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The Operational Mechanism and Impact of Takeout Platforms Achieving Perfect Price Discrimination Through Big Data-Driven Recommendations and Pricing

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Abstract. As takeout service participate in daily life of the public more and more deeply, the content related to platform coupon distribution have also attract widespread attention. This essay focus on how the takeout platforms employ a triple-track price discrimination system, which including product recommendations, coupon distribution and dynamic surcharge fee, to approximate the perfect price discrimination in a highly competition market. It systematically analyze the system influence on consumer behavior, platform profit, merchant response and market fairness. This study adopt the method of analyzing cases from public sources, research out that takeout platforms use methods such as user portrait and A/B testing to personalized pricing and profit maximizing. Furthermore, it also points out that the price discrimination system can strengthen the data flywheel effect and heighten the completive barriers. However, the price discrimination system always faces potential risk such as algorithm out of control, marchers resisting. Based on the research result, the study suggest that the regulatory authority should strengthen the investigation of relevant algorithm and protect the price transparency, while the platforms should shift to "value co-creation" strategy to enhance market health and trade fairness.

Keywords: Internet+, Pricing Strategy, Price discrimination.

1. Introduction

As the speeding up of urbanization and life paces, takeout service has been transformed into a kind of basic service of urban life from a convenient dining choice. According to the 56th Statistical Report on China's Internet Development, by June 2025, 569.47 million people in China had used online takeout services, accounting for 50.7% of the number of total internet user. Hundreds of millions of users rely on takeout service to meet their daily dietary requirements, and such a huge user base lead to massive number of data of transaction, behavior and location as well. The volume of data is the foundation company behind the platforms to conduct their operation and strategy.

Under the surface of "convenience", an algorithm-driven price maze are quietly shaping. The platforms are no longer satisfied by unify dynamic price but start to combine personalized product recommendation, differentiated delivery fee and highly customized coupon distribution system, which present each user a unique, hard to compare price horizontally price system.

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During the process of pricing, the internet companies usually tend to employ a tiered pricing strategy, namely divide customers into "Zero price" group, "Nominal price" group, and “Profit generating price" group and so on. So that they can create a "reservoir-like" user segmentation system, which lead to sales increasing and consumer surplus extraction based on that [1]. It is particularly obvious in the takeout platforms. When different user in same or similar time period and location access same takeout platform to search same or similar dishes, they could face different ranking of merchant, dish price, minimum order thresholds, and coupons with different denominations and available ranges. For example, frequent users can meet a higher delivery fee and less direct discount, while new or infrequent users are surrounded by large-value coupon and low price product.

It is worth noting that the high competitive condition of takeout market provide a fertile ground for implementing such strategies. The major takeout platforms create a "limited free choice" market environment with their market share and user stickiness, which further strengthen their pricing dominance [2]. In this case, this study adopt a method of case analysis to explore how takeout platforms use historical consumption patterns and real-time contextual factors and so on multidimensional big data, though a triple-track price system including product recommendations, price adjustments, and coupon combinations, try to approximate the state of perfect price discrimination. Furthermore, it would discover how the complex pricing system influence on the long-term profit structure of the platforms.

The potential contribution of this paper lies in the research on the price discrimination system can extend perfect price discrimination in the digital era, especially within takeout platform such an information-intensive context. Furthermore, due to the often hidden nature of discrimination by internet companies, this research also offer some insight and evidence for regulatory practices and consumer rights protection [3].

2. Coupon-centric price discrimination system

2.1. Triple-track price discrimination system

Hou Zemin et al. have noted in their study on profit model of takeout platform that during the period of highly competitive, the return from charging customers directly is low [4]. Therefore, platforms usually employ a more invisible and data-driven approach of price discrimination to extract greater value from consumers while preventing user losses.

To achieve the goal, takeout platforms adopt a combined strategy which combine product recommendations, coupon distribution and dynamic surcharge to conduct a triple-track price discrimination system and extracts consumer surplus. The system can be summarized across three tracks.

Track one is differentiated product recommendation, which respond to do overt price adjustment. Platform can achieve price leveling at the information entry by offering different group of customer different ranking of merchant and dish price [1]. After evaluating user portraits, which including but not limited to consumption capacity, category preferences and price sensitivity, the platform prioritizes promoting high-priced items to users with high spending intent, while prioritizing value-for-money or promotional items for users with low spending intent.

Take Meituan's “Sheng Qiang Shou” channel as an example. The channel cooperate with grilled fish brands such as “Tanyu” and “Yuku” and launched a kind of high-price grilled fish product named “Bawang grilled fish” , which is tended to promote to customers who have a preference of grilled fish or whose average historical order value higher. Conversely, customers who have lower

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average historical order value or have showed higher price sensitivity would have more possibility to be promoted similar product with a lower price or a “limited-time promotion” label when they search “grilled fish”.

This track can complete initial selection and division of users with different payment willing by controlling the information environment, which construct the overt level of the price discrimination system without changing the unify price.

Track two is highly personalized coupon distribution, which respond to do covert price adjustment. A study have shown that the perceived entertainment value of coupons, namely the surprise and satisfaction the coupon give customer from obtaining them, can obviously impact on user`s willing to use coupon [5]. Platforms can achieve price discrimination to the greatest extent possible with distributing different types of coupon to different kinds of customer in different time period in different way [1,6].

JD takeout offer “campus privilege packages” to college students and “Free blind box” to the PLUS members, while provide only small discount coupon or task coupon to frequent customers.

This track enables consumers to pay under specific conditions, ensuring maximized revenue and sales, which construct the covert level of the price discrimination system.

Track three is dynamic surcharges, which is the final step of price adjustment. It mainly add dynamic surcharges, which usually are delivery fee, in last stage of an order, which is last stage of realizing “everyone a price”.

Ele.me will increase delivery fee to the order during rush hours, poor weather or those with remote location. Tests show that delivery fee would raise 30% at most to normal during raining lunchtime for same user.

This track significantly raises the information cost and difficulty of price comparison for users and effectively reducing their price sensitivity, which constitutes the final, hard-to-notice level of the price discrimination system [2,7].

2.2. Coupon types and discrimination logic

The coupon distribution system realize accurate test and adjustment of customer`s willingness of payment, whose nature is personalized and conditional discount system. It is harder to notice and more flexible than directly adjust price, as well as is the covert factor of price adjustment and the core of price discrimination system.

Besides, coupon is a kind of efficient and dynamic tool for testing payment willingness. Platforms can continuously improve their model of user payment willingness by analyze different users` rate of using coupon with different denomination or distributed in different ways. So that, they can decide the future strategy of accurate pricing and coupon distribution based on the result.

Coupons can generally be categorized into the following four main types.

First, new user coupon or reactivation coupon for new users or infrequent user, which are aim to build or rebuild the consumption habit. These two kinds of user either have not developed consumption habit in the platform, or the original consumption habit interrupted, so their user stickiness and payment willingness are related low. Platform can draw them into or back to the transaction environment by giving them directly and strong price excitement.

Second, threshold coupons, such as minimum spend discount coupon and category coupon, which giving discount after order satisfy certain conditions. Due to different average order value flexibility and payment willingness of each user, threshold coupon aim to test those and guide consumption behavior by methods such as setting minimum consumption threshold. Low-threshold coupons, save $5 on orders over $30 for example, mainly promoted to price-sensitive or infrequent

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users, and the target is encourage basic purchases with small discount and maintain sales. High-threshold coupons, save $15 on orders over $80 for example, focus on users with higher average order values or price-insensitivity, making them feel "cost-effective" and enhance repurchasing willingness. Category coupon give large discount for certain products, so that customer`s purchasing willingness of the products are higher than the other. To achieve the discount threshold, customers usually would purchase product additionally do not plan to buy originally and increase the sales and average order value.

Third, threshold-free coupons for price-sensitive users, which directly decrease the final payment. The coupon provide the most directly and the most easy-notice payment reduction, namely a covert and personalized discount for certain customers and effectively transforming them into loyal customers. It basically is a discount sale for limited targets without changing price publicly.

Forth, exclusive coupons which related to identity (e.g., membership) or specific actions (e.g., completing tasks) and mystery coupons which distributed through games or raffles. The former give customers a sense of "special treated" while the later give customer a surprise. These two coupons leverage the "endowment effect" and "surprise effect" in behavioral economics to enhance user stickiness and engagement [5].

2.3. Technical implementation of collaborative operations

The coupon distribution strategy is required to continuously change to cooperate with more and more refined user portrait. In the process, the system first recalls multidimensional user portrait tags in real time, which including consumption ability, price sensitivity, preference, life period and so on, and then performs predefined promotion rules. After that, platforms also would employ the method such as A\B testing to keep confirming discount denomination, thereby maximizing distribution efficiency.

The effectiveness of coupon depends not only on the denomination, but also on the promotion time and situation. Platforms can use technical means to link coupon distribution with time period, lunch and dinner hours for example, and behaviors, viewed but not purchase or ordered but pay for instance, resulting in accurate coupon distribution.

"Coupons for everyone, each one unique" long-term strategy is the core strategy of coupon distribution system. The strategy reflects price discrimination in the time dimensions, and it realized technically by the accurate management of users` value life period. A user's value life period can be divided into three following benefit stages.

First, the initial stage. The sense of "cost-effective" is primarily built during the process of using large-value and threshold-free coupons, gradually developing consumption habits. Second, middle stage. Discount of coupons are gradually and slightly reduced by algorithms with user stickiness increase, such as threshold-free coupon become threshold coupons or threshold of coupons become higher. Third, long-term stage. The coupons the frequent users distributed are small and infrequent, and the consumption behaviors rely on their consumption habits. The platform may even charge them higher prices or delivery fees.

During the whole value life period, benefit stages of users are dynamically adjusted by algorithm in case being noticing, which maximizing the user's value over their entire value life period.

2.4. Why price discrimination hard to detect

First, from the social common sense, coupons usually viewed as promotional giveaways instead of a part of final payment, allowing them for greater legal flexibility and room for interpretation and

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easier to avoid accusations of price fraud. Users generally treat coupons as an additional benefit and make it harder to associate them with discrimination. Therefore, it is hard to recognize the price distribution system whatever for regulator or consumer, and often abandoning further investigation due to the difficulty of gathering evidence, the high cost of protecting their rights and so on, even if some of them do aware of it.

Second, takeout, namely food delivery, not only about food but also about delivery, and such a service factor takes a significant place in the takeout. Compared to physical goods with clear and transparent costs, the comparability of service price is lower and harder to compare prices with similar products even with their last consumption before. Therefore, the price difference in each order is harder to notice and have weaker comparability.

3. Impact on platform and merchant operations

3.1. Compound effects on platform sales

The core influence of the price discrimination strategy is that charge users with a high willingness to pay a price close to their psychological upper limit, while attracting price-sensitive users with discounts so that maximizing the sales and profits in the surface of unify price for everyone [8]. The result realized by three ways.

First of all, increasing average order value. The platform effectively excite users to make more purchases to meet the discount threshold with coupons such as minimum spend discount coupon, directly pushing up the value of each transaction.

Secondary, increasing sales. The platform help the new users and infrequent users build a new consumption habit, which extend the user base increase sales at the same time. Additionally, the low frequency users could raise their frequency of consumption for the coupon, from once every two days changing to once a day for example, which also effectively help sales growth.

Third, guiding the consumption flow. Customers' consumption demands are directed towards high-profit goods or specific items requiring inventory clearance by coupons such as category coupon, which improved overall resource distribution and sales structure for both the platform and merchants.

Moreover, the personalized pricing strategy also drive a data flywheel process, which is a positive feedback loop of “data → improving algorithm → more transaction → more data”. Every behaviors, such as clicking, ordering or even abandoning payments, will be fed back to the algorithmic model to continuously increasing the accuracy of product recommendation and coupon distribution. The process will finally lead to three closed-loop outcomes.

First, Consumption inertia and path dependence developed by user`s sense of “more use it, more understood”, which decrease the willingness of price comparison or changing platform actively.

Secondly, the platform can thereby continuously enhance and capture the total value of user’s life period, and solidifying market share at the same time.

Finally, the continuously enriching user data and the constantly improving predictive models jointly construct the technical and competitive barriers that difficult for latecomers and competitors to overcome. By combining complex calculations of prices and coupons, raise the psychological and operational costs for users to compare prices, thereby locking in users and reducing user churn.

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3.2. Traffic dependency and profit squeeze

Merchants need to keep adjusting their promotion strategy to comply with platform traffic allocation and coupon rules, so that securing traffic and platform support [9]. In this case, merchants have to devote significant time and effort into the activities that not related to daily operations additionally, while the benefit they gained are still uncertain.

Under the platform rule, merchants lose their power of pricing and bargaining for their products and services, though they still control the production materials, such as stores, equipment and so on. Because of that, consumers` loyalty shift from the brands to the platforms, turning merchants into a part of “supply chain” of the platform. Some merchants even complain they have essentially become employees and are working for the platform [9].

4. Risks the platform facing

The high-dimensional modeling and real-time optimization required to achieve "everyone a price" make the algorithm system extremely complex, and its stability is facing challenges [1]. Once there is a mistake, showing overly high prices to loyal users for example, there will very likely to directly trigger user dissatisfaction. Coupled with the highly sensitive nature of "eating" as a basic need, such unfair incidents can quickly wake up social empathy and, under the magnification of the media, evolve into a serious brand public opinion crisis.

In addition, if merchants' dissatisfaction with the platform's algorithms and traffic rules cannot be effectively resolved, it will make them develop personal traffic channel like WeChat groups and mini-app to chase “independence”. It will fundamentally weaken the platform's control of its core supply side, namely merchants, as long as the de-platforming trends reaches a large scale.

With the widespread exposure of the “big data price discrimination” phenomenon, users' awareness of cross-platform price comparison has also significantly increased. At the same time, price comparison tools like price comparison mini-apps are becoming increasingly popular, and it is convenient for users to open multiple takeout apps simultaneously to compare prices without the aid of these tools, . This puts the “information imbalance” basis on which the price discrimination strategy depends at risk of being dismantled.

5. Governance recommendations

5.1. Recommendations for regulatory authorities

Regulatory authorities should address new types of monopolistic and discriminatory behaviors in the platform economy through a combination of institutional innovation and technological means.

To achieve the goal, regulatory authorities should implement algorithm auditing and accountability mechanisms. By building a third-party evaluation mechanism, the platform is required to disclose the core logic of product recommendation and coupon distribution, without revealing business secrets of course, review whether there is systematic discrimination and enhance the transparency of the algorithm. Additionally, the price transparency tools should be enforced, requiring the platform must provide standardized options such as “sort by actual payment price” in the search and sorting functions for instance, so that breaking the information cocoon and safeguarding consumers’ right to be informed and price comparison. Regulatory authorities can also clearly identify law enforcement cases of “big data price discrimination” and form deterrence by publicizing typical penalty cases. For instance, referring to the provisions on “differential treatment”

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in the revised Anti-Monopoly Law, qualitative penalties should be imposed on the behavior of platforms abusing their data advantages [10].

5.2. Recommendations for platform companies

The companies behind platforms shift their attitude form “value extraction” to “value co-creation” and constantly improve service quality and user experience, which help platforms reach sustainable and healthy development.

To achieve the goal, the platforms should use the data they have to recommend healthier and more flavor-appropriate meals to users, retaining users by enhancing service experience instead of controlling product price. Besides, it is supposed to organize independent algorithm ethics committees in the internal or external side of platforms to review strategies' potential impacts on vulnerable groups and set technical fairness thresholds, restrict repeated price hikes for the same user for example, so that fulfilling corporate social responsibility. Platforms can still focus on enhancing the accuracy of coupons distribution to improve user experience, as long as ensuring no price discrimination occurs. This includes designing more interactive coupon obtaining methods (such as game tasks) to increase consumers' perceived entertainment value and perceived convenience of coupons, as well as optimizing search and recommendation functions to boost user satisfaction [5].

6. Conclusion

This study systematically analyze the triple-track price discrimination system which including product recommendation, coupon distribution and dynamic surcharge fee, arguing it approximate the perfect price discrimination under the current conditions of market and technique and its operational mechanisms and far-reaching impact. According to the result, the system control the information environment and payment net value through algorithms, accurately matching users' payment intentions and maximizing the extraction of consumer surplus and building competitive barriers. The system also result in merchants` profit room squeezed and loyalty shifting, which has also addressed multiple hidden challenges such as public opinion crises, merchant resistance, and being easily broken. To solve the problem, the multi-parts cooperation is significant. Regulatory authorities should focus on algorithm auditing and price transparency tools, while platform enterprises need to shift towards value co-creation and establish algorithmic ethics committees to fulfill their social responsibilities.

The main contribution of this paper lies in deepening and expanding the traditional theory of price discrimination in the digital age, proposing the new form of “algorithm-driven perfect price discrimination”, and conducting an evidence-based and detailed deconstruction of its operational mechanisms and compound effects. It provides a clear theoretical framework and rich experience evidences for new monopolistic behaviors within the platform economy. The result will not only provide decision-making reference to identify and regulate covert price discrimination behaviors for regulatory authorities, but also lay an important foundation for subsequent further research by scholars in related fields, such as quantifying the welfare effects of discrimination or conducting cross-industry comparative studies.

Still, this research holds room for further refinement. Firstly, due to the privacy of platform data, most of the research is based on public source cases and theoretical inferences. In the future, if desensitized micro-transaction data can be obtained through cooperation for quantitative analysis, the conclusion will be more convincing. Secondly, this study mainly focuses on the platform, and

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the investigation and analysis of the merchant end are somewhat insufficient. In the future, it is possible to delve deeper into the response strategies or performance differences of different types of merchants when facing platform algorithms.

References

[1] Li, S. (2023) Pricing Strategies and User Acquisition of Internet Platform Companies: Empirical Evidence from China's Food Delivery Industry. Economic Research Journal, 58(6), 84-101.
[2] Wu, Z. (2024) A Brief Discussion on the "Exclusive Partnership" Phenomenon in Food Delivery Platforms. Cooperative Economy and Technology, (12), 73-75.
[3] Wang, J. (2025) Antitrust Regulation of Price Discrimination by Internet Companies. Southwest University of Political Science and Law.
[4] Hou, Z., Qi, Y. and Li, W. (2023) Profit Model Selection for Food Delivery Platforms Considering Consumer Delivery Time Sensitivity. Management Review, (3).
[5] Liu, F., Zhao, X., Zhang, J., et al. (2016) A Study on Consumers' Willingness to Use Mobile Coupons: A Perspective Based on Individual Characteristics and Motivations. Management Review, 28(2), 10.
[6] Mao, X. and He, S. (2020) Factors Influencing Online Sales Growth of B2C Merchants: An Empirical Study Based on Meituan Takeout Merchant Data. E-Commerce, (3), 3.
[7] Yu, S. (2023) Analysis of Social Welfare and Competition Effects of "Exclusive Partnerships" on Food Delivery Platforms. North China University of Technology.
[8] Jia, Y. (2024) Research on Optimization Strategies for Labor Management of Internet Platform Employees Based on Algorithm Control Technology: Taking Food Delivery Platforms as an Example. Enterprise Reform and Management, (15), 53-55.
[9] Jiang, X. and Ji, D. (2024) Platform Migration: An Exploratory Study of Food Delivery Merchants in the Gig Economy System. International Journalism, 46(10), 93-118.
[10] Du, J. and Dong, Y. (2022) Market Power Analysis of "Exclusive Partnership" Practices by Food Delivery Platforms. Changbai Journal, (1).