TILBURG UNIVERSITY

APPLIED ECONOMIC ANALYSIS I

# Disruptive Innovation and Regulated Markets

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# Introduction

This canon will explain the concept of regulated markets and the ways in which the structures in these markets are challenged by the entrance of new competitors. The canon proceeds with a general introduction to the basics of competition and regulation, followed by a relevant example of a regulated market that is currently challenged by new competitors. This market is the taxi market, which is fiercely challenged by the emergence of the ridesharing company Uber. First, the regulation in the taxi market will be discussed. Second, the rise and the implications of the entrance of Uber in the taxi market will be considered in detail. Third, the regulations and policy measures against Uber will be reviewed. Finally, the canon presents how the case of Uber fits into the big picture and discusses existing scientific research and literature on the matter. A brief summary about heavily regulated markets facing new entrants concludes the canon.

# Basics

## Competition Policy

Anyone who has ever taken a class in economics is taught the concept of perfectly competitive markets. Basically, our current economic system, Capitalism, is built on the fundaments of this theory. In a perfectly competitive market, marginal revenue equals marginal costs. This leads to a Pareto-efficient outcome, where no individual can be made better off without making another worse off. This looks great, however in practice, these perfectly competitive markets do not exist. This is because the theory is built on many strong assumptions: there are large numbers of buyers and sellers, there is perfect information, products are homogeneous, property rights are well defined, there are no entry or exit barriers, no agent has any form of market power, factors are perfectly mobile, sellers maximize their profits, buyers maximize their utility, there are no transaction costs, no increasing returns to scale or network effects and lastly, there are no externalities on third parties (John and Cassidy (2013)). If a market does not satisfy all of these conditions, this Pareto-optimum is not reached. The violations of the assumptions are called market failures. If market failure leads to an undesirable outcome, there is cause for government intervention. Policy makers can then regulate markets in order to maximize social welfare, often by increasing competition in imperfect markets. Obviously, the type of government intervention depends on the form of market failure.

## Entry Barriers

One example of a market failure is an entry barrier. An entry barrier inhibits new firms from entering the market at zero cost. This may be an undesirable feature of the market as entry barriers give incumbent firms market power, which implies that they can charge a higher price than under perfect competition.

There are many different forms of entry barriers. Some occur naturally, as for restricted access to resources and economies of scale that create natural monopolies (Joskow (2007)), while others are imposed on purpose by the incumbents, e.g. exclusive dealing agreements (mel) between suppliers and retailers, or even by governments in the case of licenses and intellectual property rights (Boldrin and Levine (2013)). As an example of a market in which we find all of these features, we can mention national electricity markets (Wilson (2002)), which exhibit common traits all over the world: it used to be a vertically-integrated, often state-owned, natural monopoly, but in the recent years it has witnessed

consistent waves of liberalization and privatization worldwide.

However, the effects of removing entry barriers and increasing competition on total welfare are not always univocally defined, and we will analyze this issue with respect to the recent developments of another relevant field: the private transportation sector (taxi market).

### New Entrants

In the recent past, new firms entered various markets by overcoming entry barriers using innovative technologies and modern communication. The case of Uber in the taxi market will serve as an example of how newly emerging players bypass legal regulations by creating a direct connection between providers and consumers. Now let us discuss these regulatory issues in more detail.

## Regulation in the Taxi Market

In this part, the regulation in the taxi market will be considered. First, we will describe the market failures that form the foundation of regulation in the taxi industry. Second, we will provide information on the regulatory instruments that are used in the taxi industry. Finally, problems associated with regulation will be discussed.

An unregulated taxi market faces market failures that provide reason for regulation. Among these, important failures are: the absence of perfect price competition (Liston-Heyes and Heyes (2007)), excess entry (Schaller (2007)), asymmetric information regarding quality (Liston-Heyes and Heyes (2007)) and congestion externalities (Yang et al. (2005)).

- Perfect price competition will not prevail in an unregulated taxi market. In an unregulated market, operators could set their prices separately. The perfect competitive outcome would predict that an operator that undercuts his rivals would extract additional sales from his rivals. In reality, this might not be the case. The problem is that consumers cannot observe the different prices of all operators easily. Therefore, it would be costly for consumers to search for the cheapest taxicab. These costs include the time that passes before finding the cheapest offer, as well as the psychological cost of declining offers.
- Open entry to the taxi market could lead to an excessive supply of independent operators. Low entry costs and the opportunity of self-employment could lead to persistent over-supply in the taxi market.
- Some aspects of taxicab quality are unobservable for consumers. For example, it is fairly difficult, if not impossible, for consumers to observe the competence of the driver ex ante. So, there is asymmetric information regarding the characteristics of the taxi service.
- Taxis are a considerable source of road traffic congestion. For example, in 2014 there were approximately 485000 taxi trips in New York City per day (Bloomberg and Yassky (2014)). Obviously, the enormous amount of taxi rides contributes to traffic congestion.

To counter these market failures, taxi markets are often heavily regulated. Price control, entry regulation and quality regulation are frequently used policy instruments (Liston-Heyes and Heyes (2007)).

- To counter the inadequacy of price competition, prices are often controlled by means of metering. The regulated price is a function consisting of a fixed cost plus a variable part related to distance and time of a taxi ride.

- To control for the excess entry result, entry is widely regulated by means of limitation. Usually, a distribution of mandatory licenses or medallions is used. This regulation could also temper the congestion externalities.
- Quality regulation is used to solve the problems regarding asymmetric information regarding quality. Distribution and suspension of licenses is used to maintain high quality services.

Many taxi markets that were first heavily regulated, later faced deregulation. This stems from problems associated with regulation in the taxi market. Important problems are discussed below (Liston-Heyes and Heyes (2007)).

- Regulation of the taxi market is very time-consuming and difficult, especially in contrast to the economic activity that it generates. Regulatory instruments may not be able to solve the problems associated with a free market. For example, quality regulation might not be able to solve asymmetric information problems.
- Taxi operators are often very politically active. They lobby for entry regulations and price regulation that increases prices. Customers are poorly organized, so their preferences are underrepresented in regulation.

These problems can lead to regulatory capture, in which the regulation favours the interests of the regulated industry above the interests of its consumers.

As shown, the taxi industry is heavily regulated. Regulated industries sometimes face the competition of new entrants in spite of heavy regulations, as is the case in the taxi industry. Uber challenges the regulations in the taxi industry to potentially change the entire structure of the industry. The next section will discuss the rise and the implications of the entrance of Uber in detail.

# A New Player in the Market

With the emergence of the ridesharing company Uber, the taxi industry faces an unprecedented challenge of its traditional structures.

The transportation network company Uber Technologies Inc. officially launched its mobile app in June 2010 and since then, has expanded from San Francisco to more than 500 cities and 60 countries worldwide, therefore making it one of the fastest growing global startups. Recent statistics show that in the US, Ubers market share in the transportation sector is nationwide on the rise, even surpassing traditional taxi services in some cities such as San Francisco and Dallas (Fischer (2015)). Since its founding, it took the company only five and a half years to surpass the valuation of long-established companies like General Motors and Ford Motor and reach a market capitalization as high as $68 billion (Chen (2015)). The immense success of Uber can be attributed to several features of the service that set it apart from regular taxi services. Not only are the fares generally cheaper than taxicab fares, but the large volume of vehicles provided by the service also leads to shorter waiting times for customers.

The startup utilizes the latest technology in its business model. Potential passengers can request an Uber vehicle via the Uber app. An algorithm then matches them to the nearest available car which takes them to the desired destination. In this, Uber acts as an intermediary: for a commission fee, it connects the private drivers and the clients, sets the fare, and processes the payment. However, the effects of Uber on society are controversial. On the one hand, social benefits include increased welfare for consumers.

Not only does Uber offer a time-saving and convenient means to get around, the relatively cheap prices for rides could also incentivize individuals to forgo having their own car and use Uber instead, causing Uber users to save costs. The positive externalities arising from this include less cars on the streets, thus creating more available spaces in the city, and less carbon dioxide emissions and therefore positive effects on the environment. Furthermore, the existence of Uber may reduce drunk driving and traffic accidents.

On the other hand, Uber faces harsh criticism regarding various matters. The most important concern expressed against the company is that it enters the transportation market unfairly by bypassing regulations. As a consequence, both the traditional taxi services and Uber exist in the same market but are not subject to the same rules. On top of that, Uber seems to be following a similar scheme in every new market it enters: first, the company starts flooding the market with drivers, then, it starts cutting prices. That way, the traditional taxi service is undermined. Another point of criticism is the drive of Uber to create a supremacy in the ridesharing sector, which would imply monopoly prices and with that, a welfare loss for consumers. In fact, current numbers show a clear dominance of Uber in the US hailing market with a share of 84-87% (Hartmans (2016)). Furthermore, there are concerns regarding safety issues since Uber drivers are not screened as thoroughly as taxi drivers, leading to an uncertainty about their driving abilities. The same issue applies to Uber vehicles, which are not subject to equally rigorous safety checks as regular taxicabs. Finally, the Uber app requires passengers to provide private contact and payment information. The collection of consumers private data enables the potential misuse of said information and the violation of privacy rights of clients.

## Regulations and Policy Measures

As already discussed, the American market is the one that witnessed Ubers foundation and initial expansion (McAlone (2016)). Nowadays, Uber is legally available in 204 cities in the United States making positive profits, whereas in many other countries it is incurring losses with the financial situation of the company showing an overall loss of $1.2 billion for the first half of 2016 (Newcomer (2016)). However, even the perhaps more lenient American market is raising concerns and the government is trying to increase regulations and protection. The focus of regulators seems to be towards the safety of customers rather than towards the protection of taxi drivers, with several measures that address not only Uber but also its biggest emulative competitor Lyft. These new measures include the digital scanning and registration of drivers fingerprints, rules on cars safety, additional insurance and regulations on pick-up locations and ride charges. Fingertip scanning is compulsory in Texas, one of the biggest national submarkets, and could soon also be enacted in the key strategic market of New York City (Hanks (2016)). Here, however, the legislation seems to be more oriented towards the protection of regular licensed taxi drivers, for instance by lessening some of the requirements for passing the legal driving test. With a similar objective, other states, like Massachusetts, have imposed a tax on Uber rides that is going to subsidize taxi drivers. However, there are also some jurisdictions, like in Florida, which are actually in favor of deregulation and the free market and openly legalized Uber, Lync and other transportation network companies (TNCs) as a result.

On the other hand, Uber is struggling to sustain its expansion to the European markets, where it has generally been victim to legal claims and protests: in France, there have been harsh public demonstrations and the managers of the company were arrested for promoting illegal taxi, Germany, Spain, Italy, and Belgium have also banned or punished the company with fines of around 100,000-500,000 euros. The UberPop service was the victim of the bans, given the fact that it was the most diffused,

but also the one that did not require licensed taxi drivers. Indeed, those services like UberBlack and UberX, which involve licensed taxi drivers are generally permitted by the national legislations. In The Netherlands, UberPop was launched in Amsterdam in 2014 but it was banned at the end of the same year, with fines imposed on not only to the company but also to the drivers who illegally affiliated with it. There have also been some remonstrations between the employees at the offices in Amsterdam and the Dutch police. Although most European countries are fighting against Uber, the company managed nevertheless to gain some crucial strategic marketplaces, like the one of the City of London (Knight (2016)), where the transportation authority openly authorized the service in July 2014. The problem is that regulating in this matter involves weighing up many pros and cons and overall, it requires dealing with the trade-off between consumer benefits and protection of taxi drivers profits. Indeed, it is true that Uber and similar innovative TNCs offer many benefits to consumers, with the main ones including the reduction of search costs thanks to its mobile application and online platforms, an indication of the quality of drivers via customer reviews, as well as more competitive prices. However, the issue that legislators are worried about in the short run is the fact that sharing economy companies are breaking legal requirements on licenses and could also easily escape taxation. Then in the medium run, oversupply would worsen traffic congestion, bringing down prices in the long run up to the point where regular taxi drivers, who unlike Uber drivers have to sustain the costs of the license, would no longer make profits and exit the market. In this case, a monopoly or oligopoly market of a few TNC companies could easily result, increasing prices and possibly instigating collusive behavior, so that consumers would eventually end up worse off rather than benefiting.

An interesting question that arises at this point is what the future of Uber and co. will be? Indeed, the huge amount of fines that the company received and the significant losses for 2016 do not provide encouraging signals for its future. Moreover, it is reasonable to assume that all the lawsuits, allegations and public protests have compromised the image and reputation of the company in Europe, so that customers may mistrust Uber and identify it with illegal, black market drivers. Finally, it is not unlikely that the above predicted long-run negative consequences of liberalization may also manifest themselves in the American market, eventually leading legislators to prohibit Uber in the United States. There could be, however, some safe expansion paths that Uber could ride on. These include focusing on one of the legal and revolutionary elements of Ubers success: the exploitation of modern technology and especially the development of the mobile app for finding rides. This is a service that most regular taxi drivers do not offer and could adopt by buying or renting it from Uber. Finally, Uber is also planning on investing in carpooling projects and in even more technological ambitious ventures, such as self-driving cars (Lafrance (2016)). Could these become reality in the close future or are they merely Ubers latest attempt to escape the law on licenses for drivers by abolishing the very figure of drivers in the first place?

## The Sharing Economy in the Big Picture

In this section, we will show that the case of Uber in the Taxi market can be representative of new entrants facilitated by technological progress, introducing competition into other regulated markets or markets with barriers to entry. Uber is part of a wider newly emerging sector referred to as the sharing or collaborative economy. This new sector involves using technology to link demand with supply of underutilized assets mostly from individuals rather than firms. To date, the European commission has been enthusiastic in encouraging the progress of the collaborative economy as a way to enhance competition in the single market and increase economic activity in the area (European Commission (2016)). However, it acknowledges that there are areas where regulation needs to be introduced to this sector

such as taxation, liability and the employment status of those providing their assets and/or services.

This new movement has the capacity to challenge incumbents in markets that previously had been suffering from entry barriers and excessive regulation such as the taxi market as discussed in this canon. However, the taxi market is not the only one to have been effected by the emergence of this new technology, the most notable example of which being Airbnb as a challenger to the hotel industry where large fixed costs and heavy advertising may be prohibitive to new entrants (Journalist's Resource (2017)). Airbnb allows individuals to advertise spare rooms or beds they have on a website to those interested in a short stay.

In their paper, Zervas et al. (2014) study the effect of Airbnbs entrance to the travel accommodation market in the state of Texas, USA, by comparing hotel revenues in affected areas before and after the entry of Airbnb, while controlling for city-specific characteristics and trends as well as seasonal variations in lodging demand. The main result states that, on average, with each 10% growth of the Airbnb market, the revenues of established hotels decreased by 0.39%. As a reaction to the rising threat from the new accommodation provider, the authors describe short-term responses in form of a slight decrease in occupancy and a significant decrease in room prices in the traditional hotel market. The study also establishes that the negative impact of Airbnb is magnified for independent and budget hotels which do not cater to business travel, as compared to chain and upscale hotels, hinting at the fact that private travelers with lower monetary funds are the ones to increasingly prefer Airbnb over traditional hotels. Finally, the paper finds that the ability of Airbnb to flexibly supply accommodation during peak-demand periods significantly limits the pricing power of hotels during said peak seasons. In fact, the authors constitute said flexibility as the defining feature of the sharing economy, which the incumbent firms in the market have difficulties to counter.

Even though the presented scientific research was conducted in a specific geographic region and in a different sector than the Uber case we presented, it still gives valuable insights on how incumbent firms in established regulated markets can be challenged by a new entrant. Both Airbnb and Uber could be described as operating in a parallel market to the hotel and taxi markets respectively but it is very clear that both have the potential to introduce effective competition to the market. The problem here is that while they have the potential to disrupt the status quo of these markets, the fact that they do not face the same regulations as the incumbents provides the likes of Uber with a significant advantage over the taxi drivers. If allowed, this could lead to regular taxi drivers becoming uncompetitive and thus, leaving the market. Uber, Lyft or whatever other provider of drivers with cars in the city could then be left in a dominant position in the market, especially given the network effects in the industry. Therefore it is vital that these new competitors in the collaborative economy are also regulated and not allowed to either enter freely or banned from entering the market. In this way, new and effective forms of competition establish while at the same time consumers are protected both from excessive prices due to competition and unnecessary dangers due to safety and quality regulations.

# Conclusion

In this canon, we discussed heavily regulated markets and used the ridesharing platform Uber as a case study of how the rise of new entrants can challenge incumbents in these markets by bypassing the entry barriers imposed by regulation using technology. The taxi market was used as an example due to the heavy regulatory pressure placed on it in many jurisdictions and because of the well documented

rise of Uber and the upset it has caused in many markets around the world. The main reasons requiring regulation in the taxi market we argued are that perfect price competition will not prevail in an unregulated market, without limits on the number of operators there would be excessive supply of taxis and elements of the quality of driver are unobservable to the customers. Therefore, price, quality and supply limit regulations are put in place. Recently, there has been a trend of deregulation due to the fact that it is very costly to regulate the taxi market and due to political economy reasons. For insights into the new ridesharing market, we provided a brief history of Uber and the effect that the company is currently imposing on the market.

As a final note to policy makers, it is our view that policy and regulations should be implemented in a way as to enhance the workings of the market for taxis and ridesharing and not to protect the dominant position of the drivers. Operators in the collaborative economy should be allowed to operate in the market although their operations should not be unfettered and they should not be given an unfair advantage over the incumbents, or else, we run the risk of replacing one inefficient market structure with another.

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