

An Examination on Competitiveness Analysis of Huawei Enterprise

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Abstract: Background/Objectives: Huawei started with 20,000 yuan in 1987 and grew to achieve sales of 721.2 billion yuan in 2018. Currently, it consists of 180,000 employees in 900 offices worldwide. As the company grew bigger, its market circumstance and strategy were changed. Thus, its competitiveness also changed. Therefore, we are trying to analyze Huawei's competitiveness change by time.

Methods/Statistical analysis: This study analyzed Huawei's competitiveness using Michael Porter's diamond model, showing the transition of Huawei's growth in recent years (2011-2018). There are 4 conditions to analyze competitiveness according to Porter's model, Factor, Demand, Related and Support Industries, and Firm strategy. Factor condition is measured by the cost of capital, labor and the number of R&D employee. Demand condition is determined by market, consumer, and economic environment. Related and Support Industries are surveyed by related industry and Social Overhead Capital (SOC). Firm strategy is consisted of management performance, government, and rivalry.

Findings: The analysis based on Porter's diamond model shows that Huawei's competitiveness is decreasing in terms of factor conditions. On the other hand, it is increasing in terms of demand, its related and support industries, and firm strategy. Particularly, the demand conditions are witnessing a sharp increase. A recent comprehensive analysis of Huawei's corporate competitiveness shows that the company is becoming increasingly competent. Particularly, it has emerged as a key company among network equipment manufacturers in the 5G industry over the past 2-3 years.

Improvements/Applications: Although the U.S. President Trump's sanctions will adversely impact its management performance in 2019, Huawei's internal competitiveness is sufficient, and it has a potential to grow in the future.

Keywords: Huawei, Diamond model, Competitiveness, Globalization History, Firm Strategy.

Article History

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1. Introduction

Huawei was established by RenZhengfei, a retired soldier, in 1987 for selling phone switches, and it currently operates telecommunication equipment and smart devices businesses. Since then, the company underwent several changes and grew into a key player in China's fourth industry. Additionally, Huawei has been increasing annual sales by more than 20 percent over the past 5 years, matching leading global companies; for example, the company ranked first globally for submitting the highest number of patent applications in 2018, and it ranked a fifth globally for its R&D investments. Since Huawei occupies a leadership position in the international market, it would be meaningful to analyze its competitiveness.

This study analyzed Huawei's competitiveness using Porter's diamond model[1], showing the transition in Huawei's growth in recent years. As per Porter's argument, conventional macroeconomics theory, such as the classical trade theory, only values external variables, government policy, and exchange and interest rates; hence it cannot fully account for phenomena like an intra-industrial trade or global competitiveness of enterprises. Therefore, he developed a model for determining competitiveness called the diamond theory of national advantage. This model is useful for analyzing competitiveness as it analyzes the dynamic environment of global competition as well as the underlying factors that determine competitiveness from a long-term perspective.

Huawei's opportunities and crisis factors have been changing rapidly, thereby causing a responsive change in its overall business[2]. The sporadic rise in China's labor costs or the rising smartphone penetration rate in the country depict the changes in Huawei's business environment. Huawei has been making inroads into the smartphone business since 2000 in response to the changing market demands and continuously growing through the diversification of its business[3]. It is not easy to simplify Huawei's competitiveness in this dynamic changing environment. Therefore, this study analyzed four

factors through Porter's diamond model and analyzed and indexed the competitiveness of Huawei's in the last 8 years. Owing to the homogeneity in the size of firms since 2010, the period 2011–2018 was considered suitable as the base year for analysis based on the diamond model.

2. Huawei's Globalization History and Growth Background

Huawei started with a capital of 20,000 yuan in 1987 and grew to achieve sales of 721.2 billion yuan in 2018 and provide telecommunication equipment to more than a third of the world's Internet using population. Currently, it operates 900 offices and consists of 180,000 employees, of which 70,000 work as research and development (R&D) personnel in 15 research centers; Huawei's current human capital and infrastructure for R&D explains its focus on innovation activities.

Although it has steadily grown since inception, different management strategies were used for each generation. Earlier, the company expanded its size in the domestic market by mainly targeting the Chinese market; in 2000, Huawei diverted its attention to the global market and, since then, it has been making rapid strides globally. Subsequently, it acquired a large share of the southeast Asian, middle eastern, and African markets with low price and high performance, earning \$244.4 million in the overseas markets alone in 2001. Based on this success, Huawei set new benchmarks for itself on the international stage. In 2001, the company acquired technological skills and scale as well as considered overseas listing[4].

In 2009, it obtained a 3G business license in China, generating \$10 billion in sales in China alone and signing \$30.2 billion in contracts with countries such as Europe and the United States of America. It was ranked 397th among Fortune 500 companies. Huawei's regional sales from 2011 to 2018 indicate that the company holds the highest market share in China. Particularly, the country has been accounting for the largest portion of Huawei's sales since 2014. This is can be attributed to Huawei's transition from business-to-

business to business-to-consumer sales; specifically, owing to the rising income of the Chinese middle class, the company has started to focus on its smartphone business. In the telecommunications equipment industry, Huawei has already made it difficult for companies to grow anymore, so Huawei has turned its eyes and entered the Chinese retail industry. As a result, the relative share of sales in Europe, the Middle East, Africa, and the Americas decreased. There are three reasons for Huawei's growth:

First, in order to promote products and enhance the brand value, Huawei exhibits its products in fairs like the Mobile World Congress (MWC). Huawei's P30 Pro won the Best Smartphone 2019 Award of Asia Mobile Awards during MWC 2019, which was held in Shanghai[5, 6].

Second, technological and price competitiveness have contributed toward strengthening R&D activities, such as R&D investment and R&D manpower, which account for around 10 percent of the total sales every year; additionally, Huawei's internationalization strategies have been responsible for its global success. Huawei's R&D workforce in 2018 was around 80,000, or 45 percent of its total workforce; its current R&D investment is 480 billion yuan, which is equivalent to about \$69.88.75 billion[7].

Third, it has been leading internationally due to its strategic alliances with major multinational companies. Huawei's major product portfolio comprises wired, wireless network equipment and handsets. Besides, it has expanded its product offering to include telecommunication-related support services and mobile handsets. At the MWC Shanghai 2019 in June this year, Ryan Ding, executive director of Huawei's board and president of communications network business group, said in a keynote speech that many countries, including South Korea, Britain, Switzerland, Italy, and Kuwait, started commercializing 5G in the first half of this year, and more than two-thirds of the commercially launched 5G networks have been built by Huawei. It is apparent that Huawei could diversify business and improve performance within a short period because it already formed alliances with global telecommunication businesses, Huawei was able

to manufacture and sell telecommunication terminals at a lower price[8, 9, 10].

3. Huawei's Competitive Analysis

3.1 Measure of Huawei's competitiveness

Huawei's international competitiveness index was divided into the following four major determinants—factor conditions; demand conditions; related and support industries; and firm strategy, structure, and rivalry—by using the Porter diamond model[11]. It is shown in Table 1. First, capital, labor, and R&D were taken as the basic factors of production. In this study, capital was measured in terms of the corporate bond interest rate and labor cost, and R&D development was measured in terms of the number of R&D employees.

The second subfactor of demand conditions comprises the following categories: market, consumer, and economic environment. The market represents the number of Internet server subscribers worldwide; the consumer represents China's per capita gross national income (GNI), and the economic environment gauges China's GDP growth. Since 2014, China has been accounting for the largest portion of Huawei's sales, and more than 50% of its sales in 2018 has contributed toward China's per capita GNI and GDP growth rates.

Third, the related and support industries were measured by external industry indicators, which may influence the telecommunication equipment industry, as well as related infrastructure patents and R&D costs of the company. The related industry was measured on the basis of the 'Electromagnetic devices and their parts' (HS codes 85), and the related infrastructure was measured by the number of patent registrations and R&D costs.

Fourth, corporate strategy, structure, and competition were measured on the basis of operating profit by setting the performance of the corporate strategy as a sub-factor; additionally, government's influence on the corporate strategy and the competitive advantage was measured with government support. Competition was measured

on the basis of Huawei's share of the global smartphone market.

Table 1: Determinants and Metrics of Huawei's Competitiveness

Four Determinants	Subfactor	Measurement index
Factor Conditions	Capital	Corporate bond interest rate
	Labor	Labor costs
	R & D	Number of R&D personnel
Demand condition	Market	Internet server subscribers worldwide
	Consumer	China's per capita GNI
	Economic environment	China's GDP growth rate
Related and Support Industry	Related industries	Proportion of electronic equipment and parts in China's exports
	Related SOC (Social Overhead Capital)	Patent number
	Related SOC (Social Overhead Capital)	R&D Cost
Firm Strategy, Structure, and Rivalry	Management performance	Operating profit
	government	Government grant
	Rivalry	Global smartphone market share

3.2 Results of the comprehensive evaluation

The results of Huawei's overall assessment are shown in Figure 1. Overall, the company shows competitiveness in terms of elemental conditions in 2011, with the remaining three conditions contributing the most toward competitiveness in 2018. This implies a steady decline in the competitiveness of the production element due to the rising price of the factors of production; this trend has been observed in all the companies in China, and it highlights the need to be prepared for the accompanying changes[12].

Demand conditions increased the competitive index, from 5.4 in 2011 to 8.98 in 2018, particularly from 2016 to 2017 and from 2017 to 2018. Related and support industry and firm strategy, structure, and rivalry have been increasing steadily every year, with the rest of the conditions, except for the component conditions,

contributing the most toward competitiveness in 2018. This can be attributed to Huawei's recent business environment, which presented the company with more business opportunities.

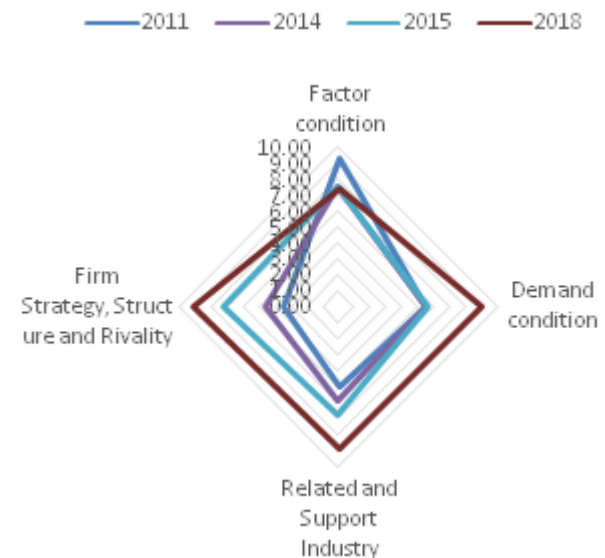


Figure 1. Design of the Improved decision tree algorithm for educational data mining

3.3 Evaluation result by factor

Table 2: Comprehensive Average Index by Four Determinants

	2011	2014	2015	2016	2017	2018	2019
Factor condition	9.25	7.99	7.76	7.56	7.55	7.41	7.40
Demand condition	5.40	5.14	5.39	5.48	5.56	5.85	8.98
Related and Support Industry	5.00	5.15	5.20	5.83	6.74	7.70	8.91
Firm Strategy, Structure, and Rivalry	3.45	3.10	3.21	4.52	7.15	6.38	9.15

3.3.1. Factor condition

Factor condition's time trends are shown in Table 2 and Figure 2. It measures the competitiveness of

production elements such as capital, labor, and infrastructure. Porter's theory divides the production factors into basic and advanced factors. Capital and labor, which are representative basic production factors, were designated as sub-factors, and R&D was designated as a progressive subfactor. When the component conditions were measured by each metric, it was found that the component conditions were the most competitive with 9.25 in 2011 and the least competitive with 7.4 in 2018. Particularly, the gap between 2011 and 2012 was greatest due to low interest rates and labor costs. Labor costs more than tripled from 39.37 billion yuan in 2011 to 146.584 billion yuan in 2018, thereby reducing competitiveness.

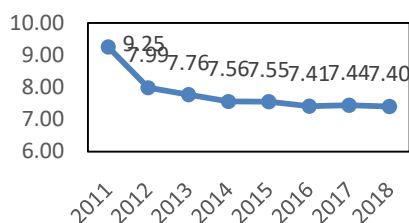


Figure 2. Factor Condition

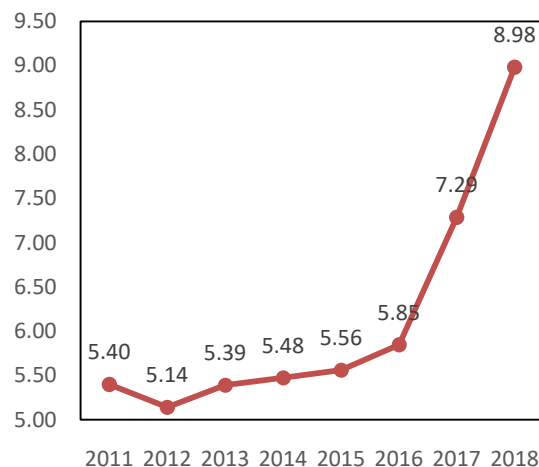


Figure 3. Demand Condition

3.3.2. Demand Factors

Demand Factor's trends are shown in Table 2 and Figure 3. Huawei's products are mostly targeted for telecommunication equipment and smartphone markets. Huawei's telecommunication equipment not only dominate China but also global markets; its smartphones are focusing the Chinese markets. Therefore, the demand condition metric was measured in terms of the Internet penetration rate in the global population, per capita GNI, and GDP growth rate. Demand conditions showed the

lowest competitiveness in 8 years at 5.14 in 2012 and grew steeply to 7.29 in 2017; it contributed the most to competitiveness at 8.98 in 2018. This can be attributed to the rapid growth in the number of Internet subscribers and China's per capita GNI; specifically, Huawei has a high market share in developing countries such as Africa, the Middle East, and Southeast Asia, and hence it is considered competitive in terms of demand.

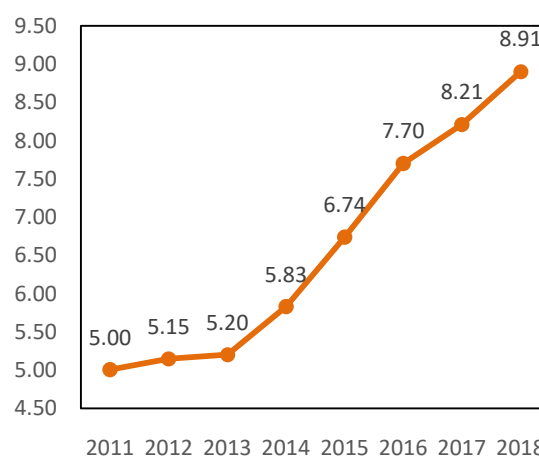


Figure 4. Related and Supported Industries

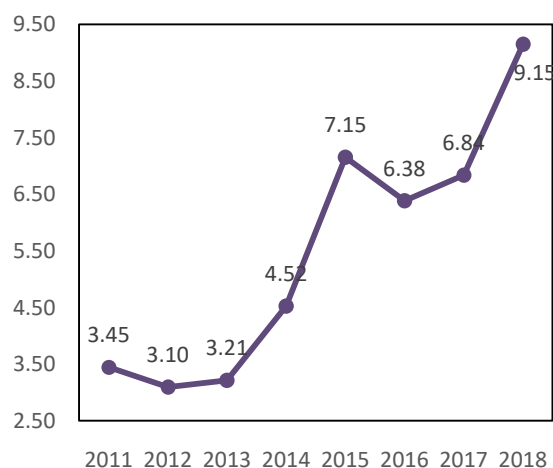


Figure 5. Firm Strategy, Structure, and Rivalry

3.3.3 Related and Support Industry

Related and Support Industry's time trends are shown in Table 2 and Figure 4. China's export of HS code 85 electric devices and their parts, which are required for both telecommunication

equipment and smartphones, was taken as the measurement indicator. In addition, R&D is critical due to the nature of the telecommunication equipment industry; hence, the higher the number of patent registrations and R&D costs, the better would be the prospects for Huawei. Therefore, the number of patent registrations and R&D costs were analyzed as measurement indicators.

The related and support industries showed the lowest index at 5 in 2011 and the highest at 8.91 in 2018. Specifically, the number of patents and R&D costs was the highest in 2018 at 87,805 and 1.01 billion yuan, respectively, while the exports of electronic devices and their parts were the highest in 2011, with \$6.63 billion. In total, the competitiveness index was the highest at 8.91 in 2018.

3.3.4 Firm Strategy, Structure, and Rivalry

Firm Strategy, Structure, and Rivalry are shown in Table 2 and Figure 5. The measurement indicators for firm strategy, structure, and rivalry were management performance, government support, and competition, respectively. Management performance was measured by operating profit, and competition was measured by the share of global smartphone markets. Unlike other factors, firm strategy, structure, and rivalry have not increased or declined in a straight line in the sampled years. This is due to the highest government funding in 2015. Although its operating profit and market share smartphone markets has steadily grown from 2011 to 2018, its government support has fluctuated greatly.

4. Conclusion

According to Huawei's recent comprehensive analysis of its corporate competitiveness, Huawei is growing more competitive. Particularly, it has emerged as a key company among network equipment manufacturers in the 5G industry over the past 2–3 years. Analyzed using Porter's diamond model, Huawei's competitiveness is decreasing in terms of component conditions, but it is increasing in terms of demand, related and support industries, and corporate strategy and structure and competition. Particularly, the increase in demand conditions is growing

noticeably. Although the U.S. President Trump's sanctions will adversely impact its management performance in 2019, Huawei's internal competitiveness is sufficient and there is potential for growth in the future. It is predicted that Huawei's potential will grow further in the fourth industrial era if it secures parts and foreign markets as before.

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