

Research on the Business Strategy Employed by China's Mask Industry to Minimize the Impact of COVID-19

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Abstract. Based on SWOT–PEST analysis theory, this study compares and analyzes the external macro environment impacting Chinese mask companies and the strengths and weaknesses of these companies when confronted with similar unknown risk impacts. Furthermore, this study examines the opportunities and challenges of these companies in such a market environment and analyzes what marketing strategies they should employ. In conducting a comparative analysis, the significance of the study lies in its investigation of the impact of external environmental factors on making marketing strategies, aiming to improve the correctness of the company's choice of marketing strategies. This paper is also significant because it explores how companies can change their marketing strategies to overcome challenges, seize opportunities, and generate growth when facing rapid changes in the economic environment caused by the disturbance from unknown risks. Therefore, this study hopes to provoke discussion on how Chinese mask companies can survive and progress in the post-epidemic era.

Keywords: Chinese mask industry; COVID-19; SWOT-PEST analysis; Marketing strategy.

1. Introduction

Before the arrival of the novel coronavirus pandemic, masks were not a niche product in the Chinese market and were widely used in medical care, catering, chemical companies, pesticide production, and other industries. According to the data, the output value of masks in mainland China from 2015 to 2019 showed overall positive growth. Furthermore, the production of masks in mainland China exceeded five billion in 2019, with an output value of 10.235 billion yuan. Of the masks produced in 2019, medical masks that can be used for virus protection accounted for up to 54%, with an increase of 12.57% in 2019 compared to the same period in the previous year when medical masks accounted for the largest share of 54% of all mask types, with a year-on-year growth of 15.97%, noting that the domestic mask market has maintained a growth rate of more than 10% each year [1, 2]

Obviously, the Chinese mask market was already saturated before the pandemic, and mask manufacturers were not prepared to stock up for the sudden surge in demand. After the outbreak of COVID-19, the market's supply side was severely inadequate, given the dramatic increase in demand, causing the price of masks to skyrocket in the early stages of the pandemic. In response, the government incentivized manufacturers to expand their production scale, and the supply of masks was increased. While the pandemic is now well controlled, it should be noted that the domestic mask market reached saturation around May 2020. In this context, the response of Chinese mask companies before, during, and after the pandemic is an issue requiring deliberation.

2. Literature Review and Theoretical Analysis

2.1 Marketing Strategy

In 1935 the American Marketing Teachers Association (AMA) (the predecessor of the American Marketing Association) defined marketing as “the general term for the relevant methods, strategies, and means employed by a firm to focus on the needs of the marketplace and to aim for its own growth.” Later the AMA twice revised this definition in 1985 and 2013, the most recent revision of which explained that “marketing is a process of planning and executing ideas about goods, services, and

innovations, pricing, promotion, and distribution to create exchanges that meet individual and organizational goals” [3]. Marketing strategy, on the other hand, is the process by which a company takes the needs of its customers as a starting point and, by acquiring information, analyzes the amount of customer demand and its own position in the market so that it can develop appropriate strategies to guide a series of economic activities of the company.

2.2 Marketing Mix Theory

Marketing mix refers to “the general term for the activities that marketers use to optimize the combination of multiple controllable factors to achieve their marketing objectives according to their marketing goals and marketing strategies.” The 4Ps theory, which focuses on product, price, place, and promotion, laid the foundation of marketing mix theory.

A product is anything that can be offered to the market to satisfy consumer needs. A company’s marketing activities seek to define the optimal mix of products, and the selection of this mix depends on the product’s characteristics. Product mix strategy includes expanding product mix strategy, reducing product mix strategy, and product extension strategy. Price can be understood as the value that consumers pay for a product. Many factors can influence the price; thus, the pricing strategy is not easy to grasp. Pricing strategy requires identifying pricing as an objective, analyzing the cost to determine the minimum price, studying the trend of price changes, determining the demand to set the maximum price, and then determining the optimal price based on the market environment [4]. Channels are all the links a product needs to go through to move from the producer to the consumer. Channel design and management have become the most important aspects of successful product marketing. Promotion is essentially a form of communication used to arouse consumers’ interest and satisfy their needs by building a relationship with them, thus converting consumer motivation into consumer behavior [5]. The methods utilized for promotion as the last link of sales include, for example, advertising and personnel sales. Only a comprehensive analysis of the advantages and disadvantages of these methods can lead to an optimal promotion strategy.

2.3 SWOT–PEST Theory

PEST analysis is an important tool for analyzing a company’s external macro environment. It generally affords an understanding of the macro environment through the analysis of factors relating to politics, the economy, society, and technology (i.e., the four aspects) and evaluates the impact of these factors on the company’s strategic objectives and strategy formulation.

The political aspect refers to the political forces and related laws and regulations that have actual and potential influence on the organization’s business activities. When the government’s attitude toward the business operated by the organization changes, and when the relevant laws and regulations change, the company’s business strategy must be adjusted. Economic factors refer to a country’s economic system and structure, industrial layout, resource status, level of economic development, and future economic trends. Social factors refer to the ethnic characteristics, cultural traditions, values, religious beliefs, education level, and customs of the members of the society where the organization is located. The elements comprising the social environment include population size, age structure, ethnic structure, income distribution, consumption structure and level, and population mobility. Each society has core values, which often have a high degree of continuity, and these values and cultural traditions are steeped in history, transmitted and perpetuated through family reproduction and social education, and, therefore, have considerable stability. Technological elements include not only those inventions that cause revolutionary changes but also the emergence and trends of new technologies, processes, and materials related to business production and the prospects of their application [3].

SWOT analysis is a two-sided four-layer analysis method that focuses on internal strengths, weaknesses, external opportunities, and threats. It analyzes the company’s strengths and weaknesses in the internal environment and the opportunities and challenges in the external environment to reflect the competitive position of the research subject in such a market environment and summarizes the

key issues of development, thus driving the development of marketing strategies [6]. The joint SWOT–PEST analysis is shown in Table 1.

Table 1. Joint SWOT–PEST analysis

SWOT–PEST	Politics	Economic	Society	Technology
Strengths	SP	SE	SS	ST
Weaknesses	WP	WE	WS	WT
Opportunities	OP	OE	OS	OT
Threats	TP	TE	TS	TT

This study analyzes the environmental characteristics of Chinese mask enterprises under the influence of the COVID-19 pandemic through comparative analysis combined with SWOT–PEST analysis and gives improvement measures for marketing strategies based on 4P theory. By analyzing the different stages of the pandemic separately, this approach uniquely shows the macro environment changes from the perspective of mask enterprises. At the same time, the improvement measures on marketing strategies also broaden the direction of the development of marketing strategies for relevant enterprises in the post-pandemic era.

3. Chinese Mask Enterprises at Different Stages of the Pandemic

3.1 Different Stages of the Pandemic

Chinese mask market was already saturated before the onset of the pandemic, and mask manufacturers were unprepared for the sudden surge in demand and had insufficient stock. At the same time, the outbreak coincided with the holiday season, when mask production workers were on vacation, and the operations of corresponding industrial upstream companies providing raw materials had essentially been halted [7]. Influenced by these factors, the supply of masks during the pre-pandemic shortage was severely insufficient to meet the sharp increase in demand for masks, thus also causing mask prices to rise. During this period, many governments introduced price restriction policies to curb the continuous rise of mask prices. The introduction of the price limit policy restricted the uncontrolled pricing of mask manufacturers and led to a constant shortage in the supply of masks to meet market demand. This supply shortage stimulated the emergence of numerous mask enterprises and pulled many of them to transform the production of masks. During the mid-pandemic elevation phase, with the continued increase in demand and the removal of the price limit policy, the government incentivized manufacturers to expand their production scale, resulting in a substantial figure draft of the mask market supply level. Furthermore, after the pandemic was well controlled, the supply level exceeded the demand as more companies transformed their entry and small factories emerged, noting that the domestic mask market reached saturation around May 2020 [8]. In the late saturation stage, the government's severe crackdown on fake masks and strict control over mask production caused the closure of many mask manufacturers established during the pandemic due to overcapacity.

3.2 SWOT–PEST Analysis during the Pre-Crisis Stage

3.2.1 PEST analysis based on weaknesses and threats

During this period, due to the surge in demand for masks in a short period, the supply of the entire mask market could not match the overall demand within this short timeframe, thus leading to a sharp increase in the price of masks. During this period, many local governments introduced maximum price restriction and profit margin policies, lottery purchase policies, and other related policies to limit the rise in mask prices [9]. Although the price limit policy strengthened the regulatory role of the market and ensured that the price level of masks would not rise uncontrollably, it also limited the output level of enterprises with high production costs and affected the subsequent increase and

expansion of production of some enterprises, which instead shrank the output of the entire mask market.

For example, consider the maximum price limit policy, a government policy prescribing a maximum price for masks. As shown in Figure 1, the demand and supply curves of the mask market before the outbreak are D and S , and the equilibrium market price and equilibrium quantity are P_0 and Q_0 , respectively. After the outbreak, the demand curve moves to position D_1 as the demand for masks rises, but the supply remains at S because the market capacity and other problems temporarily fail to rise. Although the equilibrium price should have risen to the level of P_1 at this time, only the level of P_0 can be restored because of the maximum price policy. At this time, according to curve D_1 , the demand is Q_1' , but the overall supply of mask enterprises can only reach the level of Q_0 , thus creating a supply and demand gap of $(Q_1' - Q_0)$. Referring to Shi's study [2], Figure 1 can be obtained.

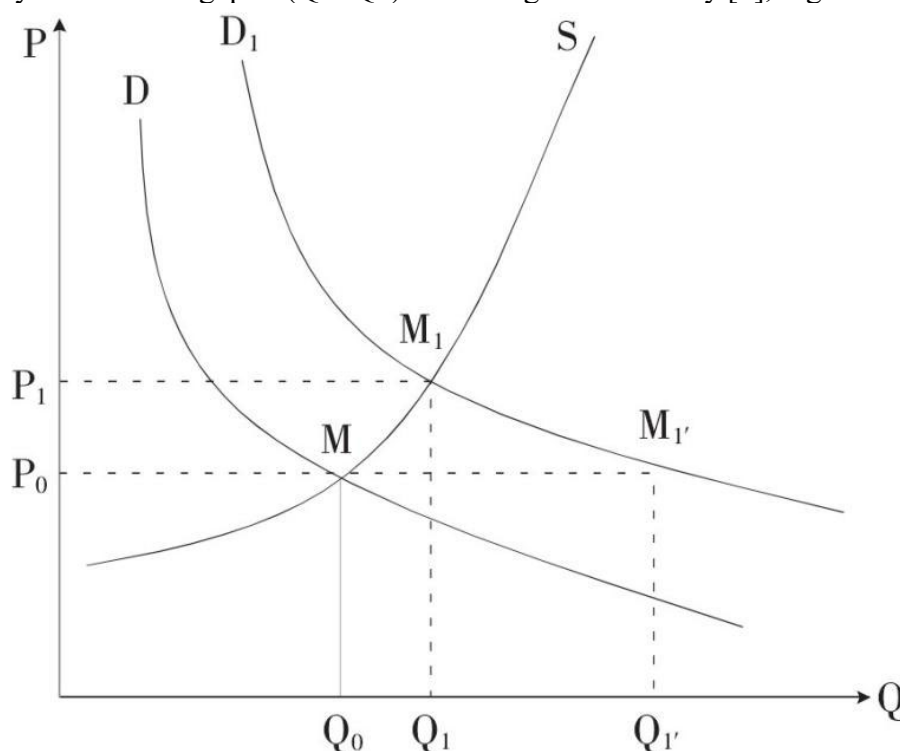


Fig. 1 Market supply and demand curves under the maximum price policy

Mask enterprises were not sufficiently prepared for the sudden outbreak of the pandemic, which led to the supply level not being able to meet the demand and the existing inventory not being able to meet the market. At the same time, because it coincided with the Spring Festival, the industrial chain of enterprises could not quickly reach the level of normal work, and the increase in transportation and other costs also posed a challenge to mask producers at this stage [10].

3.2.2 PEST analysis based on strengths and opportunities

After the outbreak of the pandemic, because the appropriate use of masks can effectively block the transmission path of the novel coronavirus, the importance of masks in public life increased significantly, gradually changing from non-essential to essential products. Faced with the explosive increase in the demand for masks, the gap between supply and demand under the influence of price restriction policies also resulted in this gap not being filled, with the demand in the subsequent market also remaining high, and mask enterprises also having to increase production and expand production for enhanced reserves to be equipped to satisfy the subsequent market demand [11]. At the same time, since mask enterprises can engage in technological innovation, they could have stimulated further innovation to boost mask production capacity within the context of the pandemic.

The results of the SWOT-PEST analysis for this phase are shown in Table 2.

Table 2. SWOT–PEST analysis of the shortage phase

	Policy	Economy	Social	Technology
Advantages			Masks are transformed from non-essential to a necessity, and the demand for masks will persist	
Disadvantages	The launch of the government's mouthpiece price limit policy			
Opportunity		The supply and demand gap exists in the mask market, providing the impetus for the supply of masks from subsequent companies		The massive demand for masks will drive innovation and progress in the production capacity of mask companies
Threats		Coinciding with the Chinese New Year, the business chain could not recover quickly, while the cost of transportation and other costs increased significantly		

3.3 SWOT–PEST Analysis during the Mid-term Enhancement Phase

3.3.1 PEST analysis based on strengths and opportunities

After the pandemic passed the shortage stage, the government adjusted its price limit policy for masks, introduced relevant policies to encourage the production of mask enterprises, and provided facilities for the sale of masks and the supply of raw materials. On February 9, 2020, three departments, including the National Development and Reform Commission, the Ministry of Finance, and the Ministry of Industry and Information Technology, jointly issued a document indicating that the government would provide funding, production sites, raw materials, and equipment support to companies willing to produce medical products [1]. Also, on January 30, 2020, Sinopec promised that during the anti-pandemic period, it would not increase the prices of raw materials related to medical and health supplies it produced, prioritizing the production of raw materials for medical supplies. Meanwhile, after getting through the initial period, the various industrial chains of mask companies gradually resumed work and significantly increased their production capacity. With a continued and considerable demand for masks, the production enthusiasm and production capacity of mask enterprises were stimulated. At this stage, with the growth of profits by mask enterprises, their product and industrial line upgrades were gradually and sufficiently promoted to match the higher level of demand.

As shown in Figure 2, at this stage, the market demand continued to rise, and the demand curve moves from the D1 to D2 position, while the market supply also increased substantially and the supply curve moved to the S1 position to reach the new market equilibrium. Referring to Shi's study [2], Figure 2 can be obtained.

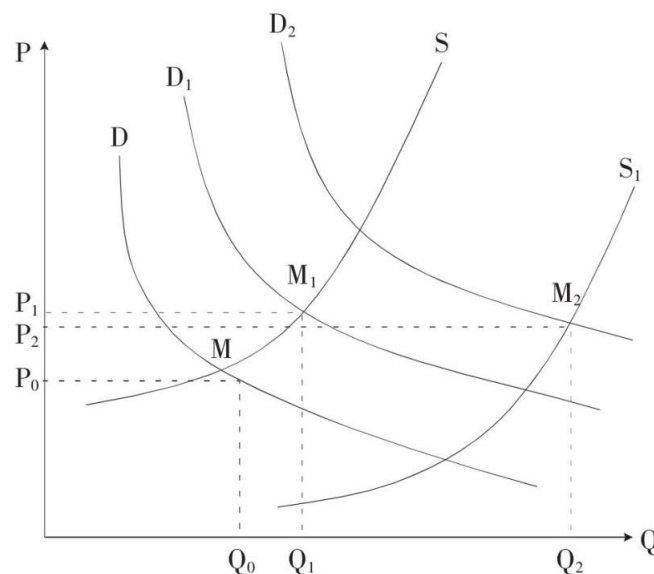


Fig. 2 Market supply and demand curves in the medium-term ramp-up phase

3.3.2 PEST analysis based on weaknesses and threats

Table 3. SWOT–PEST analysis of the upgrading phase

	Policy	Economy	Social	Technology
Advantages	The government introduced relevant policies to encourage the production of mask enterprises	Mask companies' industry chain capacity recovery		
Disadvantages			Masks-related companies emerge in large numbers and competition intensifies within the market	
Opportunity			Since there is still very high mask demand, the production enthusiasm and production capacity of mask enterprises are stimulated	With the growth of corporate profits, the product and industrial line upgrades of mask companies have been gradually advancing
Threats			The emergence of unhealthy competition, as well as competition-induced price increases for raw materials and production machinery	

With the liberalization of government policies, not only has the production of the original mask enterprises been promoted, but because of the simplicity of the mask production process, it has also promoted the cross-border transition production of other types of enterprises and the rapid emergence

of small local mask production factories. The involvement of these enterprises and factories has intensified the competition among mask enterprises. The emergence of more mask brands has led to the need for mask companies to enhance the competitive advantage of their respective products while expanding their production. In these circumstances, vicious competition will inevitably occur (e.g., related businesses will choose to hoard masks), and there will be uneven quality among mask products in the market, which also affects the cost of mask production machines and raw materials.

The results of the SWOT–PEST analysis for this phase are shown in Table 3.

3.4 SWOT–PEST Analysis during the Late Saturation Stage

3.4.1 PEST analysis based on weaknesses and threats

After a significant increase in the mask market's supply level, overall market saturation was reached. In April 2020, with the resumption of work in the country, there was a growth spurt in the registration of mask-related enterprises, which resulted in the market demand for masks being largely satisfied [8]. Thus, many enterprises had excess capacity with significant raw material accumulation. At the same time, with the introduction of national laws and regulations prescribing strict requirements for mask production, the mask market tends to be regulated, and many low-level mask enterprises face transformation and closure. The growth spurt in the number of mask-related enterprises also caused an additional increase in production costs, further narrowing the profit margins of mask enterprises. After meeting the immediate demand for masks, more consumers will choose higher-quality mask products with a strong brand effect. Furthermore, foreign brands have dominated the Chinese market for a long time, and few Chinese mask companies are particularly influential [12].

3.4.2 PEST analysis based on strengths and opportunities

Table 4. SWOT–PEST analysis of the saturation phase

	Policy	Economy	Social	Technology
Advantages				
Disadvantages	Market regulations are more specific and professional requirements become higher		Excessive supply leads to market saturation	
Opportunity	Mask market policy gradually standardized to promote the optimization of the industrial structure of enterprises		With the outbreak of foreign pandemics, the demand for masks in foreign markets has also risen sharply and mask companies can explore foreign markets	
Threats			With the emergence of a growth spurt in the number of mask-related enterprises, production costs have further increased and corporate profit margins have narrowed. At the same time, because the demand for masks is met, the influence of the brand effect disturbs domestic enterprises.	

With the outbreak of the pandemic overseas, the demand for masks in foreign markets has likewise increased sharply, and with the domestic market approaching saturation, mask enterprises can explore international markets, open up sales channels, and supply these foreign markets [13]. Meanwhile, with the continuous improvement of market rules, market competition can promote the innovation of enterprises and optimize their industrial structure.

The results of the SWOT–PEST analysis for this phase are shown in Table 4.

4. Improvement Measure for Chinese Mask Enterprise

4.1 Product

Throughout the three stages of environmental changes for mask companies examined in Chapter 3, the sharp rise in demand for masks is the most significant external factor stimulating changes in marketing strategies among mask companies. The consumer is the product's target audience. Influenced by the pandemic, masks became a necessity in consumers' lives. In the face of massive demand, the marketing strategy must also be demand-driven. In the early stage of the pandemic, under the premise of meeting the burgeoning market demand, the product strategy focused on providing products of high quality and low production cost with high speed. At this stage, the goal was to match the large demand volume. In the middle and late stages, low-technology mask products could no longer match the market demand, and the marketing strategy focused on providing special, brand-effective, and diverse products for competitive advantage [14]. At this stage, the goal was to match the higher product demand of consumers. First, the comfort level of masks can be improved, for example, by upgrading the fabric of the ear cords of masks or changing the way these ear cords are adjusted in terms of elasticity. Second, the aesthetic level of masks can be increased, given that more beautiful masks are more attractive to consumers. Third, the variety of mask segments can be increased so that consumers can actively choose according to their needs. Fourth, the quality of products can be improved, and the production process of masks can be upgraded to meet higher protection standards [3].

4.2 Price

Influenced by the pandemic, the price movement of the mask market was disturbed by many external factors. The emergence of the price limit policy in the previous period briefly stabilized the continuous rise of mask prices. At that stage, the mismatch between supply and demand in the market made consumers insensitive to the change in mask prices and highly receptive to the price of masks. However, in the middle and later stages, with the increase in supply, the price of masks gradually declined and eventually reached stability. The emergence of more competitors in the mask market makes consumers more inclined to buy quality products with brand effects, and prices are expected to fall, albeit still higher than pre-pandemic levels. The price strategy of mask companies should also be oriented to capture consumers. First, prices cannot be raised arbitrarily. In the case of high demand, although high prices can generate much profit in a short period, it is not conducive to future competitiveness. A choice can be made to have a price increase strategy where the basic models of products are sold at an average price, while new high-quality products can take appropriate price increases to establish the brand image. Second, prices need to change over varying periods, using different pricing strategies to match the needs of diverse consumers.

4.3 Place

With the pandemic being under control nationally, offline sales channels can hardly meet sales requests, and online sales platforms have become the primary sales channels; therefore, covering the whole network platform and mobile terminals should be the goal of the channel strategy [15]. Establishing an efficient and complete online sales chain is the primary goal of mask companies in the post-pandemic era. Given the outbreak overseas, expanding overseas sales channels is also an important decision to be taken by Chinese mask companies. For offline pharmacies and other sales

stores, a perfect replenishment team should be established so that timely measures can be taken to avoid risks in the face of changes in the economic environment brought about by unknown risks, and a two-way complementary system between online and offline can be established, effectively broadening the sales channels of products.

4.4 Promotion

The purpose of promotion is to expand the share of the company's products in the market. In the early stage, the multi-volume promotion sales model can have been adopted to match the enormous demand. The more products consumers purchased, the more discounts could have been received. In the middle and later stages of increased competition within the market, it would have been necessary to move the products toward branding, removing simple price discounts, improving product quality, expanding the promotion of core products, and using a combination of online and offline methods to expand awareness. Under the premise of adapting to consumer demand, the focus could have been placed on consumer experience, collecting market feedback, and the timely adjustment of products and strategies to create quality brand products with sticky fickle users.

5. Conclusion and outlook

This study takes Chinese mask enterprises as the research object, and through SWOT-PEST analysis, the environment in which enterprises operated during different stages of the pandemic is specifically assessed. Furthermore, the results of the assessment are combined with the 4P theory of marketing to suggest improvements to the marketing strategy adopted by enterprises. Specifically, it is concluded that upgrading the product's production line and enhancing its uniqueness should have entailed three aspects: comfort level, aesthetics level, and variety. Also, a differentiated price increase should have been adopted and the price structure optimized to adjust the product price over time. At the same time, an efficient and complete online sales channel should have been established to form a complementary system with offline stores. Furthermore, the promotion mode should have been changed to enhance consumers' recognition of the products, focusing on consumer experience and building brands. With the domestic experience with the pandemic clearly under control, the mask market is back to a stable state. Given the influence of the pandemic, masks have changed from non-essential to essential products, and even though the mask market has stabilized, there remains much room for development. This paper is limited to analyzing and giving results from a model-theoretical perspective and does not delve into the process of developing marketing strategies by combining examples. In the post-pandemic era, it is worthwhile to study how these mask companies can develop marketing strategies to adapt to market changes.

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