A Welfare-Economics Examination of Market Segmentation Between Cruising Taxis and Ride-Hailing Services

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Abstract: The legalization of ride-hailing services has broken the administrative monopoly of the traditional taxi market. Nevertheless, debates over its welfare effects have largely centered on the interest losses of license holders. Rejecting the presupposition of "zero-sum competition", this paper investigates the differentiated competitive landscape between cruising taxis and ride-hailing services from the perspective of market segmentation. The study identifies three dividing dimensions of their comparative advantages: pre-booked versus instant trips, price elasticity versus price rigidity, and information-driven matching versus station-based support. Instead of substituting for one another, the two types of services develop complementarity amid competition. Such market segmentation expands consumers' options, forces the cruising taxi industry to improve under competitive pressure, and elevates overall resource allocation efficiency. In this sense, the urban travel market after the ride-hailing reform demonstrates features of Pareto improvement, and the shrinking license premium essentially represents the reasonable return of administrative monopoly rents. The policy implication is that public regulators ought not to choose sides between the two services, but to safeguard an institutional environment for fair competition so that market segmentation can take shape spontaneously.
Key words: ride-hailing; cruising taxis; market segmentation; Pareto improvement; comparative advantage

Introduction

In July 2016, the General Office of the State Council issued the Guiding Opinions on Deepening Reform and Promoting the Healthy Development of the Taxi Industry, and in November of the same year the Interim Measures for the Administration of Online Booking Taxi Operation and Services came into force, whereby ride-hailing services obtained a legal status. In the following years, ride-hailing services rapidly penetrated major cities across the country, and the cruising taxi industry experienced a profound market shock. Around this transformation, mainstream policy discussion and academic analysis have mostly adopted a zero-sum narrative: the rise of ride-hailing comes at the cost of the decline of cruising taxis, and the two wax and wane over the same pie.

But in real market operation, are cruising taxis and ride-hailing services really competing in a fully homogeneous way? What irreplaceable comparative advantages does each of the two services possess, and do these advantages push them toward segmentation rather than zero sum? If market segmentation is indeed occurring, then from the perspective of Pareto improvement the welfare effects of the reform may be more positive than the zero-sum narrative suggests. An analysis of the market interaction between the two services from the perspective of dynamic games shows that they have gradually formed differentiated positioning amid competition and cooperation [1]. Research based on travel big data has revealed significant differences in service scenarios between the two: cruising taxis are more concentrated on station trips and instant demand, while ride-hailing covers a broader range of pre-booked travel scenarios [2-3].

1. Pareto Improvement and Market Segmentation: Establishing the Analytical Framework

1.1 Pareto Improvement as a Criterion for Policy Evaluation

Pareto improvement means making at least one party better off without harming the welfare of any party. As an ex post evaluation criterion for public policy, it carries strong ethical binding force: if a reform is a Pareto improvement, there is almost no reason to reject it. In the real world, however, almost all substantive reforms touch vested interests and produce losers, and strict Pareto improvement is extremely rare in policy practice.

1.2 Market Segmentation: A Neglected Analytical Dimension

Market segmentation is a basic concept in industrial economics, referring to the process by which different products and services within the same industry move toward differentiated positioning according to differences in function, price and target customer groups. In the travel service market, although cruising taxis and ride-hailing services ostensibly provide the same kind of product — point-to-point urban passenger transport — they differ markedly in the way services are obtained, pricing mechanisms, information conditions and applicable scenarios; they face consumer groups with different preferences rather than one fully overlapping market. An analysis of the structural evolution of the taxi market under mobile internet conditions shows that technological progress is driving the travel service market from homogeneous competition toward structural differentiation [4].

The significance of this judgment lies in the fact that market segmentation changes the determination of the nature of competition. If the two services were completely homogeneous, market expansion would inevitably be accompanied by a zero-sum redistribution of shares; if the two services are differentiated, the overall market capacity may expand owing to the introduction of a new service, while the original service also undergoes qualitative improvement amid competition. This is precisely the theoretical starting point of the core argument of this paper.

2. Before the Reform: Welfare Limitations of the Single Market of Cruising Taxis

2.1 Market Structure Under Administrative Licensing

Before the emergence of ride-hailing, the taxi industry in Chinese cities had long implemented quantitative control of operating rights. The government controlled the total capacity by issuing a fixed number of operating licenses, intending to maintain industry order and the balance of capacity, but the actual effect was the formation of an administrative monopoly. Licenses became a scarce resource and formed a considerable transfer price on the secondary market. This institutional arrangement enabled license holders to occupy monopoly rents for a long time, while drivers and passengers in actual operation bore the efficiency losses.

In terms of price, cruising taxis implemented unified government pricing, with complicated price adjustment procedures and long cycles, and could not change flexibly according to actual supply and demand. During periods of surging demand such as morning and evening peaks, holidays and severe weather, unified pricing made it difficult for price to perform its regulating function: it could neither guide more capacity into the market nor screen out travelers with higher willingness to pay. Information asymmetry was equally prominent: passengers did not know where the nearest empty car was, how long they would have to wait, or what condition the car was in, while drivers did not know which area had the most concentrated demand.

2.2 Three Losses of the Single Structure

The single structure of cruising taxis caused welfare losses at three levels. Consumer choice was extremely limited: the whole city had only one mode of “hail and stop, charge by meter”, and pre-booked travel, price stratification and service grading simply did not exist, so heterogeneous demand was suppressed by homogeneous supply. In terms of resource

allocation, difficulty in getting a taxi during peak hours coexisted with a high empty-running rate during off-peak hours, and there was obvious room for improvement in the efficiency of matching supply and demand. In terms of service quality, entry thresholds restricted competition, and drivers lacked external pressure to continuously improve service — complaint mechanisms and regulatory measures existed, but their effectiveness fell far short of market competition.

The cruising taxi market before the reform was far from Pareto optimal. Whether viewed from consumer surplus or resource allocation efficiency, clear directions for improvement could be found. It is in this sense that the emergence of ride-hailing opened up room for welfare improvement.

3. Formation of Market Segmentation: Comparative Advantages of the Two Services

3.1 Comparative Advantages of Ride-Hailing

The core advantage of ride-hailing comes from the service flexibility generated by the combination of technology and platforms. Passengers can book trips in advance and need not wait blindly at the roadside; dynamic pricing raises prices during peak periods to attract more capacity and lowers prices during off-peak periods to stimulate demand, making the price signal once again a means of regulating supply and demand; information transparency enables passengers to know in advance the vehicle location, estimated fare, driving route and driver rating, greatly alleviating the information asymmetry of the traditional market. At the same time, product lines such as express, premium and carpooling realize the vertical stratification of services, so that consumers with different willingness to pay can each obtain what they need. From the supply side, ride-hailing provides drivers and vehicles without license resources with a channel to enter the market, creating space for flexible employment [5].

3.2 Comparative Advantages of Cruising Taxis

The irreplaceability of cruising taxis in specific scenarios is often underestimated, and this is precisely the key to the formation of market segmentation. Hailing and stopping means no mobile phone, no application and no advance booking are needed: in emergency scenarios where the phone is out of power, the signal is poor or time is pressing, a cruising taxi at the roadside is often a more realistic choice than a ride-hailing car. The queue-and-wait mechanism for passengers at transportation hubs such as airports and railway stations guarantees a stable supply of capacity, which the individualized dispatch model can hardly replicate. Unified pricing is indeed insufficiently flexible, but it provides fare predictability, so passengers need not worry about the uncertainty brought by dynamic surcharges. For the elderly who are not accustomed to using smartphones, cruising taxis are almost the only choice.

3.3 From Substitutive Competition to Segmented Complementarity

Placing the comparative advantages of the two services side by side, the difference in the demand scenarios they cover is clear. Ride-hailing is more suitable for planned travel, price-sensitive travel and travel with higher service-quality requirements; cruising taxis are superior in instant travel, emergency travel and age-friendly scenarios. Each has its own advantages in core scenarios, and there is some competition in the overlapping zone, but this competition is closer to “inspiring each other to improve” than to “crowding out each other’s living space”. The dynamic game model of Jiao Jinchi et al. supports this judgment: in equilibrium, the two services form stable differentiated pricing and service positioning in the market.

Market segmentation is not a static division of labor but takes shape gradually amid dynamic competition. The entry of ride-hailing broke the monopoly position of cruising taxis and forced the latter to adjust and upgrade; meanwhile, the existing advantages of cruising taxis in specific scenarios also constrained the expansion boundary of ride-hailing. The result of these two forces shaping each other is not the demise of one party but the formation of a relatively stable differentiated pattern.

4. Welfare Effects and Pareto Improvement Under Market Segmentation

4.1 Expansion of Consumer Welfare

In discussing the welfare effects after the reform, consumers are the clearest beneficiaries. The expansion of choice itself is a welfare improvement: consumers used to face the binary choice of "take a taxi or not", whereas now they can make diverse choices between ride-hailing and cruising taxis, and among different price levels and services. The expansion of the choice set means that, under a given budget constraint, consumers can make decisions closer to their own preferences, and consumer surplus increases accordingly. Intuitively, after the reform waiting times have been greatly shortened, travel scenarios have clearly expanded, the difficulty of getting a taxi at night and in remote areas has been alleviated, and service stratification has also met differentiated demands.

4.2 Competition-Driven Improvement of the Cruising Taxi Industry

The entry of ride-hailing exerted substantive competitive pressure on the cruising taxi industry. Research on the transformation of the taxi industry in Beijing reveals the transmission path of this pressure: cruising taxi companies were forced to carry out digital upgrading, connect to online booking platforms and improve the service quality of vehicles and drivers [6]. Cruising taxi companies in various places successively connected to online ride-booking platforms, whereby traditional cruising taxis acquired some of the service attributes of ride-hailing. Improvements in vehicle interior cleanliness, drivers' service awareness and the standardization of complaint mechanisms can to a considerable extent be attributed to the transmission of competitive pressure. Some cities also took the opportunity of the reform to abolish the paid-use fee for operating rights and simplify entry procedures. The sum of these changes means that, although the net income of cruising taxi drivers may have declined in the competition, the overall operating quality, service level and management standardization of the industry are healthier than before the reform. A market with effective competition is closer to Pareto optimal for both practitioners and consumers than a market lacking competition.

4.3 Reassessing the Nature of the Shrinking License Premium

The most controversial part of the welfare discussion of the ride-hailing reform is the loss suffered by license holders. The legalization of ride-hailing constitutes a "regulatory taking" of taxi licenses and should be compensated [7]. As a property interest formed through administrative licensing, the loss in value of the license does raise an ethical demand for compensation. What this paper attempts to explain, however, is that the issue of compensation and the judgment of Pareto improvement belong to different levels.

The reason why taxi licenses have a transfer price is rooted in the entry barriers created by administrative monopoly, which make the license a certificate of income rights based on scarcity. The license premium is not a return on production efficiency, nor compensation for operating investment, but the capitalization of an "exclusive right of entry". When the ride-hailing reform broke this right of entry, the shrinking of the license premium was merely the return of administrative monopoly rents — it does not belong to the objects that the "no one is harmed" principle in the sense of Pareto improvement ought to protect.

Therefore, when judging the welfare effects of the ride-hailing reform, it is inappropriate to count the shrinkage of license value as a factor offsetting the improvement of social welfare. This judgment does not deny the necessity of compensation — compensation design is an important component of the ethical integrity of the reform — but compensation is a subsequent arrangement of public policy that should not affect the judgment of whether the reform itself constitutes a welfare improvement.

4.4 Overall Judgment: Approaching Pareto Improvement

Integrating the above three levels of analysis — significant expansion of consumer welfare, competition-driven improvement of the cruising taxi industry, and the fact that the shrinking license premium does not fall within the scope of Pareto protection in nature — the travel service market after the ride-hailing reform as a whole possesses the characteristics of Pareto improvement. The premise of this judgment is the existence of market segmentation:

differentiated competition based on comparative advantages enables the expansion of market share and the improvement of quality to occur simultaneously, avoiding the partial welfare collapse that zero-sum competition might bring.

Of course, this does not mean that there were no welfare losses at all in the reform process. Some individuals, especially traditional cruising taxi drivers who could not transform, did bear the pressure of declining income. But under the framework of market segmentation, these individual predicaments are more an adaptation problem in structural transformation than a fundamental defect in the direction of the reform. Responses to these problems belong to the improvement of public policy and do not affect the welfare judgment on the overall direction of the reform.

Conclusion

This paper re-examines the welfare effects of the ride-hailing reform from the perspective of market segmentation. The research shows that cruising taxis and ride-hailing services each possess irreplaceable comparative advantages, and that amid competition they have moved toward differentiated positioning rather than zero-sum substitution. The resulting expansion of consumer choice, the competition-driven improvement of the cruising taxi industry and the improvement of overall resource allocation efficiency give the travel service market as a whole the characteristics of Pareto improvement. The shrinkage of the license premium is in nature a reasonable return of administrative monopoly rents and should not be understood as a welfare loss in the Pareto sense.

At the theoretical level, when evaluating the welfare effects of a reform, it is inappropriate to apply simply the binary framework of "beneficiaries and losers"; instead, the deep impact of the reform on the market structure itself should be considered. Dynamic changes such as market segmentation, competition-driven improvement and service upgrading often explain the true welfare significance of a reform better than static redistribution of interests.

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