

Governance and Regulation of Ride-hailing Services in Emerging Markets: Challenges, Experiences, and Implications

Daniel Oviedo
Daniel Perez Jaramillo
Mariajosé Nieto

Transport Division

TECHNICAL
NOTE N°
IDB-TN-02164

Governance and Regulation of Ride-hailing Services in Emerging Markets: Challenges, Experiences, and Implications

Daniel Oviedo
Daniel Perez Jaramillo
Mariajosé Nieto

August 2021



Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Oviedo, Daniel.

Governance and regulation of ride-hailing services in emerging markets: challenges, experiences and implications / Daniel Oviedo, Daniel Pérez Jaramillo, Mariajosé Nieto. p. cm. — (IDB Technical Note ; 2164)

Includes bibliographic references.

1. Ridesharing-Latin America. 2. Urban transportation-Latin America. 3. Local transit-Latin America. I. Pérez Jaramillo, Daniel. II. Nieto, Mariajosé. III. Inter-American Development Bank. Transport Division. IV. Title. V. Series.

IDB-TN-2164

JEL classifications: J16, N76, O32

Keywords: Ride-hailing, Regulation, Governance, Latin America

<http://www.iadb.org>

Copyright © 2021 Inter-American Development Bank. This work is licensed under a Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives (CC-IGO BY-NC-ND 3.0 IGO) license (<http://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>) and may be reproduced with attribution to the IDB and for any non-commercial purpose. No derivative work is allowed.

Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the UNCITRAL rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this CC-IGO license.

Note that link provided above includes additional terms and conditions of the license.

The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



Governance and Regulation of Ride-hailing Services in Emerging Markets: Challenges, Experiences, and Implications

Daniel Oviedo^{1*}, Daniel Perez Jaramillo², Mariajosé Nieto¹

Abstract

Between 2010 and 2019, the e-hailing industry -understood as digitally enabled transport services that connect spare capacity or idle goods with demand for mobility- has seen a total disclosed investment of USD56.2 billion (Holland-Letz et al., 2019). Some forecasts suggest an expected growth of 25% by 2025 (considering business areas such as bike-sharing, ridesharing, car-sharing, and ride-hailing), with most investments concentrating on companies originating in the United States, China, and Europe (Wolff, Possnig & Petersen, 2019). These companies have rapidly expanded their operations to cities globally, including significant investments in cities in the global south where also a fertile ecosystem for start-up investments. Entrepreneurship has given rise to homegrown companies seeking to fill gaps in the urban mobility market through data-driven innovations and adapted versions of services for the local conditions (WEF, 2019).

These investments and growing interest from stakeholders at all levels – investors, operators, users, incumbents, and decision-makers – make ride-hailing a topical concern that re-defines urban mobility and what it may mean in the future. Moreover, the development, expansion, and operation of urban mobility start-ups in the sharing economy suggest that emerging innovations for urban mobility such as ride-hailing are here to stay in one form or another. The process in emerging markets has outpaced decision-making and law-makers' ability to produce guidelines and regulations for the operation and control of ride-hailing. In Latin America, apart from Mexico and Brazil, Ride-hailing has yet to be regulated on a national scale. Currently, the window of opportunity to regulate Ride-hailing services shaping their evolution instead of just responding to it is rapidly closing as new large-scale competitors such as DiDi enter emerging markets, and new forms of app-based ride-hailing services emerge from local and international players alike.

This paper seeks to shed some light on the different considerations for regulation and governance of ride-hailing platforms in emerging markets, highlighting their positive and negative externalities. Building on an extensive review of the literature and secondary sources, we outline Ride-hailing's identified and potential effects on users (providers and consumers), incumbents, and society. Based on the welfare impact's structure, we identify the significant challenges that regulators face in understanding, monitoring, evaluating, and regulating this type of transportation innovation. Finally, the paper proposes a framework for approaching such mobility innovations from governance and regulation perspectives. In a context of exponential growth in research and innovation in urban mobility in general and Ride-hailing, a rigorous review of the literature and a critical framework for understanding governance and regulation in such services in rapidly changing contexts is a timely contribution.

Keywords: Ride-hailing, Regulation, Governance, Latin America

¹Development Planning Unit, University College London

² Inter-American Development Bank

Contents

1. Introduction	4
2. Smart mobility transitions and the sharing economy	7
3. Welfare effects, stakeholders and society	9
3.1. User-providers	10
3.1.1. An alternative source of income	12
3.1.2. Erosion of workers' rights	14
3.1.3. Conclusions	16
3.2. User-consumers	16
3.2.1. 3.2.1. Reduced transaction costs, lower prices, and moral hazard	16
3.2.2. Consumer protection and diffused liability	17
3.2.3. Conclusions	19
3.3. Incumbents	19
3.3.1. Public transit	19
3.3.2. Taxi industry / unscheduled passenger transport / pre-booked services	20
3.3.3. Unbalanced competition	21
3.3.4. Conclusions	21
3.4. Society	22
3.4.1. Economic efficiency	22
3.4.2. Regulation is a must for general rule of law and planning	24
3.4.1. Case study: Mendoza, Argentina	25
3.4.2. Market failures	27
3.4.3. Externalities: (un) desired effects on third parties	27
3.4.4. Information asymmetries	32
3.4.5. Non-competitive markets	32
3.4.6. Reduced tax base	33
3.4.7. Distributional effects.	34
4. Regulatory challenges	36
4.1. Regulating disruptive innovations	37
4.2. Uncertainty & complexity	39
4.3. Incompatibility with previous regulatory frameworks	40

4.3.1. Case study: Chile

44

5. Conclusions

45

1. Introduction

This paper seeks to shed some light on the different considerations for regulation and governance of ride-hailing platforms in Latin America³, highlighting their positive and negative externalities and providing stakeholders in different sectors of policy with updated information about the state-of-the-art in understanding, monitoring, evaluating, and regulating this type of transportation innovations.

This paper is part of a broader research agenda led by the Transport Division of the Inter-American Development Bank that seeks to better-understand new urban mobility services provided by Transportation Network Companies (TNCs) such as ride-hailing. The paper presents a review of the current landscape for regulation and governance of ride-hailing based on the current academic literature and available information for the region and makes reflections on the challenges and experiences with this type of services. The paper is strongly aligned with the Transportation Sector Framework of the Bank's Transportation Division (Roa *et al.*, 2020), which recognizes limited inclusion and sustainability of urban mobility as a key challenge in Latin America. The paper responds to the needs for knowledge and information, and the promotion of technological transformations in the sector, which are identified as key lines of action for the improvement of urban transport in the region. The paper provides concepts, methods, and evidence for addressing the challenges associated with the rapid growth of these transport alternatives in the region, aiming at both researchers and practitioners working on urban transport issues in LAC cities.

The paper has a wide scope and encompasses as many aspects as possible of ride-hailing services that are relevant for Latin American urban contexts. However, the authors recognize that the activity of ride-hailing platforms includes many dimensions that may lead to regulatory challenges in a diverse context such as Latin America. Some of such dimensions are not exclusive to ride-hailing and are common to most markets that use online or mobile platforms. The review explores specific challenges and experiences in regulation and governance of ride-hailing platforms and their most unique and problematic aspects: pricing, worker's rights, competition against traditional, legal status of Transportation Network Companies (TNCs), and economic externalities, (in)efficiencies and distributional effects. Considerations such as privacy, cybersecurity and data collection are only addressed partially in this document.

Between 2010 and 2019, the *e-hailing* industry -understood as digitally enabled transport services that connect spare capacity or idle goods with demand for transportation- has seen a total disclosed investment of USD56.2 billion, with an increase of average annual investment from USD0.2 billion to USD11.4 billion by February 2019 (Holland-Letz *et al.*, 2019). Some forecasts suggest an expected growth of 25% by 2025 (considering business areas such as bike-sharing, ride-sharing, car-sharing, and ride-hailing), with most investment concentrating in companies originating in the United States, China, and Europe" (Wolff, Possnig & Petersen, 2019). According to a 2017 report by Goldman Sachs, the ride-hailing industry will grow eightfold to USD285 billion by 2030.

³ The review emphasizes on research about experiences and challenges regarding governance and regulation of ride-hailing platforms. The review does not include arguments from stakeholders defending the idea of maintaining on-demand transport services such as ride-hailing unregulated. In the LAC context, pressure from interest groups such as conventional taxi drivers are actively pushing for the prohibition of ride-hailing platforms, polarizing debates between prohibition and regulation. The reduced scope responds to literature suggesting State intervention is desirable even within a liberal economic framework, given externalities and competition problems.

In Latin America, a fertile ecosystem for start-up investments and entrepreneurship has given rise to homegrown companies seeking to fill gaps in the urban mobility market through data-driven innovations and adapted versions of services in various sectors for the local conditions (Hewko, 2018). Moreover, within the mobility start-up sector in 2019, significant investments in e-hailing are closely related to other technological innovations such as electric and autonomous vehicles, with many investors betting on both markets as ways of pushing the boundaries of e-hailing shortly (Holland-Letz et al., 2019). Ride-hailing companies and other industry players have quickly expanded their operations to cities globally, including significant investments in Latin America and the Caribbean (LAC), India, South-east Asia, and, increasingly, Africa (ibid). These significant levels of investment and growing interest from stakeholders at all levels make e-hailing and other forms of innovation a topical concern that is re-defining urban mobility and what it may mean in the future. Moreover, the development, expansion, and operation of urban mobility start-ups in the sharing economy suggest that emerging innovations for urban mobility such as ride-hailing are here to stay in one form or another.

Since its foundation in 2010 as UberCab in San Francisco, Uber has become the most renowned ride-hailing service globally, being available in around 633 cities across the world. By the first half of 2018, the app registered 10 Bn trips, and in July 2019, the Uber platform reached over 100m monthly active platform consumers for the first time. Such rapid expansion has not always been without resistance in some specific contexts, which has led to its complete or partial ban in nine European countries and Australia's Northern territory (Shead, 2019). In this landscape, Latin America is the fast-growing and most prosperous region with the highest number of simultaneous trips, more than 25 million monthly active riders across 15 countries (Moed, 2018). In 2017 Uber worked in 26 cities in 11 countries in the region: Argentina, Brazil, Bolivia, Chile, Colombia, Costa Rica, México, Panamá, Perú, Dominican Republic, and Uruguay. Brazil is Uber's second-largest market globally with 500,000 drivers. According to the company, more than 17 million users (Darlington and Londoño, 2017), while just in Central America, there were an estimated 1.3 million users in the first semester of 2018. The top-three cities in demand are Rio de Janeiro, Mexico, and Sao Paulo.

Furthermore, Uber has developed tailored products for specific market needs in the region: Uber Lite is a less data demanding version of the Uber app – downloads use under 5 MB and can operate with less than 20MB of data – for areas where internet connection is more costly or slower. The company also launched UberMoto in Dominican Republic and Uber Angel based on the high percentage of drunk driving related accidents in Colombia. The company has two regional offices: (i) Andean, Central America and the Caribbean based in Costa Rica; and (ii) South Cone located in Buenos Aires. Additionally, the firms have excellence centers in San José and Sao Paulo and one about planned for Bogotá with 40 million dollars of investment in the next five years and projected to create 600 new jobs by the end of 2023.

Apart from Uber's primary competitor's Lyft (launched in 2012), a myriad other ride-hailing apps have emerged - Gett founded in Israel in 2010 is available in 120 cities and three countries, Bolt (Taxify) launched in 2013 in Estonia and now has more than 25 million costumers operating in 50 cities in 30 countries and Kabee, Wheely, Ola, Mytaxi, between others

(Shead, 2019) – leading to a rapidly expanding market in cities across the globe. In Latin America, Beat, Cabify and Didi are the main Ride-hailing services alternative from Uber after the merger of Cabify and Easy (See Figure 1). A Didi associated industrial tech media and investment research company reports that as of May 2019 the Ride-hailing and food delivery services in the region covered 200 million users and it is expanding quickly. Starting in Mexico and Brazil — where it acquired local player 99 for \$1 billion — in February 2019 the company was recruiting managers in Chile, Peru, and Colombia, according to job postings and a company official (Reuters 2019).

Figure 1 Ride-hailing companies self-reported presence in Latin American cities in 2019



Source: authors based on web pages of each ridesourcing service

The introduction of ride-hailing providers into emerging markets has outpaced the ability of decision- and lawmakers to produce guidelines and regulations for the operation and control of ride-hailing and other similar services. Such a challenge is not foreign to cities in LAC, where apart from Mexico and Brazil, ride-hailing has yet to be regulated on a national scale. However, the window of opportunity to regulate Ride-hailing services to shape their evolution instead of just responding to it becomes more precising as Uber and its competitors expend rapidly in the region and banning operations from one company seems to only spark the expansion of another.

Although academic literature has developed an important number of articles about regulation of ride hailing platforms, and some authors have highlighted the importance of early regulation of such volatile and evolving market, we recognize that the industry is still in an early stage of development and predicting future trends or how will TNC's adapt to new regulation is nearly impossible. In that sense, a regulatory analysis is not robust enough, but the opportunity of identifying valuable experiences and to analyze trends and experiences, can be useful for lawmakers, policymakers, and regulators worldwide.

The following sections present the main challenges and opportunities that ride-hailing bring to the region, first from a conceptual framing of smart mobility transitions and the sharing economy (section 2), and a review of the welfare effects on different stakeholders (section 3). The final sections present the regulatory challenges associated with ride-hailing services (section 4) and conclusions for urban contexts in Latin America and the Caribbean. The

different sections are also informed by case studies from different contributors that illustrate some of the challenges faced at present by cities in the region in relation to these new services.

2. Smart mobility transitions and the sharing economy

This document investigates ride-hailing governance issues in the context of the sharing economy's broader challenges and the transition to a model of mobility as a service. Although there have been some discussions about Ride-hailing services like Uber not being part of the sharing economy (Frenken & Schor, 2017) more narrow definitions restrain the complexity of the analysis. They could exclude valuable insights into Ride-hailing services' regulatory and governance issues (Acquier, Daudigeos, & Pinkse, 2017). However, we acknowledge the differences between ride sharing and Ride-hailing. While the Ride-hailing ride is mainly motivated by profit, in ride sharing there is an independent transport requirement that also includes an offer for someone else to use the spare capacity (Aarhaug & Olsen, 2018; Rayle, Dai, Chan, Cervero, & Shaheen, 2016).

The sharing economy remains a rapidly evolving, elusive concept (Miller, 2015) that has come to encompass other neighboring concepts such as platform capitalism, on-demand (Cockayne, 2016) or gig economy (Friedman, 2014; Sundararajan, 2013), peer-to-peer economy (Bauwens, 2005), connected consumption (Dubois et al., 2014; Schor, 2014, 2015; Schor & Fitzmaurice, 2015) collaborative consumption (Botsman, 2013; Botsman & Rogers, 2010a; Botsman & Rogers, 2010b), and access economy or access-based consumption (Bardhi & Eckhardt, 2012; Belk, 2014). Similarly, when talking about the sharing economy it is possible to find a broad spectrum of economic organizations, from for-profit to non-profit initiatives (Acquier, Carbone & Massé, 2016; Schor, 2014; Sundararajan, 2013).

Outside the research landscape the sharing economy concept is used in national regulatory agencies such as the US Federal Trade Commission, multilateral organizations like the OECD, in official documents of the European Commission, the European Economic and Social Committee, and the European Parliament (Codagnone & Martens, 2016) as well as by a council of corporations that are trying to understand ways how to participate in this new economic dynamic (Catalyst Companies 2017). Bringing together the most common references, the sharing economy can be defined as the use of digital platforms that allow interaction between the owner of an under-utilized asset or service and a temporary user without the transference of ownership (Benkler, 2004; Cockayne, 2016; Eckhardt and Bardhi, 2016; Frenken & Schor, 2017; Botsman, 2013; Rauch & Schleicher, 2015; Vaughan & Hawksorth, 2014).

In the transportation sector, new business models have started to shift consumer preferences towards mobility as a service instead of vehicles as products (Schulze, MacDuffie, & Täube, 2015; Watanabe, Naveed, Neittaanmäki, & Fox, 2017). Such an interpretation of mobility emphasizes on exchanges of capital, assets, and services between individuals in a system that enables sharing of otherwise underutilized resources while decreasing transaction costs (Avital et al., 2014). As part of the model of mobility as a service, ride-hailing or ride-hailing describe app-based, on-demand ride services that are provided commercially by matching supply and demand dynamically using smartphone apps to request and accept trips with private vehicles. These services are in between individual transit and mass transit, without fitting well in either category or as such present the general challenges associated with the governance of the sharing economy (Dowling, 2018).

The introduction of information and communication technologies in mobility services has been rapidly changing the rules of how transport systems work, transforming established processes and societal practices, including the position of the state within the transport system. Accordingly, Ride-hailing platforms are part of what can be understood as a smart mobility

transition a component of a much broader transition that is affecting prominent aspects of society fundamentally transforming how we access goods and services and how we travel (Marsden & Reardon, 2018). Simultaneously, there is still high uncertainty about the new configurations it would bring, how it will happen, and where the structural change it brings about is inevitable and how it will unfold is contingent on its governance (Marsden & Reardon, 2018). The transition indeed could bring a society beyond congestion, automobility and its environmental consequences, but steering the new networks of actors towards these societal goals is fundamental to achieve them (Bakker, Maat & van Wee, 2014; Marsden & Reardon, 2018; Fagnant & Kockelman, 2015). Therefore, governance analysis of the transition "is of parallel importance to research into the technological questions which exist about how to make it possible to happen" (Marsden & Reardon, 2018 p.165).

As a social process of coordination and collective solution of issues by implementing binding rules (Treib, Bähr, & Falkner, 2007; Mayntz 2009; Borzel & Risse, 2010; Knill and Tosun, 2011) governance goes beyond the power of the state to include a diverse array of networks, in space and functions that can be formed by public, voluntary, and private agents with which the state interacts. The boundaries between these different kinds of organizations can be opaque and the sustained interaction of members of networks is necessary due to interdependence for resources. Such interactions include reaching shared goals through negotiations that are rooted in trust and regulated by guiding rules that result from everyday purposes. These dynamics have a significant degree of autonomy from the state, who's role is limited to steer these interactions (Rhodes, 2011) and be an enabler stimulating others to action to ensure that the desired goal is acquired (Giddens 2018). Within this process of coordination there are diverse modes of governing that encompass sets of rules that steer interaction based on general principles about how actors are best motivated (Evans 2012). Such set of rules can be understood as regulation, a way to deal with market failures or achieve important genuine policy objectives (Edelman & Geradin, 2018).

Governance and regulation of Ride-hailing is particularly important in the context of combined disruptions from the sharing economy and from the initial stages of transition to a smart mobility system. First, because transport markets tend to produce bespoke and disintegrated systems while small-scale changes are frequent in transport policy making it a regulatory field that is more easily adaptable (Dowling 2018). Second, a positive result of the transition to a smart mobility system and a peer-to-peer economy requires a high level of collaboration and cooperation of multiple successful innovations and actors (Marsden and Reardon, 2018).

Identifying and understanding the choices that technological change brings in terms of multi-generational welfare, distributional matters, public value, and environmental sustainability is fundamental to be able to steer these changes towards agreed societal goals. Such understanding also fundamental so that minor incremental decisions does not lock processes of change into undesired trajectories for years to come (Docherty, 2018). On one hand, the current dominant automobility system is already shaping priorities and ways to govern new mobility services (Dowling, 2018). On the other, private agents whose fundamental goal is to maximize profit by increasing consumption of their service (mobility) are the ones that provide most of the mobility services transforming behaviors and practices. As Docherty (2018) highlights, smart mobility innovations are usually associated with a brighter and better future. However, the private, profitability-based nature of most new mobility providers requires considering carefully other potential pathways with widespread negative environmental externalities and distributional concerns (Docherty, 2018). Even more when in lack of regulation such organizations have yet no incentives not to reduce costs by externalizing them (Docherty 2018; Acquier, Daudigeos, & Pinkse, 2017). It is then fundamental to better comprehend the dynamics of the decentralized choices of the actors of these new networks for the state, stakeholders, and society to be part of structuring how the transformation is going to evolve.

The current early stages of these services are a window of opportunity for the state to adopt its steering role in a pro-active manner to not lose institutional capacity to engage later the transition and end up responding to events instead of shaping development (Marsden & Reardon, 2018). Eivan et al. (2015) argue that the rapid scalability of platforms in the sharing economy requires early regulatory intervention given that once they become big regulating them becomes problematic. However, regulating and governing these new forms of mobility services to achieve the desired societal goals and managing the welfare effects presents important challenges. Such a departure from the business-as-usual mobility landscape appears from the disruptive nature of the business models of smart mobility companies and the complexity and uncertainty of its development and interaction with other multiple new actors.

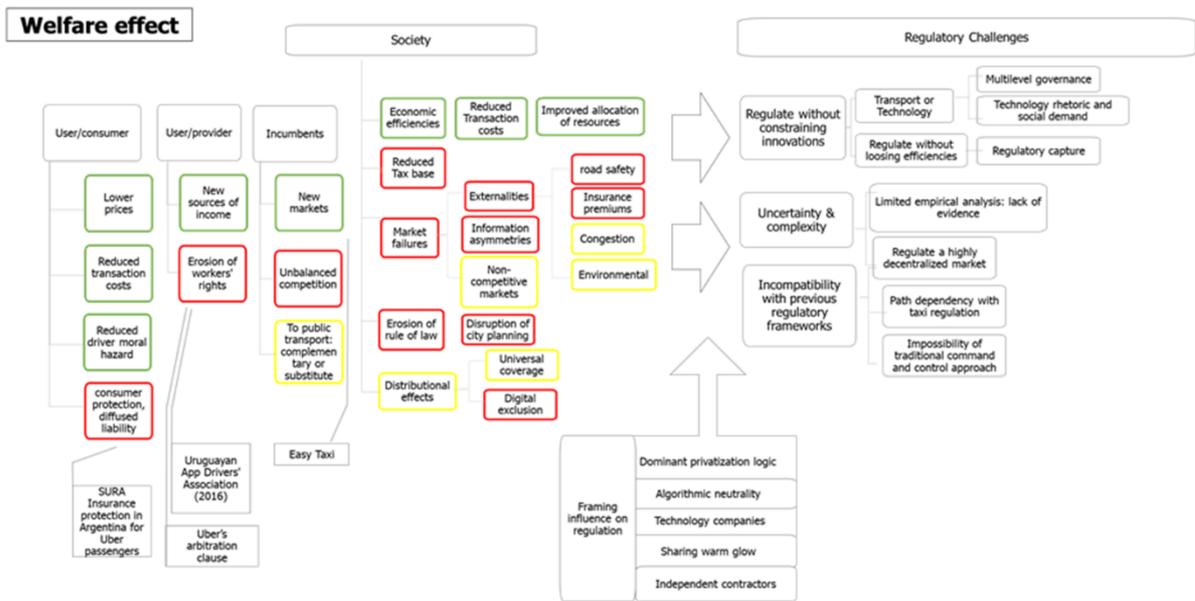
The sharing economy services in general and ride sharing in particular works by challenging incumbent providers to give consumers something new and 'better', which is why smart mobility innovations are often referred to as 'disruptive' (Miller, 2015; Marsden and Reardon, 2018 p.3). These new business models and mobility services question institutional arrangements for transportation supply (Cohen et al. 2014) particularly those of incumbents and the state (Badger 2014) but also those of users' and providers (Koopman et al., 2015; Shaheen, 2014; Zha et al., 2016). Reduced transaction costs using digital platforms and new institutional arrangements based on rating systems and algorithmic pricing are reshaping completely the interactions of users, providers and what the state needs to oversee and regulate to achieve societal goals and the highest possible welfare effect. According to Davis (2015), smart mobility innovations, such as ride-hailing platforms, will produce a collective action problem as its positive outcome depends mainly on the steering role of the state to coordinate and oversee the network of competing private firms and users of smart technology guided by their singular priorities.

Systems and networks of transport governance that are already weak are being further disrupted by several new and powerful players, such as the global computing giants and agile service providers whose business models depend on creative destruction of existing regulatory frameworks (Marsden & Reardon, 2018). Uber's outmaneuvering of governments and regulators is an excellent example of the challenges that regulating Ride-hailing services present if the full range of impacts is going to be considered and the benefits of the disruption are going to be weighed (Dudley, Banister, & Schwanen, 2017; Edelman & Geradin, 2018). Issues that emerge with the disrupting operation of unregulated Ride-hailing platforms go from market failures related to the nature of this new market to broader societal concerns such as environmental sustainability, congestion, and the rule of law (Aarhaug & Olsen, 2018; Edelman & Geradin, 2018).

In sum, appropriate regulation of Ride-hailing is fundamental first given the size and rapid expansion of these services. Second, because of the economic efficiency losses – higher consumer surplus, improved allocation of resources and reduced transaction costs – that banning Ride-hailing would entail, even more when prohibition has in most cases failed to stop users from these services. Finally, and most importantly regulation allows Ride-hailing services to operate legally and provide the benefits of economic efficiency they offer while competing fairly with existing providers (Edelman & Geradin, 2018; Witt, Suzor, & Wikström, 2015). Furthermore, the importance of regulation beyond prohibition becomes even more apparent when incumbents are industries with high regulatory overheads and barriers to enter that are competing on an uneven plain while users (both consumers and providers) may not be well protected and can also embrace efficiencies related to the operation of business through software platforms (Witt et al., 2015).

3. Welfare effects, stakeholders, and society

Figure 2 Ride-hailing effects on stakeholders and society and its regulatory challenges



Source: authors based on literature review

Although recognized as disrupting and part of a substantial innovation that allows to introduce idle resources to the market, for the most part Ride-hailing services mediate a monetary exchange for a service that is not entirely unlike longstanding commercial relationships (Eckhardt & Bardhi, 2015). Moreover, the critical efficiencies come from the market structure that platforms facilitate, including casual service providers who avoid a fixed cost and, often regulation associated with traditional service. As such, any attempt to regulate Ride-hailing services should start by understanding and negotiating liabilities across the stakeholders while considering the effects on third parties. Market regulation, consumer protection and minimum service standards to protect socially necessary services are some examples (Pangbourne et al. 2018). Any policy will need to balance the competing interests of the different stakeholders to maximally benefit society. (Codagnone & Martens, 2016; Edelman & Geradin, 2018; Witt et al., 2015; Wolff, Possnig, & Petersen, 2019).

The operation of Ride-hailing services involves three key stakeholders: two types of users – consumers and providers and incumbents, that include public transit and other non-schedule passenger services – taxis, car, and van hiring services. **Error! Reference source not found.** shows the fundamental positive, adverse, and yet-to-be-seen ride-hailing effects on these sets of stakeholders, third parties, and society. Although empirical evidence about Ride-hailing services' welfare effect is still limited, sometimes inconclusive, and highly concentrated in the US, the following sections explain the effects for each of the stakeholders and society based on what the literature has found so far.

3.1. User-providers

The first type of user of Ride-hailing platforms are the providers of the services, i.e., the drivers. Worldwide for the most prominent Ride-hailing platform drivers amount to 3.9 million (Dobush, 2019), and 1'162.900 in LAC in 2019. However, it is essential to clarify that "the raw number of participants indicates a far greater size than their actual economic weight"

(Mishel, 2018; p.2). While there are 833,000 Uber drivers in the US a year, when weighed by weekly hours worked there are 90,521 drivers who work full time. Such full-year equivalent drivers account for 0.07% of national employment (Mishel, 2018). Despite its relatively small size there was a clear tendency of this percentage to go higher with a monthly growth rate above 100% in the fall of 2015 (Farrell & Greig, 2016) and the ILO recognizes the potential of what they call the gig economy to change how work is organized and performed and the quality and content of jobs (Johnston & Land-Kazlauskas, 2019). As an example, in Santiago metropolitan region, the percentages are slightly higher already: the sum of Uber and Cabify full time drivers has reached the same number of traditional taxis and they represent 1.13% of employed people and 5.3% of the self-employed population (Gutierrez, 2018). In addition, Uber's IPO and the concomitant drivers' strikes around the world and their employment rights claims – taken to legal action in some countries like the US, the UK and Australia – have brought to the center of the debate the welfare effects of Ride-hailing for providers (Butler, 2018; Paul, 2019; Karp, 2019; Sainato & Paul, 2019).

To understand and estimate the welfare effects on providers it is important to establish their demographic and socioeconomic characteristics. In the United States, where Ride-hailing was born and based on data from the predominant Ride-hailing firm (Uber), Hall & Krueger (2018) establish that Uber's drivers age and education level is more alike to the general working population than to traditional taxi drivers and the percentage of female drivers (14%) is almost double than in other similar markets. In the US Uber drivers are more likely to have children at home than taxi drivers and chauffeurs and 71% of the drivers reported to be supporting financial dependents. In CDMX, one of the few cities in LAC that has published information about Ride-hailing drivers' demographics, out of approximately 249,000 providers just for Uber 5% are female. The low percentage is halving the proportion of women in general transport services, but it is still higher than the percentage of female taxi drivers (0.5 to 2.5 per cent) (Eisenmeier, 2018). An estimate of 40 per cent of the active drivers were unemployed before, 99,600 drivers that account for 5% of Mexico's 2017 unemployed population (Eisenmeier, 2018). In Panamá, according to Uber Newsroom (2017) out of 800,000 drivers 63% are heads of their families and 400,000 depend on Uber as their only source of income. In Costa Rica, that in January 2019 had 783 thousand users according to Uber, 22 thousand families have the app as a source of income. In Colombia, the Ride-hailing platform reports 88 thousand drivers in 12 cities, more than four times than those reported in 2015. In 2016 6.8% of Uber drivers in Colombia were women (Uber Newsroom, 2016) with Medellín being the city with the highest percentage (10%). In Chile, according to the Nacional Productivity Commission 65% of Uber drivers' have secondary studies and 9% are women.

Ride-hailing services are based on the premise that independent drivers, with their own vehicle provide a transport service to a consumer while the platform works as an intermediary to connect them. Similarly, to other sharing economy services, drivers that participate in ridesourcing platforms are not classified as employees but as independent contractors. This condition provides flexibility for providers while bringing an alternative or additional source of income (Hall & Krueger, 2016). However, being independent contractors, drivers are not covered by workers' rights such as health, retirement plans, unemployment insurance or vacations (Rauch & Schleicher, 2015; Kuttner 2013, De Stefano 2016, Aloisi 2016, Rogers 2015, Hill 2015, Scholz 2017) and are also not subjects of the right to bargain collectively (Johnston & Land-Kazlauskas, 2019). While the positive value of an alternative or additional source of income is straightforward, the flexibility of this source of income is twofold and the loss of workers' rights is a clear disadvantage. Indeed, some of the success on recruiting drivers is attributed to their launch after the economic crisis in the US, providing an income opportunity for the growing numbers of unemployed. Accordingly, Farrell and Greig (2016) find strong evidence to connect adverse shocks in other employment sources to increased supply of work to online platforms such as Lyft and Uber. In Brazil and Argentina, the growth of Ride-hailing drivers has been connected to the countries' economic downturns (Darlington &

Londoño, 2017; Raszewski et al. 2019) as it creates work opportunities that would otherwise not exist.

Regarding the loss of workers' rights, it can be measured by the monetary value of these benefits. In the US, for instance, this would amount to \$2.56, the difference between an Uber's driver hourly income after Uber fees and vehicle expenses (\$11.77) and what it would be if she also deducted the value per hour necessary to get a modest benefit plan (\$9.21) (Mishel, 2018). If driving is a full-time job (40 hours a week), such a difference amounts to around \$435 a month.

Finally, the flexibility that Ride-hailing providers have has two sides. On one hand, adaptability to demand and other daily activities has been a factor of attraction for Ride-hailing drivers that are primarily working part-time hours (Chen et al. 2017) and as a complementary economic activity (Hall & Kruger, 2016) in the US. For countries in LAC where there is available data, like Chile and Mexico, this tendency is lower, with a third of the drivers working full time (Uber, 2015; Gutierrez, 2018; Eisenmeier, 2018). Furthermore, having this ability to adapt to daily shocks is rare for lower-wage, lower-skill workers (Chen et al. 2017). On the other, flexibility becomes a condition necessary for some drivers to make enough profit, given that they need to adapt to the changing demand (Collier et al. 2017) and it brings other adverse effects such as inconsistent income, unpredictable scheduling, and unreliable long-term employment prospects (Johnston & Land-Kazlauskas, 2019). Evidence in Mexico points to the dual nature of the flexibility Ride-hailing providers have. While a 29% of Uber's drivers work more than the standard working week (45 hours) and only one third of the drivers works part-time (Uber, 2015), Eisenmeier (2018) findings from 32 interviews with CDMX Uber drivers show the positive value that Ride-hailing providers attach to having flexible hours. However, the latter is limited when the driver does not own the car and has a limiting arrangement with the owner or has entered a loan to have a vehicle to drive, common situation in Mexico, Brazil, and Colombia (Eisenmeier, 2018; Sadré, 2016; Venegas Loaiza, 2019). Such financial obligations not only change the amount of income available to the driver but also how flexible her working hours can be (Eisenmeier, 2018).

3.1.1. An alternative source of income

Ride-hailing represents an opportunity to obtain compensation for transporting people in a private vehicle. This return to providers depends on the number of hours they work, the fixed costs of operating and maintaining the vehicle, and the percentage taken by the platform, better known as fee or commission. Empirical evidence about the economic value of such an opportunity, mainly in the context of US cities, has either focused on comparing it to traditional taxi wages or on estimating hourly net wages for Ride-hailing platforms.

Empirical analysis shows that Uber's drivers gain from the opportunity to drive without leasing a medallion (Angrist, Caldwell & Hall, 2017) and have higher hourly earnings than traditional taxi drivers (Chen, Chevalier, Rossi, Oehlsen, 2017). Cramer and Kruger's (2016) results explain Uber drivers' higher hourly earnings by showing the higher capacity utilization that the dynamic pricing and better driver-passenger connection allow for. Based on a survey and administrative data, Hall and Kruger (2015) find that Uber's main attractors for drivers are flexibility, level of compensation, and non-variability in hourly earnings based on the number of hours worked. The study also finds that Uber drivers' effective hourly wages are almost equal to taxi drivers' earnings once overheads have been accounted for. According to the Economic Policy Institute (2018), the median wage after expenses and fees to make it comparable to a regular employee's wage is \$9.21 an hour. This is substantially less than the \$32 average hourly compensation for a private-sector worker and less than the \$15 per hour compensation of the lowest-paid primary occupation (i.e., service workers) (Mishel, 2018). The latter was established as minimum wage in New York to cover Lyft's and Uber's drivers at the

end of last year (O'Brien, 2019). In the UK, Berger et al.'s (2019) study – albeit with Uber's participation – estimates that after covering vehicle operation costs and Uber's service fee, the median London driver earns about £11 per hour spent logged into the app. In contrast, the Independent Workers Union of Great Britain (IWGB) analysis suggests that Uber drivers in the UK earn an average of £5 an hour, well below the legal minimum wage of £8.21 for over 25s (Butler, 2019).

Information in LAC cities is still limited and mostly comes directly from Uber reports, blogs, or newspapers. Only in Chile Fielbaum & Tirachini (2019) have information from a 238 Easy, Uber y Cabify drivers' survey mainly in Santiago showing a considerable difference between drivers' stated incomes (around \$2800), authors' high and low estimations (\$3072 and \$3974) and companies' promises (\$8.823). Within this sample, more than half do not have another job, and a similar percentage says that they plan to work as drivers for an indefinite amount of time.

Ride-hailing driver's earnings estimations also variate widely in Mexico. However, the widespread switching of taxi drivers to Uber could indicate that driving for Uber represents an attractive income opportunity (Eisenmeier, 2018). The variation responds partially to whether the driver owns the car or not. Eisenmeier (2018) estimates that 60% of the drivers do not own the car they drive and pay around 25% to 47% of their earnings as rent to the owner (between MXN 1,500 and MXN 2,800 per week). Based on informal interviews, Lagarreta (2018) estimates that drivers that rent their vehicle and work around 11 hours daily, after paying Uber fee, the owner of the car, gas, and other expenses, can earn between Mex\$9 and 12 thousand (USD465 – 619). When the driver owns the car, the estimated earnings after all expenses are between 15 and 20 thousand Mexican pesos (USD772 – 1030). According to a poll by the local financial newspaper, an Uber driver can earn between US\$540 and US\$720 monthly, which is like a professional's monthly wage in Mexico (El Financiero 2015). Compared to Mexico's official monthly minimum wage, USD162 for a 20-day working month, drivers would be getting around four times and up to ten times more if they own the vehicle. Nevertheless, the high variation and informal nature of the arrangements between drivers and vehicle owners make it hard to estimate Ride-hailing providers' average wage in Mexico (Eisenmeier, 2018).

In Panamá, according to Uber, as of 2017, 50% of the drivers were wholly dependent on the app as their only source of income; this amounts to around 400,000 people. Uber's advertised potential income for drivers is \$1200 (working 7 to 10 hours 6 days a week), more than double the countries' average minimum monthly wage (\$550). In Brazil, while a taxi driver in 2015 had a monthly net income of R \$2,675.42, with a workload of 12.8 hours per day (TaxiMachine, 2019) (\$121 daily with a 20-day month) and Uber driver estimated net income in Sao Paulo is R \$54.27 daily (Uber, 2019).

Country	# Cities	Drivers	% Full-time workers	Earnings (National currencies)	Country's minimum wage (national currencies)
Argentina	3	80,000	40% ⁴	\$250 - 350 h ⁵	\$129.25h without retirement
Bolivia	2	-		\$37 h ⁶	\$10.88h
Brazil	100	+ 600,000	+50%	Sao Paulo: \$152 - 200d; \$3.06 – 4.24h (gas, data, insurance, oil & wash) ⁷	\$33.27
Chile	19	70,000 25,000 ⁸	+33% ⁹ 45%	Santiago: \$5,000 – 3,704h (gas, oil & insurance) ¹⁰	\$1.488h
Colombia	19	90,000 ¹¹		Bogotá: \$6,000 h (gas, data, maintenance) ¹²	\$3.450h
Costa Rica	3	22,000			
México	50	250,000	60%	\$61.98 h (gas)	\$12,8h
Panamá	1	6,900 ¹³	50%	\$5.8 h \$1.88 (gas, tolls & car wash) ¹⁴ .	\$1.22 – 2.36
Perú	3	32,000 ¹⁵		S/141.6 d (gas)	S/35.41
Dominican Republic	2	12,000 ¹⁶			

h: hourly; d: daily

3.1.2. Erosion of workers' rights

Among the most challenging legal issues presented by this societal shift is whether certain sharing platform workers should be classified as employees or independent contractors. The positive rhetoric of autonomy and flexibility has been attached to the status of independent contractors of drivers in all Ride-hailing apps, but early on, lawsuits and protests highlight labor concerns (Hill, 2015; Roose, 2014; Rauch & Schleicher 2015). Drivers have sued most prominent Ride-hailing platforms or the subject of claims and strikes for undermined working standards (European Parliament 2015; Rauch & Scheleicher 2015; Butler, 2018; Paul, 2019;

⁴ <https://www.iprofesional.com/negocios/279610-ley-ingreso-trabajo-Salida-laboral-40-de-los-conductores-de-Uber-en-Argentina-tiene-a-la-app-como-unica-fuente-de-ingresos>

⁵ <https://www.ganadineromanejando.com/cuanto-gana-un-chofer-uber;>
<https://www.infobae.com/economia/2017/04/07/el-chofer-que-mas-gana-de-uber-supera-por-mas-de-10-000-el-sueldo-de-un-bancario/>

⁶ https://www.youtube.com/watch?v=5G_q2tw5jUg

⁷ [https://freesider.com.br/produtividade-e-gestao/descubra-se-ainda-vale-a-pena-trabalhar-de-uber-agora-em-2018/;](https://freesider.com.br/produtividade-e-gestao/descubra-se-ainda-vale-a-pena-trabalhar-de-uber-agora-em-2018/)
[https://uberbra.com/ganhos-diaros-de-um-uber/;](https://uberbra.com/ganhos-diaros-de-um-uber/)
[https://freesider.com.br/produtividade-e-gestao/descubra-se-ainda-vale-a-pena-trabalhar-de-uber-agora-em-2018/;](https://freesider.com.br/produtividade-e-gestao/descubra-se-ainda-vale-a-pena-trabalhar-de-uber-agora-em-2018/)
<https://vejasp.abril.com.br/cidades/uber-teste-motorista-um-mes/>

⁸ (Gutierrez, 2018) <http://www.economiaynegocios.cl/noticias/noticias.asp?id=448480>

⁹ Ibid supra

¹⁰ <https://www.autofact.cl/blog/mi-auto/actividades/cuanto-se-gana-en-uber>

¹¹ CNN Español, 2018

¹² <https://conductorescolombia.co/Uber/cuanto-gana-un-conductor-de-uber-en-bogota/>

¹³ Revista Summa (11 September 2019) <https://revistasumma.com/uber-se-consolida-en-panama/>

¹⁴ [http://www.telemetro.com/nacionales/Conductores-Uber-denuncian-generando-ganancias_0_1188481517.html;](http://www.telemetro.com/nacionales/Conductores-Uber-denuncian-generando-ganancias_0_1188481517.html)
<http://uberpanama.blogspot.com/>

¹⁵ Redacción El Comercio (2019) <https://elcomercio.pe/economia/negocios/uber-planearia-ofrecer-servicios-scooters-electricos-peru-noticia-616792>

¹⁶ (El Dinero, 2018)

Karp, 2019; Sainato & Paul, 2019). In the UK, several strikes organized by the IWGB have been staged to claim better payment and conditions from Ride-hailing companies. In the last one, held worldwide in the cities where Uber operated just before its stock market flotation in May 2019, UK drivers were asking for an increase of £2 per mile, to reduce the commission from 25% to 23% and for drivers to be recognized as workers who would guarantee minimum wage, paid holidays, and other benefits (BBC, 2018; Butler, 2019).

However, the question is not as simple as classifying Ride-hailing providers as workers. First, while legally platform drivers are independent, there is apparent economic subordination (Carboni, 2016; Redfearn III, 2016). Second, part of the attraction to the activity comes from the flexibility it allows for the drivers (Chen, Chevalier, Rossi, Oehlsen, 2017; Hall & Krueger 2015). Third, not classifying drivers as employees reduces operation costs and legal liability for Ride-hailing companies (Carboni, 2016), as it shifts risk from employers to workers (Rauch & Schleicher 2015). Accordingly, Uber stated maintaining its drivers' status as independent contractors within its risk factors in its prospectus for its IPO. In sum, as Eivan et al. (2015) argue, based on theoretical and empirical economics, the labor effects of the sharing economy platforms remains an open empirical question.

Divergent resolutions of driver's claims show how complex it is to determine Ride-hailing platform drivers' welfare effect in terms of workers' rights. In June this year, the Australian Fair Work Ombudsman ruled that Uber's drivers are not employees, referring to a minimum condition for someone to be an employee is that he/she performs work when the employer demands it and not only when and for how long he/she wants (Karp, 2019). In contrast to the National Labor Relations Board opinion about Uber drivers not being subject to traditional labor protections because of their status as individual contractors (Paul, 2019), the AB5 bill in California – passed in September 2019 – makes business reclassify workers by a three-part test to determine if they qualify as contractors or not: (i) the company must not exert control over how the worker performs his/her tasks; (ii) the contractor's work must not be central to the company's business; and (iii) he/she has an independent business in that industry (Paul, 2019; Reuters San Francisco, 2019). So far, in the UK, Uber has lost its first appeal against an employment tribunal ruling about its drivers having to be classified as workers (Butler, 2019). Similarly, in April this year, the European Parliament approved new rules to establish minimum rights to protect on-demand platform workers, directly mentioning Uber as an example. More predictable hours, compensations for canceled work, being able to reject a gig, and receive payment for training hours are some of the new conditions that apply to those who work more than three hours a week (BBC Europe, 2019; Dobush, 2019). So far, public, and regulatory pressure has brought the leading Ride-hailing company to expand health insurance to more than 150,000 drivers in 21 European countries.

In LAC, Uber does not cover drivers beyond accidents, and only since the driver accepts a ride and until it finishes, if an accident occurs while the driver is waiting for a request is it not covered. As of the beginning of 2019, Mexico was the only country with officially regulated Ride-hailing, which focuses most of the debate in the region on formalizing its operations and traditional taxis' opposition to these services instead of drivers' rights. However, recently, there have been more episodes related to works rights in the region. For instance, by unanimous decision, Brazil's Superior Court ruled that drivers are independent workers overruling a previous ruling from a local court. The decision was explained based on the lack of a hierarchic relationship between the drivers and the Ride-hailing app, the casual nature of the services provided, and the absence of preestablish schedules or salaries (Moura & Lima, 2019). According to Uber, this ruling reinforces 250 lower court decisions, confirming no labor tie between the Ride-hailing app and the drivers (Moura & Lima 2019). In contrast, in Chile, some of the changes made by senators to the so-called Uber Law that is under debate in the Senate intend to establish that there is a working relationship between the drivers and the platform

while platform lobbies argue that the law has lost its focus and request to deal with labor issues separately (Capital, 2019).

3.1.3. Conclusions

Regulating Ride-hailing to assure the benefits of an alternative flexible source of income without losing long recognized workers' rights depends on such rights' structure. In welfare countries where health, unemployment insurance, and other social benefits are not dependent on employment, priority can be given to the benefits of additional options to earn a living while recognizing users that are indeed full-time workers and not occasional 'partners'. The latter can also be the departing point in countries where employment status is attached to most social benefits such as health and pensions. In LAC, a better understanding of each city's market is the first step to design regulations that ripen the benefits of these new services in terms of economic growth without creating more job insecurity.

3.2. User-consumers

Brazil, Colombia, and Mexico's number of consumers of Ride-hailing services has reached six digits, with a reported 22 million users (Banamericas, 2019), 2.2 million (CNN Española 2018), and 8 million (Uber, 2018), respectively. Including Beat, Didi, and Cabify, close to 14% of the population in Mexico uses Ride-hailing services as a means for transport. In other Central American countries where there is information there are close to one million and a half users reported: Panamá 285.000 (Revista Summa, 2019), Costa Rica 783.000 (La República, 2018), Dominican Republic 345.000 (El Dinero, 2018), El Salvador 33.000 (Uber, 2017). How much users spend varies highly, and there is still limited information. However, there are estimates that in Mexico, users spend up to USD800 a year on mobility services like Didi, Uber, or Cabify, and on average, the expenditure is USD83.97 (Gutierrez, 2019). Like in Uber's hometown, users in Peru and Chile are predominantly young people, around 34 years old (Uber, 2017) and between 18 and 29, respectively (Tirachini & del Río, 2019). In Santiago, 28% of Ride-hailing users are part of a household with a monthly income between \$USD863 and 1777 (equivalent to two and four minimum monthly wages in 2017), and 24% of Ride-hailing users have a household income between \$USD1777 and \$1805 (Tirachini & del Río, 2019).

3.2.1. Reduced transaction costs, lower prices, and moral hazard

Ride-hailing users' rapid growth on the demand side clearly shows that these services bring positive changes for their consumers. Beyond the economic indicators that consumer preferences favor these services, there is some empirical evidence about reduced and more reliable waiting times (Rayle, Dai, Chan, Cervero & Shaheen 2016; Zha et al. 2016) increased accessibility through denser networks of available vehicles and with flexible hours which opens access to new activities and opportunities, reduced information asymmetry about prices and quality (Aarhaug & Olsen, 2018; European Parliament 2015), lower costs and reduced liability compared to ownership (Eckhardt and Bardhi, 2015), competitive prices and convenient features such as splitting the fare (Zha et al. 2016; Esteves, 2015).

For instance, in San Francisco, Rayle et al.'s (2016) analysis of a 380 Ride-hailing users survey and a San Francisco Municipal Transportation Agency's survey of taxi users shows that while only 35% of residents reported they wait less than 10 minutes for a taxi on a weekday during the day, 90% of the Ride-hailing users said they wait less than 10 minutes always. In New York, denser networks of vehicles to hire result from Ride-hailing vehicles' entry while street market services continue to operate albeit becoming less critical (Schaller 2017). In terms of reduced information asymmetries about prices and quality, while street hail and taxi rank services entail a temporary monopoly of supply, Ride-hailing services allow the user to go beyond the peer-to-peer relationship driver has an information advantage (Aarhaug & Olsen,

2018). In Brazil, competition between Ride-hailing services (99 Taxi, Easy Taxi, and Uber) brought reduced prices and offers for users (de Souza Silva, Oliveira de Andrade, & Alves Maia, 2018). In sum, there is clear evidence that the introduction of Ride-hailing services has increased consumer surplus (Cohen, Hahn, Hall, Levitt, Metcalfe, 2016). However, the question remains if, from a societal perspective, the maximization of mobility – in this case, related to motor vehicles – is a de facto purpose (Docherty 2018).

3.2.2. Consumer protection and diffused liability

According to Codagnone and Martens (2016), consumer protection's fundamental concerns are divided into service quality issues and liability. According to the authors, while the latter requires third-party insurance contracts, reputational ratings can serve as a means of self-regulation. While quality control through ratings could be a way to replace certification schemes for providers, according to Rauch & Schleicher (2015), it has raised concerns about consumer protection. It does not solve the limited availability of information the services provide to consumers about risks.

Ride-hailing companies use rating schemes and information technology to ensure the service's quality, partially replacing traditional regulatory schemes that have set minimum service requirements such as maximum mileage or climate control in the vehicles to reduce uncertainty for the clients. For instance, in Colombia, taxis must pass a review that certifies the vehicles' minimum mechanical, environmental, and safety conditions such as their bodywork, brake status, steering, suspension, visual and audible signal system, tires, and safety glass assembly. In CDMX, vehicles more than ten years old must be replaced (SEMOVI, 2019). In addition to users' quality control for those noticeable characteristics during a ride, most Ride-hailing platforms also have implemented requirements for the vehicles that are allowed to register. These vary depending on the city or country.

Furthermore, by sharing the rides' GPS route path with customers, Ride-hailing provides extra information that allows customers to verify if the driver took the shortest route and introduce a complaint if necessary (Koopman et al., 2014). So far, while the lack of monitoring from any public authority of the vehicle's requirements in Ride-hailing platforms raises concerns about consumer protection, it has also been argued that traditional minimum standards regulations are inefficient from a consumer surplus perspective. Some users would likely be happy to accept lower quality vehicles for a lower price. Consequently, if there is no price to each requirement, regulators and consumers will not see the rules' actual economic costs (Edelman & Geradin, 2018).

In contrast, the rating system puts quality controls of the services directly in the users' hands. Wallsten's (2015) results in New York and Chicago point to a small (-0.002 in NY and 0.008 in Chicago) but statistically significant ($p < 0.01$) negative correlation between Uber demand and the number of taxi complaints by consumers. These results are consistent with previous studies about other markets that show that increased competition reduces complaints from customers (Beard, Mayo, and Macher, 2015). In this case, complaints are assumed to be related to service quality, pointing to a likely taxi service improvement as a reaction to Ride-hailing competition (Wallsten, 2015).

Geolocation and routing, pricing, vehicle type, name, and a picture of drivers are added information for Ride-hailing users. Increased access to such characteristics reduces some fundamental asymmetries inherent to other kinds of hailing services in cities. Besides, rating systems in Ride-hailing applications bear information about the service quality that reduces another form of information asymmetry in a more direct way than centrally required regulations such as certifications and licenses, mainly when there are loose enforcement and control. A key point in ride-hailing is the increased social control created through the rating systems

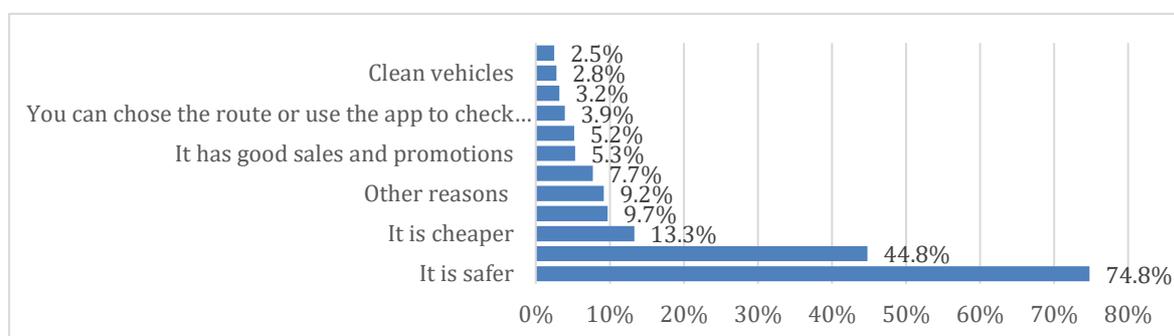
(Aarhaug & Olsen, 2018). However, rating systems also have limitations of veracity. They can only be applied to those service characteristics that typical consumers notice (e.g., drivers' and passengers' behavior or state of the vehicle) and not as much for dimensions that are not apparent to the naked eye (safety of the vehicle or level of emissions).

Regarding the reliability of user's opinion, scholarship on the sharing economy has identified the following limitations: (i) fear of retaliation: truthful negative information is a public good with no benefit to a contributor creating a tendency that might minimize negative reviews (Cannon & Chung, 2015; Eivan et al. 2015; Edelman & Geradin 2016); (ii) costumers knowing the cost of a bad rating for the drivers (Witt et al. 2015); (iii) cognitive biases: ignoring relevant information, relying on irrelevant information, overweighting an unimportant but salient feature of a problem (Edelman & Geradin 2016; Codagnone & Martens 2016); and (iv) patterns of discrimination (Witt et al. 2015). These issues reduce ratings' reliability and accuracy as systems replace licenses and certifications to assure quality standards. However, they do not eliminate the improvement in access to information from the parties involved.

Some scholarship argues that there are mechanisms to solve the limitations of rating systems as self-regulation mechanisms. For instance, Edelman & Geradin (2018) propose minimum standards to protect users from those problems that are not captured through ratings. Acquire et al. (2017) argue that by leveraging peer evaluations and other monitoring properties from digital platforms such as digital tracking and insurance contracts, it would be possible to reduce the risk of moral hazard in all hailing services. The discussion is critical in the context of Uber's claims about achieving all things existing regulatory systems do through ratings and the pre-screening process (Witt et al., 2015). Rating systems are designed to build a more scalable regulation model compatible with Ride-hailing platforms' high scalability while carrying the narrative of infusing the system with trust (Botsman & Rogers, 2010; Shirky, 2008). Accordingly, Saheen (2014) argues that most regulations for Ride-hailing services have been limited to codify the standards and practices that were already put in place by ride-hailing firms.

Accordingly, in Chile, according to an online survey after 'convenience to pay' and 'price', 'transparency of the tariff', 'possibility to identify the driver' and 'rating the service' are the predominant (more than 50%) chosen reasons by Uber's users to use Ride-hailing (Tirachini, 2107). In Costa Rica, generally, almost a third of the population uses the service between two and five times a week to commute, go out at night-time, visit family and friends, go to the doctor, or the day they cannot use their vehicle because of restriction. More than half the users manifest that they use Ride-hailing apps because of the lower prices and safety reasons (Agüero, 2017). In Peru, safety is also the main reason people use Ride-hailing services, with 74.8% of the respondents choosing it (Figure 3).

Figure 3 Reasons why people choose to use Ride-hailing services



Source: Compañía Peruana de Investigación de Mercados (CPI), 2016

3.2.3. Conclusions

So far, empirical studies show that Ride-hailing's use of information technology to provide transport services brings several and, in some cases, substantial benefits for consumers, such as increased accessibility and reduced asymmetries of information between driver and rider. Quality control through ratings provides a self-regulatory scheme that has the potential to increase overall consumer surplus. However, traditional consumer protection regulations also account for features of the services that cannot be judged by the rider's bare eye. In some cases, they are linked to broader societal goals (e.g., reduce pollution and CO₂ emissions). Consequently, there is a need to complement the self-regulatory function of rating schemes to account for those hidden characteristics, particularly those related to undesired outcomes for non-users.

3.3. Incumbents

3.3.1. Public transit

The main effect that Ride-hailing has on public transport depends on users' choices that can either be to substitute public transit rides or to complement them. The main risk of widespread substitution for the systems of public transport is fundamentally the societal support for its provision as demand for these services declines, which also undermines their financial viability (Marsden & Reardon 2018). However, currently whether Ride-hailing is already or is going to develop into a substitute or a complementary service to public transit remains a highly context specific issue, dependent on locations and services (Hall, Palsson, & Price, 2018). What is clear is that Ride-hailing as an addition to a city's mobility options influences public transit functioning.

Rayle et al. (2016) establish that for San Francisco at least half of ride-hailing trips replaced modes other than taxi, including public transit and driving while Clewlow & Mishra (2017) find that ride hailing services act as direct substitute for bus and light rail services and complement to commuter rail in the United States. In contrast, Graehler, Mucci and Erhardt (2018) establish an expected 1.3% decrease on heavy rail ridership and 1.7% reduction in bus use as the effect each year after Ride-hailing services enter a market. Sadowsky and Nelson (2017) analysis in stages of entrance of Uber and then Lyft to US cities, points to an initial complementary relation of ride hailing with public transport that with the entrance of a second platform becomes more a substitutive one. Hall et al. (2018) findings about Uber concord with the complementary relation in this case with the average transit agency. However, the authors also find that there is heterogeneity in this complementary relation, particularly dependent on the size of the city and of the transit agencies. In Toronto, Young and Farber (2019) find that ride hailing is too small to have a significant effect on other more substantial modes of travel, although for specific market segments such as wealthy younger generation has significant impact reducing taxi rides. Apart from empirical studies, there is one example of a city in the United States that replaced two bus lines with Uber and Lyft rides claiming better cost-efficiency (Brustein, 2016).

Although still limited, the available evidence in Latin American cities point to a substitutive Ride-hailing – public transit relation with relatively small impact in terms of public transport demand. Tirachini and del Río (2019) found that in Santiago de Chile Ride-hailing is mainly substituting taxi and public transit trips with 11 rides that replace use of public transit per each ride that has a complementary use. In this city, according to Santiago's 2012 Origin – Destination survey public transit trips account for 29% of a total of more than 18 million trips in a working day. Private means represent a similar percentage with 28% while non-motorized are predominant (38,5%). In Brazilian cities, de Souza et al. (2018) found that most Ride-hailing trips are replacing taxi and public transit. However, the authors also point to the limited effect that this change in behavior can have on public transport demand given that the part of

the population that uses individual paid transport is very small. Similarly, Haddad et al. (2019) analysis of substitution patterns for Ride-hailing in Sao Paulo shows that only 2,8% of the public transit and private car trips would be absorbed by e-hailing entrance to the market. Both public and private motorized trips in Sao Paulo Metropolitan Region (SPMR) account for 67% of the total 42 million daily trips in the city, with collective transport trips accounting for 36% and individual for 31% (Metrô-Pesquisas, 2017). Compared to 2007 Origin – Destination survey, the percentage of trips in public transport in SPMR has not changed while the percentage of trips in private motorized modes has increased by 1.5%. In CDMX according to the O-D survey two thirds of the trips in the region are done in public transport (74% collective transport, 28.7% metro and 10.5% taxi) (Deydén, 2019).

3.3.2. Taxi industry / unscheduled passenger transport / pre-booked services

In contrast with the relation between Ride-hailing and public transit, Ride-hailing services are clearly a substitutive of taxi (Rayle et al., 2016) and other individual paid transport services, such as private car rental and unscheduled passenger transport¹⁷. Without many empirical studies about the actual proportion of the market that has been taken by Ride-hailing companies, it is still clear that its arrival means that large parts of the established taxi industry need to change their business model, accept being side-tracked or get a form of regulatory protection (Aarhaug & Olsen, 2018; Kim et al. 2018). The descriptive data of pre and post Uber taxi's revenues and value of medallions for San Francisco, District of Columbia and New York suggest that the entry of Ride-hailing services has had a negative impact (Bond 2015). Berger et al. (2019) find that in USA metropolitan areas where Uber is operating relative earnings of taxi drivers have decline on an average of 10 percent but with no significant effects on the labor supply of taxi drivers. In Taiwan, Uber entry is estimated to have reduced by approximately 12% taxi drivers' revenues and up to 18 per cent after three years. As In Latin America, de Souza Silva et al. (2018) show that from a random sample of 6 Brazilian regions, almost half of the respondents that where Uber users were replacing taxi rides with the Ride-hailing service. In contrast when focusing on Sao Paulo Haddad et al. (2019) find that 83% of current e-hailing trips derived from trips that were previously made by traditional motorized private modes.

In addition to disrupt, sharing economy services are also creating new markets (Miller 2015). As an example, in Vancouver, some of the taxi operators came together to be part of the app Kater which includes all the additional services that Ride-hailing applications have, particularly booking rides through a smartphone (Wolff et al., 2019). Similarly, Brazil's 99 and Colombia's Tappsi and Easy Taxi and Buenos Aires' BA Taxi were initially built as a taxi-hailing app, to bring the e-hailing benefits to regular taxis. In Monterrey, the general secretary of government proposed as a solution to the disputes between taxis and Uber's drivers to generalize the use of digital platforms to taxis (El Financiero, 2019). Furthermore, the entry of Ride-hailing into the transport market in Latin American cities has enticed the use of digital platforms beyond traditional taxi services to other forms of individual and collective transport. For instance, the start-up Picap introduced the use of technology to a longstanding transport service, the so called 'moto taxis', and currently is available in Chile, Colombia, and Mexico. Uber offers the

¹⁷ Services that provide door-to-door passenger transport for one or a few persons. Unscheduled passenger transport may also include vans and minibuses—traditional actors in these markets include taxis, limousine services and adjacent services such as demand-responsive-transport (DRT), inside or outside the organized public transport realm (Aarhaug & Olsen, 2018)

same service in Dominican Republic. Similarly, Jetty, a collective private hire transport digital platform in CDMX and Puebla emerged while Ride-hailing services like Uber and Cabify kept operating without being regulated.

While the illegal or unregulated status of Ride-hailing is a limitation for the traditional ride hailing industry to enter the new market opened by Ride-hailing innovations, in Latin American cities' informal transport services such as motorcycle taxis or bicycle taxis have been operating for decades and now are starting to use digital platforms as well. As argued by Miller (2015), the illegality of the services within the sharing economy deterrers incumbents from participating in the new market while it is still illegal given that they do have physical capital that can be seized by regulators (Miller 2015). In the case of taxis, a good example is the incapacity to include surging prices systems where there are prices regulations. Some taxi platforms have introduced "tips" and other ways to allow a more dynamic pricing system and the efficiency in allocation that comes with it. Facing this scenario, according to Edelman and Geradin (2018) the first regulatory option could be to reduce the incumbents' burden by waiving on rescinding certain requirements, but this requires consensus, and controversial subjects like insurance, zoning and safety are unlikely to create easy consensus (Edelman & Geradin, 2018). As long as the playing field is divided between actors following different rules, it will be difficult to enforce proper competition regulation.

3.3.3. Unbalanced competition

In addition to the inherent advantage of the sharing economy services regarding lower fixed capital costs (Benkler, 2006), there is a competitive advantage for Ride-hailing services that have not been subject to regulation compared to similar services that pay taxes and incur in costs to comply with quality and insurance limitations (Arvind et al. 2014). In other words, not bearing the same regulatory overheads as services that have been regulated for a long time in the name of consumer protection and broader societal goals, enables the provision very similar services at significantly lower costs (Miller, 2015). The latter is frequently what most incumbents voice as their major concern pointing to the distortions resulting from asymmetric regulation that burdens them more heavily (Rauch & Schleicher, 2015). The European Parliament (2015) includes unfair competition without following regulations and fare as one of the negative consequences of Uber. For instance, in Brazil a national law (12.468, 2011) defines the prerequisites for the taxi driver profession and determines that taxis must have taximeters in cities with more than 50,000 inhabitants. The law made it compulsory for taxi drivers to take courses in human relations, defensive driving, first aid, mechanical and basic electrical vehicles. In Colombia, according to the national code of transport taxis must have a taximeter and yearly local governments set minimum fares and extra charges. The prerequisites to get the necessary license to drive a taxi are literacy, age (above 18 years old), and sufficient scores on the practical and theoretical exam and a test of physical and cognitive skills.

Beyond the advantages that the lack of regulation entails in terms of costs e.g., licenses and certificates, Ride-hailing services present fundamental cost efficiencies by replacing telephone dispatchers and purpose-built radios with mass-produced smartphones (Edelman & Geradin, 2018) that additionally bring geographical positioning systems to improve matching between user and driver. The widespread and rapid penetration of smart phones enables lower costs for communication that additionally are decentralized to users and providers and enhanced with geolocation (Oviedo et al. 2018). Consequently, a fundamental question beyond the unbalance that unregulated actors represent, is how the traditional companies are going to compete with the new business model of the sharing economy (Cusumano, 2015) and how cities are going to regulate them.

3.3.4. Conclusions

While the effects of Ride-hailing on public transport are highly context dependent and divided into substitutive and complementary uses, for taxis, unscheduled and pre-booked transport services there is consistent evidence of the negative impacts. Inherent competitive advantages of Ride-hailing innovations (e.g., reduced communication costs, improved matching between supply and demand) but also unbalanced competition point to the need of regulatory changes that balance the playfield without obstructing the gained efficiencies. These changes need to include regulations that create incentives for incumbents to introduce Ride-hailing innovations like geolocation, while applying consumer protection and insurance requirements to Ride-hailing companies.

3.4. Society

Most state and local governments would naturally seek to encourage the sharing economy because it permits jurisdictionally bound entities to grow their economies while adding little in the way of infrastructure costs or annexation battles (Miller 2015). Technological advances not only create a new range of business opportunities but can make the provision of traditionally public service more efficient by reducing information asymmetries and transaction costs. However, as with any other economic activity there are also unwanted effects for third parties (i.e., negative externalities) and there is a need to steer these activities towards broader societal goals. In the case of Ride-hailing as was discuss for users (providers and consumers) there are welfare effects for society both positive and negative and some that are yet to be determined. More economic efficiency resulting from reduced transaction costs and improved allocation of resources are the clearest positive effects. Other effects' signs are still to be determined such as the distributional effects or the impact on congestion and the environment. Finally, there are some clear negative impacts particularly related to the lack of regulation, which creates an erosion of the rule of law and disrupts city planning. The following sections build on what the literature about the sharing economy and Ride-hailing has analyzed and proposed as the effects that these new services have on society.

3.4.1. Economic efficiency

The introduction of smartphones applications to connect drivers and riders with geographic positioning systems and surging prices mechanisms entails two fundamental changes in the market: reduction of transaction costs and of information asymmetries. In turn, these transformations bring economic efficiencies based on an improved allocation of resources (Edelman & Geradin, 2018; European Parliament, 2015). The reduction of the costs to find a suitable transaction counterpart (Rajeev, 2004) and contracting with them (Williamson, 2000) using information technology allows for more goods and services to enter the market and more transactions to be completed. The exchange of goods and services that before would have been a too expensive process to be profitable or even to be considered due to prohibitive transaction costs now becomes a possibility, maintaining expensive assets active. This is the case with idle time of cars that is now used for Ride-hailing services. Similarly, the introduction of platforms to access and offer goods and services creates a much more flexible business model (Witt et al., 2015) that expands people's incentives to enter the market and improve resource allocation.

Furthermore, beyond expanding the possibilities of commercial exchange, lower costs of information communication reduce information asymmetries between the parties as well as information imperfection for market equilibrium and in turn allocation of resources. First, including geolocation in Ride-hailing platforms improves the used time and kilometers of driving for the vehicle by reducing driving time without a passenger and the waiting time for the passenger (Witt et al., 2015). Although still contested, based on pure economic criteria, the introduction of dynamic pricing gets the market closer to an equilibrium by reducing information imperfection. Surge pricing is modeled on how a free market with almost perfect

information will work, changing prices to match demand and supply with real time information about market conditions and easy communication between all parties (Edelman & Geradin, 2018). In fact, the efficiencies of dynamic prices have been used before in the hotel and travel industry using tourism seasonality information. Transport services had not been able to implement this given the lack of information and to some extent customer protection regulations (Edelman & Geradin, 2018). However, low-cost information has changed the limited information landscape challenging regulation of traditional taxi services and the caps it sets on supply size (Badger, 2014). Lower communication costs also allow to distribute and access more information, compared with traditional taxi dispatchers. Such increased access to information – like geolocation, photo and name of the driver or model of the car – not only improves supply and demand matching but also reduces information asymmetries between the parties, improving consumers and providers decision making and resource allocation.

More information also helps to uncover and discourage unwanted behavior. While a passenger that hails a taxi on the street or from a taxi rack does not have any information about the driver, price, routing or tracking, the additional information included in Ride-hailing app discourages drivers to charge more, take longer routes or even have inappropriate behavior towards the passenger (Aarhaug and Olsen, 2018). Similarly, drivers have more information available to decide when or where to provide its services to increase their profit, allocating more efficiently their time and the use of the vehicle and fuel. Furthermore, the collection of decentralized information from clients allows to create a 'reputation' system that creates a form of accountability, both for passengers and drivers, that at least in taxi systems is harder to get. Additionally, in principle software platforms can reduce opportunistic behavior. First drivers and passengers are matched based on location, eliminating subjective biases from intermediaries like phone dispatchers while it facilitates tracing such behavior from drivers or users. Second, if a given platform is having discriminatory practices it would be easier discover if necessary as it would be embodied in its algorithms (Edelman & Geradin, 2018).

In more general terms, Wolff et al. (2019) argue that the benefits of a thicker network of unscheduled mobility options and lower congestion can convince more customers to travel to a business location while shorter waiting times and lower transaction costs also broaden the labor market by allowing workers to reach more employers within a reasonable commute time, making the market more efficient (Wolff et al., 2019; Haddad et al., 2019). However, it is important to notice that some key issues for these efficiencies to become real are that congestion does not increase and that the accessibility to jobs is highly dependent on how these new services affect affordability. In Haddad et al. (2019) analysis about the impact of Ride-hailing on commuters' travel time and accessibility in Sao Paulo, they find that the impact on travel times of the current Ride-hailing offer is negligible (from 65.8 in the scenario without e-hailing and 65.9 in the scenario with for public transit users and from 31.7 to 32.1 for private cars and e-hailing).

Regarding economic growth Ride-hailing can influence night-time economy by providing more transportation options when public transit is not available or there are security concerns. Initial studies in Austin (Kooti et al., 2017) and US cities (Komanduri et al., 2018) about Ride-hailing indicated that the highest use of these services was during night-time coinciding less with morning and afternoon rush hours and commuting times. Accordingly, in Chile, (N=1600) leisure activities are predominantly stated (>70%) as the trip purpose when using Uber, during weekends close to half of the trips were during night-time hours and 90% of the trips that would not have been done without Uber were between 8pm and 6am (Tirachini, 2017). In Santiago in particular, night-time trips account for 35.6% of Ride-hailing trips mentions (Tirachini & del Rio, 2019) and regardless of the users' age most of the trips are taken on the weekends (above 70% in all cases). Also showing the influence that Ride-hailing services might have on night-time economy is the analysis of the first transportation survey in Toronto and Hamilton area to include Ride-hailing as a mode. Calderon & Miller (2019) show that in contrast to other modes

the travel demand pattern of Ride-hailing has an extended afternoon peak relative to conventional modes and displays a third night-time peak. In Johannesburg 77% of the respondents mention as purpose to use Uber, to get to and/or from a night out and similar responses such as “going to/from a party” (67%), “out for dinner” (59%) “to a bar” (51%) account for more than 50% of the reasons to use Uber (Giddy, 2019). In Denver, close to half of the respondents said going out/drinking was their main reason to choose ride-hailing over other modes (Heano & Marshall, 2019). Finally, as stated before, the flexibility of Ride-hailing platforms presents an option for alternative or additional income for its providers.

3.4.2. Regulation is a must for general rule of law and planning

In the context of broader changes in mobility practices and services in cities – smart mobility transition (Marsden and Reardon 2018) – and in how commercial exchange works – peer to peer economy or the sharing economy – there are higher risks of inaction by the state because doing nothing is not the same as no change (Pangbourne et al. 2018). As argued by Rauch and Schleicher (2015) historically, cities have had both political incentives and the legal power to regulated private market transport services to ensure the local market depth as well as efficient matching to minimize effects on congestion. Regulating these services is an essential part of urban development policy given their tight relation to access agglomeration gains (Rauch & Schleicher, 2015). The established market has generally worked bound by rules of pricing and quality and sometimes seeks to change the rules to an approach that favors them more. In contrast, sharing economy companies and the most renowned Ride-hailing service has had the approach of nimbly dodge such regulation (Miller 2015; Mastrorillo, 2016) or to exploit loopholes to avoid rules and taxes (Arvind et al. 2014). As an example, Uber’s communications manager in Mexico declared that since transport network companies are not yet regulated in Nuevo Leon is not illegal to provide or offer the service (Peon & Rivera, 2019).

The main issue with the lack of action or firms and agents acting outside the rules is that it creates additional regulatory problems: (i) a growing proportion of illegality in the economy means that more economic activity is underground and therefore it becomes harder to understand its nature; (ii) participants in illegal activities are less likely to reach out when there is danger and impedes dispute resolution when problems occur; (iii) more illegal economic activity reduces the access to capital investments given the regulatory risk; (iv) economies permitted to linger in the shadows of the law face the likelihood of taking on more sinister malfeasance and large scale rule braking undermines respect for the law (Miller, 2015; Edelman & Geradin, 2018). Furthermore, when cities are not enforcing their own planning codes (licensing, zoning, etc.) with regards to some agents then their ability to enforce and the applicability of those codes are subject to be perceived as weak or selective (Miller, 2015).

In addition to the regulatory issues brought about by inaction or plane prohibition, licensing, pricing, and service’s standard of quality are part of the local toolkit to achieve planning objectives, a source of fiscal income as well as a way for the local authorities to obtain data and to manage unwanted behavior. For Ride-hailing to contribute and be subject to these rules they need to be legitimized (Miller 2015). In the case of getting information for planning and controlling, similarly to how low-cost sharing and communication of information has disrupted private transport services with Ride-hailing, disclosure of information and data collection for planning and control is fundamental. In 2018 Uber had already cooperated with 300 agencies in 51 countries and built relationships with the police to facilitate information sharing (Tabachnick, 2019¹⁸).

¹⁸ <https://elfinanciero.com.mx/bloomberg-businessweek/uber-quiere-ser-el-nuevo-mejor-amigo-de-la-policia>

Regarding plane prohibition, the challenge to stop Uber operations in most of the jurisdictions where it has been banned is a signal that beyond its effects on incumbents Uber and other Ride-hailing agents entail a regulatory challenge that must go beyond its prohibition. In Cancun the platform received one million requests during 2018 even as the services was not active (El Financiero, 2019). While in Chile an appeals court proved Uber right in the face of a lawsuit seeking to declare it illegal, almost at the same time an Argentine court accepted a taxi driver claim against the company (BBC, 2016). Also, in Argentina the government has repeatedly challenged Uber authority, since the start of its operation the company offices have been raided and the use of local credit card payments has been banned. The company has responded by enabling cash payment (available in most of the region) while still requiring registering a credit card to use the app. Furthermore, considered an illegal activity Uber's drivers face seizing of their vehicle and fines of US\$2,000 (Moed, 2018). In contrast Argentina's capital city, Buenos Aires is the city where Uber is growing faster in the world with 3 thousand new drivers per week (Raszewski, Cohen and Rochabrun, 2018). Clearly the risks and costs of the activity being illegal are not high enough for users to be deterred from providing the service. Uber's executives attribute the success to the nation increased unemployment, referring that a fifth of the drivers did not have a job before becoming Uber drivers.

Uber's strategy regarding regulatory controls has already change now calling to be regulated by appropriate authorities (Guo, 2015) which also responds to increased competition by other Ride-hailing companies given that in addition to legitimacy, explicit standards of regulation bring some measure of protection from new and future entrants (Witt et al. 2015). As shown by Witt et al. (2015), part of the strategy is to assert its capacity to regulate its users through its own sociotechnical governance system appealing to the authorities to avoid banning, costly direct intervention or governance processes by law. The argument is that they can meet any standard or target set by regulators without being subject of traditional regulatory systems and approaches to decentralized regulation that have been in place for incumbents. The challenge for regulators in this new strategy is that there is still limited evidence and evaluation tools to judge this regulatory choice (Witt et al. 2015).

The novelty of Uber strategy combined with the bigger regulatory issues that banning Ride-hailing services entails point to the need of also novel and more dynamic ways of governance and regulation. First, currently there is already considerable set of regulations that operate through the participation of private firms that exercise some degree of control over market activity (Burris, Drahos, & Shearing, 2005; Shearing & Wood, 2003). Firms have the resources to perform quality control and compliance operations, and have incentives to do so from market forces, the prospect of legal liability, and direct regulatory obligations. Although the last two of these incentives depend on the state exercising control, it is no longer a state monopoly to regulate compliance with certain standards and rules (Black, 2001; Burris et al, 2008). Second, given the scalability of Ride-hailing its regulation involves multiple actors, requiring a more participatory approach. According to Davis (2018) bringing multiple actors from government and the interested sectors to debate and negotiate with the objective to build consensus about the value of a given mobility innovation is a path to institutionalize organizational commitments that go beyond single policy success.

3.4.1. Case study: Mendoza, Argentina

By: Florencia Rodriguez Tourón

The road towards TNCs regulation in Argentina, as in many other countries around the globe, has been a bumpy one. Uber was the first company to establish operations in the City of Buenos Aires in 2016, enduring a strong opposition from the local government to this day. Cabify rapidly followed yet developing a different strategy, in compliance with an old

regulation designed for “remises”, which did not reflect the changes in the nature of the service but provided a legal status to the company. Since then, TNCs have expanded operations to other cities without a regulation tailored to their specific needs.

In 2018, the City of Mendoza made the first move in the opposite direction, committing to developing regulation before TNCs set foot in the province. This anticipation provided an opportunity to establish a level playing field through a process of dialogue with the array of parties involved. The engagement of the different sectors reflected on a series of modifications that were made to the original project.

One of the key issues when imagining a role for TNCs in an urban mobility system is the preexistence of a highly regulated service of taxis and the resulting claim of unfair competition. Leaving aside measures regarding safety (vehicle conditions, type of insurance, drivers’ qualifications), two issues sit in the eye of the storm: fare regulation and

controls on the number of vehicles (by imposing entry barriers such as medallions). TNCs rightly claim that technology enables offsetting real-time imbalances of supply and demand -and therefore turns these regulations obsolete-, whilst public officials fear an unsustainable proliferation of ride-hailing services if left to the invisible hand of the market.

Due to several factors, among which institutional culture is critical, certain cities tend to favor high regulation for all types of services (making TNCs look a lot like taxis), and others are more prone to flexibilization. In the case of Mendoza, the Governor’s office understood that promoting competition would be in the interest of users and proposed that TNCs should have a tailored regulation. However, this was not an isolated piece of legislation but a section inside an overarching Mobility Act for all transport modes in the province. This holistic approach played a pivotal role in the success of the dialogue regarding TNCs, seen as a disruptive yet small piece of a larger mobility system.

Expectedly, the debate was not free of conflict. The legalization of TNCs suffered a strong opposition from taxi unions, but the high consensus reached in the Provincial Congress (46 of 46 deputies of the lower house voted in favor of the project) outshined the effect of public demonstration and media presence of union representatives. Besides, taxi drivers were authorized to operate within the platforms, creating dissension among the workers.

The first novelty of the act was to clearly define TNCs. Whilst taxis and “remises” are categorized as “transport services of general interest”, TNCs become a sub-type of authorized transport defined as “private transport via electronic platforms”, amongst services such as school buses or touristic vans. TNCs are then defined as “the service that, by means of the development of mobile technology, using global positioning systems and independent platforms, allows connecting users that demand it, point-to-point, with drivers who offer that service through the same application, in order to celebrate a contract in the terms of (...) the National Civil and Commercial Code”.

The characterization of these services as a private activity is already a stance, and the Act enables operations if they do not interfere with public transport. While the definition of itineraries, frequencies, schedules, and fares are explicitly left to the discretion of TNCs, the public authority maintains the prerogative to limit the number of vehicles and the zones in which operation is allowed in accordance with population density and “other criteria”. Between the two key regulations mentioned above, fare and offer restriction, Mendoza chose to leave the door open to intervene in the second.

The Act establishes several obligations to be fulfilled by license holders, drivers, and TNCs. The most relevant are listed below:

- Only individuals (not legal entities) are allowed to obtain a license for their own vehicle. The license holder can be a different person from the driver.
- License holders should pay an inscription fee, ensure the perfect functioning of the vehicle reporting periodic technical inspections, pay all tax dues, and hold an insurance policy that covers eventual damage against drivers, passengers, and third parties.
- A mobility fund is constituted with the compulsory contribution 1% of TNCs' gross income and license inscription fees. The fund will be destined to facilitate access to financing for vehicle renewal of taxis, remises, school buses and other hired services, with a view to mitigating the claims of unfair competition.
- TNCs are forbidden to operate unregistered vehicles and drivers, and they cannot assign trips to one single driver for more than 8 straight hours or more than 12 intermittent hours in a day.
- TNCs are obliged to share information with public authorities about trips, billing, drivers, and other judged relevant.
- Drivers should hold a professional license (the same issued for taxi drivers) and accept trips only from platforms where the vehicle is duly registered.
- Authorized vehicles should have an age limit of 5 years (except for electric vehicles which are allowed 10) and a capacity limit of 8 seats maximum. Taxis and remises can operate under this modality as long as they fulfill the obligations respective to their category.
- In sum, the Mobility Act of Mendoza might not be a perfect piece of legislation for all stakeholders, but it is an interesting case of public policy setting the stage for disruptive technologies instead of lagging behind the market. The reason of its success lies certainly on the fact that it was conceived as a collective effort to embrace innovation without neglecting the role of all modes of transport in achieving a sustainable mobility system for all users.

3.4.2. Market failures

While Ride-hailing entry to the market of transport services entails two fundamental changes: lower transaction costs and more information availability, the nature of this new service also involves market failures: negative externalities, new or different information asymmetries and potential non-competitive outcomes. Market failures are related to goods and services' characteristics and from a liberal perspective should be the only subject of regulation to maximize social welfare. As any other market for a particular good or service, Ride-hailing's market can present failures because of its characteristics. Effects on third parties (i.e., externalities) and information asymmetries result from the market interaction of users and providers and the different levels of access to information of each party (i.e., information asymmetries). Accordingly, in the conclusions of an extensive analysis of the governance of the smart mobility transition Mardsen & Reardon (2018) highlight the agreement of all the contributors on the unique role the state has in securing the reduction of negative externalities to a minimum. Furthermore, the authors point out that some of the fundamental concerns to regulate these services and in general the sharing economy are related to access to information. Finally, although so far non-competitive outcomes seem unlikely it is still a possible result and an important consideration when regulating these services.

3.4.3. Externalities: (un) desired effects on third parties

In the previous section positive, negative, and still undetermined welfare outcomes of Ride-hailing were outlined for each of the agents that knowingly participate in this market:

users and incumbents. In addition to each of these parties, other members of society are affected by the entry of Ride-hailing, even if they do not take part in any transaction in this market. In this context, it is important to note that the skewed focus of Ride-hailing platforms' towards creating benefits for the companies' shareholders and users (Acquier et al., 2017) does not set them apart from other firms, nor does the fact that their operation affects third parties. What really makes Ride-hailing platforms disruptive is their high and fast scalability. The speed at which Ride-hailing platforms have grown since the emergence of Uber in San Francisco entails that the unwanted effects on third parties and for the society – known as externalities – could also escalate quickly. While some scholarship argues that sharing economy services have inherent characteristics that lead to negative externalities (Cannon & Chung, 2015), most ride-hailing operators proclaim their positive effects on the environment. Scant empirical evidence and context specific dynamics do not allow to conclude the sign of Ride-hailing externalities but so far it is clear that there are at least three fundamental unwanted effects on non-users: road safety, insurance gaps, congestion, and environmental effects.

Road safety

One of the most evident externalities caused by Ride-hailing services is on other users of streets and in turn on common societal goals of road safety. Pedestrians and cyclist account for a considerable percentage of casualties of traffic accidents in most urban areas. In Buenos Aires 44% of deaths were pedestrians while only 13% were passengers of automobiles. Similarly, in Mexico urban and suburban areas pedestrian account for a quarter (24%) of injured people in traffic fatalities and a third of the fatalities. According to the WHO there are 1,3 million deaths caused by traffic accidents in the world, almost half of these happen in cities and the organization considers it an epidemic. 12% of the total number of deaths in the world happen in Latin America, with an average of 16 persons dying for every 100 thousand inhabitants. Within a 100 Latin American cities sample (more than 400 thousand inhabitants and Costa Rica, Puerto Rico, and El Salvador capital cities), there are ten cities that are way above this average. San Salvador has 75 deaths for 100.000 inhabitants being the highest in the sample and the only capital city that excides the average number of deaths in the region. Brasilia is the second highest capital city by number of deaths with a rate of 13.1 for 100.000 inhabitants followed by La Paz with 12.8. most capital cities are between 9 and 7 deaths per 100 thousand inhabitants: San Jose, Montevideo and Quito have around 9 deaths, Rio de Janeiro, Ciudad de Panamá, and Sao Paulo have around 8, La Habana, Bogotá, Santiago, Santo Domingo, and Asunción have around 7 and Lima 5. Mexico City and Buenos Aires have the lowest number of deaths per inhabitant with 2.6 and 2.3 respectively (LA Network, 2017).

The positive or negative effect on other users and road safety in general is yet to be established but the concern of ridesourcing causing a negative externality to other road users follows from the lack of control of the skills and level of safety of ridesourcing drivers and vehicles respectively. Unlike traditional taxi and pre-booked transport services, ridesourcing in most cities has not been subject to licenses and certifications but vehicles and drivers are increasing the risks of traffic accidents by being on the road more than if they only had private use. Drivers have a regular driver's license but do not require commercial endorsement that might increase driver's training requirement. In terms of the vehicles, periodical inspections of those registered for commercial purposes are intended to keep a minimum standard of safety of the automobiles, compared to private ones. As an example, NY taxi drivers must take a yearly drug test and medical exam and a defensive driving course. In San Francisco taxi drivers need a printout of 10 years of driving record and the City of Chicago requires at least every six months inspections of the vehicles (Edelman & Geradin, 2018). In Buenos Aires, taxi drivers must have professional license and the vehicles are required to pass a yearly technical exam (Buenos Aires Ciudad 2019) that is certified by a sticker that must always be on the windshield. Vehicles or drivers that are found to be operating without fulfilling these conditions can face a

fine of up to 130 thousand pesos (Infobae, 2018). Similarly, in CDMX to operate as taxi vehicles must pass a mechanical and technical test every year, and since 2018 CENFES (government-academy created institution that trains and test taxi drivers to get the necessary license to drive a taxi).

The longstanding policy approach has been indeed to hold commercial drivers and vehicles to hire standards than privates in training and inspection. Higher regulatory requirements for commercial drivers and vehicles correspond to the basic sense that those drivers and vehicles carry higher risk: more passengers and more driving (European Parliament 2015). However, there is no study yet about the size of these results. In principle, differential in insurance rates could serve as reference to study the magnitude of these effects but the data in this area is imperfect given that insurances are charged yearly instead of based on distance. Distribution of traffic accidents by type of vehicle could also show the effect of differentiated standards for commercial vehicles and drivers. For instance, in Mexico's urban areas, 18% of traffic accidents in 2018 involved collective transport vehicles, while motorcycles and automobiles were the type of vehicle in 69% of the accidents and 62% of those with casualties (INEGI). In Buenos Aires, 1.4% of traffic accidents casualties were public transport passengers while motorcyclist and automobiles drivers and passengers' amount to 50% of the deaths (Observatorio de Seguridad Vial de la Ciudad de Buenos Aires, 2018). However available data does not distinguish between private and taxi automobiles limiting the evidence to understand the potential results of commercial licenses and safety standards to reduce negative effects of ridesourcing on road security.

As a response to this need for regulation, ridesourcing platforms have made more public their requirements for providers to be accepted and recently Uber has announced more features related to drivers' skills and road safety. The basic requirement that ridesourcing platforms have for vehicles is how old (in years not mileage) the vehicle can be and for the driver to have driver's license and at least an insurance for accidents. In Argentina Uber reports that since 2017 drivers that have been on the platform for more than 90 days are required to have a professional license (Infobae 2018). In Peru, Uber claims to run background checks on drivers and the vehicle as well as psychological risk test before they are admitted as providers in addition to a compulsory training (Peru 21, 2019). According to the platform, in November 2017 7.800 drivers were not accepted for not complying with this quality standards (Gestion, 2017). Furthermore, Uber has recently introduced a feature that forces drivers to stop driving after 12 consecutive hours driving, blocking them until 6 hours after and lets riders know when the driver is getting close to the 12 hours mark.

In sum, as with other effects of ridesourcing its impact on road safety is still to be determined and effective regulation will depend highly on the capacity of governments to identify those rules like licenses and certifications that are worth preserving and those new ridesourcing platforms' self-governing procedures that should be institutionalized. Regarding licenses in particular, the management of the number and types of vehicles for hire services is a challenge for governments (Greenwood & Wattal, 2015) and relates to another potential effect of ridesourcing services on road safety: drunk driving. The hypothesis is that a limited supply of transport services may result on people driving under the influence of alcohol (Jackson and Owens 2011) increasing the risk for all users of roads. Accordingly, one of the corporate responsibility flags of ridesourcing market leader Uber is about reducing "impaired driving" referring to driving under the influence of drugs and/or alcohol (Uber Technologies, 2019). The strategy includes partnership in the US with the organization Mothers Against Drunk Driving. Similarly, the platform has developed services such as Uber Angel in Colombia (users can book an Uber driver to take them home in their own vehicle) and research focused on underscore the road safety benefits of ridesourcing.

Empirical evidence is still contradictory and there are no studies for the region. Greenwood and Wattal (2015) four-year analysis (2009 – 2014) in Californian cities based on a difference-in-difference identification strategy concludes that Uber's entry, particularly the low-cost service, contributed to reducing motor vehicle homicides related to alcohol by 3.6–5.6% per quarter in the state of California. Also using a difference in difference estimations Peck (2017) finds that boroughs with high coverage of Uber services: Manhattan, the Bronx, Brooklyn, and Queens had a 25 to 35 percent reduction in car accidents related to alcohol since the ridesourcing platform entry in 2011 whilst other counties in the state did not. Similarly, a study in areas of the US not traditionally known for a high degree of access to public transportation shows that there is a 6 to 27 percent decrease in the rate of arrest for driving under the influence of alcohol (DUI) after Uber's entry and larger declines in fatal accidents the longer the service is available – fatal crashes decline by 0.02 per 100,000 for each additional month, a 0.5% decline and there is a 1.65 decline if the operations are considered quarterly and there is a 17% to 40% decline in fatal crashes after four or more years of operation (Dills & Mulholland, 2016). The latter also contributes as evidence of a positive externality of ridesourcing for road safety and not only in relation to alcohol related accidents. In contrast, Brazil & Kirk (2016) find no correlation between the entry of Uber and the number of traffic fatalities when analysing data of about 100 densely populated counties across the United States.

Insurance gaps

Connected to road safety, the literature has analyzed two unwanted effects of unregulated Ride-hailing services on third parties related to insurance. First, an insurance gap between commercial insurances and the provider private insurance means that in a traffic accident the harmed parties might be unable to recover losses (European Parliament 2015). Beyond the negative effect on the harmed parties' welfare, this gap is problematic because without regulation, drivers and transportation platforms will not consider these irrecoverable losses when assessing their activity and precautions creating a moral hazard problem. Second, this insurance gap encourages drivers to make claims to the private insurance making insurance premiums for all other drivers higher (Edelman & Geradin 2018).

As with respect to other Ride-hailing externalities, regulation of traditional taxis has been a guide. In most Latin American cities, taxis are required to have a commercial insurance but there is variation in how stringent these are. As illustration, Buenos Aires taxis and public transport providers are required to have insurance for the vehicle, civil liability, personal accident, and work and life accident insurance. In CDMX the minimum requirement is a civil responsibility insurance and in Bogotá the civil responsibility must be contractual and extra-contractual and cover at least death, temporal or permanent inability and medical expenses. Correspondingly, the dominating Ride-hailing platform – Uber – now offers to drivers in most cities in the region an insurance policy that covers personal, passenger and third parties since the moment the driver accepts the trip until the last passenger leaves the vehicle (Uber, 2019). Since 2014 in India, Australia and Singapore Uber has required drivers to acquire commercial insurance and in 2014 and 2015 several states passed legislation specifically disallowing non-commercial insurance plans to cover claims resulting from transportation platform activities (Edelman & Geradin, 2018). Cannon & Chung (2015) argue for minimum insurance requirements, such as the one imposed in California for ride-sharing companies where Uber and Lyft changed policies to cover drivers during the period without a passenger.

From insurance policies that covered only accidents that occurred while the passenger was in the vehicle and that in some jurisdictions covered more than required from taxis and some for the driver (Denmon, 2014) coverage since the driver accepts the trip represents an evolution. Other platforms such as Bolt in Mexico and Cabify in Colombia provide insurance to the drivers or require driver to have one to be able to be part of the platform respectively. In Argentina, the oversight institution for insurances (Superintendencia de Seguros de la Nación) regulated

the kind of coverage that Ride-hailing vehicles should have created a specific alternative for motor vehicles that take part in a service arranged through a digital platform (Manfredi, 2019).

In some cases, like in Colombia it has been the result of the company's self-governance structures while in others like Mexico corresponds to new demands from regulation. Before Uber's adoption of an insurance policy that covers driver, passenger and third persons since the services is accepted, there had been insurance gaps emerging from the mix use of the vehicle: the private insurance won't cover events that happen while the driver is going to pick up a passenger because the trip was being done beyond the private use of the car, neither will the platform insurance because there is no passenger. Despite the improvement in those jurisdictions where the insurance policy is provided by Uber and not as a legal requirement there is still a gap during the period where the vehicle is searching for a passenger, specially haphazard given the incentives for drivers to check their phones more often (responding to the request on the app, check location and surge prices) paying less attention to road conditions (Edelman & Geradin, 2018).

Environmental impact and congestion

Fossil fuel consumption, GHG emissions and pollution are arguably the most negative externalities that the use of motor vehicles brings to third parties and society. The effect of Ride-hailing on fleet and number of kilometers per capita are still to be determined. While there is some empirical evidence that suggest that these services have increased the traffic volume (Rayle et al. 2016; Schaller 2017), the impact on overall vehicle travel is generally unclear (Rayle et al., 2016) besides recent evidence for six US metropolitan regions that measures Uber's and Lyft's vehicles contribution amount to up to 13% of vehicles miles traveled (Fehrs & Peers, 2019). Split results are connected to the alternatives Ride-hailing represents for different consumer segments, being a better alternative than private cars for some and an alternative superior to taxis or public transport for others. Whilst the former has a potential effect on reduced car ownership, the latter could increase the total kilometers driven (Esteves, 2015).

From a theoretical perspective, the sign of the effect of ridesourcing on the environment is also ambiguous. As argued before, like other sharing economy services ride-hailing characteristics allow for a more efficient allocation of resources and increased intensity of their use. Better allocation and heightened use of products offer higher utility per unit of natural capital, which also reduces the need for more extraction (Acquier et al., 2017). However, the so-called Jevons paradox (1865) shows that technological progress that enhances efficiency reducing relative costs rises demand instead of reducing environmental impact. As argued by Acquier et al. (2017), greater access to resources enabled by cost efficiency can go against positive environmental effects (Acquier et al., 2017).

From an economic perspective, the incentives of platform-based Ride-hailing companies are only related to the transport network, and this means having as many vehicles driving as possible. The business models of most 'smart' transport providers depend on the generation of as much mobility as possible so that their returns are maximized (Docherty, 2018). The incentive structure tends to be conducive for Ride-hailing operators to go to redundancy (Aarhaug & Olsen, 2018) which has significant impacts on urban planning beyond the transport sector and fundamentally over air pollution and GHG emissions. The dimension of the impact depends on the type of vehicle (i.e., technology) and the complementary or substitutive role Ride-hailing plays with respect to car ownership, public transport, and non-motorized trips. Accordingly, in London where close to 50% of Uber's are Priuses or another hybrid or electric car the company has promise to ban all diesel fueled cars from their platform within three years and has programmed financial assistance (grants of up to £5000 and a total of £2 million) for its 40,000 licensed London drivers for them to switch. A 35p surcharge to passengers will be

also collected to this end and £1500 credit will be offered to the first 1000 Uber's users that have a pre-Euro 4 diesel car in exchange to their old cars (Vaughan, 2017). In Latin America, the vehicle requirements are still only related to how old the car is.

Regarding congestion in Latin America, Amaral Haddad et al. (2019) find that in Sao Paulo the current e-hailing supply has mostly negligible effects on travel times, from a 45min to 45.02min mean in the current scenario and from 45 to 42.98 if e-hailing occupancy increase to 3 passengers per vehicle and 10% of private modes migrate to e-hailing in the long term. Based on a sensitivity analysis the authors explain that an occupancy of at least 2 passengers per trip for e-hailing would be required to mitigate the increase on travel times. In the case of CDMX, Eisenmeier (2018) argues that drivers use Ride-hailing platforms to be able to own a car; instead of reducing car ownership Ride-hailing platforms are creating opportunities to buy a car for people that else would not be able to afford one.

In addition to digital platforms self-regulating their fleet, as proposed by Aarhaug & Olsen (2018) road pricing, toll schemes and taxing empty vehicle-kilometers are regulatory alternatives to reduce congestion and for local pollution environmental standards in terms of vehicle technology (Aarhaug & Olsen, 2018).

3.4.4. Information asymmetries

Increased access to information at reduced costs is at the core of the success of the Ride-hailing market. It then follows that dealing with information asymmetries should be a fundamental regulatory action to reduce negative effects of these services on society and enhance its benefits. As argued before, low-cost communication allows for a series of efficiencies and benefits to the users that were not possible before but also entails more ramifications for unbalanced information access between agents and society. On one side, as mentioned before compared to street hailing or private hire services, Ride-hailing reduces the information asymmetries between users and drivers. A key part of this information comes through rating systems that introduce a form – albeit imperfect – of self-regulation and consumer protection. On the other, both providers and consumers can be subject of asymmetries of information from the platform and more importantly society could have less information available without the use of licenses and certifications. The former is materialized in questions of transparency and fairness about how platforms manage providers through ratings as a form of quality control as these providers relation to the platforms is closer to one of employer-employee than peer to peer one, entailing unbalanced power (Bauwens and Kostakis, 2014). The lack of disclosure about the methods used by platforms to manage the results of rating systems and if whether they have some degree of manual intervention (Witt et al. 2015). Consequently, disclosure requirements can be a tool to control and reduce negative effects of Ride-hailing to society and its users.

3.4.5. Non-competitive markets

As has been mentioned before the sharing economy business and in particular Ride-hailing platforms are characterized by their high and fast scalability (Acquier et al., 2017). The degree to which Uber has grown in half a decade and the widespread presence of this services in the LAC region (Figure 1) are good examples. Srineck (2016) argues that once ecosystems have been created, platforms naturally drift towards an 'enclosure of ecosystems. High and rapid scalability allow for first entrant/s to soon become the largest operator with enough power to potentially curb competition and in turn monopolize it (Aarhaug & Olsen, 2018). Although there are no evident barriers to new entrants with little sign of market structure that would prevent entry or prevent incumbents from providing similar services (Edelman & Geradin, 2018). Accordingly, so far Ride-hailing platforms have not triggered competition law concerns, but the European Parliament sees the risk of monopoly formation by the largest operator in Ride-

hailing as a negative consequence. To draw conclusions there is need of more research about the relevant markets and geographical scope. Furthermore, the substitutive or complementary relation of Ride-hailing with private cars and incumbents needs to be clarified to establish the degree of importance former market power (Aarhaug & Olsen, 2018).

Risk of monopoly is an issue when the only supplier has the potential to extract monopoly rents, either reducing the quality of the good or services or by increasing prices above the competitive margin. Recent controversies about Uber progressively raising its commission constitutes an example of such tendencies (Acquier et al., 2017). In the context of Ride-hailing platforms, monopoly tendencies are particularly important given that a monopoly in peer-to-peer economy entails a monopsonic market (Aarhaug & Olsen, 2018). Furthermore, the monopoly risk has been assessed to go beyond Ride-hailing to a more extreme situation called walled gardens: provision of all mobility options through one platform. This would be clearly problematic making residents of a city overly dependent on one service provider, making them vulnerable to pricing, data regulation and investment decisions that in turn would shape the transport options available. Concerns about such an outcome have emerged because of recent mergers and acquisitions such as Uber's acquisition of Jump (Wolff et al., 2019). However, Didi's fast expansion in LAC major cities and particularly in Brazil (see Figure 1) contests the feasibility of a monopolistic market soon.

3.4.6. Reduced tax base

The yearly estimated cost in lost tax and employer national insurance contributions from falsely classified employees is £314m¹⁹.

In addition to serve the purpose of quality control and consumer protection, licenses and certifications are a way for governments – local or central depending on the level of (de)centralization – to collect fiscal revenues. Some collect revenue by selling licenses, others by trip (NY) and others by vehicle revenue (Edelman & Geradin, 2018). Consequently, Ride-hailing operation and rapid expansion has raised a concern for the loss of tax revenue, that could be the more obvious and pressing for the state (Miller, 2015). First, decentralization of Ride-hailing operation makes it easier to circumvent tax obligations in comparison to other services and goods. Second, as Ride-hailing services create negative externalities and vehicles use shared roads that are public goods sustained with public spending. In Sweden, taxes were the central flashpoint that emerged with Uber arrival, mobilizing taxi operators on the bases of unfair competition as well as unions and tax authorities concerned with the potential for tax evasion (Thelen, 2018).

The first deadlock to tax Ride-hailing services is to identify the tax base and control that those who are required to pay do so. So far, platforms have exclusive control of the necessary information to collect taxes from users and compel them to pay. It would be infeasible for the state to identify drivers and users without disclosure of information from the platforms which in turn is connected to all the complexities of privacy and data protection. The feasibility of a tax payment from drivers or users of ridesourcing services is even lower when the incentives of the owners of the information are considered: there are no reasons for the parties in a Ride-hailing platform mediated transaction to want to pay tax (Edelman & Geradin, 2018). As an alternative to tax users, Edelman and Geradin (2018) argue that a fee-for-service model of taxation can compensate for the use of shared roads. Such alternative would have the advantage of avoiding the decentralized nature of the transactions, but it is still dependent on the disclosure of information from the platform. In Sweden, where most of the conflict

¹⁹ [Citizens Advice responds to tribunal ruling on Uber drivers' employment status - Home](#)

surrounding Uber's operation was related to tax evasion a government commission assigned to provide policy guidance in the long term recommended to favor equipment that would enable direct communication with platform-based apps to facilitate the provision of data to the tax authorities (Thelen, 2018).

The continuing rise of the sharing economy should be a boon to cities for tax revenues—presuming they are ultimately collected on sharing economy uses (Miller 2015). However, so far, most cities have not yet been able to collect the fiscal gains. Based on Uber's operation in San Francisco, Davis (2018) concludes that although impacts of this service for individual transit consumers were meaningful, they were not for local authorities. Positive spillovers to the operation of the transport network in terms of coordination or budget were few.

3.4.7. Distributional effects.

More than 50% of Uber users decide to use cash in Panama (Revista Summa, 2019) that is the fourth LAC country in terms of digital penetration with a 69% Digital Scope Index. In Peru more than 7 million people in urban areas has access to smartphones indicating a 73% smartphone penetration. In 2018 a light version of Uber started operating in Peru for users with low-speed internet.

The addition of Ride-hailing to the transport network of a city is likely to influence the accessibility of citizens, but this depended greatly on its affordability and relation to public transport. While the system was not equitable before the arrival of Ride-hailing services (Bickerstaff & Walker, 2005), particularly not in LAC cities, the relative recent emergence of these new form of transport and its rapid scalation is an opportunity to acknowledge in time who are going to be the new winners and losers. Particularly because of the commercial and private nature of these services, business models that do not generally align with notions of social provision (Marsden & Reardon, 2018).

Similarly, to other effects of Ride-hailing empirical evidence is still scant and more case studies need to be developed before general conclusion can be drawn. On the positive side, a study funded by Uber shows that in Los Angeles, Uber vehicles arrived more quickly than taxis even in low-income neighborhoods with a mean wait time for UberX more than ten min shorter (6.49 min UberX and 17.42 Taxi) (Smart et al. 2015). The study however included only daylight hours and low-income neighborhoods with low violent crime rates. An independent study for Los Angeles by Brown (2018) about Lyft also found that the use of ride-hailing is ubiquitous across low-income and high-income districts in the city with 25 and 28 per cent of the trips in Low and high-income neighborhoods respectively. These percentages assimilate the share of population and jobs in this neighborhoods. Although more Lyft users live in high-income neighborhoods, use of the app is more frequent from low-income districts. The author concludes that the Ride-hailing service manly provides access to auto mobility in neighborhoods with low car ownership. In New York Ride-hailing entrance to the market seems to have pushed taxis to increase their service coverage to retain the number of trips and market share (Kim, Baek, & Lee, 2018). The active response of the incumbent taxi drivers brought positive consequences to areas that were not served before as taxis now can be hailed in a broader area of the city (Kim, Baek, & Lee, 2018). Furthermore, Wang and Ross (2019) found pre-booked transport services play a significant role in providing mobility options to the economically or physically challenged population in New York.

In contrast, recent experiments suggest that Uber and Lyft chauffeurs discriminate against Afro-Americans in terms of longer average waiting times and more frequent cancellations (Ge et al., 2016). With data from 581 trips (Lyft, Uber, and Flywheel) the authors find some evidence that in Seattle there is a 30% difference in the waiting time to be picked up between African American and white travelers when using UberX after controlling for differences in the

estimated waiting time. Similarly, the mean UberX travel time was about 8% longer for African American than for white passengers, after adjusting for differences in the length of the assigned trip. Accordingly, the European Parliament (2015) sees that discrimination by drivers/passengers could be one of the main negative effects of Ride-hailing. Einav et al. (2015) highlight the question about potential racial and gender discrimination through rating systems that can lead to fewer opportunities to these groups. In Latin America, Haddad et al (2019) find that although the difference in mean travel times with the introduction of e-hailing in Sao Paulo is negligible, the introduction of e-hailing does affect inequality in travel time by substituting some trips from public modes of individuals who were taking some of the longest trips in the region. In LAC Didi provides alerts for drivers to know if the pickup or drop off location is reported as not safe in their data bases (Portafolio, 2019). There is no evidence yet about these alerts creating discrimination of such areas.

Beyond racial and spatial discrimination, digital exclusion, and the principle of universal service²⁰ are potential distributional direct and indirect Ride-hailing effects respectively. The reliance of ridesourcing on user registration and digitalization creates additional barriers for those who are already experiencing exclusion, adding a loss of mobility to problems caused by, for example, the digital gap or through lack of access to banking (Pangbourne et al., 2018). However, in the region most countries have a high percentage of digital access. According to the Digital Reach Index, Costa Rica, Chile, Brazil, and Panamá score above 70%, close to countries like Singapore (84%). The index compares access to internet use according to population, number of connected people and percentage of access (Villar Liste, 24 Agosto 2019, El Capital Financiero). In Peru, more than 7 million urban dwellers (out a 32 million total population) had a smartphone and only two of every ten had downloaded a Ride-hailing app but the number of families that had access to a smartphone had multiplied by 5 with four out of ten families having at least one smartphone (Manrique Chavez, 2018). In Ecuador close to thirty percent of the population owns a smartphone and Colombia has reached a 34.6% internet penetration index with 17 million people accessing mobile or broad band. In Central America 82% of smart phones operate still with 3G technology context in which Uber created a light version of the app called UberLite that works even with low-speed internet, and only takes 5mb to download and 25mb to use (Contreras, 2018).

Cities have pursued to reach universal coverage of public services, including transport. Most regulatory regimes require full service from providers to disfavored groups, e.g., NY regulation on taxis and limousines prohibits rejecting rides based on race or disability and requires drivers to serve all areas in the city. While taxi companies can send drivers to underserved areas, transportation platforms rely on decentralized decisions that they do not control. However, the platforms could comply with this requirement if needed. In the case of transportation to any destination transport platforms have the advantage that if a driver wants to reject a particular destination there is written prove of it, in the case of taxis it is easier for a driver to reject a ride if it is towards a disfavored destination. The state will have to develop and adapt to steer towards positive social outcomes, in this case to continue as guarantor of a certain level of socially necessary or desirable services (Docherty, 2018), such as transport for all citizens.

With regards to disability, some cities require service providers to have a proportion of the fleet that can carry wheelchairs and the cost of these vehicles is spread across all users. Ride-hailing platforms are not yet part of this requirement in those cities. In LAC, close to 85 million people lives with some form of disability being Brazil the country with the highest percentage – 2000 Census data (14.5%) – followed by Chile (12.7%) (Senadis, 2013), Mexico (5%) (Inegi

²⁰ The term matches longstanding obligations that utilities must provide at a reasonable price and quality to a given territory.

2018) and Colombian with 3% of the population registered as disabled (Ministerio de Salud y Protección Social, 2017). Failing to make transport platforms to incur in the costs to provide their service to disabled people distorts the market towards the platforms that can charge lower fees compared to incumbents that have to charge the surcharge. In time more people will have an incentive to choose the platform over the incumbent given that the costs will be increasingly sheared by fewer people. This regulatory environment will allow platforms to take market share from taxis not because they are genuinely preferable or have a genuine cost advantage but because they allow passengers to circumvent regulatory requirements that benefit others.

A solution would be to require platforms to make sure to have a proportion of their drivers with wheel accessible vehicles, Uber has already incentive schemes in place to attract new drivers, the same could be applied to assure a proportion of the vehicles are wheelchair accessible. As a result of a partnership with the National Disability in Chile UberAssist was created to connect people that live with disabilities with sensitized drivers who can offer adequate special attention during the trip (Revista Summa, 2019). A second option is for public authorities to designate a universal service provider, to the extent needed and compensate the operator for the costs incurred and cover these costs with general taxation or on the sector concerned. Finally, economic incentives seem to discourage platforms and their service providers from accommodating disfavored groups: the increased cost incurred by one provider would be paid only by the provider who would not be compensated by the additional cost (Edelman & Geradin, 2018).

4. Regulatory challenges

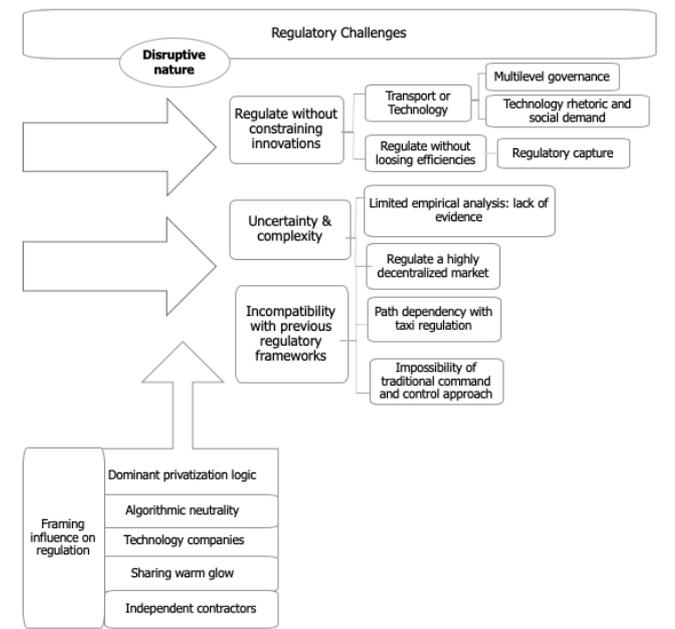
Three features of Ride-hailing services pose challenges to regulators: (i) their novelty and disruptive nature; (ii) the aspiration to preserve their advantages while avoiding their negative effects; and (iii) their level of uncertainty and complexity. Ride-hailing represents a new way of unscheduled, pre-booked hailing services mainly differentiated from traditional services because of the use of communication technologies. This fundamental difference allows to connect independent drivers with passengers including geolocation information, dynamic pricing, and user-based quality ratings. In turn as explained in the *user consumers* and *economic efficiency* sections increased access to information reduces transaction costs and at the very least improves resource allocation. Low-cost communication also creates a much more decentralized market which is hard to control and surveil without access to information whilst it is full of user's and operators' incentives to not be intervened by centrally generated regulation. Although the transportation service is quite similar to traditional taxis and pre-booked services these new characteristics are incompatible with previous regulatory frameworks, entail higher levels of complexity and uncertainty and empirical evidence is still inconclusive.

The decentralized nature of ridesourcing services and how fast technology and business practices can change are at the center of these challenges. As illustration, enforcing licenses or codes for traditional taxi services in most cities does not require too much effort given that the vehicles are easy to identify. Similarly, the decentralized nature of user-providers and user-riders that are connected through platforms that generally are internationally based, makes the process to monitor and enforce regulations more intricate, particularly regarding access to information. The private nature of the vehicles that are used to provide the services further complicates the design of efficient regulations. Lack of information, the novelty of digital services and its intrinsic flexibility entails that government regulators are working under unknown and not definite conditions.

The following sections present these three challenges based on the current scholarship to first identify its key characteristics and potential means for regulators to deal with them. There is need to clarify how can Ride-hailing be regulated to avoid its negative effects without limiting

the potential for innovation and the associated efficiencies of these new transport services. Second, the uncertainty and complexity of Ride-hailing related to the inconclusive empirical evidence and the highly decentralized nature of its market will be analyzed. Finally, as Ride-hailing works fundamentally as a pre-booked or traditional taxi service whilst entailing substantial differences in its operation it is necessary to analyze how and why previous regulatory frameworks are incompatible to govern the new.

Figure 4 Regulatory challenges associated with technological disruptors in passenger transport



Source: Own elaboration

4.1. Regulating disruptive innovations

Considered an innovation with inherent economic efficiencies, regulating Ride-hailing entry to the market of private transport services creates a regulatory dilemma. On the one hand, commonly innovations are associated with positive value and support of the service from Ride-hailing users – both providers and consumers – points to the same direction. On the other, in general not regulating innovations leaves society exposed to the undesired risks (Ashford & Hall 2011) and in the case of Ride-hailing work rights, consumer protection, unbalanced competition, market failures, fiscal income and distributional effects require action from regulators to achieve the best possible welfare result for society (Oviedo & Nieto, 2020). In the context of transport, set out how this task needs to shape up is even more important given that, as argued by Docherty (2018), its governance has tended to be ineffective even during periods with few substantial changes in modes and infrastructures.

Regulating Ride-hailing is a challenge even when the process is informed by precedent regulations about innovation given that it is unclear if these services can be framed by existing rules that apply to similar commercial practices (Ranchordas, 2015). To regulate Ride-hailing platforms and services without hampering their benefits and in particular their innovative dimension there is need to first identify what it is that is innovative about these practices. According to Fagerberg (2007) innovations are more than ideas, an innovation needs to be carried to practice and materialized in the market or society. There can be incremental innovations or the Schumpeterian destructive innovations that brake paradigms

and have generalized societal level impacts. Regarding Ride-hailing, what is innovative is the creation of an online platform that connects users in a simple way (Ranchordas, 2015). Accordingly, the design of regulation of Ride-hailing platforms needs to be guided by this fundamental difference with traditional taxi and pre-booked transport services if the potential of innovation to improve service quality is to be recognized.

In sum, what is innovative about Ride-hailing is the use of ICT to connect drivers and riders (Baron, 2018), and as such it is also at the core of the tensions to regulate it. The technology rhetoric puts emphasis on the role of Ride-hailing companies as technical facilitators through communication services and the liberation and empowerment they bring to users (Witt et al., 2015). Users, both providers and their clients are independent from the company and technology brings them more freedom and the capacity to do more (Witt et al., 2015). At the same time, as technology is generally connected to positive economic outcomes, these companies are seen as a welcome addition to most national economies. Indeed, as stated before, a fundamental part of the economic efficiencies these services bring are the result of lower communication costs. The regulatory challenges result from first, the use of the status as technology platform to avoid claims (e.g., responsibility for safety or labor issues) and regulations regarding operations as a transport provider (Dudley et al., 2017; Elliot, 2014).

Second, by framing and actual legal status as technology platforms Ride-hailing companies legitimize transport services that in most cities are not legitimate by law. Functioning as a platform instead of a transportation services ridesourcing companies can avoid regulatory frameworks meant to govern taxis and other pre-booked services (Baron, 2018). Uber fast scale up was indeed favored by its legal status as technology platform allowing it to be subject to the strong protection of US Federal law of online intermediaries and its hometown light taxi regulation and strong support for technological firms (Gorenflo, 2012). Similarly, prior taxi market deregulation gave Uber in Sweden the space to establish a considerable consumer base (Thelen, 2018). Furthermore, in California pressure from incumbents for a balanced competition was negligible compared to what happened in other cities, there was not needed to reform existing industry regulation which enabled the platform to quickly grow without regulatory constraints (Witt et al., 2015). Once the platform expanded to other geographies it had the advantage of being a market disruptive innovator with the political opportunity to function informally, between the fringes of rules framed in another era and almost impossible to enforce on a highly decentralized market.

Exploiting gaps in existing regulatory frameworks Uber starts functioning on regulatory grey zones (Baron, 2018) and rapidly establishes a robust operating ground, creating a large and exited consumer base (Thelen, 2018). When the platform has achieved a certain critical mass restricting their operation becomes politically sensitive as it is seen as against public demand (Dudley et al. 2017; Thelen 2018). Similarly, to other sharing economy firms, this resistance to regulatory pushes partially grounded on their ability to rally consumers as political advocate, has given Uber a consistent advantage (Rauch & Schleicher, 2015; Dudley et al. 2017). Indeed, the major challenge to ban sharing economy services such as Ride-hailing is consumers keep demanding them even when they become illegal or are informal (Miller, 2015). Consumer interest in sharing economy products, and the desire to monetize under-utilized existing uses does not disappear when the app is banned. Ridesourcing markets have shown to have a pent-up demand (Baron, 2018), particularly in cities where traditional taxi services and public transport has low quality.

Third, national and local levels and transport and technology branches of the government tend to adopt contradictory positions towards such companies given their diverse agendas, incentives and how susceptible they are to incumbents' pressure. The latter can vary from a taxi industry organized as an effective cartel or a competitive market with easy entry (Baron, 2018). Whilst a cartelized market is more attractive to new ridesourcing services given the

limited supply, it also presents higher incentives for incumbents to oppose ridesourcing services although the nature of the opposition depends on how the rents are distributed between taxi companies and drivers (Baron, 2018). Multilevel governance²¹ of Ride-hailing entails a clear contrast between local governments incentives and approaches towards Ride-hailing markets and National State necessities: namely taxes and services that are framed as solutions to trans local problems i.e., climate change mitigation, economic growth. Local taxation vs workers' rights are clear examples of the contrasting jurisdictions and incentives from different governmental levels to regulate sharing economy participants in general and Ride-hailing companies in particular (Baron, 2018). As an illustration, Thelen (2018) points out the difference between regulatory outcomes in the United States and Germany given that conflicts about Uber operation were resolved mainly through decentralized battles in the former and a nationalized conflict in the latter. Nationally coordinate action by the association of taxis in Germany limited the space for competition across cities and limiting the formation of substantial user base (Thelen, 2018). There are also several examples of national bills that have override local Ride-hailing regulation: Boise in Idaho, Texas bill contradicts Austin and Houston previous regulation among others²² (Miller, 2015). In Colombia for example, before Uber was banned from operating, national and local authorities had been in conflict regarding the legal and formality status of the Ride-hailing company (Oviedo, Sabogal, Perez, Granada, 2019). The contradictory arguments emerged from on one side Colombian law protection of platforms and web-based businesses right to operate. On the other, pressure from interest groups – mainly taxi's companies – and a national goal to reduce informal supply of urban transport (Revista Semana, 2018). In the case of Brazil, local governments have had different takes on the national legislation about mobility - quality and safety requirements for the vehicle and driver of taxis are determined at national level, while local governments negotiate tariffs – resulting in complete prohibition or stringent conditions for operation (de Souza Silva, Oliveira de Andrade, & Alves Maia, 2018). As soon as June 2015 two of Brazil's major cities already had bills to ban Uber (Esteves, 2015). Rio de Janeiro's bill got the approval of the city's council that included fines as high as \$500 for vehicles found using the platform. Later, these prohibitions were lifted, and the Senate amended national law to eliminate the strictest requirements, such as drivers being the owner of the vehicle and the need of a particular license plate (Ferreira, 2016; Pinho, 2016; Rio de Janeiro, 2016).

Finally, another challenge – less subject to political pressure but not less complicated – emerges when regulations are established or adapted and need to be enforced in a highly decentralized market. Sharing platforms enable a much larger number of individuals to contract directly for goods and services, and this decentralization fundamentally alters the regulatory landscape (Witt et al. 2015). On one hand, the scale of the internet, its transnational nature, and the anonymity of users make it extremely costly to target the individuals who breach national civil or criminal laws (Goldsmith & Wu, 2006). On the other, the use of private cars and app technology by Ride-hailing calls into the question the definition of private and commercial transport and consequently the question about its regulation and control (Aarhaug & Olsen, 2018) while the nature and scale of the internet make it costly if not impossible to control individuals (Burk, 1997).

4.2. Uncertainty & complexity

²¹ Multi-level governance: "how policy makers and interest groups in liberal democracies find themselves discussing, persuading and negotiating across multiple levels" (Hague and Harrop 2007)

²² Dovey, R. (2017, May 31). Texas bill overrides local ride-hailing regulation. *Next City.Org*, Retrieved from <https://search.proquest.com/docview/1904309705?accountid=14511>

Although regulating and deregulating the transport industry has been a common practice in response to diverse market failures and to achieve societal goals, the case of Ride-hailing poses the necessity for new methods, as well as the challenge of limited information and empirical evidence to design appropriate regulations. Whilst platforms are very flexible and prone to change rapidly or adapt characteristics, regulation design, approval and implementation is a lengthy process and it is difficult to reverse (Einav et al., 2015). Services anchored on fast moving technology allow its providers to work in the gaps of existing regulatory frameworks with slow moving regulation always lagging a step behind of the new technologies and business practices (Hacker, Pierson & Thelen, 2015).

Regulation also needs to consider the impacts of Ride-hailing on patterns of accessibility, that in turn influences complex issues such as land use planning and social inclusion (Docherty, 2018). In this context, regulatory control entails a series of trade-offs that have not yet been indisputably conceptualized or modelled (Witt et al., 2015) and governance of complex systems depends fundamentally on information that also needs to be congruent in scale and acknowledge the relative uncertainty (Dietz et al., 2003). As argued by Ranchordas (2015) regulating social and technological innovation with little information on the novelties in question and their effects and side effects, represents a significant challenge for regulators.

Moreover, common strategic responses of dominant digital platforms – chiefly Uber in the Ride-hailing scenario – to avoid direct interference by law is to appeal to the efficiency of its own sociotechnical governance system to regulate its users in order to meet the targets required by regulators (Witt et al., 2015). However, this poses an additional alternative that state regulators cannot properly evaluate because they do not have yet the procedures or the information to be able to do so (Witt et al., 2015). Although the claim is like previous free-market liberal appeals to deregulation, Uber's is not about deregulation in general bringing better outcomes. It represents a new form of argument for better outcomes at lower regulatory costs: technologies allowing a scale-free mechanism based fundamentally on consumer rating systems for quality and algorithms to set prices (Witt et al., 2015, p. 181).

As stated before, the empirical evidence about Ride-hailing services effects on incumbents, users, providers, and societal welfare in general is limited and inconclusive (Oviedo & Nieto, 2020). Similarly, scholarship focusing specifically on policy response to these services is still sparse and highly concentrated in law journals (Depuis 2018). The evidence about changes in regulation for traditional pre-booked and taxi services is also equivocal (Moore & Balaker, 2006; Witt et al., 2015) highly polarized (Dempsey, 1996) and context specific (OECD, 2007) subsequently reducing references to address the new services.

Ideally, the regulatory response would start by controlling the entry of ridesourcing platforms into the existing market and then regulating based on sound understanding of the complexity of the changes brought by the technology to existing and new markets (Miller, 2015). Accordingly, Einav et al. (2015) argue that to cope with the high flexibility and scalability of Ride-hailing platforms the strategy should be early but lenient regulatory intervention. Additionally, to deal with uncertainty and complexity information sharing and data disclosure have been proposed as a solution to the lack of information. Witt et al. (2015) argue that regulators should use the large sets of data now available from market actors and intermediaries in order to ground regulation design on quantifiable results and market-based outcomes. Uber Movement an Uber's data sharing platform about travel times and new mobility is an incipient step towards more information sharing and disclosure. In LAC Sao Paulo, Santiago and Bogotá travel times data are already accessible. The platform in Sao Paulo allows for more than 267 thousand trips 'combinations between 517 areas in the 39 municipal districts of the metropolitan area (Diogenes, Newspaper: Estadão, 24 April 2019).

4.3. Incompatibility with previous regulatory frameworks

In general, industries sharing economy firms participate in – e.g., taxi transport, housing, hotels, and restaurants – have long been subject to extensive local-level policymaking (Rauch & Schleicher, 2015). In particular, the history of regulation of unscheduled transport services, or vehicle-for-hire industry mainly represented by taxi services is global and tracks back to the XVII century (Gilbert & Samuels, 1982). Since then, regulations have been motivated either on its characterization as public service to reduce externalities (e.g., tap entrance of vehicles to avoid congestion) or on the necessity to reach equilibrium of demand and supply (Cairns & Liston-Heyes, 1996; Schaller, 2007; Cetin & Eryigit, 2013). The latter received more attention during the 1960s until 1990 focusing on the properties of taxi market segments (Aarhaug and Olsen, 2018) and more recently in connection to the need for regulation for the new Ride-hailing services (European Transport Safety Council, 2016; Farren, Koopman, & Mitchell, 2016; Rienstra, Baker, & Visser, 2015). However, these new services have particularities that make traditional regulatory approaches to similar transport services inconducive (Cannon & Chung 2015, Baron, 2018) and being an innovation, its regulation should be focus on the need to tackle its newness, uncertainty, and inherent risks (Ranchordas, 2015). As was mentioned before, central to this incompatibility is the issue of defining ridesourcing firms as technology platforms or transportation service providers that should fall under the jurisdiction of existing regulatory frameworks (Baron, 2018).

At the core of the Ride-hailing innovation is the use of information and communication technologies to connect drivers and passengers. Technology platforms are the mean to operationalize this connection and consequently should be the focus of regulation that aims to address the newness of this service. According to Goldsmith & Wu (2006) analysis, the only effective and scalable way to regulate the actions of people on the internet is through online intermediaries. In contrast, current taxi regulations respond to correct some unwanted results of the underlying characteristics of the street hail and rank taxi market²³ such as a high number of vehicles, high or arbitrary prices, low salaries, low profits and consequent cost coting and poor quality. Arguments for regulation are then public safety and security, service quality standards and pricing, environmental concerns, congestion, working conditions, city image and competition, and so on. The regulations can come in the form of quantitative restriction (a limited number of licenses), qualitative entry restriction (like ‘the knowledge’ in London), price regulation (setting compulsory fares), or other forms of market intervention, such as safety and environmental minimum standards, and technical requirements such as color schemes and taximeters (Zha et al., 2016; Aarhaug & Olsen, 2018).

The existence of a platform as intermediary changes drastically the possibilities to correct and control such unwanted results while it also points to the vulnerability of regulatory frames that were developed before technological innovations (Dudley et al. 2017). First, dynamic prices and the efficiency they bring might render strict price regulation less important while allowing to avoid arbitrary prices and to track high unjustified prices. For instance, the result of successive complaints over Uber’s surge pricing in several cities, particularly in times of emergency, led the platform to publicly limit the operation of its algorithms in these cases. In New York a threat of direct regulation helped push Uber to include these limitations resulting in a negotiated agreement with public authorities (Holmes, 2015).

Einav et al. (2015) argue that regulating platforms with the same strategies as incumbents have been regulated before, such as licensing and certifications may only serve the purpose to protect incumbents without really protecting consumers. This is particularly true when there

²³ Absence of a supply and demand curve, temporal monopolies, information asymmetries, few or no economies of scale and limited capital requirements for operating taxis in the street hailing segment.

are tendencies for regulatory capture²⁴ (Stigler, 1971; Peltzman, 1976) and firms whose profit could change due to new regulation have strong incentives to try to curve such regulation (Baron, 2018). The result is that the beneficiary of the regulation is the firm and not the public. In this context, banning software platforms has been perceived as a form of regulatory capture i.e., imposing limits to new entrants to avoid competition for existing providers (e.g., taxis and Uber) and not aiming at a clear policy objective or to correct a market failure. As an example, in Mexico, the antitrust authority recommended governors, legislators and the CMDX major to recognize and not ban Ride-hailing services (Esteves, 2015).

The theory of incumbency shows that established market participants might use existing regulatory structures – such as licenses and codes for taxis – to keep our competition or otherwise limit it to sort of oligopoly that works to maintain a high barrier to entry (Miller, 2105). Additionally, when regulations that limit entry to markets are poorly aligned toward consumer protection and not updated to reflect changes in those markets can impose substantial costs on job seekers, consumers, and the economy in general (Miller, 2015). Theoretical studies discussing from an economics point of view the quantitative limits as form of taxi regulations were predominantly against stablishing restrictions to entrance. The studies related such regulations with rent-seeking behavior (Aarhaug & Olsen, 2018). For instance, in Rio de Janeiro, a judge rule in favor of an Uber driver sentencing that the state incentive to ban Uber was related to regulatory capture and was not address at highest public interest (Esteves, 2015).

Second, moving from the direct relation between passenger and driver to booking through an intermediary involves to quality controls that could be centralized on the intermediary. Although it can be argued that this is similar to the role of taxi companies, technology platforms increase traceability and have lower costs of control of quality if required. Indeed, most of the service quality standards that regulatory frameworks seek to codify have been already put in place by Ride-hailing firms (Hall & Krueguer, 2015) but there is still a void regarding issues such as fleet size or drivers' salaries. Third, this central role of the intermediaries also means that they become more powerful in relation to users, both drivers and passengers. In sum, while low-cost communication and data management might render inefficient to apply traditional restrictions on price and quality to Ride-hailing, the relationships of the platforms with their users will become key key in future regulation (Leiren and Aarhaug, 2016).

The challenge is that controlling intermediaries is difficult when the nature of their operation - digital services – does not require to have a physical presence within a particular jurisdiction. On one hand, national laws often have little effect in a transnational environment (Witt et al. 2015). However, most platforms seek to provide some staff in each region where they operate – for example Uber country and city managers, along with supporting office space, local banks accounts, and other company assets in each city and country, provide a natural basis for jurisdiction as well as an immediate means to enforce judgement. France used this approach, including arresting Uber's France CEO. On the other, this creates a new form of 'race to the bottom' in the market for regulatory schemes (Burk, 1997) fueled by increased competition of cities to attract innovative activities, given the predominant role such activities have had historically in local economic growth and competitiveness (Brail, 2017). In this context Mardsen & Reardon (2018) argue that it is key to first evaluate welcoming or resisting innovations based on clearly defined policy objectives that the government is seeking to achieve. The authors propose a series of question to this end: "what will a socially necessary level of provision look like in the next five years? Should we continue to regulate modes, or should it be (Mobility as

²⁴ This tendency is more present when regulators are closely link to the firms they regulate, through extended discussions, career trajectories or a desire to maintain the status quo (Laffont & Pouyet, 2004)

a) service providers? How is access to, and quality of, a basket of mixed services to be regulated to protect consumers?” (p. 164).

In terms of liability, the question is if platforms should be liable for activities their platforms coordinate or facilitate. Historically, there are few laws that make third parties responsible for the actions of individuals unless there is a special especial relationship under which the actions have occurred (Witt et al., 2015, p. 177). First option is if platforms are taken as employers of their service providers, as several allegations have alleged and could be subject to the “worker classification test” to determine if Ride-hailing drivers are workers or not (Redfearn III, 2016). Then the platform will be responsible for the actions of its employees under the well established principle of *respondeat superior* (is a common-law doctrine that makes an employer liable for the actions of an employee when the actions take place within the scope of employment). Second, secondary liability could be used and there has not been any regulatory precedent about a jurisdiction declaring itself unable to oversee activity mediated by a software platform. Even more, with a comprehensive electronic record of who did what platforms create a virtual road map to users’ activities and indeed platforms’ records tend to be granular and well organized. Platforms also offer the opportunity for further control than offline intermediaries: a software platform can easily track where their drivers are to enforce a spatially base rule. Similarly, most online platforms are based on electronic transactions, that are easier to track and totalize than cash payments, particularly regarding tax evasion (Edelman & Geradin, 2018).

4.3.1. Case Study: Bogota, Colombia

By: Daniel Oviedo, Yiseth Scorcia, and Lynn Scholl

A series of interviews conducted in Colombia showed the perspective of different actors concerning some of the main public problems regarding ride hailing platforms. The main issue identified in the interviews is how the illegal nature of ride hailing platforms creates, exacerbates, or leaves unaddressed various relevant public policy matters. The nature of the services provided by TNC’s make them important for regulators in two distinct ways: on one hand, there are problems created by their very existence that can’t be addressed because they are illegal, and there are other kind of public problems not directly created by the TNC’s activities, but in which they are relevant actors and stakeholders that can’t be integrated in public policy solutions.

In the first category, the drivers interviewed are clearly dissatisfied by the disproportionate power the platforms have over them, having total autonomy to unilaterally establishing the prices of their services and the fees charged to both customers and drivers. They seem to want either some form of regulation or the possibility for collective bargaining to improve their position. Obviously, the fact that the services provided by TNC’s are considered illegal or in the bet case unregulated, the first option is out of the table, while the second is not available to independent contractors.

In the second category the interviews reflect several issues where TNC’s should be considered relevant actors that can be integrated to the process of public policy formulation but can’t be because of their illegal status. Problems in this category include crime, gender discrimination and the risk of violence for female drivers, adequate infrastructure for the inclusion of users with disabilities and affordability for lower income people. For the first two, the response of the ride-hailing platforms, or its drivers is to address the issues directly, through private means; they have used tools like WhatsApp groups or in-platform means of communication to share information among them, both to respond against a threat or to warn others about potential risky areas. The drivers perceive their activity as dangerous and consider themselves “the most vulnerable actor in the provision of ride-hailing services”

(F, TNC), but their fear of being persecuted by authorities push them to rely on private solutions rather than working with the police. A similar phenom occurs with gender discrimination, where TNC's have implemented training and sensibility campaigns to protect female drivers and users; drivers have also adapted their behavior to avoid risks, by working mostly during daylight and using SaraLT, a platform exclusive for women that acts as a safer transport alternative, for them and for users. Although these problems receive some sort of private responses, the solutions are partial, and don't guarantee in any way effective remedies for victims, rather are oriented to reducing liability for TNC's.

In the case of affordability for lower income people, some TNC's have created alternatives that appeal to these markets. The case of Picap is particularly interesting, as it has been quite successful at capturing part of the transport market in lower income areas. One of the key factors in their success is the fact that drivers lie in those communities, so unlike other ride hailing platforms that avoid lower income areas based on security concerns, the mentality of Picap is, as one of the TNC's representatives said, "I would not reject a trip to or from my neighborhood" (M, TNC). Of course, this is another case of a partial solutions because the service provided by Picap is inferior to other platforms, or even taxis, in areas such as passenger safety, considering that Picap uses motorcycles instead of cars, which represents a higher risk of suffering injuries in an accident.

The situation is quite different for issues with no economic incentives to address them, and it's not reasonable to expect private solutions. The clearest example of this kind of phenom is the inclusion of elderly users or people with disabilities, one of the TNC's representatives interviewed said: "they are not requirements for universal accessibility in the platform (...) this is remit of the regulator" (F, TNC). Furthermore, according to one of the drivers, providing adequate conditions for these kind of users "It goes in your conscience" (M, ride-hailing driver). In this case, a segment of the transport market is not bounded by regulation and is excluded of public policy goals, ultimately reducing social welfare, and affecting vulnerable users.

All cases, although there are significant differences in the responses and their efficacy to respond to public policy objectives, highlight that the market of ride hailing platforms is relevant for regulators and can be an important factor in increasing social welfare, and how inconvenient prohibition can be in face of a dynamic changing economy where services can adapt and transform quickly and will continue to exist despite regulators efforts and pressure of interest groups.

4.3.2. Case study: Chile

By: Florencia Cinalli

Governance plays a key role in the introduction and development of mobility systems that support cities' sustainable growth. In Chile, urban mobility is a clear example of the need for cooperation between the public and private sectors. The planning and development of transport networks is a government responsibility (national, regional, local). A significant cause of mobility issues is fragmented governance (Valenzuela and Toledo, 2017) and the outdated and rigid regulation (LyD, 2018). During the last 5 years, the main Chilean capitals have experimented the arrival of different ride-hailing systems, such as Cabify, Uber, Beat and Didi. The sudden irruption of these platforms has led to tensions between various stakeholders, both from the public and private sector.

Ride-hailing platforms have been marketed as a beneficial, comfortable, safe, and efficient alternative to private car usage and ownership. However, despite the aforementioned benefits there have been strong political and social repercussions due to their impact on

cities' transport systems. Until recently, the operation of these services in Chilean cities has been outside the legal framework, which has led to a series of scandals, accidents, fines, vehicles impounded and strikes. The companies, which arrived in the country in 2014, have gained significant support from the general public. They have more than two million users and around 100,000 people working as ride-hailing drivers (Fielbaum and Tirachini, 2019). However, they have been heavily criticized by taxi and collective drivers who accuse them of illegal operation and blame them for unfair economic losses. Additionally, there are concerns regarding their impact on congestion, pollution, sources of energy, vehicle kilometers travelled (VKT), reduction of public transport usage, privacy protection, passenger safety and driver labor rights (Tirachini and Gómez-Lobo, 2019).

The Chilean government has been receptive to the users' demands of these services and there have been several attempts to regulate them despite resistance from taxi unions. Currently, a bill nicknamed 'Uber Law' is being discussed in Congress with the objective to define a flexible and basic framework to regulate the system, and gradually modify this initial attempt to include, for example, shared travel services (carpooling). Chile is in a moment of inflexion concerning the development of this technology. Good regulation will result in citizen benefits, while bad regulation could promote delayed progress and will not allow technology to achieve its full potential. Authorities need to be able to build a structure flexible enough to adapt to innovations, as what is decided today is likely to become obsolete in as little as five years. Furthermore, when looking at the institutional structures in Chile, in addition to national regulation, it would be interesting to complement them with ones of regional and local scale. There are different needs throughout the country and thus it is fundamental that public-private cooperation creates the conditions for these methods to be practical and useful for each territory's community. Sound relationships between stakeholders are critical to overcome service coverage issues and facilitate data exchange to support decision-making when planning and executing infrastructure.

In addition to good regulation, enforcement is required to ensure that norms are complied with, however, lack of personnel to do so is a challenge for the country. Chile's national police force is focused on security, one of the country's largest challenges. A potential solution could be the introduction of technologies, such as fixed or mobile cameras, that would be integrated with the local police courts and make charging fines for non-compliance and bad practices. Today, this link with the local courts is not allowed by the national regulation. Furthermore, in such a large and diverse country, different transport solutions are required to suit the needs of various regions and demographics. Thus, regulation must not only regulate the ride-hailing platforms themselves but link them to other modes by promoting inter-modality and its integration into the general transport system. Hence, it is evident that governance and collective decision-making is a key factor in Chile to ensure decisions are made based on an informed debate so that ride-hailing services provide a sustainable, safe and equity transport alternative for all citizens.

5. Conclusions

The evidence outlined in this paper bears witness to the path-dependency of transport governance, which is created by the categories through which governance is thought and enacted (Blomley 2014). The emergence of new forms of technology-assisted urban mobility can open the room to what Jensen et al. define as 'Epistemic experimentation', which is defined as fostering new ways of governing a new phenomenon by testing new ways of understanding it (Jensen, Cashmore & Elle, 2017). Our paper represents an attempt to provide a multidimensional analytical lens to the understanding of the phenomenon of ride-hailing in Latin America that enables both researchers and practitioners to 'put all cards on the table' when approaching regulations of new mobility services. By building on existing literature, our framework allows to consider both benefits and burdens associated with the introduction of

urban ride-hailing services, as well as the distribution of such benefits and burdens across stakeholders in the urban transport ecosystem.

Considering the scale and complexity of the problem as summarized in Figures 1 and 2, the authors suggest a collaborative approach to co-regulation to design mechanisms that enable regulators to effectively complement the inherent efficiencies of the sharing economy with an optimal level of protection of public interest over interest groups and cost-effective feasibility (Cannon et al. 2015). As Davis (2018) argued, the introduction of regulations for 'Transportation Network Companies' (TNCs) in California bears the mark of a complex set of trade-offs between leadership strategies and political understanding, as well of reciprocal recognition of not only the private and public sector, but also of the users of the disrupting services.

The introduction in 2013 of regulations to TNCs in California that imposed new "(...) obligations related to insurance, background checks for drivers and vehicle inspections but did not require substantial changes in existing business models" (Davis, 2018, p.111) have become an example that has sought to be replicated in various contexts with different levels of success. Our paper recommends not replication but evidence-base co-learning, allowing stakeholders at different levels of governance and with different degrees of availability of resources and capacity, to develop tailored solutions to their current priorities and conditions. Such a process entails the development of spaces for openly accessing, sharing, and using information, as well as the construction of spaces of representation that enable regulators, operators, users, and non-users alike to voice their concerns and expectations regarding the incoming services, as well as rethinking existing regulatory frameworks that may not fit the conditions under which new personal transport services operate. Furthermore, the development of regulations for new forms of urban mobility requires rethinking some of the tenets and methods for the understanding of transport behaviors and decision-making. This means also building on multiple perspectives for the re-design of current information and instruments for planning and control so they can better-reflect the features of new services as well as their potential risks and externalities.

In a context where regulators deal with informality and rapidly changing definitions of legality and illegality in transport services such as Latin American cities, the understanding of transport systems as a continuum rather than a dichotomy may contribute to the development of more comprehensive regulatory frameworks. The general attitude towards technology-driven innovations presents an opportunity for regulators and decision-makers to develop and deploy experimental regulations for ride-hailing services instead of forcing new operators to adhere to frameworks that do not necessarily account for some of their main benefits and risks (see Posen, 2015). For instance, Toronto city council's regulatory framework leveled the play field for traditional taxis and ridesourcing services by allowing more flexibility in pricing and operation for the former and applying a minimum price for the latter as well as more stringent background checks and special licenses for drivers, identifiers and twice-a-year inspections for vehicles and insurance (Baron, 2018).

Thelen (2018) argues that a fundamental entry point to understand regulatory process related to Uber are the differences in the specific points of contestation around which the regulatory politics centered. Multiple countries and cities in LAC are facing similar challenges with the disruptive arrival of ride sharing services but diverse institutional arrangements translate such challenges into different struggles based on which issue is more salient. The centrality of consumer protection or tax evasion or employees' rights requires the understanding of transport beyond traditional governance and government structures (e.g., ministries and departments of transport and mobility) needing to mobilize different actors in other sectors. This will lead to the creation of different coalitions and consequently opening spaces for regulations of the new services.

Acknowledgements: The authors thank the Inter-American Development Bank for providing the funding for this research. We also acknowledge the contributions of Florencia Cinalli, (University College London), Florencia Rodriguez Tourón (Independent Consultant), Yisseth Scorcia (Independent Consultant), and Lynn Scholl (Inter-American Development Bank) in the three case studies presented in this paper.

References

- Aarhaug, J. and Olsen, S. (2018) 'Implications of ride-hailing and self-driving vehicles on the need for regulation in unscheduled passenger transport', *Research in Transportation Economics*. Elsevier, 69(July), pp. 573–582. doi: 10.1016/j.retrec.2018.07.026.
- Acquier, A., Carbone, V., Massé, D., 2016 Creating value in the Sharing Economy: Business models, scalability, and sustainability impacts. In: Paper Presented at the EGOS Conference, Sub-theme Organizing in the Shadow of Sharing, July 7–9, Naples.;
- Acquier, A., Daudigeos, T., & Pinkse, J. (2017). Promises and paradoxes of the sharing economy: An organizing framework. *Technological Forecasting and Social Change*, 125(July), 1–10. <https://doi.org/10.1016/j.techfore.2017.07.006>
- Aloisi, Antonio. 2016. "Commoditized Workers: Case Study Research on Labor Law Issues Arising from a Set of 'on-Demand/Gig Economy' Platforms." *Comparative Labor Law & Policy Journal* 37 (3): 653–90.
- Angrist, J.D., Caldwell, S., Hall, J.V., 2017. Uber vs. taxi: A driver's eye view (No. w23891). National Bureau of Economic Research.
- Ashford, N.A. & Hall, R.P., 2011. The Importance of Regulation- Induced Innovation for Sustainable Development, *Sustainability*, Vol. 3, No.1, pp. 270 - 292
- Avital, M. et al. (2014) 'The Collaborative Economy: A Disruptive Innovation or Much Ado about Nothing?', *35th International Conference on Information Systems*, pp. 1–7. Available at: <http://aisel.aisnet.org/icis2014/proceedings/Panels/5/>.
- Avital, M. et al. (2014) 'The Collaborative Economy: A Disruptive Innovation or Much Ado about Nothing?', *35th International Conference on Information Systems*, pp. 1–7. Available at: <http://aisel.aisnet.org/icis2014/proceedings/Panels/5/>.
- B. Cannon, H. Chung, A framework for designing Co-regulation models well- adapted to technology-facilitated sharing economies, *St. Clara High. Tech. L.J* 31 (2015) 23e97.
- Baccaro, Lucio and Chris Howell. 2011. "A Common Neoliberal Trajectory." *Politics & Society* 39(4): 521–63.
- Badger, E., 2014. Taxi Medallions have been the Best Investment in America for Years. Now Uber May be Changing that. *The Washington Post* <<http://www.washingtonpost.com/blogs/wonkblog/wp/2014/06/20/taxi-medallions-have-been-the-best-investment-in-america-for-years-now-uber-may-be-changing-that/>> (accessed January 4, 2015).
- Bakker, S., Maat, K. & van Wee, B. (2014). Stakeholders' interests, expectations, and strategies regarding the development and implementation of electric vehicles: The case of the Netherlands. *Transportation Research Part A: Policy and Practice*, 66,52?64. doi:10.1016/j.tra.2014.04.018
- Bardhi, F., Eckhardt, G.M., 2012. Access-based consumption: the case of car sharing. *J. Consum. Res.* 39 (4), 881–898.
- Berger, T., Frey, C. B., Levin, G., & Danda, S. R. (2019). Uber happy? Work and well-being in the 'gig economy'. *Economic Policy*, 34(99), 429-477.

Baron DP (2016) Strategy beyond markets: A step back and a look forward. de Figueiredo JM, Lenox M, Oberholzer-Gee F, Bergh RGV, eds. *Advances in Strategic Management*, Vol. 34 (Emerald Group Publishing, Bingley, UK), 1–54.

Baron, D. P. (2018) 'Disruptive Entrepreneurship and Dual Purpose Strategies: The Case of Uber', *Strategy Science*, 3(2), pp. 439–462. doi: 10.1287/stsc.2018.0059.

Bauwens, M., 2005. The political economy of peer production. *CTheory* (1 December).

Beard, R.T., Macher, J.T. and Mayo, J.W. (2015) 'Can You Hear Me Now?' Exit, Voice and Loyalty under Increasing Competition.

Benkler, Y. (2006). *The wealth of networks: How social production transforms markets and free- dom*. New Haven, CT: Yale University Press.

Benkler, Y., 2004. Sharing nicely: on shareable goods and the emergence of sharing as a modality of economic production. *Yale Law J.* 273–358.

Blomley, N. (2014). Disentangling law: The practice of bracketing. *Annual Review of Law and Social Science*, 10(1), 133–148. doi:10.1146/annurev- lawsocsci-110413-030719

Börzel, T. A. and Risse, T. (2010) 'Governance without a state: Can it work?', *Regulation and Governance*, 4(2), pp. 113–134. doi: 10.1111/j.1748-5991.2010.01076.x.

Botsman, R., Rogers, R., 2010. *What's Mine Is Yours: The Rise of Collaborative Consumption*. Harper Collins, New York.

Brail, S. (2017) 'Promoting innovation locally: Municipal regulation as barrier or boost?', *Geography Compass*, 11(12), pp. 1–12. doi: 10.1111/gec3.12349.

Brustein, J. (2016). Uber and Lyft want to replace public buses. Retrieved May 20, 2017,

Burk, D. L. (1997). Virtual exit in the global information economy. *Chicago-Kent Law Review*, 73,943

Cairns, R. D., & Liston-heyas, C. (1996). Competition and regulation in the taxi industry. *Journal of Public Economics*, 59, 1–15.

Cairns, R.D., Liston-Heyas, C., 1996. Competition and regulation in the taxi industry. *J. Public Econ.* 59, 1–15.

Cannon, B., and H. Chung. 2015. "A Framework for Designing Co-Regulation Models Well-Adapted to Technology-Facilitated Sharing Economies." *Santa Clara High Technology Law Journal* 31 (1): 23–96.

Carboni, M. (2016). A New Class of Worker for the Sharing Economy. *Richmond Journal of Law and Technology*, 22(4), 11.

Catalyst Companies (2017) About Us. Retrieved from URL <http://www.catalystcompanies.co/about-catalyst-companies/>

Catalyst Copanies, 2017. accessed: <http://www.catalystcompanies.co/>

- Cetin, T., & Eryigit, K. Y. (2013). The economic effects of government regulation: Evidence from the New York taxicab market. *Transport Policy*, 25, 169–177.
- Chang, H.H., 2017. The economic effects of Uber on taxi drivers in Taiwan. *J. Competition Law Econ.* 13 (3), 475–500. Christensen,
- Cheal, D., 1988. *The Gift Economy*. Routledge, London.
- Christian Denmon, Ride sharing vs. traditional taxis: how do injury insurance claims compare? *Huffington Post* (July 7, 2014)
- Clelow, R. R., & Mishra, G. S. (2017). *Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States*. UC Davis ITS Research Report.
- Cockayne, D.G., 2016. Sharing and neoliberal discourse: the economic function of sharing in the digital on-demand economy. *Geoforum* 77, 73–82.
- Codagnone, C. and Martens, B. (2016) 'Scoping the Sharing Economy: Origins, Definitions, Impact and Regulatory Issues', *JRC Technical Reports Institute for prospective technological studies digital economy working paper*, 01. doi: 10.2139/ssrn.2783662.
- Cohen, B. & Kietzmann, J. 2014. Ride On! Mobility Business Models for the Sharing Economy. *Organization and Environment*, Vol. 7, No. 3.
- Cohen, P., Hahn, R., Hall, J., Levitt, S., Metcalfe, R. (2016). Using big data to estimate consumer surplus: the case of Uber. Technical Report, National Bureau of Economic Research (2016)
- Collier, R. B., Dubal, V. and Carter, C. (2017) 'The Regulation of Labor Platforms: The Politics of the Uber Economy', *University of California*, (March), pp. 1–42. Available at: <http://www.brie.berkeley.edu/wp-content/uploads/2015/02/Reg-of-Labor-Platforms.pdf>.
- Cooper, J., Mundy, R., & Nelson, J. (2010). Taxi! Urban economies and the social and
- Cramer, Judd, and Alan B. Krueger. 2016. "Disruptive Change in the Taxi Business: The Case of Uber." *American Economic Review*, 106 (5): 177-82.
- Darlington, S. and Londoño, E. (2017) 'Brazil Becomes Uber's Latest Regulatory Battleground', *The New York Times*.
- Davis, D. 2018. Governmental capacity and the smart mobility transition. In G. Marsden & L. Reardon (Eds.), *Governance of the smart mobility transition* (pp. 19–32). London: Emerald Group Publishing Limited. Chapter 7
- de Souza Silva, L. A., Oliveira de Andrade, M. and Alves Maia, M. L. (2018) 'How does the ride-hailing systems demand affect individual transport regulation?', *Research in Transportation Economics*, (June), pp. 1–0. doi: 10.1016/j.retrec.2018.06.010.
- De Stefano, Valerio. 2016. "The Rise of the 'Just-in-Time Workforce': On-Demand Work, Crowdwork and Labour Protection in the 'Gig-Economy.'" Working paper. http://www.ilo.org/travail/whatwedo/publications/WCMS_443267/lang--en/index.htm.
- Dempsey, P. S. (1996). Taxi industry regulation, deregulation & reregulation: The paradox of market failure. *Transportation Law Journal*, 24, 73.

Dietz, Thomas & Ostrom, Elinor & C Stern, Paul. (2004). The Struggle to Govern the Commons. *Science* (New York, N.Y.). 302. 1907-12. 10.1126/science.1091015.

Dills, A., & Mulholland, S. (2018). Ride-Sharing, Fatal Crashes, and Crime. *Southern Economic Journal*, 84(4), 965-991.

Docherty, I. (2018). New governance challenges in the era of 'Smart' mobility. In G. Marsden & L. Reardon (Eds.), *Governance of the smart mobility transition* (pp. 19–32). London: Emerald Group Publishing Limited. Chapter 2.

Dowling, R. 2018. Smart mobility: disrupting transport governance. In G. Marsden & L. Reardon (Eds.) *Governance of the Smart Mobility Transition* (pp. 51 - 64). London, UK: Emerald Publishing

Dudley, G., Banister, D. and Schwanen, T. (2017) 'The Rise of Uber and Regulating the Disruptive Innovator', *Political Quarterly*, 88(3), pp. 492–499. doi: 10.1111/1467-923X.12373.

Dupuis, N. (2018) 'Stories of the sharing economy: Policy narratives surrounding the entry of transportation network companies into four mid-sized American cities', *Critical Policy Studies*. Routledge, 00(00), pp. 1–22. doi: 10.1080/19460171.2018.1437459.

Eckhardt, G.M., Bardhi, F., 2016. The relationship between access practices and economic systems. *J. Assoc. Consum. Res.* 1 (2), 210–225.

Edelman, B. G. and Geradin, D. (2018) 'Efficiencies and Regulatory Shortcuts: How Should We Regulate Companies like Airbnb and Uber?', *SSRN Electronic Journal*. doi: 10.2139/ssrn.2658603.

Einav, L., Farronato, C., & Levin, J. (2015). Peer-to-Peer Markets. National Bureau of Economic Research Working Paper Series, No. 21496.

Eisenmeier, S. (2018). Ride-sharing platforms in developing countries: effects and implications in Mexico City.

Elliott, J. (2014, October 8). Uber ride share: Taxi or tech company? CTV News. Retrieved from <http://www.ctvnews.ca/business/uber-ride-share-taxi-or-tech-company-1.2044508>

Esteves, L. A. (2015). *O Mercado de Transporte Individual de Passageiros: Regulação, Externalidades e Equilíbrio Urbano*, Vol. 1. Brasília: Departamento de Estudos Econômicos

European Transport Safety Council [ETSC] (2016). Making Taxis Safer: Managing road risk for for taxi driver, their passengers and other road users.

Evans, J. P. (2011) 'Resilience, ecology and adaptation in the experimental city', *Transactions of the Institute of British Geographers*, 36(2), pp. 223–237. doi: 10.1111/j.1475-5661.2010.00420.x.

Fagerberg, J. (2006). Innovation: A Guide to the Literature. *The Oxford Handbook of Innovation*, The Oxford Handbook of Innovation.

Fagerberg, J., Mowery, D., Nelson, R., & Nelson, Dick. (2006). *The Oxford handbook of innovation* / edited by Jan Fagerberg, David Mowery, and Richard Nelson. (Oxford handbooks online). Oxford: Oxford University Press.

- Fagnant, D., & Kockelman, K. (2015). Preparing a nation for autonomous vehicles: Opportunities, barriers, and policy recommendations. *Transportation Research Part A: Policy and Practice*, 77, 167-181.
- Farrell, D. & Greig, F. (2016). Paychecks, paydays, and the online platform economy: Big data on income volatility. JP Morgan Chase Institute
- Farrell, Diana, and Fiona Greig (2016). The online platform economy: What is the growth trajectory? JPMorgan Chase & Company Institute. Accessed at <https://www.jpmorganchase.com/corporate/institute/institute-insights.htm> (January 2017).
- Farren, M., Koopman, C., & Mitchell, M. (2016). Rethinking taxi Regulations: The case for fundamental Reform. Washington
- Frenken, K. and Schor, J. (2017) 'Putting the sharing economy into perspective', *Environmental Innovation and Societal Transitions*. Elsevier B.V., 23, pp. 3-10. doi: 10.1016/j.eist.2017.01.003.
- Friedman, G., 2014. Workers without employers: shadow corporations and the rise of the gig economy. *Rev. Keynesian Econ.* 2 (2), 171-188.
- Ge, Y., Knittel, G.R., MacKenzie, D., Zoepf, S., 2016. Racial and gender discrimination in transportation network companies. NBER Working Paper No. 22776, October, <http://www.nber.org/papers/w22776>, Retrieved November 1, 2016.
- Giddens, A. (1991) *Modernity and self-identity: self and society in the late modern age*. Polity, Cambridge. Goldthorpe,
- Giddy, Julia Kathryn. "The Influence of E-hailing Apps on Urban Mobilities in South Africa." *African Geographical Review* 38.3 (2019): 227-39. Web.
- Gilbert, G., Samuels, R.E., 1982. *The Taxicab: An Urban Transportation Survivor*. University of North Carolina Press, Chapel Hill.
- Hacker, J. Pierson, P. & Thelen, K. (2015). Drift and Conversion. In *Advances in Comparative Historical Analysis*, ed. J. Mahoney & K. Thelen. New York: Cambridge University Press.
- Haddad, E. A., Vieira, R. S., Jacob, M. S., Guerrini, A. W., Germani, E., Barreto, F., ... Sayon, P. L. (2019). A socioeconomic analysis of ride-hailing emergence and expansion in São Paulo, Brazil. *Transportation Research Interdisciplinary Perspectives*, 1, 100016. <https://doi.org/10.1016/j.trip.2019.100016>
- Hall, J.V., Krueger, A.B., 2015. An Analysis of The labor Market for Uber's Driver-Partners in the United States, Princeton University Industrial Relations Section Working Paper No. 587, Princeton University Industrial Relations Section.
- Henao, A., Marshall, and National Renewable Energy Lab. "The Impact of Ride Hailing on Parking (and Vice Versa)." *Journal of Transport and Land Use* 12.1 (2019): 127-147. Web.
- Hill, Steven. 2015. *Raw Deal: How the "Uber Economy" and Runaway Capitalism Are Screwing American Workers*. First edition. New York: St. Martin's Press.

Hirsch, P.M., Levin, D.Z., 1999. Umbrella advocates versus validity police: a life-cycle model. *Organ. Sci.* 10 (2), 199–212.

Holland-Letz, D., Kloss, B., Kässer, M., & Müller, T. (2019). Start me up : Where mobility investments are going. Retrieved from https://www.mckinsey.com/~/media/McKinsey/Industries/Automotive_and_Assembly/Our_Insights/Start_me_up_Where_mobility_investments_are_going/Start-me-up-where-mobility-investments-are-going-vF.ashx

Infobae (2018) <https://www.infobae.com/tecnologia/2018/04/12/dos-anos-de-uber-en-la-argentina-numeros-de-un-fenomeno-que-aun-enfrenta-resistencia/>

Jean-Jacques Laffont & Jerome Pouyet, The Subsidiarity Bias in Regulation, 88 *JOURNAL OF PUBLIC ECONOMICS*, 255 (2004)

Jensen, J. S., Cashmore, M., & Elle, M. (2017). Reinventing the bicycle: How calculative practices shape urban environmental governance. *Environmental Politics*, 26(3), 459–479. doi:10.1080/09644016.2017.1311089

Kim, J., Rasouli, S., Timmermans, H., 2017. Satisfaction and uncertainty in car-sharing decisions: An integration of hybrid choice and random regret-based models. *Transp. Res. Part A Policy Pract.* <https://doi.org/10.1016/j.tra.2016.11.005>

Knill, C., Schulze, K. and Tosun, J. (2011) 'Measuring environmental policy change: Conceptual alternatives and research implications', *Institute for Advanced Studies (Vienna): Reihe Politikwissenschaft Political Science Series*, (125), p. 38.

Komanduri, A., Wafa, Z., Prousaloglou, K., 2018. Assessing the impact of app-based ride share systems in an urban context: Findings from Austin. Presented at the 97th Annual Meeting of the Transportation Research Board, Washington, D.C., January, Paper No. 18-01356. Kooti, F., Grbovic, M., Aiello, L.M., Djuric, N., Radosavljevic, V., Lerman, K., 2017. Analyzing Uber's ride-sharing economy. *Proceedings of the 26th International Conference on World Wide Web Companion*, pp. 574-582. International World Wide Web Conferences Steering Committee.

Koopman, C., Mitchell, M., Thierer, A., 2015. The Sharing Economy and Consumer Protection Regulation: The Case for Policy Change. Mercatus Center at George Mason University

Kuttner, Robert. 2013. "The Task Rabbit Economy." *The American Prospect*, October 10, 2013. <http://prospect.org/article/task-rabbit-economy>.

Laing, A. and Jourdan, A. (2019) 'Exclusive : China ride-hailing giant Didi plans Chile , Peru launches to take on Uber', *Reuters - Business News*, 15 February, pp. 1–4. Available at: <https://uk.reuters.com/article/uk-didi-chuxing-chile-exclusive/exclusive-china-ride-hailing-giant-didi-plans-chile-peru-launches-to-take-on-uber-idUKKCN1Q42K7>.

Leiren, M. D., & Aarhaug, J. (2016). Taxis and crowd-taxis: Sharing as a private activity and public concern. *Internet Policy Review*, 5(2) 2016

M. Arvind, V.A. Marshall, The dark side of the sharing economy and how to lighten it, *Commun. ACM Assoc. Comput. Mach.* 57 (11) (2014) 24e27.

M.A. Cusumano, How traditional firms must compete in the sharing economy? *Commun. ACM* 58 (1) (2015) 32e34.

Manfredi, M. (Jul 2019) Uber y Cabify podrán contratar seguros de responsabilidad civil para sus conductores. *EL Cronista*. URL: <https://www.cronista.com/finanzasmercados/Uber-y-Cabify-podran-contratar-seguros-de-responsabilidad-civil-para-su-conductores-20190717-0051.html>

Manrique Chavez, W. (2018) Caso Uber Peru 2017 - 2021 http://repositorio.up.edu.pe/bitstream/handle/11354/2197/Wendy_Tesis_Maestria_208.pdf?sequence=4&isAllowed=y

Marsden, G. and Reardon, L. (2018) *Governance of the Smart Mobility Transition*. Edited by E. P. Limited.

Meelen, T., Frenken, K., 2015. Stop Saying Uber Is Part of the Sharing Economy. *Fast Company*.

Miller, S. R. (2015). First principles for regulating the sharing economy. Retrieved from <http://papers.ssrn.com/abstract=2568016>

Moed, J. (2018, December). Uber's Wild Ride To Make Latin America Its Fastest Growing Region. *Forbes*, 1–14. Retrieved from <https://www.forbes.com/sites/jonathanmoed/2018/12/20/is-uber-operating-illegally-in-its-fastest-growing-region/#488e79d19251>

Moore, A., & Balaker, T. (2006). Do economists reach a conclusion on taxi deregulation? *Econ Journal Watch*, 3(3), 109–132

Nicholas A. Ashford & Ralph P. Hall, The Importance of Regulation- Induced Innovation for Sustainable Development, 3 *SUSTAINABILITY* 270, 273 (2011).

OECD. (2007). *Taxi services: Competition and regulation* (No. DAF/COMP(2007)42). Retrieved from <http://www.oecd.org/regreform/sectors/41472612.pdf>

Posen, H. A. 2015. "Ridesharing in the Sharing Economy: Should Regulators Impose Über Regulations on Uber?" *Iowa Law Review* 101 (1): 405–433.

Ranchordas, S. (2015) 'Does Sharing Mean Caring? Regulating Innovation in the Sharing Economy', *Minnesota Journal of Law, Science and Technology*, 16(1), pp. 413–476.

Raszewski, E., Cohen, L., & Rochabrun, M. (2018, September 24). Uber 's strongest growth comes in depressed Argentina -- minus commissions. *Reuters*, pp. 1–6. Retrieved from <https://www.reuters.com/article/us-argentina-uber/ubers-strongest-growth-comes-in-depressed-argentina-minus-commissions-idUSKCN1M4117>

Rauch, D. E. and Schleicher, D. (2015) 'Like Uber, But for Local Governmental Policy: The Future of Local Regulation of the "Sharing Economy"', *SSRN Electronic Journal*. doi: 10.2139/ssrn.2549919.

Rayle, L., Dai, D., Chan, N., Cervero, R., & Shaheen, S. (2016). Just a better taxi? A survey-based comparison of taxis, transit, and ride-hailing services in San Francisco. *Transport Transport Policy*, 45, 168–178.

Redfean III, R. L. (2016) 'Sharing Economy Misclassification: Employees and Independent Contractors in Transportation Network Companies', *Berkeley Technology Law Journal*, 31, pp. 1023–1056. Available at: <http://10.0.61.163/Z38JR9M%0Ahttp://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=120485594&site=ehost-live>.

Remes, J. and Kharas, H. (2019) *What happened to Latin America 's ' missing middle ' . Available at: <https://www.weforum.org/agenda/2019/08/latin-america-fill-missing-middle-economy-digital-tech/>.*

Revista Semana, December 2018. Conductores de Uber y Cabify podrían ser sancionados con 25 años sin licencia. URL: <https://www.semana.com/tecnologia/articulo/conductores-de-uber-y-cabify-podrian-ser-sancionados-con-25-anos-sin-licencia/594804>

Rhodes, R. (2011). Policy network analysis. In D. Levi-Faur (Eds.), *The Oxford handbook of governance* (pp. 425–447). Oxford: Oxford University Press. Rosenau,

Richardson, L., 2015. Performing the sharing economy. *Geoforum* 67, 121–129.

Rienstra, S., Baker, P., & Visser, J. (2015). International comparison of taxi regulations and Uber.

Rogers, Brishen. 2015. "The Social Costs of Uber." SSRN Scholarly Paper ID 2608017. Rochester, NY: Social Science Research Network.

Roose, Kevin (Sept. 18, 2014) Does Silicon Valley Have a Contract-Worker Problem? NYMAG.COM, <http://nymag.com/daily/intelligencer/2014/09/silicon-valleys-contract-worker-problem.html> [<http://perma.cc/2KTU-FRLH>]."

Rosanna Smart, Brad Rowe, Angela Hawken, Mark Kleiman, Nate Mladenovic, Peter Gehred, Clarissa Manning Faster and cheaper: how ride-hailing fills a gap in low-income Los Angeles neighborhoods, BOTEC Analysis Corp. 4 (July 2015)

Sadowsky, N., & Nelson, E. (2017). The impact of ride-hailing services on public transportation use: A discontinuity regression analysis. Bowdoin working paper 5-26-2017.

Sam Peltzman, Toward a More General Theory of Regulation, 19 J. L. & ECON. 211 (1976).

Schaller, B. (2007). Entry controls in taxi regulation: Implications of US and Canadian experience for taxi regulation and deregulation. *Transport Policy*, 14, 490–506.

Schettino, 2019 <https://elfinanciero.com.mx/opinion/macario-schettino/automotriz>

Scholz, Trebor. 2017. *Uberworked and Underpaid: How Workers Are Disrupting the Digital Economy*. Cambridge: Polity Press.

Schulze, A., MacDuffie, J. P. and Täube, F. A. (2015) 'Introduction: Knowledge generation and innovation diffusion in the global automotive industry-change and stability during turbulent times', *Industrial and Corporate Change*, 24(3), pp. 603–611. doi: 10.1093/icc/dtv015.

Shaheen, S., 2014. Transportation Network Companies and Ridesourcing. California Public Utilities Commission (CPUC) En Banc <<http://www.cpuc.ca.gov/NR/rdonlyres/5C961222->

B9C8-4E53-A54D-FC2A89C0A30C/0/RidesourcingCPUCShaheen_Final_v2.pdf>
(accessed August 7, 2019).

Shed, S. (2019) 'Uber's Rocky Road To Growth In Europe: Regulators, Rivals And Riots', *Forbes*. Available at: <https://www.forbes.com/sites/samshead/2019/05/10/ubers-rocky-road-to-growth-in-europe-regulators-rivals-and-riots/#1984051f5c67>.

Stigler, G. (1971). The Theory of Economic Regulation. *The Bell Journal of Economics and Management Science*, 2(1), 3-21.

Streeck, Wolfgang. 2008. *Reforming Capitalism*. Oxford: Oxford University Press.

Sundararajan, A., 2013. From Zipcar to the Sharing Economy. *Harvard Business Review*, Online edition.

Thelen, K. (2018) 'Regulating uber: The politics of the platform economy in Europe and the United States', *Perspectives on Politics*, 16(4), pp. 938–953. doi: 10.1017/S1537592718001081.

Treib, O., Bähr, H. & Falkner, G. (2007). Modes of governance: Towards a conceptual clarification. *Journal of European Public Policy*, 14(1) 1?20. doi:10.1080/135017606061071406

Uber. 2015. "MEXICO CITY: A Mobility Case Study."

Vaughan, A. (Sep 2017) Uber: London drivers must use hybrid or fully electric cars from 2020, *The Guardian*. URL: <https://www.theguardian.com/technology/2017/sep/08/uber-london-hybrid-fully-electric-cars-2020-vehicles>

Watanabe, C. et al. (2017) 'Consolidated challenge to social demand for resilient platforms - Lessons from Uber's global expansion', *Technology in Society*, 48, pp. 33–53. doi: 10.1016/j.techsoc.2016.10.006.

Williamson, O.E., 2000. The new institutional economics: taking stock, looking ahead. *J. Econ. Lit.* 38, 595–613 (September).

Witt, A., Suzor, N. and Wikström, P. (2015) 'Regulating ride-sharing in the peer economy', *Communication Research and Practice*. Routledge, 1(2), pp. 174–190. doi: 10.1080/22041451.2015.1048041.

Wolff, H., Possnig, C., Petersen, G. An Open Data Framework for the New Mobility Industry. Presented at 54th Annual Canadian Transportation Research Forum, Vancouver, Canada, May 2019

Yochai Benkler, *Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production*, 114 *YALE L.J.* 273, 276, 288 (2004).

Zha, L., Yin, Y. and Yang, H. (2016) 'Economic analysis of ride-hailing markets', *Transportation Research Part C: Emerging Technologies*. Elsevier Ltd, 71, pp. 249–266. doi: 10.1016/j.trc.2016.07.010.