Price Discrimination in the Era of Big Data

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ABSTRACT

As an economic phenomenon, price discrimination has its unique characteristics and influence, and the advent of the era of big data will change its traditional characteristics and influence. This paper integrates the impact of price discrimination on consumers, businesses, and society in the era of big data and shows how to use legal and economic means to standardize price discrimination to make it play a positive role as much as possible. It is concluded that because consumers will pay attention to the reasons behind the price difference and compare them with other consumers, it will have a negative impact on reducing the willingness to consume after feeling unfair. However, once price discrimination is eliminated entirely, social welfare will improve. In the context of big data, it is difficult for consumers to perceive unfair treatment. Therefore, the nature of algorithmic discrimination can be clarified in law, and the responsibilities of actors who develop and use the algorithms can be clarified to reduce negative impacts. Whether the behavior of price discrimination has improved social welfare so as to require relevant policies to increase its positive impact is yet to be determined.

Keywords: big data; price discrimination; social welfare, information technology

1. INTRODUCTION

However, price discrimination has been around for a long time, especially with the development of modern information technology. Price discrimination also presents new characteristics and trends. This paper collects academic research conclusions on traditional price discrimination and related research on price discrimination in the era of big data. It explores the possibility of playing a positive role in price discrimination in the era of big data, and offers suggestions for possibilities. The combination of law, economics, algorithms, and big data provides a certain thinking direction for future modern economic theories, such as price discrimination, which already exists in the theory, and the analysis of modern society.

2.1 Classification and Characteristics of Traditional Price Discrimination

First-degree price discrimination (complete price discrimination) is when a monopoly pays each consumer. Consumers demand the highest price they are willing to pay per unit of product, and thus receive all consumer surplus. Second-degree price discrimination occurs when firms offer an indirect selection mechanism, using consumers' self-selection constraints to separate different consumption levels, so that different prices can be charged to different consumers [1]. For example, you can get a 20% discount if you buy three books, but if you buy five books, you can get a 30% discount. Third-degree price discrimination means that the company asks different consumer groups for different prices for the same product. price. This is a segment of the market that is generally price-sensitive. Buyers set lower prices, and buyers with low price sensitivity set higher prices. Whether the price is sensitive here refers to the degree to which the sales volume of the product changes when the price changes. According to the above classification, first-degree price discrimination is the deepest. For businesses, this can lead to greater benefits, but it's not fair to consumers. And if consumers discover that they are being treated unfairly, it can have a serious negative impact on purchase intentions [2]. Under the previous technical conditions, it was very difficult to achieve first-degree price discrimination. But the development of information technology has made it possible.

2.2 Characteristics and trend of price discrimination in the era of big data

Today's Internet development has greatly reduced the cost of obtaining consumer information for sellers, and

the quantity and quality of consumer information that can be obtained has greatly increased. Thus, differentiated pricing can be carried out for different consumers, such as different mobile phone systems, different fares for consumers of taxi frequency, or complex price reduction activities designed to distinguish different types of consumers. After merchants use effective information to identify consumers' intrinsic value, first-degree price discrimination is no longer difficult to achieve. In recent years, with the behavior. With the rise of experimental economics, more and more research on price discrimination has shifted from traditional economic theoretical analysis to individual. At the micro-level, pay more attention to individual fairness preferences, and study the impact of price discrimination strategies on consumer behavior. And moreover, the background of the Internet and big data in the Chinese context also provides important topics for the study of experimental economics[3].

There is an example to show that the mistake in using big data to personalize prices is that it unfairly erodes the ability of consumers to benefit from the market, which is the key to owning the market. BDPP is a species of price discrimination. In price discrimination, firms charge individuals different prices for the same (kind of) product with the same (or almost the same) production costs.7BDPP leads the wealthier to pay a higher percentage of their resources for the same product than without BDPP. Of course, those with less resources may also end up paying a higher percentage than they otherwise would have. However, the less resources they have, the more likely it is that they were already paying somewhere around their reservation price before we introduced the possibility of BDPP. With BDPP, the more resources one has, the higher the price they are charged. Because it charges the wealthier more than equal pricing does, BDPP makes accumulating resources more difficult. And when all participants in the market pay personalized pricing for everything, then it is likely to become even more difficult. And as accumulating resources becomes more difficult, resources end up being distributed more equally. BDPP, thus, seems like a better option for treating people equally in terms of resources.

The BDPP has certain commitments to better equality of benefits and resources. More precisely, while charging people the same amount for the same product is one way to treat them equally, charging them a reserve price allows us to treat them equally in terms of benefits and resources. BDPP can also lead to better overall social welfare, especially in terms of improving efficiency in imperfect markets. In an imperfect market of companies with strong markets, the BDPP allows these companies to serve consumers they haven't previously served. However, these advantages of BDPP are diminished when BDPP does not contribute to any socially desired purpose (other than improving market efficiency in imperfect markets)[4].

2.3 Negative effects

Within these studies, the content mainly involves the different decisions of heterogeneous consumers in the face of price discrimination and consumers' unfair disgust at price discrimination. Depending on the impact of implementation effects and based on behavioral economics frameworks such as reference point theory and framing effects, price discrimination is under consumer decisions. For example, consumers will care about the motivation behind producers' price increases.

Consumers feel that they are entitled to the relevant transaction terms for reference. When consumers learn that producers are motivated to raise prices not because of rising production costs but for profit motives, they will feel a strong sense of unfairness. [5]

Consumers' judgment on price fairness will affect consumers' purchase intentions when they recognize that the price is unfair. They will either refuse to purchase it or reduce their willingness to purchase it [6]. Price hikes cause consumers to compare themselves, resulting in a sense of unfairness that will make them refuse to buy. When a product's price is reduced, consumers are less likely to buy it again. Also, if you learn after your purchase that you are being charged a higher price, it will make consumers feel a stronger sense of unfairness. However, there is another viewpoint that consumers should consider: a fair judgment is based not only on a comparison of the current price and the historical price, but also on the price of the same industry and the reference price in comparison to the cost [7].

Consumers also compare the price they pay with other consumers. Individual motivations and behaviors tend to be Based on psychological preferences about fairness after comparison with others (Fehr and Schmidt, 1999; Fehr and Falk, 2002), such as Martins (1995), who put forward that consumers think that as long as there is a price difference, it is unfair [8]. Consumers feel unfair when they are subjected to price discrimination, especially when they are charged more. When the price paid by the buyer is higher than that of other consumers, the disadvantaged buyers will be rejected by the buyer. Never purchase something to express your dissatisfaction.

Anderson and Simester (2008) also found in laboratory experiments that when consumers suffer from price discrimination, their dissatisfaction is generated, which is an important reason for the reduction of producer profits [9]. In Levitt et al. (2016), A field experiment on quantity discounting was conducted to test whether theoretical price discrimination would lead to better welfare for firms [10]. However, the results showed quantity discounts do not significantly affect firm profits. Price discrimination will increase the psychological cost of consumers' psychological cost The negative effect and the positive effect brought by price

discrimination cancel each other out, so that there is no significant change in the profit of the manufacturer. Visible, price The effect of price discrimination is closely related to the psychology of consumers facing price discrimination.

Consumer perceptions of unfairness are also closely related to how producer price discrimination is practiced. When producers design pricing mechanisms, they will also consider the impact that consumers' unfairness may have on their own profits. Experiments by Leibbrandt (2020) found that producers will spontaneously avoid the implementation of price discrimination when they know that consumers are aware of being charged a different price [11]. The price provided by the producer to the consumer will be regarded as a reference point by other consumers. Above this reference point, other consumers will refuse to buy.

2.4 Positive influence

However, price discrimination is not all negative. If a company wants to implement price discrimination, it depends on the policy. In addition to the government's permission, there is a premise. The condition is that the enterprise has a certain monopoly on the market strength. Under perfectly competitive market conditions, it is impossible for a firm to implement a discriminatory policy. In real life, it is difficult to find a theoretically perfectly competitive market where firms have more or less a certain amount of monopoly power. Therefore, our discussion is based on the fact that we start from the "enterprise has a certain monopoly power" basically. The theory of economics tells us that, in most cases, compared with the monopoly situation where enterprises implement uniform prices, price discrimination can increase the profits of enterprises; besides, price discrimination can also increase the surplus of some consumers. Therefore, this policy can be a kind of Pareto improvement; even if it is not a Pareto improvement, it is a Kaldor-Hicks improvement, which can improve social welfare. If the company can implement full price discrimination, where each consumer is charged a different price, it can have the same effect as a perfectly competitive market, even if social welfare is maximized.

3. THE WAYS TO REDUCE NEGATIVE IMPACTS AND ENHANCE POSITIVE IMPACTS

We already know that price discrimination has both positive and negative effects. In the information age, the realization of price discrimination has also become easier, so some measures should be taken to make it play a suitable role for such things.

3.1 Legal means

The main reasons for the lack of legal effect on price discrimination in the era of big data (take algorithmic discrimination as an example) are: first, the legal nature of algorithmic price discrimination is difficult to define, which is the primary reason for the regulatory trouble. Although algorithmic price discrimination has produced a differentiated result of "thousand people, thousand prices," this result is not based on the abuse of market dominance by operators, so algorithmic price discrimination is not a monopoly. This is why the legality of algorithmic price discrimination is in trouble.

Second, the current legal rules are difficult to apply to the regulation of algorithmic price discrimination, which is another important reason for the difficulty of regulation [12]. First of all, algorithmic price discrimination is an act of abusing the technological advantages of algorithms, not a monopoly that abuses a dominant market position. Naturally, it is not suitable for adjustment by the Anti-Monopoly Law. The difficulty in applying legal rules directly leads to the inability to identify and implement legal responsibilities, making algorithmic price discrimination common.

So to make the law more effective in regulating algorithmic discrimination, we should do the following things: First, clarifying the legal nature of algorithmic price discrimination is the primary task of improving relevant laws and regulations. Since algorithmic price discrimination has broken through the cognition of "clearly marked prices" in the past, it is necessary for us to further expand the extension of the right to know in the era of big data, and identify algorithmic price discrimination as an abuse of algorithmic technological advantages and violations of consumers. Improper acts of legitimate rights and interests fundamentally solve the problem that algorithmic price discrimination is difficult to characterize. Second, clarifying the legal responsibilities of actors is a key part of further implementing the protection of consumer rights. On the one hand, it is necessary to clarify the legal responsibility of the operator as the subject of the behavior. At the end of the day, an algorithm is just a tool. The ultimate legal responsibility still needs to fall on the business.

3.2 Economic means

If price discrimination is properly used to obtain more consumer surplus within a reasonable limit, it can also increase the sales of products, thereby increasing total social welfare. But if producer price discrimination is not used properly, it will distort the price mechanism to reflect the relationship between supply and demand, resulting in a decline in economic efficiency. Therefore, different types and degrees of price discrimination can be classified using the ultimate economic purpose as a criterion. Firstly, increase dynamic efficiency and

producer welfare through innovation, enabling consumers to enjoy better products and improve the price discrimination implemented by buyers' evaluation. This behavior can motivate other producers to improve dynamic efficiency and obtain R & D funds for implementers. At the expense of consumer interests, but in the long run, dynamic efficiency has played a role in promoting a significant increase in total social surplus.

Secondly, in order to increase the efficiency of resource allocation and improve the welfare of producers, sales volume is increased through price discrimination, which increases the total surplus of consumers and finally achieves the increase in producer welfare, total social welfare, and total consumer surplus, and most consumers enjoy the benefits of low prices.

Thirdly, check the sales volume and whether consumers receive an equitable share of the increase in social benefits, if price discrimination results in a significant decrease in sales or if the majority of consumers believe that the benefits are being harmed.

All in all, for the first and second suggestions, we should use some policies to encourage them. For the third condition, we should suppress them.

4. CONCLUSION

In conclusion, this paper finds that so far, due to the relatively novel nature of big data and algorithms, there is still a large gap in the laws. The negative effects of economic price discrimination include consumers' reduced purchase intention. The positive effects involve improving social welfare, which is less noticeable, and the effect is greater. The laws need to be made clear about the nature of algorithmic discrimination, the responsibilities of those who use algorithms, and the economics to judge how the positive effects of specific price discrimination compare to the negative ones.

Traditional price discrimination is divided into degrees and types, among which first-degree price discrimination is the most serious. With the advent of big data, first-degree price discrimination is easier to achieve today, and it has both positive effects, such as increasing corporate profits, consumer surplus, and social welfare; and negative effects, such as reducing consumers' willingness to buy and destroying society. Therefore, using legal and economic means is of great significance to regulate algorithmic discrimination in today's big data era [13]. Due to the innovation of information technology, traditional law and economics cannot play an effective role. In order to find a systematic and practical solution, it is necessary to combine the characteristics of big data with the law and economy.

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