheng	0.49
C4	5.11	C4	7.40	C4	8.13	C4	8.66	C4	13.83
C8	6.69	C8	9.53	C8	10.60	C8	11.04	C8	16.70

Source: Based on data from annual reports of enterprises

According to Bain's market structure classification, the top four C4 and top eight C8 of China's nonwovens industry's market share in 2016-2020 are below 30%, indicating that the market concentration of China's nonwovens industry is not high and belongs to a competitive market structure, but the top four C4 and top eight C8 of China's nonwovens industry's integrated market share in 2016-2020 are constantly rising, indicating that its market concentration needs to be improved.

3.2 Degree of product differentiation

According to the above measurement of the market concentration of listed nonwoven enterprises in China, it can be seen that the market concentration of nonwoven enterprises in China is relatively low. In addition, there are very many small and medium-sized enterprises producing nonwovens in China, and the development of enterprises mainly focuses on the expansion of enterprise scale and the increase of product output, with a relatively weak technical research and development capability^[1]. Competition among enterprises is very fierce, the degree of monopoly is relatively low, and the differentiation of products is relatively small. As a result, China's nonwoven enterprises have to reduce costs by increasing output and rely on low prices to gain market competitiveness.

3.3 Barriers to entry and exit

China's nonwovens industry belongs to a competitive market structure. In addition, at present, except for a few backbone enterprises in the industry, most of the enterprises producing nonwovens in China are small and medium-sized enterprises, who are inexperienced in production technology, lack of technical content and serious homogenization of products. New entrants do not need to enter the industry by investing capital in technology, but only need to master the production methods of producing nonwovens that are already mature in the market^[2].

At present, most of the nonwoven enterprises in China are among those that invest less in technological research and development, and the scale of the enterprises is small, and the fixed production equipment used by the enterprises to produce nonwovens has a lower technological content and less investment. Therefore, when exiting the industry, the exit barriers for enterprises may be relatively low, as they may only need to pay the salaries of their employees, severance payments and the elimination of some production equipment.

4. Analysis of the market behavior of China's nonwovens industry

4.1 Advertising behaviour

Advertising has a significant impact on the degree of product differentiation, and two indicators, the absolute amount of advertising expenditure and advertising density, are usually used to measure the degree of product differentiation. As shown in Table 2, SteadyHealth's advertising density is very high in 2019 and 2020, which indicates that SteadyHealth pays much attention to its advertising investment and increases the publicity of its products, among which SteadyHealth's brand "Cotton Time" invests a lot in advertising, and it achieves good This is also an important reason for the significant increase in market share of Stable Medical in 2019 and 2020. The advertising density of Yanjiang, Xinlong Holdings and Shengfang is basically less than 1%, which can be seen that these companies have relatively small investment in advertising.

Table 2: Change in Advertising Expenditure as a Share of Total Turnover of Nonwovens Companies in China, 2017-2019 (%)

	2017	2018	2019	2020
stable medical care	-	-	5.872	2.975
Yanjiang shares	0.033	0.090	0.036	0.036
Xinlong Holdings	0.387	1.684	0.374	0.434
Spun by Sheng	0.095	0.321	0.160	0.056

Data source: annual reports of enterprises

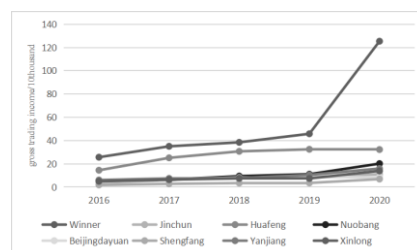
4.2 Acts of sponsorship

With the outbreak of the New Crown epidemic in 2020, China's demand for medical supplies such as masks and protective clothing increased greatly^[3]. As a well-known enterprise in the medical and health products industry, Stable Medical donated tens of millions of medical supplies during the Wenchuan earthquake, Ya'an earthquake, Yibin earthquake and the New Crown epidemic; Xinlong Holdings urgently deployed 120,000 masks to support the prevention and control of the province at the beginning of the New Crown epidemic; Jinchun also donated 1 million yuan of supplies to help Wuhan at the beginning of the New Crown epidemic.

5. Market performance analysis of China's nonwovens industry

5.1 Profit margin

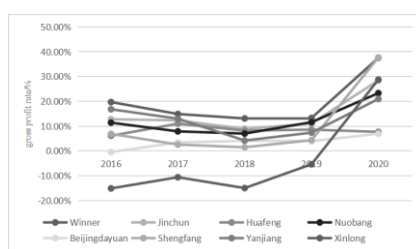
As shown in Figure 4, since 2016, the total operating revenue of some listed Chinese nonwovens companies has continued to increase, and under the influence of the epidemic, the demand space for nonwoven products in medical and health care has increased, promoting the sales of nonwovens. The total operating revenue of the nonwoven fabric industry rose at the same time, and locally, the total operating revenue of Jinchun, Nuobang, Beijingdayuan, Shengfang, Yanjiang and Xinlong Holdings were not very different and were at a lower level in the industry; Huafeng steadily improved, but the growth rate slowed down in recent years; the total operating revenue of Winner has been at a higher level in the industry since 2016, especially in 2020. Its total operating revenue reached 125.34 ten thousand yuan, with a growth rate of 173.99% over the previous year, mainly because its main products are located in the medical segment, which is very suitable for the market demand under the epidemic.



Source: Compiled from annual reports of enterprises

Figure 4: Trend of total revenue of nonwovens enterprises in China, 2016-2020 (Unit:10thousand RMB)

As shown in Figure 5, the average gross profit margin of the nonwovens industry increased from 9.15% in 2016 to 25.6% in 2020, which is lower than the average of the textile industry, the data may be able to be slightly lower than the real average gross margin of the nonwovens market, but it is enough to show the more average profitability of nonwovens companies. The nonwovens industry in general saw a significant increase in gross profit margin in 2020, in which, Winner Gross margin in 2020 is above average, about 38%, with good performance, but mainly because of its expansion of production lines of non-woven masks and medical supplies during the epidemic, seizing the opportunity brought by the epidemic and gaining a lot of profit. 2020 Huafeng gross margin is the lowest, and it has maintained a fluctuating downward trend in recent years, mainly because the sudden epidemic made the orders in the first quarter almost cut off, and in the second quarter when the epidemic spread globally, export business almost came to a halt. The gross profit margin trend of Jinchun and Nuobang is similar but less than that of Winner, and Jinchun's gross profit is relatively higher than Nuobang's.



Source: Compiled from annual reports of enterprises

Figure 5: Trend of Gross Margin of Nonwovens Companies in China 2016-2020

5.2 Technological advances

Research and development expenses can usually be measured using research and development density^[4]. As shown in Table 3, Research and development density of Chinese nonwovens companies is generally on a declining trend, with a slight increase in 2019. Specifically, Huafeng Microfiber, which is above average, reached an R&D density of 4.57% in 2018 and has continued to grow since then. Shengfang is a company after Huafeng Microfiber R&D density, but in 2020 it has a decrease in R&D density compared to the previous year. Beijingdayuan has the fastest growth rate of R&D density in these three years, from the lowest in the industry in 2018 to the middle to upper level of the industry in 2020. The changes in R&D density for the two pairs, Shengfang and Nuobang, and Stable Medical and Jinchun, are largely consistent, with the former being largely higher than the latter over the three-year period.

Table 3: R&D intensity of Chinese nonwovens companies

	2018	2019	2020
stable medical care	3.04%	3.39%	3.28%
Jinchun shares	3.12%	3.46%	3.29%
Huafeng Microfiber	4.57%	5.07%	5.44%
Nuobang Corporation	4.00%	4.04%	3.40%
Beijingdayuan	0.29%	0.70%	3.37%
Spun by Sheng	4.05%	4.32%	3.83%
Yanjiang shares	5.38%	3.53%	3.19%
Xinlong Holdings	1.59%	1.92%	2.01%

Data source: Compiled from annual reports of enterprises

6. Conclusions and recommendations

6.1 Conclusion

The production of nonwovens industry has been rising in recent years, and the industry distribution is concentrated in coastal areas. With the wide application of nonwovens in life, its market demand has further grown, especially in 2020 by the epidemic, the growth of market demand and market scale has increased. The product differentiation of nonwoven fabric in China is small and homogenization is serious. In addition, low technical requirements and small company size have also resulted in low barriers to entry and exit from the market in China's nonwovens industry^[5].

Not many of the nonwovens companies engage in advertising practices, but some of the nonwovens listed companies they are more common for social and national sponsorship. By analyzing the market performance of the nonwovens industry, we found that the overall main

business income of the nonwovens industry rose sharply due to the sudden epidemic, and the gross profit margin is also increasing, but it is still lower than the average level of the textile industry.

6.2 Recommendations

Based on the above analysis of some of China's listed nonwovens companies, this paper will make the following recommendations for China's nonwovens industry.

6.2.1 Enterprises can combine their own advantages, scientifically and reasonably position their products, implement brand strategies and take the road of personalization

With the further refinement of social needs, only by providing the market with standardized and single products is not a long-term solution. Only by realizing the diversity of the market and providing timely products to meet the needs of customers in different markets, can enterprises gain more space for development. At the same time, China's non-woven fabric enterprises should increase investment in advertising, through product exhibitions and other ways to promote the influence of enterprises^[6].

6.2.2 Improve the supply chain and combine whole lines with high technology upstream raw material markets and downstream product markets

Because of the fierce competition in the nonwovens industry and the large number of small and medium-sized enterprises in the industry, it is necessary to adopt relationship marketing strategies in order to improve its own market competitiveness and expand its market share^[7]. Only by coordinating with various stakeholders upstream and downstream can we develop a broader market. The same should be done with customers, to provide customers with good quality products and improve their satisfaction, in order to improve customer loyalty and increase market share.

6.2.3 Actively transforming the growth pattern to align with international markets

It is necessary to actively take advantage of the tendency of enterprises to shift from "crude operation" to "intensive operation", and to pay attention to the effective coordination between production factors. Technological progress is an important element of the intensive economic growth mode. Therefore, China's non-woven fabric enterprises should increase the capital investment in research and development, improve the technical level and research and development capability of producing non-woven fabric, continuously launch more environmentally friendly and sustainable non-woven fabric, and improve the differentiation of products^[8].

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References

- [1] Lu, An, Hao, S. L. *Organization of the apparel industry* [M]. Beijing: People's Publishing House, 2013: 102 - 105.
- [2] National Bureau of Statistics. *Catalogue of Product Categories for Statistics 18 - Textile, Clothing and Apparel Industry* <http://www.stats.gov.cn/tjsj/tjbz/tjyplml/2010/18.html>
- [3] Yang Xuelian. *Research on the problems and countermeasures faced by small and medium-sized nonwoven enterprises in China* [J]. *Journal of Henan Higher Institute of Mechanical and Electrical Engineering*, 2008, 16(06): 59-60+142.
- [4] Zhu Dequan. *A few thoughts on the development of China's nonwoven enterprises at this stage* [J]. *Technical Textiles*, 2005(09): 5-8.
- [5] *New opportunities for the nonwoven fabric industry arising from anti-epidemic products* [J]. *Textile Testing and Standards*, 2020, 6(04): 48-49.
- [6] Zhao Junge, Zhong Xiaoling, Li Xia, Lu an, Zhu Guanghao. *A study on China's children's clothing industry based on SCP framework* [J]. *Mall Modernization*, 2018(02): 23-24.
- [7] Li, M.J., Li, S.N., Lu, A. *Market analysis of Chinese sportswear industry based on the "structure-behavior-performance" paradigm* [J]. *Woolen Technology*, 2018, 46(02): 81-86.
- [8] Gao Yunyao, Xu Junjie, Lu an, Bai Yuling. *A study on the market structure and performance of China's men's apparel industry* [J]. *Shandong Textile Economy*, 2021(02): 5-8.