

The Dilemma and Relief of Anti-monopoly Regulation in Personalized Pricing Algorithms

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Abstract: In the era of big data, online platforms utilizing algorithms for personalized pricing pose monopoly risks that harm competition, and contradict the economic market concepts of consumer protection and encouraging innovation. China's anti-monopoly laws face difficulties in defining relevant markets, and law enforcement agencies are at a loss when identifying abuse of market dominance. The defense rights originally granted to platforms by the law have been abused. In view of this, this paper proposes to establish an evaluation system for competition damage based on consumer protection, specifying the considerations for justifying damage, and suggests using user engagement intensity and activity level as statistical indicators, incorporating the influence of algorithmic computing power, and employing a relative market share assessment method as a determinant factor for judging market dominance.

Keywords: Personalized Pricing; Anti-monopoly Law; Abuse of Market Dominance.

1. Introduction of the Issue

Since the term "big data price discrimination" was listed on the popular Internet buzzwords chart in 2018, the phenomenon of online platform merchants offering different prices to different customers has gradually entered the public eye. Subsequently, legislation and various departmental regulations have responded comprehensively to this phenomenon. Although the term "big data price discrimination" is often used to refer to all such behaviors [1], the targets of big data price discrimination are limited to "regular customers" and "new customers", and it cannot encompass all behaviors where operators utilize all consumer data such as affordability, preferences, family members, browsing information, and other characteristics and behaviors [2], analyze them through algorithms to determine the willingness to pay of specific consumers [3]. Moreover, presupposing evaluations is not conducive to maintaining an objective and neutral analytical stance [4]. Therefore, this article uses the term algorithmic personalized pricing to refer to the aforementioned behaviors. Personalized pricing, as a sub-concept of price discrimination, has long existed, but digital technology has made it possible for platforms with strong data capabilities to implement first-degree price discrimination [5], thus necessitating consideration of whether such behaviors should be regulated as abuse of a dominant market position. Algorithmic personalized pricing, as a double-edged sword, can bring market expansion benefits, leading to higher demand and output, thereby enhancing overall social welfare, and in some cases, it can promote competition and have a positive impact on consumer welfare [6]. However, in the context of antitrust, algorithmic personalized pricing still poses concerns about harming competition [7]. However, competition harm, as the core element for regulating price discrimination under antitrust law [8], is limited to other competitors and downstream competition, making it difficult to adapt to the practical needs of algorithmic personalized pricing targeting end consumers and thus hindering its effectiveness. Based on this, this article intends to explore the concept and behavior of algorithmic personalized pricing, conduct a deep analysis of the antitrust

regulatory dilemmas associated with this behavior, and ultimately propose actionable strategies to better promote the healthy and orderly development of the digital economy and effectively protect consumer rights and interests.

2. Examination of the Dilemmas in Antitrust Regulation of Algorithmic Personalized Pricing

2.1. Necessity of Regulating Algorithmic Personalized Pricing on Platforms

Digital platforms use personalized pricing to quickly identify groups with purchasing intent in the market and complete transactions, which is a key reason why digital platforms favor algorithmic differential pricing. From the perspectives of protecting consumers, maintaining fair market competition, and encouraging business innovation, it is necessary to regulate platforms' personalized pricing through legal means.

From the consumer perspective, personalized pricing, in name, actually results in the extraction of consumer surplus value. In terms of consumption outcomes, consumers, based on mistaken beliefs, purchase products or services that do not align with their actual interests due to overestimated value or underestimated price, which may even constitute infringement upon their rights to information and fair trading. Furthermore, the ability of enterprises to leverage algorithmic advantages to acquire consumers involves deep mining and analytical processing of market information, making it difficult to ensure the protection of consumer privacy during this process. Supported by big data and AI pricing technologies, enterprises can incorporate privacy data related to individual behavioral preferences and lifestyle information, such as consumers' purchasing power, habits, methods, etc., into the calculation scope without alerting consumers, thereby completing consumer profiling and identifying potential customers. However, the diverse data required for this process may compromise consumer privacy protection and even lead to discriminatory or biased decision-making outcomes [9].

In the era of big data, platforms compete to attract consumers using algorithms and computing power. The focus

of corporate investment has shifted from the quality of products or services themselves to the acquisition or development of technologies that measure consumers' willingness to pay [10]. From the perspective of corporate development, the focus of innovation has shifted, making capital and technology investments ineffective. While it is understandable for companies to use normal marketing means to attract consumers, if they invest excessive time, money, and effort into obtaining consumers' purchasing intent, or even deceive consumers into making misjudgments and purchases, it will not only be unsustainable in the long run but will also quickly lose consumer trust.

From a market perspective, competition based on personalized pricing is essentially a competition of algorithms, corporate capital, and computer talent. Dominant enterprises can leverage their capital and technological advantages to collect and obtain the maximum willingness to pay from potential users and occupy the market or hinder new competitors from entering by setting minimum prices through computing power. Market regulators should be vigilant about the algorithmic competition in markets where operators engage in personalized pricing, to prevent the emergence of monopolistic enterprises abusing their market dominance and maintain a fair order of effective market competition.

2.2. Dilemmas in Identifying Abuse of Market Dominance

(1) Dilemmas in Applying Traditional Methods for Defining Relevant Markets

According to the methods outlined in the "Guidelines on the Definition of Relevant Markets," traditionally, defining a relevant market can be done through analyses such as determining products or services, geographic locations, substitutes, cross-elasticity of demand, barriers to market entry, and considering relevant time periods. Two methods, substitutability analysis and the Small but Significant and Non-transitory Increase in Price (SSNIP) test, can be used. In the era of big data, traditional methods for defining relevant markets have become inadequate. Under the internet platform paradigm, a new form of two-sided market has emerged, where platforms need to simultaneously promote the participation of users with both high and low willingness to pay, leading to differentiated pricing strategies. This characteristic results in the existence of multiple markets when defining the relevant market. Furthermore, the process of defining a relevant market involves categorizing products based on their use, functionality, and price. However, two-sided markets exhibit cross-network externalities, where the number and activity level of platform users influence the product categorization process, thereby posing challenges in defining the relevant market. Therefore, some scholars propose determining the relevant market based on the characteristics of cross-network externalities of different types of platforms and the different feedback mechanisms of users on both sides of the platform [11].

(2) Difficulties in Identifying Abuse of Market Dominance

Consumers are at a disadvantage and find it difficult to directly conclude that platforms are abusing personalized pricing algorithms, constituting abuse of market dominance. Firstly, it is unclear whether the abusive behavior of platforms occurs at the market level or the individual level. Generally, antitrust enforcement does not penalize discrimination based on individual treatment; the facts upon which penalties are based must be the impact of the behavior on the entire

consumer group and even the entire market. Even if behaviors at the individual level can be qualitatively assessed, they cannot address the fact that individual consumers benefit from personalized pricing. Secondly, the extent of proof for the implementation effects of personalized pricing is unclear. Demonstrating that personalized pricing harms competition in the relevant market is a crucial element of proof. From an economic perspective, personalized pricing or explicit price discrimination is not necessarily negative and can also bring certain positive effects. From the perspective of antitrust investigations, only when personalized pricing has actual or potential anti-competitive effects or harm can it be considered a violation of the law [12]. There is a consensus on the reasoning that abuse of market dominance should not be directly inferred from the discriminatory behavior of personalized pricing itself, but the extent of proof and considerations are still unclear. Thirdly, personalized pricing behavior does not necessarily have a negative impact on economic welfare effects. Antitrust law has always focused on the assessment and consideration of economic welfare effects [13], but whether economic welfare effects refer to overall social welfare or individual consumer welfare is not agreed upon in the legal community. In terms of the implementation effects, personalized pricing does not directly exclude consumers without willingness to pay from the market; platforms merely obtain high profits from high-willingness-to-pay groups, which is not sufficient to constitute harm to overall social welfare.

(3) Abuse of Defenses

According to the "Interim Provisions on the Prohibition of Abuse of Market Dominance," platforms can use "preferential activities carried out within a reasonable time limit for the first transaction of new users" as a defense. The "Antitrust Guidelines in the Field of Platform Economy (Draft for Comment)" issued by the State Administration for Market Regulation also explicitly lists "random transactions implemented based on fair, reasonable, and materially initiated rules of the platform" as a defense. In order to reasonably respond to differential treatment in pricing between new and old customers, platforms often use various factors such as "shopping festivals" and "seasonal changes" as "random preferential activities" carried out "within a reasonable time limit," thereby defending against allegations of abuse of market dominance. Platforms raise defenses in the name of economic efficiency, making it difficult to substantively distinguish whether their personalized pricing behavior is normal market price adjustments or whether there is a subjective malicious intent for unfair competition. The aforementioned defenses seem to have become a "get-out-of-jail-free card" for platforms.

3. Improvement of Antitrust Regulation on Personalized Pricing Algorithms

Given the analysis above, there are numerous mismatches in traditional antitrust regulations, and China's antitrust legal practice urgently needs to respond in terms of identifying market dominance, determining competitive harm, and refining antitrust regulatory mechanisms, in order to achieve a dynamic balance between restraining monopolies, protecting consumer welfare, and promoting innovation.

3.1. Establishing an Evaluation System for Competitive Harm

The "Antitrust Law" does not explicitly stipulate the elements of competitive harm for price discrimination. Based on teleological interpretation, competitive harm should be considered as an essential element of the illegality of price discrimination. While it is undeniable that overall social welfare is a consideration for competitive harm, it does not negate consumer welfare as an influencing factor. From the perspective of the legal interests protected by the antitrust law, price discrimination formed by personalized algorithms will certainly harm consumers' interests, causing consumers to lose their rights to information, fair trading, and bidirectional choice in this process. That is, consumers should have the right to choose whether to accept price discrimination from digital platforms. In terms of proving harm, law enforcement agencies can investigate the operator's pricing strategies, product costs, determine pricing for high- and low-willingness-to-pay consumers, transaction volumes, price variation ranges, and frequency of changes. When necessary, professional third-party data measurement agencies can be introduced to estimate consumers' economic losses. The perceptions of consumers cannot be ignored, such as their judgments on reasonable costs and familiarity with pricing strategies in relevant markets. These can be used to comprehensively assess consumers' perception of price discrimination, further illustrating the factual harm caused by the platform.

3.2. Determination of Market Dominance in the Era of Big Data

Traditional methods of calculating market share based on sales revenue and sales volume may no longer accurately reflect the characteristics of the competitive environment. The features of digital markets have led to traditional market share no longer accurately reflecting market dominance in platform markets. Simply relying on user share in the market as a basis for judgment is clearly too crude and arbitrary. Instead, user engagement intensity, activity level, and the number of active users should be processed and used for statistical purposes. In digital markets, the use of computational tools cannot be ignored. Data processing capabilities are supported by algorithms and computing power. Higher-quality algorithms will attract more users, and the growing number of users will provide more samples and updated data, further consolidating the competitive advantage of algorithm users [14] and potentially creating a blockade effect on competitors.

The author believes that the review can be conducted from the following aspects. Firstly, using relative market share as a basis for determination. A high market share is not determinative for assessing market power under the influence of network effects [15]. Market share is comparable and can be judged based on the extent to which it leads competitors' market share. For example, Australian law enforcement agencies investigate digital platform markets based on unique audiences [16], using the total number of users who visit a website at least once during a specific time period as data, determining that Facebook's market share is three times that of Snapchat, and further concluding that Facebook's large market share in the social media services market has almost no competition. Secondly, consider technical means such as computing power and algorithms for data control and usage. Personalized pricing is based on the mining and analysis of

user data, so the computing power and algorithms for collecting, integrating, and storing such information should be factored into the determination of market dominance. If competitors cannot access these key algorithms, they cannot form competitiveness against dominant enterprises, which can then be used to determine the dominant position of the dominant enterprises.

4. Summary

Algorithm-based personalized pricing, as a neutral behavior in economics, should not be outright prohibited, but it also cannot be allowed to develop unchecked. It is necessary to review and develop the elements of abuse of market dominance in traditional antitrust law to encompass improper algorithm-based personalized pricing behavior, with the aim of promoting the healthy and orderly development of the digital economy and effectively protecting consumer rights and interests.

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