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Business Analysis of Didi Chuxing in the Chinese Ride-hailing Market

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Abstract: This essay presents my analysis of Didi Chuxing's ride-hailing business in the Chinese market considering economic concepts and tools such as market structure, economies of scale and price anchoring to understand aspects of Didi Chuxing such as its cost structure, pricing strategies and marketing methods. As the largest ride-hailing platform in China, the success of Didi Chuxing can offer important guidelines for the healthy development and expansion of this industry to other countries.

Keywords: Didi Chuxing, Chinese Ride-hailing market, company analysis, price discrimination

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Introduction

The optimization and integration of “Internet Plus” in the allocation of social resources has led to the evolution of economic reforms. Many vertical industries have deep integration with the internet and have developed new business forms and models. There is no doubt that the ride-hailing service is the most eye catching of all (Deloitte, 2019).

Since the establishment of Uber in 2009, the global ride-hailing market has developed rapidly. The global market scale of ride-hailing reached US\$153,91 million in 2018 and is expected to show an annual growth rate (CAGR 2019-2023) of 14.8 percent to generate a market volume of US\$318,765 million by 2023 (Statista, 2019).

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China is home to the world's largest ride-hailing market, estimated by consulting firm Bain & Company to be worth more than US\$20 billion in 2016. After several rounds of mergers, the ride-hailing industry in China has formed a market in which Didi Chuxing has a share of over 90 percent, and Yidao, Shouqi, Shenzhou, Meituan and Caocao have a slight share in each region (Bill Peng, 2018).

China has the largest ride-hailing market in the world, and Didi has developed into the world's largest ride-hailing company. Their business models and operations in China provide a good example by which to understand Didi Chuxing and to provide guidance for the development of the global ride-hailing market.

Main Analysis

Market Structure

Market structure is a collective term for different types of markets such as perfect competition and monopolistic competition. Market share is usually used as the main criterion.

The current Chinese ride-hailing market has shown a trend of transition from oligopoly to monopoly (Ma et al., 2019). After the acquisition of Uber's China operations in 2016, Didi Chuxing has almost monopolized the Chinese market, becoming synonymous with the ride-hailing service (Bill Peng, 2018).

According to Strategy& (the global strategy consulting team at PwC), Didi Chuxing has dominated the ride-hailing market in China with a market share of over 90 percent since 2018. The rest of the ride-hailing companies, such as Meituan and Shouqi accounted for less than 10 percent of the market share. These companies should provide more differentiated services and improve service quality in order to gain more advantages in the next round of competition (Liu & Kim, 2016).

In addition, the entry barriers of the Chinese ride-hailing market cannot be ignored, which is why investment interests are restricted in this industry. Barriers include the difficulty of obtaining government permits (Sun et al., 2019). Due to safety and management reasons, the Chinese government has strict supervision over ride-hailing platforms. Often it takes nearly one year from registration to obtaining a license (Bingwan, 2018). China's largest ride-hailing company, Didi Chuxing, operated in the gray zone in its first few years, and their drivers were often punished by traffic police for unlicensed operation (Xue, Chung and Yu, 2018). Furthermore, the project requires a great amount of capital investment at the beginning. The success of Didi Chuxing in the Chinese market proves that only a large amount of initial investment can attract a steady stream of customers. This Beijing-based ride-hailing company has a valuation of US\$56 billion and has raised more than US\$20 billion since its inception, making it the second most valuable private Chinese company in history, according to Crunchbase. It is backed by notable investors and companies like Singapore's Temasek, China's Tencent and Alibaba, Japan's Softbank, and Apple

(Stephan, 2018). Such a huge amount of upfront investment has discouraged many companies. Also, a ride-hailing platform needs strong IT support. In order to maximize profits, ride-hailing companies need to use big data and other tools to optimize dispatches and routing (Jia, Xu and Liu, 2016). The electronic information of the drivers needs to be updated in real time through internet technology. Road-vehicle positioning systems is also a focus for these platforms (Luo et al., 2019). These three barriers make it difficult for many companies to enter the Chinese ride-hailing market.

Competition Regulation

Competition regulation usually refers to a scheme to restrict unfair market competition through legislation or by administrative means.

On the one hand, China's market oversight of current supervision of ride-hailing market is mainly from the Ministry of Commerce and the Ministry of Transport of the People's Republic of China. The Chinese government has not yet established a special competition authority to regulate the anti-competitive practice of the ride-hailing market except for joint conferences organized for specific cases such as the inter-ministerial joint conference on Collaborative Supervision of New Business Status of Transportation. These temporary agencies are not able to cope with the cumbersome, unfair competition cases (Deighton-Smith, 2018).

On the other hand, China has a relatively complete legal system to supervise the competition in ride-hailing market. In 2007, the *Anti-monopoly Law of the People's Republic of China* was adopted at the 29th meeting of the Standing Committee of the 10th National People's Congress of the People's Republic of China. This law was enacted for the purpose of preventing and restraining monopolistic conduct, protecting fair competition in the market, enhancing economic efficiency, safeguarding the interests of consumers and social public interest, and promoting the healthy development of the socialist market economy (National People's Congress of the People's Republic of China, 2007). In addition, many local governments have also introduced competition regulations to manage the ride-hailing market. For example, in order to compete fairly, the governments of Shanghai and Beijing have launched a series of rules such as price floor and merger review to prevent a certain company from forming a monopoly (Sun & Ding, 2019).

The Chinese ride-hailing market has been investigated for monopoly. In September 2016, Shen Danyang, spokesperson of the Ministry of Commerce, said that the investigation of the merger of Didi and Uber China was in accordance with related laws and regulations of China. (Hook, 2016).

Production Function

As a ride-hailing services platform company, the main business of Didi Chuxing is to build an information link between drivers and passengers (Deloitte, 2019). Unlike traditional industries, Didi Chuxing is a new business model rooted in the sharing economy (Guo et al., 2018). Cost structure analysis of this new business should also consider more factors.

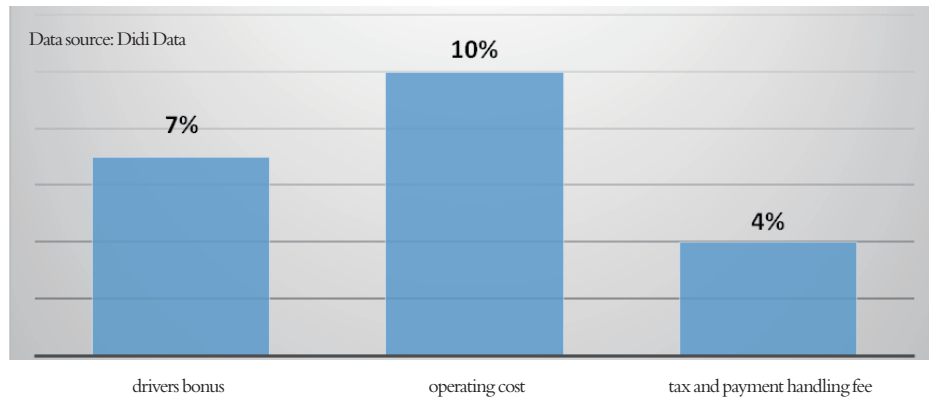


Figure 1 The ratio of cost of Didi chuxing's ride-hailing business to revenue(2018)

Figure 1 describes the cost structure of Didi Chuxing in 2018 according to Didi Data (2018). The first section is the driver's bonus. This is an extra reward for those drivers who pick up and drop off passengers in busy places like downtown during rush hours. Didi Chuxing uses subsidies to motivate drivers to do more work and it is similar to attendance and service bonuses (Chen, 2018). This section accounts for 7 percent of revenue and can be classified as variable cost. The second cost is the operating cost, which is also the largest cost of Didi Chuxing, which occupied 10 percent and can be considered as a fixed cost. This section mainly includes technical research and development (R&D), security, customer service, human resources, offline operations and other costs. The last part is tax and handling fees paid to third-party payment companies, which accounts for 4 percent and is a variable cost. The variable cost ratio reveals the total amount of variable cost incurred by a business, stated as a proportion of its revenue (Law, 2016).

$$\text{Variable cost ratio} = \frac{\text{Variable cost}}{\text{Revenue}} \times 100\%$$

According to the above analysis, the variable cost ratio of Didi Chuxing is 11 percent, and the variable cost section accounts for more than half of the total costs. This data shows that Didi Chuxing is a light asset company. From a practical point of view, Didi plays only the role of an intermediary in ride-hailing and does not have to be responsible for product supply, i.e., there is no need to purchase cars (Wang, 2019). Due to the small proportion of fixed cost, Didi Chuxing is not sensitive to the market, which is the main reason why it can continuously transform and upgrade products according to the market environment.

As an online ride-hailing company, the main factors of production of Didi Chuxing should be technology and labor. It is necessary to focus on technology if Didi Chuxing wants to achieve leapfrog development after its initial phenomenal growth. After the subsidy war, Didi Chuxing recruited hundreds of people from Baidu, Tencent, as well as Ali's cloud computing and other big data departments in order to set up its own big data team. Constant maintenance and upgrade of this

system have become the magic weapon of Didi in the ride-hailing market (Min & Kim, 2018). Didi Chuxing needs to build a professional and large customer service and marketing team to deal with cumbersome daily affairs (Crothall, 2018). According to relevant data from 58.com, a famous Chinese recruitment website, Didi had more than 13,000 employees in 2019. It is undeniable that this means a large labor cost.

Since Didi Chuxing does not disclose more financial information, this essay focuses more on the economies of scale model for theoretical analysis.

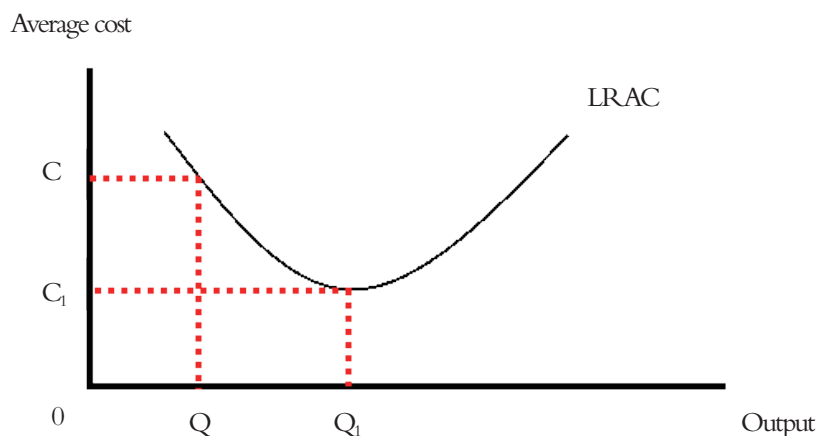


Figure 2 Economies of scale

Figure 2 is a theoretical model diagram of economies of scale. It refers to the phenomenon of increasing economic efficiency by expanding production. When a company continues to develop, i.e., as output increases, more products share the fixed cost, the average cost will fall, and the company will achieve benefits from economies of scale (Stigler, 1958). For Didi Chuxing, its main factors of production are technology and labor. Although it belongs to a sharing economy, it also follows traditional economic theory. Zha, Yin and Yang (2016) thought that when Didi merged with Uber and became the biggest player in the Chinese ride-hailing market, it gained very large benefits from economies of scale.

Price Discrimination

Price discrimination is an important monopoly pricing behavior, and it is a pricing strategy for monopoly enterprises to obtain surplus profits through differential prices. Price discrimination usually means that when a supplier of goods or services provides different recipients with the same grade and the same quality of goods or services, different selling prices or charging standards are applied between the recipients.

Didi Chuxing meets three conditions of adopting a price discrimination method. First, Didi Chuxing has strong market power. This is the basis for its price discrimination strategy. Second,

customers of ride-hailing services have different preferences and needs, and Didi Chuxing can easily classify and price them. Didi Chuxing depends on the analysis method of big data, dividing consumers into various types and marking their preferences. This effective method provides data support for the use of price discrimination (Gu & Huang, 2018). Third, Didi Chuxing is able to prevent resale. Ride-hailing users need to associate their information with an app account and Didi Chuxing can avoid resale by confirming identity before service (Hagiu & Wright, 2017).

Big data bias helps Didi Chuxing to use the first-degree price discrimination method (FDPD) although they did not admit it (Shiller, 2013). FDPD is a situation in which a firm sells each unit at the maximum amount any customer is willing to pay, so prices differ across customers and a given customer may pay more for some units than for others.

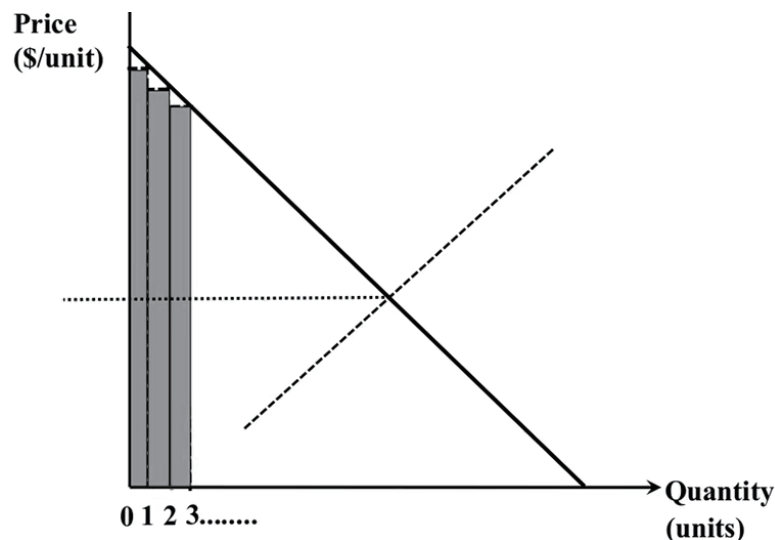


Figure 3 First Degree (perfect) Discrimination

Figure 3 is a graph drawn according to the theory of FDPD. It indicates that the goal of the sellers is to extract all consumer surplus to achieve maximum profit. Many traditional-based views argue that it is unpractical to use FDPD because no seller knows every buyer's reservation price (Carroll & Coates, 1999). However, according to Shiller (2013), the application of big data has made this possible: Didi Chuxing uses big data to collect passengers' personal information, and by analyzing customer preferences it can calculate consumers' reservation price for their ride-hailing services. For instance, a passenger using an iPhone will pay more than a passenger using an Android mobile phone; a new customer's price is lower than an old customer's. This approach, which is very close to FDPD, has brought huge benefits to Didi.

Didi Chuxing provides a fee reduction for customers who use their services multiple times, which is regarded as second-degree price discrimination (SDPD). SDPD is a situation in which a firm charges a different price for large purchases than for smaller quantities, so that the price paid varies according to the quantity purchased.

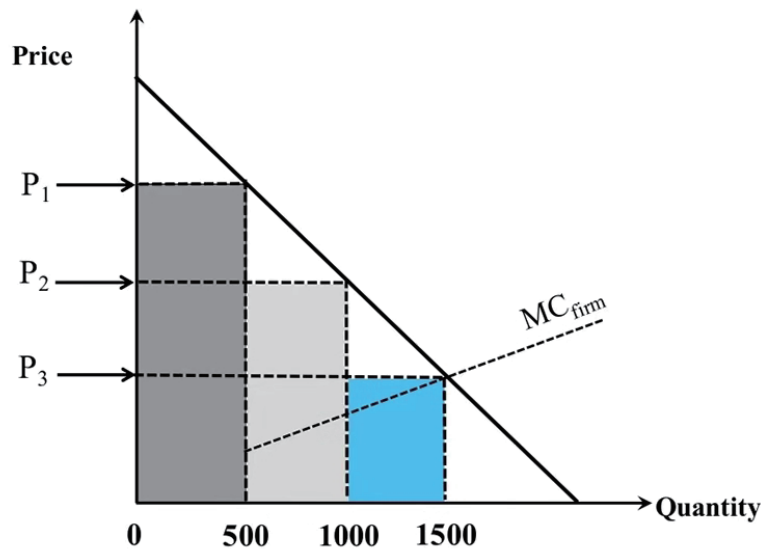


Figure 4 Second Degree Discrimination

Figure 4 is a graph drawn according to the theory of SDPD. By using the SDPD method, firms take part of the consumer surplus and can generate larger revenues and profits compared to charging a single lower price for larger quantities (Carroll & Coates, 1999). Didi Chuxing often offers discounts for frequent users, and those who regularly use their services can get fee reductions from time to time. Additionally, Didi will provide a reasonable fare solution for corporate customers. Finally, Didi Chuxing essentially allows different riding fees for identical trips. Since tips go directly to drivers, adding tips makes the request more attractive to drivers and thus increases the probability of securing riding services. The tipping option is interpreted as a device for second-degree price discrimination (Duan & Liu, 2019).

Asymmetric Information

Asymmetric information means that each person in a transaction has different information. In socio-political, economic and other activities some members have information that other members do not have, which results in information asymmetry. In the context of market economy, various types of personnel have different understandings of relevant information. Those who have sufficient information are often in a more favorable position, while those with poor information are in a disadvantaged position. Addressing information asymmetries can make markets fairer.

The Chinese ride-hailing market has become more transparent, and passengers and drivers can easily find the right services and orders through the internet or other channels (Li & Chen, 2016). In the field of promoting the transparency of industry information, Didi Chuxing has contributed a lot.

There are two problems resulting from asymmetric information: Adverse selection and moral hazard. Adverse selection occurs when one party to a transaction possesses information about a hidden characteristic that is unknown to other parties and takes economic advantage of this

information (Wilson, 1979). One of the missions of Didi Chuxing is to solve the problem of adverse selection that exists between passengers and drivers. Before 2012, in many Chinese cities, there was a problem of “difficulty in ride-hailing”. Passengers could not obtain services, drivers accepted orders selectively, and the no-load ratio remained high. According to iResearch (2018), the information asymmetry between passengers and drivers is an important reason.

After the establishment of Didi Chuxing, the problem of adverse selection in the ride-hailing market was basically solved by integrating resources and coordinating cooperation. When facing passengers, Didi Chuxing will provide them with a list of services for their consumption decisions before the trip. This list is very detailed, including the trip distance, fare, car conditions and even the character of the driver (Hu et al., 2018). This effectively protects the passengers’ right to know and prompts them to make a rational choice. When facing drivers, Didi Chuxing through data analysis, obtains the demand for ride-hailing in the whole region and rationally allocates car resources (Zhao, Zheng & Vo, 2017). This measure ensures that drivers receive orders in a shorter period, increases drivers’ income and reduces the no-load ratio.

Moral hazard problems frequently occurred at the beginning of the development of the ride-hailing market. Since the risks of operating vehicles and non-operating vehicles are different, insurers have different pricing methods for these two products. It is hard to distinguish the operating or non-operating status of the ride-hailing cars in many claims cases. If the owners of these cars do not inform insurers, it is almost impossible for the insurance companies to know the operating status of the vehicles. Therefore, many operating vehicles used non-operating insurance to get payments when accidents occurred. Didi Chuxing was aware of industry vulnerabilities and they were committed to solving this problem. Through information sharing, Didi helped insurance companies to distinguish operating vehicles and reduced the economic losses of insurance companies caused by this moral hazard (Nwogugu, 2019).

Advertising

As defined by the Advertising Association of the UK, advertising is a means of communication with the users of a product or service. Advertisements are messages paid for by those who send them and are intended to inform or influence people who receive them.

High-intensity advertising is one of the important means to Didi Chuxing’s success. It accurately targets the customer and delivers different types of ads to appeal to different preferences (Tunca, 2019). On both digital media (such as the internet) and traditional media (such as newspapers), Didi has launched a considerable number of advertisements, so that customers will think of Didi when they mention ride-hailing. For lack of data regarding advertising expenses for Didi, according to the financial reports of Uber in the same industry: advertising expenses can account for almost 10 percent of revenue (Sundararajan, 2017).

A successful advertising campaign shifts the market demand curve by changing consumers’ tastes or informing them about new products. Thus, advertising is classified as either informative or

persuasive. Didi Chuxing has used both types of advertising at different stages of development and achieved unexpected results. At the beginning, Didi Chuxing informed people of the existence of their product through various methods (Sheng, Wang & Sheng, 2018). For example, high subsidy: this subsidy is not only for passengers but also for drivers. Many passengers could have a trip for free and the drivers would be paid above the market price. It is estimated that Didi spent a total of RMB19.45 billion on its subsidy policy (Fang, Huang & Wierman, 2019). This method allowed Didi to harvest their first batch of customers. Before the advent of ride-hailing, people usually choose taxis. Didi Chuxing tells passengers through various advertisements that they can provide a better car environment and a lower fare than taxis. This approach has gradually changed the tastes of consumers, allowing them to switch from taxi to Didi (Sharma, Gaur & Iyer, 2018).

Network Effects

The Chinese ride-hailing market is a two-sided market because its essence is a platform for connecting drivers and passengers (Lee, 2017). When the number of users of this platform is growing wildly, the network effect of this market is revealed.

The network effect is simply that a product increases its own value and attracts more users by increasing the number of users. Network effects have always been one of the proudest features of internet enterprises because they can serve more users without paying the same proportion of costs and can also form interactive nodes among users. The essence of the internet is an information network. internet products generally have a network effect. In the field with strong network effects, the oligopoly effect is also more obvious. The advantage of Didi is that its large and dense network effect can defeat small and evacuated network effects (Guo, Li and Zeng, 2019). However, it is true that the strength of the network effect on ride-hailing is less than other traditional internet companies. For most traditional internet companies, the network effect is a weapon to protect them. For example, as more people use Microsoft Office System, there will be more people who must use the Office system, otherwise they cannot open files sent by others. As more people buy things on an online shopping platform, it will attract more businesses to sell things on it, which in turn will attract more customers. As more people use a chat software, their friends will be forced to use the same chat software.

The network effect of the ride-hailing industry only exists in one certain city. Most passengers do not travel from one city to another. Therefore, the network effect is only reflected in the city, and the number of vehicles in a city is limited (Gao, Jing & Guo, 2017). Thus, the national layout of leading companies in this industry such as Didi, will not become barriers for new enterprises with necessary financial strength to enter the ride-hailing market in one or two cities.

Consumer Rationality

It is unreasonable to assume that consumers are perfectly rational in the ride-hailing market. There are some strategies Didi Chuxing employs to take advantage of the bounded rationality of consumers.

First, frequent discounts to attract customer. Due to insufficient customer loyalty and high

demand price elasticity in the ride-hailing market, the discount activities introduced by Didi can often obtain many customers (Li & Lee, 2017). Second, use price anchoring to give consumers satisfaction. Consumers always want to pay less money for the same services, so Didi remains the nominal price above the real price which can also attract passengers. Finally, celebrity endorsements can also be useful. Prospective Industry Research Institute (2018) thought that the majority of Didi's customers are young people who would like to buy products with star elements. Therefore, Didi Chuxing has invested in cooperating with many popular stars like Deng Chao to attract consumers.

Conclusion

This paper used economic concepts such as market structure, economies of scale, and price elasticity to analyze the finance, pricing, and marketing of Didi Chuxing, revealing the secrets of the rapid development of this young company. This essay provides perspectives for the development of the Chinese ride-hailing market over the next five years as more customized and targeted product designs and business models will bring the ride-hailing market to the next level (Peng, 2018). The future development of Didi Chuxing should be the integration of car manufacturers, technology companies, travel platforms and map platforms thus integrating innovative development to achieve greater success in the sharing economy.

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