Transportation Research Part A 110 (2018) 118–127

Contents lists available at ScienceDirect

Transportation Research Part A

journal homepage: www.elsevier.com/locate/tra

Creative destruction of the sharing economy in action: The case of Uber

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ARTICLE INFO

Keywords:
Sharing economy
Uber
Taxi industry
Collaborative consumption
Creative destruction
Ride-sharing

ABSTRACT

This research aims to empirically examine how Uber has transformed the traditional taxi industry in New York. To this end, we employed a time-series regression model, controlling for various factors that may affect taxi trips, and found no direct evidence that the number of taxi trips, the revenue per driver, or occupancy rates have decreased since Uber entered the market. However, a closer investigation into other dimensions, specifically the degree of dispersion of pick-up and drop-off locations, reveals that taxi drivers have been forced to change their way of conducting business in order to retain their market position. Since Uber has crowded out taxis from the central area of Manhattan, the latter have actively responded by serving customers outside of this area. By increasing their geographic coverage and serving customers that were previously ignored, taxis were able to retain their numbers for trips and market share. Our results suggest that the incumbent taxi drivers actively responded to the disruptive threat of Uber's entry and have consequently provided substantial benefits to consumers as taxis can now be hailed from a wider area of New York. We thus found that the sharing economy has transformed the existing market in a positive and welfare-enhancing way.

1. Introduction

There is currently a controversial issue surrounding Uber's impact on existing businesses. Are incumbents in real threat of being substituted by the disruption that the sharing economy brings into our society or is it merely being overestimated? The Economist[1] examined whether Uber taxis were substitutions for the incumbent yellow taxis and suggested that Uber had a business-stealing effect on taxis rather than a complementary one. On the contrary, Christensen et al. (2015) mentioned that Uber might have increased the total demand by developing a better, less-expensive solution to a widespread customer need. As such, Uber has generated a great political controversy and government's role as a regulator rose as a key challenge on how embrace the benefits of the disruptive innovator while considering the full range of the disruptor's impacts (Dudley et al. 2017).

The sharing economy has been widely appraised as an alternative that can resolve today's various socio-economic and environmental problems. Still, some question the tangible value that the sharing economy brings to our society. The sharing economy has been often criticized as being the "share-the-scraps economy[2] where the majority of the revenue goes to the platform owners and

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[2] Robert Reich, "The Share-the-Scrap Economy", last modified February 02, 2015, http://robertreich.org/post/1098940950952".

https://doi.org/10.1016/j.tra.2018.01.014
Received 7 May 2017; Received in revised form 7 January 2018; Accepted 7 January 2018
0965-8564/

the scraps go to the participants. In addition to this debate, several countries suspended Uber's operations, and the lack of security and safety mechanisms on accommodation-sharing and ride-sharing businesses have posed several doubts about this economy's potential growth. Thus, it is crucial to analyze the impact of the sharing economy has on the incumbents and the destruction or creation it brings to our society. A profound investigation on the relationship between the entry of the sharing economy and the affected incumbents can address the above queries and accurately predict the future of the sharing economy.

This paper empirically examines how Uber transformed the traditional taxi industry in New York. Taxi industry is a unique market where price is fixed and the supply is regulated by licenses. Incentives for innovation in such regulated market is low and Uber must have been the first competitor it faced. This paper examines how the traditional rent-seeking taxi industry is adapting the creative destruction that Uber brought. As an extension to previous studies on Uber, this paper analyzes several dimensions of taxi-trip records that Uber might have affected and examines the consequent responses of incumbent taxis. This empirical research has managerial implications in terms of how incumbents, facing a threat of disruption from the sharing economy, should respond as well as policy implications in terms of how the sharing economy can be harmonized with the existing economic system.

We employed a time-series regression model, controlling for various factors that may affect taxi trips, and found no direct evidence that the number of taxi trips, the revenue per driver, or occupancy rates have decreased since Uber entered the market. However, a closer investigation into other dimensions, specifically the degree of dispersion of pick-up and drop-off locations, reveals that taxi drivers have been forced to change their way of conducting business in order to retain their market position.

Since Uber entered the market, taxis began covering a larger geographic area of New York, implying that the latter were crowded out from the central area of Manhattan due to an increase in competition. Incumbent taxis started picking up customers from a more widely dispersed area of New York and their active responses of searching for new markets made it possible for them to retain their previous levels of taxi trips, earnings, and occupation rates.

If we examine Uber's effect from the consumer's perspective, customers can now hail taxis in a wider area of New York, as taxis have started serving previously ignored customers. This implies that customers benefited the most from the competition between incumbent taxis and Uber. This conclusion aligns with the economic theory that higher competition leads to an augmented consumer welfare.

Our paper makes several important contributions, complementing previous studies. This paper provides managerial and policy implications on how incumbents, affected by the disruption of the sharing economy, should respond. Even though it might be premature to examine the comprehensive effect of Uber, our results suggest that incumbent taxis have effectively defended Uber's entry thus far. Without a proactive response of searching for a new market outside of Manhattan, existing taxis would have been severely hit by the business-stealing effect of Uber. We can finally conclude that, when combined with the incumbents' responses, the sharing economy does transform the existing market in a welfare-enhancing way.

2. Uber and the taxi industry in New York

Uber is known as a representative sharing-economy company in the transportation sector. Headquartered in San Francisco, California, Uber was founded in March 2009 as a transportation network company. As a platform-based company, Uber's business model consists of Uber-drivers who use their own cars to transport customers needing rides. The on-demand ride service, operated by Uber's mobile platform, works simply by linking drivers with customers, who have submitted trip requests. After its primary launch in San Francisco, it rapidly expanded to various cities in the US, including New York City, Chicago, and Washington D.C, on May 2011. As of February 2018, the service is available in 633 cities worldwide.

Among the diverse geographic areas where Uber expanded, this paper focuses on New York, where Uber expanded rapidly after its establishment in San Francisco and Los Angeles (Hall and Krueger, 2015). The yellow taxis of New York are widely recognized as a representative icon of the city. Owing to the increasing number of vehicles on roads, traffic congestion and pollution have been major problems in New York City for years. Many laws and schemes such as imposing tolls were implemented to fix the problem, but traffic woes still persist. A recent MIT study (Alonso-Mora et al., 2017) examined how ride-sharing could impact the transportation system in New York City, and found that such a technology-enabled ride-sharing business model with optimized algorithms could radically reduce traffic congestion up to 75%. The study devised an algorithm that suggests that all of the city's taxis could be replaced by just 3000 Uber drivers.

New York City's taxi supply has been tightly regulated by the licensing scheme since 1937. In order to legally run a taxi in New York, a medallion issued by the Taxi & Limousine Commission is required. There are currently over 13,000 licensed taxis and over 50,000 drivers providing taxi services. On the contrary, to become an Uber driver, such a license is not required, and therefore, there has been much controversy on how to regulate such a technology-equipped new entrant that bypasses laws in a traditionally regulated market. The ongoing strike by taxi drivers and the continuously falling medallion prices also demonstrate that Uber's introduction in the city is a real threat to taxi drivers. Such controversies suggest the need for a closer examination on the relationship between Uber and taxi industry. Unveiling such a controversy can lead to policy recommendations on whether regulating or suspending Uber's operations is the means to resolving this dispute.

3. Hypothesis

3.1. Business-stealing effect of Uber

The question of whether an entrant with a disruptive business model or technology is a substitution in the existing market or leads