

Research on Market Definition of Digital Economy and Case Analysis: Based on the Perspective of Bilateral Market

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Abstract: In recent years, with the continuous development of digital economy, regulating the healthy development of platform economy has become an important issue. China's relevant government departments call for a clear adherence to the principles of "fair competition", and for the strengthening of anti-monopoly and the establishment and improvement of market supervision to adapt to the development of the digital economy. In the process of anti-monopoly law enforcement, the relevant market definition is usually regarded as the logical starting point of analyzing the competitive behavior. Compared with traditional enterprises, platform enterprises have bilateral market characteristics such as "cross network externality" and "asymmetric price structure", which face challenges in defining their relevant markets. This article first clear the bilateral market meaning, then discusses the platform enterprise bilateral market characteristics, and sort out the scholars in recent years about "define a single or multiple market" "assumed monopolist test is applicable" point of view, finally analyzed the "Sherpa's Abused Market Dominance" "Tangshan Renren Company v.Baidu Case" "Qihoo360 v.Tencent Case" three Chinese anti-monopoly law enforcement cases. The aim is to further discuss how to better combine the theoretical investigation and case analysis of qualitative and quantitative analysis to define the relevant market more accurately.

Keywords: Digital Economy; Bilateral Market; Related Market Definition; Cross Network Externality; Asymmetric Price Structure.

1. Introduction

1.1. Definition of Bilateral Market Concepts

The origin of the concept of bilateral market can be traced back to the 1830s, but its relatively clear definition appeared in the early 21st century. XIONG Yan (2010)[1]sorted out how scholars define relevant markets;Rochet J C&Tirole J(2004)[2]pointed out that if the price changes on either side of the platform will directly affect the total demand and trading volume of the platform, then the platform market is defined as a two-sided market; Armstrong (2006)[3]pointed out that the participants in the bilateral market trade through the intermediate platform, and the income of one party determines number of participants of the other party. HUANG Min Li (2007)[4]emphasized that the definition should include the "cross-network externality": on the other hand, the platform affects the transaction volume of the platform when the total price is $p = pb + ps$ (pb and ps can be zero or negative, and p is greater than zero).In addition, HUANG Min Li (2007)[4]also pointed out that there should be two or more differentiated groups in the bilateral market, the externalities of each group due to the transaction relationship, and the media to internalize the externalities.

1.2. Analysis of Bilateral Market Characteristics

1.2.1. Cross-network Externality

The externality of the traditional unilateral market network is mainly produced between the consumers who consume similar products(HUANG Min Li,2007)[4], Different consumer groups that consume different products or services will not affect each other. For example, airlines often adopt

different ticket pricing methods for different consumer groups, and various consumer groups will not influence each other: consumers who choose first class will not affect consumers who choose economy class, and customers who buy economy class tickets will not affect customers who consume first class. For two-sided market, there are some obvious cross-network externalities between the supply and demand parties connected by the platform.

1.2.2. Asymmetric Price Structure

Unilateral market enterprises set high prices for consumers with small demand elasticity, and set low prices for consumers with large demand elasticity. Platform enterprises in two-sided market adopt different pricing strategies based on the strength of different consumer externalities. Specifically, in order to balance the needs of different consumers, the more external party is usually subsidized by implementing free pricing strategies to increase transaction volume, while charging fees for the other side to maintain operations. Take Baidu and other search engine platforms as an example, Baidu provides free information search services for Internet users on one side. It is precisely because a large number of users use Baidu that Baidu can charge fees to support its development of search engine business through operators who need bidding needs on the other side(LI Jian,2010)[5]. With the emergence of the free pricing strategy, the bilateral market has defined the relevant markets, such as "whether the platform enterprises have predatory pricing" "whether the free products need antitrust", which are different from the traditional unilateral market scenario.

1.3. General Methods of Relevant Market Definition

Before knowing what method to define the relevant

market, you need to understand what the “relevant market” is. In combination with the relevant laws and regulations currently promulgated and implemented in China, the meaning of relevant markets is intuitively understood as follows: “relevant markets” refers to the scope and geographical scope of goods in which operators compete with specific goods or services in a certain period of time. In the judicial practice of anti-monopoly, the direct purpose of defining the relevant market is to identify competition constraints, that is, the competitors need to be identified first, so as to compare whether the parties suspected of monopoly have a dominant position among their competitors (XU Guang Yao, 2018)[6].

When defining the relevant market, it is usually necessary to consider defining the relevant commodity (including services) market and the relevant regional market. Specifically involves the assumed monopolist test, supply and demand substitution analysis and other methods. Using demand substitution analysis, the primary factors include to analyze the possible alternatives and the original product is similar in some characteristics, these features include product price, use function, and product quality, further need to judge whether rational consumers will choose it as a substitute, for example, if the consumer when comparing two goods (or services) price gap is too big, then the substitution between the two goods (or services) will be greatly reduced. The analysis of supply substitution is mainly based on the difficulty of production transfer, market entry barriers and other factors, If there are fewer barriers to the conversion of technology for producing goods (or services), then the relevant companies are likely to be within the same relevant market. The assumed monopolist test rule is complementary to the qualitative analysis. The main steps are: firstly, determine the “relevant market” including the products and substitutes related to the monopoly; secondly, raise the price of goods or services (5%-10%). If the consumer buys other alternative products or services, the price increase makes no profit for the assumed monopolist, indicating that the “relevant market” is too narrow and the scope of the substitute is added to the relevant market.

The traditional related market definition method also meets challenges in use due to the “cross network externality” and “asymmetric price structure” characteristics of the bilateral market.

2. Challenges Facing the Relevant Market Definition of Bilateral Markets

2.1. Define a Single Market or Multiple Markets

Rochet J C&Tirole J(2006)[7]believed that the market in which the platform enterprise itself operates is the so-called “bilateral market”, that is, they regards the market in which the platform enterprise operates as a whole, rather than treating the products or services provided by each side of the platform as independent markets respectively. The so-called “platform theory” (XU Guang Yao, 2018)[6]. Combined with the above analysis, it can be seen that the competition constraints faced by platform enterprises are more complex. Evans D S&Noel M(2005)[8]pointed out that, in general, competition constraints to be considered are as follows: (1) the same type of platform enterprises with competitive

relations on each side of the platform; (2) platform enterprises competing in only one side of the market; (3) unilateral enterprises with competitive relations only on one side of the market. Therefore, in the face of different user groups connected by the platform and the more complex competition constraints faced by the platform, the problems that need to be solved when defining the relevant markets are: (1) whether it is defined as a single related market or multiple markets; (2) what is the basis for defining a single or multiple related markets?

2.2. Whether the Hypothetical Monopolist Test is Applicable

First, one of the requirements for implementing the price-based SSNIP test (small but significant and no transitory in price) is to assume that monopolists make a “small but significant price increase” on the basis of known commodity prices, observe consumers' behavioral choices, and judge whether goods or services should be included in the range of substitutes. But in the case of free pricing, based on the price of the elements of SSNIP may no longer apply: unlike a small price increase for low-priced goods or services, even a very small price increase for free products or services will not result in a “quantitative change” in price, but a “qualitative change” from free to charged, which actually violates the logic of the presumed monopolist test law. Secondly, due to the cross-network externalities among users on each side of the platform, the price increase of platform enterprises to users on either side will not only affect the demand of consumers on that side, but also affect the demand of consumers on the other side. Take take-out platform as an example: the delivery platform charges consumers a certain delivery fee and merchants a certain commission. If the delivery fee is increased, fewer consumers may choose to use the platform. The decrease in the number of consumers will reduce the value of the platform to merchants and the willingness of merchants to settle in will also decrease, thus further reducing the willingness of consumers to choose the platform. Therefore, if the cross network externality is not considered when the price, the test results of the monopolist will be biased. Thus the externality of the bilateral market cross network and its asymmetric price structure challenge the applicability of the assumed monopolist test.

3. Research on Market Definition Related to Bilateral Market

3.1. Discussion of Defining a Single Market or Multiple Markets

In terms of whether the user groups facing platform enterprises are defined as a single relevant market or multiple markets, and the basis for defining relevant markets, there are several viewpoints in the academic circle.

Filistrucchi L(2008), LIN Ping&LIU Feng Bo (2014)[9,10]define transactional bilateral market with single market, and define non-transactional bilateral market with multiple markets. The characteristics of transactional bilateral markets are that transactions in the market can be directly observed and that the views of the users on both sides are relatively uniform regarding the potential substitutes for a product or service in the market. In contrast, non-transactional bilateral markets do not have clearly observable transactions, and often the two parties do not have the same understanding

of the alternatives to the product or service, so the platform cannot collect transaction fees from both parties. For example, Baidu provides free information search service to users on one side, while charging advertising fees to operators on the other side to support the operation of its search engine. Users on both sides have no transaction behavior, and their demands on Baidu's platform are inconsistent. Therefore, for Internet users who use information search service, alternative choices may be Bing, Google and other search engines. For operators with advertising needs, alternatives may extend to platforms that also have promotion services such as Weibo and Wechat public accounts.

JIANG Yan Bo (2012)[11], SUN Jin&ZHONG Ying Chang (2015) [12]proposed that the profit source and profit model of platform enterprises should be considered when defining relevant markets.JIANG Yan Bo (2012)[11]divided the profit models of each side of the bilateral market according to the types of bilateral markets: for example, B2B platform and other market creation platforms, the two sides are sellers and buyers respectively, and the buyers are free while the sellers are charged fees. Another example is the portal website and other audience manufacturing platform, the two sides are respectively netizens and advertisers, free of Internet users, advertisers are charged advertising fees. Secondly, as a trading platform, the premise of the value of bilateral market is that users on all sides have demands for products or services at the same time, and the platform can attract transactions of users on all sides by implementing

different pricing strategies for each side, and the products or services traded vary according to the different needs of each side, so that the relevant market can be defined by the source of corporate profits. Finally, the scholars take Internet enterprises such as Baidu and Qihoo 360 as examples, and use relevant data to show that the main source of profit of Baidu and Qihoo 360 is the income from online advertising business, so if they adopt monopolistic behavior, it is more likely to be the competition for advertising business, thus defining the relevant market. It should be noted that the above method is only a supplement to the traditional definition of the relevant market.

TANG Yao Jia&TANG Chun Hui (2021)[13]argue that it is arbitrary to classify a single or multiple market as a trading platform. They propose that we should analyze the characteristics of “cross-network externalities” to determine how to divide the relevant markets. If users on both sides of the platform have strong bidirectional cross-network externalities, the two sides should be defined as a single market; When the multi-market definition method is adopted, there is generally a relatively weak cross-network effect between users on both sides of the platform, or the cross-network effect exists only on users on one side of the platform. Specifically, with reference to relevant research methods, the current platforms are divided into three different types, and the characteristics of their cross-network effects are investigated respectively. The proposed market definition method is illustrated by the following examples[13].

Table 1. Relevant market definition methods of each type of platform

Platform type	Type	Cross-network effect	Market definition method
market	online food	two-way	single market
trading	ordering platform	cross-network effect	definition method
audience	search engine	one-way	multi-market
manufacturing	platform	cross-network effects	definition method
technical	operating systems	one-way	multi-market
support	and app stores	cross-network effects	definition method

Note: reference: TANG Yao Jia&TANG Chun Hui ,2021.

As mentioned above, the value of an online food ordering platform is proportional to the number of merchants or users on the other side, regardless of whether it is a user using the platform or a merchant entering the platform. Therefore, the online food ordering platform has a two-way and positive cross-network effect, and the single market definition method should be adopted. For the audience manufacturing platform such as search engine, the unidirectional cross-network effect is analyzed in combination with the above mentioned: the main purpose of the search engine platform to provide users with free services is to form a huge user base, so as to attract advertisers, that is, the wider the range of users, the higher the value of the platform to advertisers; However, the more advertisements there are, the worse the user experience actually is, so the multi-market definition method should be adopted. For technical support platforms such as operating systems and app stores, the platform mainly provides technical support, and generally there is only a one-way cross network effect that the larger the user base, the more attractive the platform is to software developers, while consumer users and software developers are often not connected, so the multi-market definition method should be adopted.

3.2. Discussion on the Applicability of the Hypothetical Monopolist Test

As mentioned above, the main reasons for the limited application of the presumed monopolist test in the two-sided market are the asymmetric price structure and the existence of cross-network externalities.

Scholars who believe that single or multiple markets should be divided according to whether trading platforms are available or not[10,14]pointed out that if the market is a two-sided trading market, the total price is regarded as the benchmark price. If it is a non-transactional two-sided market, the price of each side should be selected as the benchmark price, and the market definition is too narrow or too wide due to the cross-network externalities, so the formula should be modified accordingly. Some scholars believe that the definition of too wide or too narrow market is also of practical significance: the definition of too narrow market provides a lower limit for the relevant market definition, while the definition of too wide market provides a upper limit.

Scholars who point out that single or multiple markets should be defined according to cross-network externalities[13]believe that the applicability of SSNIP test should be analyzed from the perspective of “positive cross-network effects” and “negative cross-network effects”

existing among users. Assume that there are users A B on both sides, whose prices are P_A and P_B respectively, and whose demands are D_A and D_B respectively. First, if there is A bidirectional and positive cross-network externality, assuming that the price of users on the A-side increases and P_A increases, on the one hand, D_A will decline, and on the other hand, D_B will decline. If P_B remains unchanged, profits on the B-side will decline, resulting in a narrow definition of the relevant market while ignoring the cross-network externality. Second, if there is A one-way negative network externality, it is assumed that the price of users on the A side increases, P_A increases, D_A decreases, and D_B increases at the same time; if P_B remains unchanged, the profit on the B side increases, resulting in the definition of the relevant market being too wide while ignoring the network externality. Considering the limitations of the above quantitative analysis applied to the bilateral market, TANG Yao Jia & TANG Chun Hui (2021)[13] believe that quantitative analysis methods such as SSNIP and SSNDQ should be flexibly used in judicial practice, and law enforcement should return to the focus of examining competition constraints instead of being constrained by quantitative methods.

4. Case Studies of Market Definition Related to Bilateral Markets

4.1. Sherpa's Abused Market Dominance

4.1.1. Process of the Case

The litigant in the case, Sherpa's, is an online food delivery platform, which takes English-speaking customers as its main target consumers, focuses on its demand-oriented, and provides Chinese and English bilingual services for platform users, mainly covering Shanghai, Beijing and Suzhou in China. According to the relevant investigation, from January 2017 to October 2019, Sherpa's took advantage of its dominant position in the service market of the online food delivery platform that provides English services in Shanghai, and proposed to remove the cooperative restaurant merchant from the platform if it did not immediately stop the relevant cooperation with other rival platforms.

Through the implementation of the above behaviors, Sherpa's has locked in a large number of cooperative restaurant business resources in the relevant market, and the competitiveness of competitors in the relevant market has been seriously weakened. In addition, the interests of merchants and consumers using the platform have been damaged at the same time. The behavior of "Sherpa's" one of two choices" has obvious effect of excluding and restricting competition. In addition, there is no legitimate reason for this behavior, which violates the relevant provisions of the Anti-Monopoly Law and constitutes an abuse of market dominance to restrict trading.

4.1.2. Two-sided Market Characteristics Analysis

The bilaterality of the Sherpa's platform is reflected in the bi-directional cross-network externality between the needs of restaurant merchants and consumer users. First of all, the number, type and quality of cooperative restaurant merchants are directly related to the needs of consumers and users of the delivery platform; Secondly, the demand of restaurant merchants and consumers will not only change due to the level of fees charged by the platform itself (delivery fees or commissions), but also be affected when the platform charges changes on the other side. Finally, the platform presents a

demand feedback effect to the charges of each side: If the delivery fee increases, consumers' willingness to place orders decreases, which in turn reduces the willingness of restaurant merchants to settle in, and further reduces users' willingness to place orders. Second, if the commission fee is increased, it will lead to the withdrawal of some merchants, and lead to the decline of users' willingness to place orders, and then further feedback to merchants, showing that merchants' willingness to settle in is further reduced.

4.1.3. Definition of the Relevant Market in this Case

When defining the relevant market, the relevant authorities combined the business model and competition characteristics of the relevant industry, carried out demand substitution analysis from the nature, function and price of the services provided by the parties, supplemented by supply substitution analysis, and carried out a hypothetical monopolist test around the demand characteristics and charging mode of the market. On the one hand, considering that in order to ensure the taste and safety of food, users need to first locate the city when using the platform, and cannot choose cross-city services, Shanghai, China, is finally determined as the relevant regional market. On the other hand, combined with qualitative and quantitative analysis, the service market of online catering delivery platform providing English services is identified as the relevant commodity (service) market, which is further analyzed in detail below. Reference is Shanghai Market Supervision Administration administrative penalty decision, Shanghai market supervision and anti-ridge department[2020] 06201901001.

(1) Demand-supply substitution analysis

First, online food delivery service and in-room food service do not have a substitute relationship. On the one hand, when consumers face the above two choices, their core demands and choice scenarios are quite different, and most consumers will not give up delivery services because of the price increase of online food delivery service delivery fee (5%-10%) and choose to eat in. On the other hand, restaurant merchants tend to choose to provide the above two services at the same time, and the vast majority of merchants choose to operate online delivery services will not give up and still rely on sit-down services, so the two services cannot be replaced.

Second, there is no substitute relationship between online catering delivery platform services and catering enterprises' self-operated online catering delivery services. The cost of the two services is very different: the latter requires significant additional development and marketing costs, which may lead to high delivery costs for consumers; On the contrary, platform services have economies of scale, and merchants are more willing to work with platforms.

Third, there is no substitute for online catering delivery platform services that provide English services and Chinese services. In terms of demand, the vast majority of foreigners choose the English service platform, while the majority of Chinese choose the Chinese service platform. The consumption habits of these two types of users are also different. From the supply side, the target user groups are different, and the two types of platforms have great differences in page design and distribution services, and the cost of mutual transformation is high.

Based on the analysis of the above three factors, the relevant commodity market is defined as an online catering delivery service platform that provides English services.

(2) The hypothetical monopolist test

The following is a simple analysis of the "presumed

monopolist test method” used in the case in combination with the content of the administrative penalty decision of Shanghai Market Supervision Administration, which is only the author's personal opinion. Through investigation, the putative monopolist in this case will be regarded as a monopolist that includes Sherpa's, Jinshisong, EKD, MEALBAY. The relevant factors involved are (1) meal cost p , (2) delivery cost d , (3) number of cooperative restaurants n , (4) commission rate r , and (5) order volume $q = q(p, d, n)$. Among them, when the meal cost and delivery cost rise, the order volume decreases, and when the number of cooperative restaurants increases, the order volume increases. When the commission rate increases, the number of cooperative restaurant merchants $n = n(r, q)$ decreases, and when the order volume increases, the number of cooperative restaurants increases. The relevant transaction data of the four online catering delivery service platforms show that the number of cooperative restaurants and commission rate are not significant factors affecting the total number of delivery orders, but the meal cost and delivery cost are significant factors affecting the total number of delivery orders. Therefore, the order volume is mainly affected by the meal cost and delivery cost. When the number of cooperative restaurants is fixed, the number of cooperative restaurants will not significantly affect the order volume. Suppose the profit model of a monopolist is:

$$\pi = (d + r \times p - c) \times q(d, p) \quad (1)$$

c is the average service cost. Combined with the above analysis, the order volume is significantly affected by the two factors of delivery cost and meal cost. It is assumed that the monopolist has the motivation to increase the commission rate by a small margin. In the quantitative analysis, two cases are examined: the first case is only the change of delivery cost, the sensitivity of the change of order volume, so as to judge whether the assumed monopolist is profitable; The second case is the change of delivery cost and commission rate, and the sensitivity of the change of order volume, so as to judge whether the assumed monopolist is profitable. Further, according to the “critical loss analysis”, we can judge the change in market demand when the hypothetical monopolist increases the core fee item, and the resulting impact on profits:

$$\Delta q \times [(d + \Delta d) + (rp + \Delta rp)] - \Delta q \times c = q \times (\Delta d + \Delta rp) \quad (2)$$

Among them, the left side of the equation can be understood as the profit loss caused by the decline in order demand caused by the platform's increase in delivery fees (or commission), $\Delta q \times c$ is the reduced order service cost, and the right side of the equation can be understood as the profit increment caused by the platform's increase in delivery cost (or commission rate). The basic logic of the analysis is to judge the sensitivity of users to price changes through econometric analysis, so as to judge whether the profit of the monopolist rises or falls after the price increase. If the demand price elasticity of platform users is low, then the monopolist may be profitable by raising prices, and it is assumed that the market where the monopolist resides can be regarded as a relevant market. If the price elasticity of user demand is large, the monopolist's profit is likely to suffer losses, indicating that the definition of the relevant market should be further expanded.

The regression results of econometric models are analyzed below, with emphasis on model I and model II. For model I regression results, when the delivery cost increases by 1%, the order volume decreases by 0.29%; When the meal cost increased by 1%, the order volume decreased by 0.93%. It shows that compared with meal cost, the order volume is relatively insensitive to delivery cost. Combined with the hypothetical monopolist profit model given above, that is, when delivery cost increases, the order volume decreases less, and it is assumed that it is profitable for the monopolist to increase delivery cost. For the regression result of model II, when the delivery cost and meal cost increase by 1%, the order volume decreases by 1.38%, combining the result of model I (users are more sensitive to the meal cost than the delivery cost), combined with the result of model II, and increasing the meal cost and delivery cost at the same time, the order volume decreases more, that is, the profit may be damaged. However, as mentioned above, it is assumed that the monopolist can increase the commission rate slightly to avoid losing order volume. That is, by increasing the delivery cost and commission rate at the same time, the order volume will not fall too much, assuming that the monopolist is profitable.

Table 2. Hypothetical monopolist test analysis

	model I	model II
Log(delivery cost)	-0.29*** (0.08)	
Log(meal cost)	-0.93*** (0.29)	
Log(delivery cost +meal cost)		-1.38*** (0.35)
Log(delivery cost / meal cost)		-0.23*** (0.07)
February or July R2	-0.17*** (0.02) 0.51	-0.17*** (0.02) 0.54

Note1: The explained variable is the volume of consolidated orders for online catering delivery platforms providing English services, log (order volume) (January 2015 to June 2019)

Note2: Standard deviation is shown in parentheses;significance:1%***; 5%**; 10%*.

Note3:Data source and reference: Shanghai Market Supervision Administration administrative penalty decision,Shanghai market supervision and anti-ridge department[2020] 06201901001.

Therefore, the following conclusions are drawn: (1) If the monopolist increases the delivery cost, the order volume does not change much, but the gross profit rate can be increased and the total profit increased, which is profitable; (2) If it is assumed that the monopolist increases the delivery cost and the commission rate at the same time, the order volume does not change much, but the gross margin can be increased and the profit can be increased, which is profitable; (3) The target commodity can constitute the relevant market.

4.2. Tangshan Renren Company v. Baidu Case

4.2.1. Process of the Case

Tangshan Renren said Baidu had blocked its websites from natural rankings because it had reduced its investment in bidding rankings, resulting in a significant decrease in website visits, arguing that Baidu had abused its dominant market position and forced it to conduct bidding rankings. On the one hand, Baidu said that the reason for the punishment of Renren is that its website contains a lot of junk outside the chain, and this punishment is only for natural rankings, unrelated to bidding rankings; On the other hand, it said that its own free search engine services to the majority of Internet users, free services do not constitute a relevant market. On December 18, 2009, the Beijing First Intermediate People's Court ruled against Renren's lawsuit.

4.2.2. Definition of the Relevant Market in this Case

LI Jian (2010)[5] analyzed the definition of relevant market and some existing problems of the court in this case. The Court held that: (1) According to the demand substitution analysis, the relevant market is defined as the search engine service market. When using search engine services, users can obtain a large amount of information in a very short time, while other Internet services do not have this feature, can not become alternative services, can not be included in the relevant market scope. (2) Deny Baidu's claim that "free services do not constitute a relevant market". The ability of users to use search services for free is a marketing strategy of the platform, which is often combined with other paid products or services. This free service is not equivalent to a public good, on the contrary, the platform formally forms a user base through this free service, and then obtains commercial profits by charging advertising fees. Therefore, it is not possible to judge whether the relevant market can be constituted by whether the service is charged as a standard.

4.2.3. Two-sided Market Characteristics Analysis

There are some contradictions and conflicts in the court's thinking on the definition of the relevant market. On the one hand, when defining the relevant market of this case as "search engine service market", it is based on the demand of Internet users; On the other hand, when denying Baidu's view that free services do not constitute a relevant market, it is from the point of view of advertisers who have the demand for bidding rankings. In essence, the court has realized that the search engine platform connects Internet users and advertisers, and has also realized that Baidu provides free services to Internet users on one side of the platform because operators on the other side have the need to use the platform for advertising. But the court ultimately ignored the potential conflict. Baidu's bilateral nature is reflected in the two sides of the platform facing different needs of the user groups. The reason why the merchant operators of the bidding ranking are willing to pay the fee is that they can obtain a wide network user base, and the reason why the network users can use the

search engine service for free is that Baidu charges the merchants on the other side to support the operation of the search engine. Therefore, starting from the characteristics of the two-sided market of search engines, Baidu faces multiple competitive constraints, and the court only focuses on the unilateral market of "search engine services", which has the problem of too narrow definition of the relevant market (LI Jian, 2010)[5].

4.3. Qihoo360 v. Tencent Case

4.3.1. Process of the Case

In 2010, Qihoo360 alleged that Tencent instant software QQ to obtain user privacy, in the QQ external "QQ bodyguard", guide users to uninstall QQ value-added services. In November, Tencent issued a letter to QQ users, saying that it would stop running QQ on computers with 360 software. Qihoo360 has filed an antitrust lawsuit against Tencent for its "choice of two" practices, alleging that it abused its dominant market position to engage in "restrictive trading practices". In March 2013, the Guangdong Provincial High People's Court's judgment of first instance (Reference is Guangdong High People's Court Civil Judgment (2011) Guangdong High Court Minsanchu Zi No. 2) defined the relevant market as the "global instant messaging software and service market", holding that Tencent does not have a dominant position in the market, and its behavior does not constitute an abuse of dominant position. On October 8, 2014, the Supreme People's Court basically upheld the original judgment.

4.3.2. Definition of the Relevant Market in this Case

The following is only a brief description of how the Higher People's Court of the final judgment defined the relevant market in the case. Reference is Supreme People's Court of the People's Republic of China Civil Judgment (2013) No. 4.

(1) Whether the relevant market should be identified as an internet application platform

The Court held that in determining whether the relevant commodity market should be identified as an Internet application platform, the following considerations should be taken into account in the absence of data for empirical testing: (1) Make it clear that the core product provided by the platform is a prerequisite for the competition of users' attention and advertisers' competition; (2) Advertisers are more concerned about the price and effect of advertising than the difference between products or services, but free users will be more concerned about products or services; (3) Concern whether the appellee extends its possible dominance in the field of instant messaging to the field of secure software (mainly in the free client).

(2) The hypothetical monopolist test

The court considered the applicability of the presumed monopolist test. Considering the free characteristics of instant messaging services, first, the shift from free to lower fees will lead to the loss of a large number of users; Second, raising the price indicates that the profit model of the platform will change from indirect profit to direct profit, and the characteristics of the commodity will change. Therefore, the court adopts a variant, such as a test based on quality degradation, but it is more difficult to measure the degree of quality degradation, so only this variant is used as a qualitative rather than a quantitative analysis.

4.3.3. Two-sided Market Characteristics Analysis

(Xu Guang Yao, 2018)[6] made an analysis based on the definition of the relevant market in this case and several

existing problems. In this case, the characteristics of the bilateral market are very obvious, and Qihoo360 and Tencent are facing two kinds of needs. Qihoo360 faces demands from advertisers for advertising and Internet users for security software. Tencent is also facing advertising demand from advertisers on the one hand, and users' demand for instant messaging services on the other. In the final judgment, the court actually failed to clarify the three needs involved in this case.

First of all, combined with the above mentioned, when defining the relevant market, the court recognized that the attributes or characteristics of the core products of each Internet application platform are often different. Based on this, advertisers and network users often have different concerns and cognition of alternatives: advertisers pay more attention to the price and effect of advertising, while network users pay more attention to the functions and uses of products or services provided by different network platforms. However, the court did not deeply analyze the competitive characteristics of Internet platforms in the relevant market definition stage.

Secondly, the court only defined the relevant market as the instant messaging service market, and did not realize that it was precisely because Tencent forced users to choose QQ and gave up the services provided by Qihoo360, which reduced the number of users of Qihoo360 and thus made it lose a lot of business in the advertising market, that is, the court did not recognize the restrictive effect brought by Tencent's "two choices" behavior.

5. Conclusion

Based on the characteristics of two-sided markets, this paper discusses the challenges brought by cross-network externalities and asymmetric price structures to platform enterprises in defining relevant markets. Combined with the existing research results in academia, it sorts out the viewpoints of some scholars on "the basis of defining single or multiple markets" and "assuming the applicability of the monopolist test". On the basis of theoretical investigation, this paper gives the case analysis in judicial practice, in order to deepen the understanding of the market definition of bilateral market.

In the research part, first of all, this paper summarizes the existing three viewpoints on the basis of dividing the bilateral market into a single market or multiple markets: some scholars think that the division into a single market or multiple markets should be determined according to whether it is a transactional platform; Some scholars believe that the profit model and profit source of the platform should be considered when defining the relevant market. Other scholars define single or multiple markets according to the strength of cross-network externalities.

Secondly, some scholars proposed that the benchmark price of SSNIP test should be determined according to whether it is transactional platform or non-transactional platform, and the formula should be improved according to cross-network externalities. Some scholars have proposed that due to the existence of cross-network externalities, the definition of the relevant market will be too wide or too narrow when applying the assumed monopoly testing method. In specific judicial practice, we should not be bound to quantitative analysis methods, but should return to the source of identifying competitive constraints.

In the case analysis part, the online food delivery service

platform in the "Sherpa's Abused Market Dominance" case belongs to a two-sided market with strong cross-network externalities. For the "Tangshan Renren Company v. Baidu Case", the court's own logic is contradictory. On the one hand, it defines the relevant market from the perspective of the needs of Internet users; on the other hand, it denies that free services cannot constitute a relevant market from the perspective of the needs of merchants. Finally, the single market of "search engine services" is defined. In the case of "Qihoo360 v. Tencent Case", the Court of Final Appeal actually noted the demand of Qihoo360 and Tencent for security software, instant messaging services and advertising, but did not pay attention to the competitive analysis of Internet platforms in the relevant market definition stage, resulting in the final definition of the "Chinese Mainland instant messaging service market", making the definition of the relevant market too narrow.

At present, there is no unified theory describing how to define the relevant market of the bilateral market to be able to serve as a benchmark for antitrust enforcement. In the judicial practice involving the bilateral market, we should combine the existing theory of the relevant market definition with the actual situation of the case, and flexibly use various qualitative or quantitative analysis methods. In fact, according to the literature and case documents in recent years, there are no detailed indicators for qualitative analysis when the demand substitution or supply substitution analysis is used to define the relevant market in current practice. Instead, some broad indicators. For example, in the process of academic research and judicial practice, on the one hand, in the analysis of demand substitution, relevant personnel mainly emphasized that the basic function of the platform, the user group targeted by the platform, the application scenario built by the platform and many other factors should be combined; On the other hand, when conducting supply substitution analysis, relevant personnel will analyze factors such as the difficulty of entering the market and whether there are technical barriers to entry in the industry. It can be found that whether it is demand or supply substitution analysis, the factors considered in the current qualitative analysis have not been refined to a specific and detailed index for the time being, which makes the qualitative analysis easy to be limited by the cognitive level of the analyst and has certain fuzziness and subjectivity. In addition, the rapid development of the digital economy has led to the emergence of a large number of complex commodities. In the face of market competition, platform merchants constantly update and upgrade the commodities, which makes the new functions of the commodities constantly appear, while the basic functions of the commodities themselves are gradually blurred. Complex commodities make demand substitution analysis and supply substitution analysis face great challenges in practice. Therefore, when defining the relevant market, how to further refine the relevant indicators of qualitative analysis and how to better combine qualitative analysis and quantitative analysis are all issues that need to be deeply thought about in future academic research and practical application.

References

- [1] XIONG Yan. A survey of the theory of two-sided market in industrial organization. *Journal of Zhongnan University of Economics and Law*, 2010(04):49-54+144.
- [2] Rochet J C, Tirole J. Defining two-sided markets. Mimeo, IDEI, Toulouse, France, January, 2004.

- [3] Armstrong M.Competition in two-sided markets. The RAND Journal of Economics, 2006, 37(3): 668-691.
- [4] HUANG Min Li.Two-sided markets and the evolution of market conformation.Journal of Capital University of Economics and Business,2007(03):43-49.
- [5] LI Jian.Market definition of anti-monopoly law under two-sided market:law and economics in the Baidu case.Studies in Law and Business,2010,27(05):38-45.
- [6] XU Guang Yao.Adjustment of anti-monopoly law on abuse of dominant position in two-sided market in internet industry : comment on Qihoo v.Tencent case.Law Review, 2018, 36(01): 108-119.
- [7] Rochet J C, Tirole J. Two-sided markets: a progress report. The RAND Journal of Economics, 2006, 37(3): 645-667.
- [8] Evans D S, Noel M. Defining antitrust markets when firms operate two-sided platforms. Colum. Bus. L. Rev., 2005: 667.
- [9] Filistrucchi L. A SSNIP test for two-sided markets: the case of media. Available at SSRN 1287442, 2008.
- [10] LIN Ping,LIU Feng Bo.Recent progress and case review of relevant market definition research in bilateral markets.Research on Financial and Economic Issues, 2014 (06): 22-30.
- [11] JIANG Yan Bo.On the judicial dilemma and countermeasures to define relevant markets in internet industry:from the perspective of the two-sided markets. The Jurist, [13] 2012 (06): 58-74+175-176.
- [12] SUN Jin,ZHONG Ying Chang.New definition of the relevant product market in internet platform industry.Modern Law Science, 2015, 37(06):98-107.
- [13] TANG Yao Jia,TANG Chun Hui.Digital platform antitrust related market definition.Research on Financial and Economic Issues,2021(02):33-41.
- [14] Filistrucchi L, Geradin D, Van Damme E, et al. Market definition in two-sided markets: Theory and practice. Journal of Competition Law and Economics, 2014, 10(2): 293-339.