



Case study

Ride-sharing platforms in developing countries: effects and implications in Mexico City

Background Paper

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1. Introduction

Since its founding in 2009, Uber has disrupted the transportation industry around the globe. In 2018, Uber worked with three million drivers, serving 75 million riders in over 600 cities worldwide (Bhuiyan 2018a). Many other transportation network companies (TNCs) have emerged since then. The rapid spread of such companies raises questions about their effects on workers around the globe.

This paper analyses the effects of TNCs on the social contract in developing countries. It considers the effect of such companies on workers in developing countries, and contrasts these effects with those recorded in developed countries. Lastly, this paper assesses whether TNC business models used by Uber and its competitors create good jobs in developing countries.

This paper argues that TNCs have a different impact on the social contract in developing countries than they do in developed countries. Even if the mechanisms through which such transportation network companies affect the working conditions of drivers may be similar for both developed and developing countries, the outcomes differ due to different political-economic contexts.

This case study analyses the situation that has unfolded with Uber's entry into Mexico City to provide a window into the dynamics taking place in developing countries. The study uses an analysis of the policy and market environments, as well as qualitative data gathered from 32 interviews with Uber drivers and regulators. The study focuses on four aspects of the drivers' working conditions: the flexibility and independence of the drivers, their social security, their income and income security, and their safety. The paper shows that Uber's effects are both positive and negative. While some of the drivers are able to take advantage of the low barriers to entry in the transportation industry where they can enjoy increased flexibility and attractive income opportunities, these drivers also lack social security, and their income is very volatile.

The paper is structured as follows: Chapter 2 provides an overview of some of the efficiency gains of Uber. Chapter 3 provides an overview of Uber in Mexico, and describes the population of the Uber drivers in Mexico. Chapter 4 discusses the four aspects of the driver's working conditions (drivers' flexibility and independence, social security, income and income security, and safety). The final section discusses the implications of such transportation network platforms for the social compact in developing countries, and examines the implications for workers, the private sector and government. The final section also presents policy recommendations.

2. Uber and other Transportation Network Companies (TNCs)

Uber and other TNCs, such as Lyft, Cabify, Taxify, and DiDi Chuxing, have changed the way people move from A to B. They provide internet-based platforms to match people who request rides (passengers) with people who use their private cars to offer rides (drivers). Following the prominence of TNCs, research on ride-sharing platforms has steadily grown. Cramer and Krueger (2016) highlight the efficiency gains compared to traditional industries resulting from the fact that drivers of ride-sharing cars in the United States spend a higher fraction of their time, and drive a higher share of miles, with a passenger in the car than do taxi drivers. This is due to the efficiency of technology-mediated matching between driver and passenger. Relying on large data sets from Uber, at the same time Cohen et al. (2016) claim that the ride-sharing company created a consumer surplus of USD 2.9 billion in four U.S. cities in 2015.

Uber and other platforms also argue that they help to solve traffic congestion in cities because their business allows for a reduction in car ownership. Though some research suggests that ride-sharing platforms might help to mitigate traffic congestion, the evidence overall is mixed. A recent report by Schaller (2018) shows that Uber and Lyft actually increase congestion in U.S. cities, and weaken surface transit systems. In the absence of such all-encompassing data for developing countries, this case study suggests that drivers in Mexico City use ride-sharing platforms to fulfil their desire to possess a car. Many drivers buy a new car in order to register it with Uber. In these cases, Uber does not reduce car ownership but allows people to acquire a car who otherwise might not buy one.

Much of the debate around Uber and ride-sharing platforms more broadly concerns the income and employment opportunities they present. Because drivers are not employed but work independently, they enjoy more flexibility and autonomy with regards to when to work, how long to work, and where to work. Chen et al. (2017) argue that Uber drivers in the United States benefit from these flexible working arrangements because it allows them to earn "more than twice the surplus they would in less flexible arrangements" (Chen et al. 2017, 1). This is said to be the case because Uber drivers can adapt their working schedule on an hourly basis to take advantage of higher fares passengers pay in peak demand periods. (Section 4.3 provides a more complete discussion of the driver's income.)

Furthermore, on-demand workers themselves mention flexibility as one of the main reasons why they work in the on-demand ride-sharing industry (Hall and Krueger 2016, Anderson 2014). Hall and Krueger (2016) analyse Uber data from roughly 600 drivers in the United States between 2012 and 2015, and they show that drivers value the flexibility to choose which hours and which days to work. The authors further argue that the flexible nature of this work may help to mitigate income fluctuations from other forms of employment.

This increased flexibility, however, comes at a high cost in terms of the loss of benefits and security afforded to many workers in traditional companies. The literature widely agrees that the social security of Uber drivers is very low or non-existent (Kuttner 2013, De Stefano 2016, Aloisi 2016, Rogers 2015, Hill 2015, Scholz 2017). On-demand platforms do not recognise their workers as employees, but consider them to be independent contractors or self-employed. For example, Uber argues that it is not a taxi or transportation company but a technology company providing a software application. Hence, it views drivers, not as Uber employees, but as self-employed users of the matching mechanism of the platform (Nerinckx 2016). This means that the drivers are not eligible for employment benefits such as health insurance, pensions, holidays, unemployment benefits, social security, insurance, etc. The drivers thus face a trade-off between increased flexibility on the one hand and decreased or no social security on the other. The present study analyses how this trade-off plays out in developing countries.

3. Uber in Mexico

Though reliable and available data about the ride-sharing sector are very limited, this paper makes use of existing data, and gathers additional information to provide a general sense of the sector in Mexico City and Mexico more broadly.

Uber has grown rapidly since August 2013, when it started operations in Mexico City. According to an Uber report, the company had 15,000 active drivers in Mexico City in October 2015. By November 2017, the number had grown to roughly 83,000 active Uber drivers, representing approximately one-third of the 249,000 active Uber drivers throughout the country. This number of active Uber drivers constitutes a significant share of private transportation in Mexico City in general. In 2017, an estimated 139,500 legal and 40,000 illegal taxis operated in Mexico City. Thus, the number of active Uber drivers represents almost 60 per cent of the legal taxis operating in the city.

Though other ride-sharing platforms operate in Mexico, Uber is by far the largest. Dalia Research (2017) states that Uber holds a market share of 87 per cent in Mexico followed by Easy Taxi (8 per cent), Cabify (4 per cent) and Yaxi (1 per cent). In other South American countries, Uber holds smaller market shares (Dalia Research 2017). The number of ride-sharing drivers in Mexico and Mexico City is expected to grow in the coming years. Uber plans to have 500,000 active drivers in Mexico at the end of 2018 (Ranero 2017). Meanwhile, other companies evidence interest in the market. For example, the Chinese ride-sharing company Didi Chuxing also entered the Mexican market in April 2018 (Bhuiyan 2018b).

Among the 249,000 Uber drivers in Mexico, 5 per cent (12,400) are women. This is a very low share, but not surprising given that the share of female drivers in transportation in Mexico in general is around 10 per cent (*Instituto Nacional de Estadística y Geografía* (INEGI) 2017b). Looking only at the taxi industry, Pogliaghi (2012, 191 ff) found even lower levels of female drivers, with women accounting for between 0.5 per cent and 2.5 per cent of taxi drivers. The share of female Uber drivers in Mexico is lower though than the 19 percent level in the United States (Benenson Strategy Group 2015).

An estimated 99,600 of the active Uber drivers in Mexico were previously unemployed, according to information provided by Uber during an interview. This corresponds to 40 per cent of Uber drivers, and to 5 per cent of Mexico's 2017 unemployed population (INEGI 2017b).

The amount of time a person drives for Uber in Mexico during one week varies. As a representative of Uber explained in an interview, 29 per cent of the drivers drive less than 10 hours per week. In 2015, Uber stated that 35 per cent of the drivers worked less than 20 hours per week, 36 per cent worked 20 to 45 hours per week, and 29 per cent worked more than 45 hours per week (Uber 2015). Roughly 20 per cent of the drivers have a conventional full-time job, and drive only occasionally for Uber.

One particularity of Uber in Mexico is that 60 per cent of the drivers do not own the car they drive. This means that 149,400 drivers rent the car from someone else, e.g. from fleet owners who own more than one car. The relationship between fleet owner and driver varies considerably, and depends on the two parties themselves. Some have written contracts, while others only rely on verbal agreements. Some drivers have to sign a blank cheque or make a deposit to lower the risk of robbery. The rental fee, which varies depending on the type of the car, generally falls between MXN 1,500 and MXN 2,800 per week. This means that a significant share of the driver's income (between 25 and 47 per cent) goes towards the car rental fee, assuming that a driver earns MXN 1,000 per day working six days per week. In addition, Uber charges 25 per cent commission.

Mexico City has a wide range of different taxi services: *taxis de sitio*/base, which wait for rides at a clearly defined taxi stand; *taxis de radio*, which can be requested via calling the taxi company and which are dispatched via radio; and "free" taxis, which circulate throughout the city, and can be hailed from the street (Anderson 2015, 167 ff). The number of taxis in Mexico City has grown from 104,694 in 2002 (Anderson 2015, 172) to 139,500 in 2017 (SEMOVI).

On-demand ride-sharing platforms complement these taxi services. Since July 2015, the operation of TNCs in Mexico City has been legally regulated by a special agreement, published by *La Secretaría de Movilidad de la Ciudad de Mexico* (SEMOVI), making Mexico City the first city in Latin America to regulate the operation of TNCs (Corona 2015). To ensure a level playing field and fair competition in the private-transportation sector, the participatory consultations that led to the agreement included different stakeholders such as taxi drivers, and representatives of NGOs, think tanks, TNCs, and the public sector. The most important aspects of the agreement are: ride-sharing platforms must register with SEMOVI by paying a registration fee; cars must have cost more than MXN 200,000 and must be registered with SEMOVI; TNCs must pay a tax of 1.5 per cent per ride, which goes towards a "taxi, mobility and pedestrian fund"; and drivers are not allowed to use cash payments (Semovi 2015).

During the beginning of Uber's operations in Mexico, taxi drivers protested against the TNC. The taxi drivers mainly complained that Uber drivers did not have to acquire a transportation license, and did not have to comply with annual car checks. This allowed Uber to operate at a lower cost, and to offer cheaper rides compared to taxis. Furthermore, Uber is able to set their own fares while taxi fares are set by the city government. At the beginning of its operations, Uber probably lost money due to low commissions, low fares and complementary promotions for drivers and riders. After Uber ensured a certain market share, however, it increased the commissions for drivers, raised the fare for passengers, and reduced the number of promotions. At present, Uber is not always cheaper than a taxi, especially when surge pricing (which charges higher fares during certain peak times) is in effect. Uber's ability to set their own fares, however, allows them to react to different market dynamics and to take advantage of them.

In general, however, the reaction of the taxi drivers has been less fierce in Mexico than in other countries such as Argentina or South Africa. This might be due to the multi-stakeholder negotiations that included representatives of the taxi industry. It might also be due to the nature of the regulations, which try to differentiate the taxi and ride-sharing markets by prohibiting cash

payments for Uber, and by setting threshold car prices (more than 200,00 MXN) for Uber cars. As a result of this regulation, a stable share of the population continues using taxis. These dedicated taxi customers are people who prefer paying in cash, who do not have a cell phone to request an Uber, or who have built stable relationships with the taxi drivers of the closest base to their home or work. A further reason why the taxi drivers' reaction has been less severe is that many of them switched to Uber after they realized that the entrance barrier is very low, and that driving for Uber represents an attractive income opportunity.

Further changes to the regulation of the taxi and ride-sharing industry are likely after a new centre-left mayor of Mexico City takes office in December 2018. Claudia Sheinbaum Pardo, the incoming mayor of Mexico City, has already announced that her team is revising the current regulation of TNCs, and that she will make sure to avoid "unfair competition" between TNCs and the taxi industry. Though Mexico City took steps to modernise licensed taxis by replacing traditional meters with tablets, Sheinbaum has also announced that she will undo the decision of the former minister of mobility of Mexico City to replace the taxi meter with tablets (El Financiero 2018).

It remains to be seen what the future will bring for the ride-sharing and taxi industry in Mexico. If the new city government implements stricter regulations for TNCs, ride-sharing companies will likely organise significant public support via their customer base. This is what Uber did before. Also other app-based transportation services in other countries, such as Go-Jek in Indonesia, use their customer base to make their claims heard (Ford and Honan 2017).

4. The working conditions of the drivers

Against this backdrop of debate over the advantages and disadvantages of transportation network companies, this paper provides a detailed analysis of the situation of the Uber drivers in Mexico City. Uber has a positive effect on the drivers in some dimensions, such as flexibility and safety, but a negative effect in others, such as social security and income security. This paper examines four specific aspects: the flexibility and independence of the drivers, their social security, their income and income security and the driver's safety.

4.1 Flexibility and independence

High degrees of flexibility and independence are core aspects of Uber's narrative when attracting drivers. Drivers can work whenever they want, wherever they want, and for as long as they want. This flexibility is not only mentioned as an advantage by the platform company but also by the drivers themselves. The drivers value this flexibility as one of the main advantages of being an Uber driver, and it is often one of the main motivations for people to sign up as drivers. Students can take classes in the mornings and drive in the afternoons. People who work part-time can drive in their free time. People who are self-employed can combine driving for Uber with other income generating activities. One driver, for example, sold perfumes to people across the city. When driving to his clients, he chose to connect to the ride-sharing platform and to offer rides. This allowed him to combine his self-employment with an additional income activity. These findings are mainly in line with what the existing literature says about the drivers' flexibility (Hall and Krueger 2016; Anderson 2014; Collier, Dubal, and Carter 2017).

Drivers who previously had formal, full-time jobs especially emphasise the advantage of increased flexibility and independence. For them, the effect of increased flexibility is more pronounced than for Uber drivers who previously worked as taxi drivers or who were self-employed, and, thus, also previously enjoyed some flexibility in their work.

However, even with Uber, certain factors limit the driver's flexibility. One of these factors concerns car ownership. The share of drivers who rent their vehicle is relatively large in the case of Mexico relative to other countries, a representative of Uber confirmed, and, as mentioned in the previous section, 60 per cent of the drivers in Mexico City do not own the car they drive. Instead, these drivers rent the cars from fleet owners, who own more than one car and offer these for rent to drivers¹. In some cases, fleet owners also drive one of their own cars. But for the most part, fleet owners maintain another job or business as their main source of income. They use Uber and other ride-sharing platforms predominantly as a form of investment. These fleet owners might impose working schedules on the drivers. When asked whether they would agree to be interviewed, some drivers replied that they could not stop because they are monitored by the fleet owners who demand fixed full-time working schedules (8 am to 8 pm). Stopping for 30 minutes or one hour

¹ Fleet owners can be observed in other countries. For example, Campbell (2015) provides advice for drivers in the United States on the issue of renting a car. This shows that some of the drivers in the United States are also renting cars.

would cause them difficulties because they would have to explain the reasons to the fleet owner. Other drivers similarly said they could not stop for an interview because they had to drive at least 12 hours per day. Thus, it is evident that in these two cases the drivers did not have much flexibility or independence.

The relationship between fleet owner and driver varies considerably, and depends on the two parties themselves. Some have a written contract, while others only rely on verbal agreements. Some fleet owners require that the car is returned after each shift, while others demand that the driver has a garage where s/he can park the car. The rent of the car varies depending on the type of the car, but the fee is generally between MXN 1,500 and MXN 2,800 per week. In cases where a trusting relationship between the fleet owner and the car driver exists, the fleet owner might provide the driver with informal benefits, such as small loans to finance the gasoline, or a lower weekly rent during periods of less demand (e.g. vacations).

In some cases, fleet owners turn over the operation of the business to administrative companies that take care of the cars' maintenance, find drivers, manage the relationship with the drivers, and handle administrative work, such as matters concerning taxes, insurance, etc. These companies are small and, in some cases, quite informal enterprises, which have evolved at the intersection of the gig economy and the traditional economy. When such enterprises are used, drivers do not deal with the fleet owners but deal only with the administrative companies instead.

The relationship between fleet owners and drivers could be imagined as a continuum from a kind of landlord-tenant relationship at one extreme, to an employer-employee relationship at the other. In the first case, drivers rent the means of production (the car) from the owner and return it at the end of the shift. The drivers offer a service (rides) and receive a payment for it. In the second case, the fleet owner pays a wage to a worker (the driver) to produce value (the rides). In this case, the fleet owner is more similar to an employer, who provides the means of production, which would also mean that fleet owners should make contributions to the social security of the drivers. These are idealised categories, and the distinction in reality is much less straightforward, but they represent different ways to conceptualise the relationship between fleet owner and drivers. Future research should further explore this continuum to gain more insights about the relationship between fleet owners and drivers.

A second factor that limits the drivers' independence and flexibility concerns car loans that must be repaid. This applies to people who purchased their car in order to register it with a ride-sharing platform. In the sample used for this research, 50 per cent of the drivers who own the car they are driving bought the vehicle for the purpose of registering it with Uber. Without Uber or other ride-sharing platforms, these people would not have been likely to buy a new car, but would have likely kept or purchased a cheaper one instead.

In most of these cases, people obtain a loan to buy a car and register it with Uber. The duration of the repayment period differs depending on the agreements between the buyer and the car agency, but many drivers confirmed that they will be repaying their loans for one to three years. Consequently, they depend on the income they earn as a driver to repay their loans. Theoretically, the driver has the flexibility to stop driving whenever he or she desires. In reality, however, a driver

needs this income to repay the loan, and to meet all the other financial obligations he or she has. These obligations include gasoline, mobile phone, car maintenance costs etc. Furthermore, in many cases, the driver's income represents the primary source of income of the household (Uber (2015)). This means, that dependence on the driver's income is very high. Due to this, the flexibility of driving for Uber is rather more a perceived flexibility than a real flexibility.

A third aspect of flexibility also merits mention. Flexibility is not only an advantage of being an Uber driver but also a requirement. Uber uses real-time data to calculate the fare of a ride. If the demand for rides is higher than the supply, the fare will be multiplied by a number bigger than one. As the price for one ride increases, so does the potential income for the drivers. To earn as much as possible, drivers have to "chase the surge". That is, drivers have to be flexible to react to the changes in the demand for rides, and they have to be ready to work during nights, weekends, and other premium-fare times. Flexibility, therefore, is not only an advantage of being an Uber driver, but actually a necessary condition to adapt to changing demand (Collier, Dubal, and Carter 2017) and to make enough money.

Thus, it can be concluded that Uber drivers in Mexico City do enjoy increased flexibility and independence. This applies especially to drivers who own the car they are driving, part-time drivers, students and drivers who combine driving for Uber with other income opportunities. Furthermore, drivers who previously held formal, full-time jobs particularly value increased flexibility, as compared to drivers who previously worked as taxi drivers or in self-employment, occupations that already allowed them to enjoy certain degrees of flexibility. However, a range of factors limit drivers' flexibility.

4.2 Social security

Because social security is tied to the question of the formality or informality of work, it is worthwhile mentioning that different definitions and measurements of informality exist and are used in discussion of the issue (International Labour Organization (ILO) (2012), (2013); INEGI (2014)). Generally speaking, the ILO describes informal employment as "jobs that generally lack basic social or legal protection or employment benefits, irrespective of whether they are performed inside or outside the informal sector" (ILO 2014, 38). The informal employment rate is 57.19 in Mexico, and 47.61 in Mexico City, according to data from INEGI. Mexico has a very large informal sector compared to the informal employment rates of Argentina (46.8 in 2014), Chile (41.1 in 2017) and Brazil (38.3 in 2015) (ILOSTAT 2018). It is crucial to bear in mind Mexico's high level of informal employment because it lends context to the state of the drivers' social security.

To understand the social security of Uber drivers in Mexico City, one needs to consider the political-economic context of Mexico. Social security in Mexico is provided by the Mexican Social Security Institute (IMSS) and the Institute for Social Security and Services for State Workers (ISSSTE). The IMSS provides social security for employees in the private sector, while the ISSSTE provides social security for employees in the public sector. Both institutions provide health insurance and pensions. Those eligible for these benefits are formal employees, their family members, and people who decide to affiliate voluntarily with the IMSS.

As discussed widely in literature (De Stefano 2016; Aloisi 2016; Rogers 2015; Hill 2015), Uber drivers are not defined as employees but are defined as self-employed. As a result, in Mexico, Uber drivers do not qualify to be registered with the IMSS. Therefore, Uber drivers do not have any social security.

Some of the drivers will already have access to social security, either from previous formal employment, or because they bought private insurance. In this study's sample, 27 per cent of the interviewed drivers had been employed in formal jobs with social security before becoming an Uber driver. The rest of the drivers did not previously have social security.

It is also important to emphasise that taxi drivers in Mexico City, whether licensed or unlicensed, do not receive any social security benefits (Pogliaghi 2012; Rivas Tovar and Rocha 2002). By contrast, in most countries of the European Union, taxi drivers have access to basic social security that is provided by the state (European Commission 2016). This is a crucial difference to bear in mind when evaluating the conditions faced by Mexico's Uber drivers; in terms of social security benefits, Uber drivers are no worse off than their taxi-driving counterparts in Mexico. Mexico has a different political-economic context characterised by the fact that a large share of the economically active population works in the informal sector. Furthermore, the institutional setting is different, as only those in the formal economy are eligible for social security. This should not be misinterpreted as a justification of the drivers' lack of social security. Instead, it shows that the trade-off between flexibility and social security is a very different one in developing countries that have a large informal sector compared to developed countries with a smaller informal sector and social protections that include a broader array of workers.

In Mexico, some drivers seek protection by making voluntary contributions to the IMSS, receiving insurance via family members, or contracting private insurances. Some also register with the *Seguro Popular*, which is a universal health insurance that does not require co-payments from its recipients, but also does not provide the same benefits as the IMSS (Fuente, Ortiz-Juárez, and Rodríguez-Castelán 2017). Most of the drivers, however, do not have any social security.

The drivers in Mexico City are very aware that they lack social security, but only some of them expressed discontent about this situation. While some drivers demand that Uber should provide more benefits to the drivers and support them in the case of accidents, most of the drivers seem to accept the situation. This might be due to the fact that the lack of social security does not affect the drivers immediately. It will affect them negatively in the future when they want to retire but do not have any pensions, or in case of an accident that leaves them unable to work. In the short term, however, there is no directly negative impact. Because many drivers did not have social security previously, they did not give up this benefit when they began working for Uber. Furthermore, the rather low level of protest and discontent might also be tied to a narrative that says "this is how things are done here". There is little belief that the government will change this situation anytime soon, and resignation seems to be dominant. These points are similar to those observed by Pogliaghi (2012) among the taxi drivers of Mexico City. Pogliaghi described social security as a problem of "second order" to the taxi drivers.

4.3 Income and income security

The actual income of Uber drivers depends on a multitude of variables, such as country, city, season, working time, costs of the car, maintenance costs, customer demand, taxation, regulation, loan conditions, communication costs, gasoline costs, etc. A variety of scholars have attempted to calculate the income of Uber drivers (mainly in the United States), using different methods, and reaching different conclusions (Harris and Krueger 2015; Cramer and Krueger 2016; Chen et al. 2017; Berger, Chen, and Frey 2017; Henao 2017; Castillo, Knoepfle, and Weyl 2018). Hall and Krueger (2016) argue that Uber drivers in the United States make USD 19.04 per hour on average. They also show that hourly earnings of Uber drivers do not depend on how many hours a driver works, which is different to other sectors where part-time workers often have lower hourly earnings than full-time workers. Cook et al. (2018) report hourly earnings of USD 21.07 for Uber drivers in the United States between 2015 and 2017. This study also finds that female drivers earn approximately 7 per cent less per hour than male drivers due to their preferences of where and when to work, and their preferences for lower driving speeds.

A particularly interesting debate took place in early 2018, when Zoepf et al. (2018) published a "The Economics of Ride Hailing," working paper for the Massachusetts Institute of Technology Center for Energy and Environmental Policy Research. The paper argued that Uber drivers earn only USD 3.37 per hour (before taxes) when accounting for all vehicle expenses. Jonathan Hall (2018), chief economist of Uber, immediately responded by criticizing the methodology applied by Zoepf et al. A couple of days later, on Twitter, Zoepf (2018) acknowledge flaws of their methodology and offered a corrected version, saying that Uber drivers make between USD 8.55 and USD 10.00 per hour on average, and urged Uber to be more transparent in offering needed data. This incident highlights the need for more transparency and better data. It is clear that Uber has very detailed information regarding the earnings of the drivers. However, this is not shared publicly.

The literature presents a wide range of income earned by Uber drivers. The reported income varies due to different data bases and different methodologies that were used. The reported driver income might also depend on the date of the study. In general, early studies report higher income than more recent studies. This is because the number of drivers increased, leading income per driver to decrease. Mishel (2018) also highlights that not all studies deduct Uber fees and vehicle expenses, mandatory social security contributions for self-employed workers (where applicable), or payroll taxes from the income figures quoted. After deducting these expenses, Mishel (2018) reports a driver wage of USD 9.21 per hour in the United States which is close to the one reported by Zoepf (2018).

In the case of Mexico, being an Uber driver represents an income opportunity with a very low entrance barrier. It is relatively easy to become a driver, and, even if you do not own a car, you can register as a driver. As a result, Uber is an attractive income opportunity, especially in the light of a very low minimum wage. To better to understand why Uber resents such an attractive option, we have to consider the specific political-economic context of Mexico. Mexico has a low minimum wage compared to other countries in the region (Saget 2008): the annual minimum wage in Mexico

in 2016 was USD 1,896², compared to USD 6,998 in Chile and USD 4,754 in Brazil (Organisation for Economic Co-operation and Development (OECD) 2016). The daily minimum wage in Mexico City in 2018 corresponds to USD 4.65. An estimate 44 per cent of the economically active population in Mexico City earn between one and three times the minimum wage (INEGI 2017b). Drivers reported in interviews that they earn approximately MXN 800 to MXN 1,000 gross per day, which corresponds to USD 42 to USD 52 per day. This is between nine and 11 times the daily minimum wage in Mexico City.

Given this context, driving for Uber can be an attractive income opportunity. This is especially true for people such as students or the elderly, who face discrimination in the formal job market. Some drivers had already retired, and wanted to earn extra income. Others had lost their previous job, and could not find a new job on the formal job market due to their advanced age or lack of relevant work experience or formal qualifications.

Furthermore, Uber drivers can potentially earn more than taxi drivers. One interviewee owned both taxis and Uber cars, and rented them to drivers. He said that an Uber driver who drives his own car earns more than a taxi driver who owns the taxi. Likewise, an Uber driver who rents the car earns more than a taxi driver who rents the taxi. However, the aspect of ownership is crucial here. An Uber driver who does not own the car is unlikely to earn more than a taxi driver who owns the taxi.

In her study of the taxi sector in Mexico City, Pogliaghi (2012, 14 ff.) showed that a taxi driver earns MXN 500 gross per day on average. The daily net income of a taxi driver depends on whether he owns the car and/or the concession. After deducting all costs (such as gasoline, maintenance, cleaning, depreciation, rent, etc.), Pogliaghi (2012, 403 ff.) calculated that a taxi driver who owns the car and the concession keeps MXN 0.77 on average per day, while a taxi driver who rents the car and the concession makes actually a loss of MXN 49.94 on average per day.

In comparison, Uber drivers interviewed stated that they earn approximately MXN 800 to MXN 1,000 gross per day; this is more than the taxi drivers. The costs of an Uber driver and a taxi driver are roughly the same. While Uber drivers do not have to pay a concession, they do have to pay 25 per cent commission to Uber. Depreciation, rent and gasoline apply to both Uber cars and taxis. An Uber driver has higher communication costs, as they have to pay for a cell phone and mobile Internet. On the other hand, a taxi driver has to pay a rent for belonging to a base. Insurance costs and rent for the car might be a slightly higher in the case of Uber because the cars are newer. While this study cannot provide a detailed calculation of costs and income of the Uber drivers (as the data are not representative), this information suggests that Uber drivers earn slightly more than taxi drivers. As discussed previously, 44 per cent of the workers in Mexico City earn between one and three times the minimum wage (set at MXN 88 per day). This corresponds to MXN 88 to MXN 265 per day. It is reasonable to suppose that the daily net income of an Uber driver will be above that range, given daily gross income of MXN 800 to MXN 1,000.

² Minimum wages are shown to reflect purchasing power parity exchange rates.

Even if the income can be attractive, the level of income security is very low because income fluctuates notably and depends on a variety of contextual factors. These include higher demand in certain weather (rain), every 15 days when workers receive paycheques, and during mass events, such as concerts; and lower demand during vacation times. It is important, however, to highlight that these dependencies are similar for taxi drivers as well.

An observation shared frequently by the Uber drivers is that the attractiveness of being an Uber driver in terms of income has declined. This is because the average income per hour per driver had decreased compared to when Uber started to operate in Mexico City. Drivers have to work longer shifts or more days per week to make the same income as before. Due to the increased number of drivers and cars that are registered with Uber, the number of requested rides per driver and, hence, the income per driver decreased. The waiting time between two ride requests increased. As a result, drivers register with multiple platforms (Cabify, Taxify, Easy Taxi, Yaxi) at the same time to reduce the waiting time between rides.

4.4 Safety

A major selling point of Uber is that customers perceive Uber as being safer than taxis (Rayle et al. 2014). A variety of mechanisms makes Uber rides quite safe for passengers: the car is tracked by the Global Positioning System (GPS); passengers can share their rides with friends, who can follow the passenger's location in real-time; the app includes a panic button for passengers; and drivers have to pass a background check before becoming a driver. These mechanisms have been crucial for the success of Uber in Mexico.

Uber, however, offers not only increased safety for passengers but also for drivers. People prefer driving for Uber because it is safer for them than driving a taxi. This is because Uber drivers pick up passengers who are registered on the platform with their name, their email address and, in some cases, their credit card details. As a result, Uber drivers believe that the risk of being robbed is lower than the risk for taxi drivers who pick up passengers without having any information about them. Uber drivers value the fact that passengers are registered with Uber, rather than unknown people from the street. Several Uber drivers who previously worked as taxi drivers reported that they were less frequently victims of robbery since switching to Uber.

Furthermore, Uber drivers in Mexico City handle no cash. All payments are done via debit/credit cards. Uber would like to introduce cash payments to reach potential customers without bank account or debit/credit cards, but they are not allowed to do so due to the regulation that was introduced in 2015 (Semovi 2015). This means that Uber drivers do not carry large amounts of cash which could be robbed by criminals. Uber drivers appreciate this. Also Pogliaghi (2012, 275 ff) identified insecurity, crime, robbery and violence as the fundamental inconveniences of taxi drivers in Mexico City. Uber itself stated that 20 per cent of its drivers who had previously been taxi drivers highlighted safety as the main reason for switching to Uber (Uber 2015, 20).

The INEGI reports numbers of cases of theft from cars but does not differentiate between taxis and private cars. Stealing from cars is the second most frequent delinquency of common law, with 17,060 cases in 2015 after business robbery with 17,269 cases (INEGI 2017a, 30). 1,806 of these cases took place in Mexico City. But these numbers only show that theft from cars, especially taxis is a frequent crime. The data of this study do not allow one to conclude whether there are more or fewer incidences of theft from Uber vehicles as compared to taxis. Overall, it can only be concluded that Uber drivers feel safer driving for Uber because the passenger are registered in a database, and because the drivers do not handle cash.

Nevertheless, this is not the whole story about safety. Due to the regulations of 2015, Uber cars in Mexico City must have cost at least 200,000 MXN (approximately USD 10,000) to be registered with Uber. This means that Uber cars are relatively new and modern. This represents another crucial aspect of why many customers prefer Uber over taxis. However, new and modern cars attract the attention of criminals who set up fake accounts, request an Uber, and steal the car in unsafe areas of the city (Rodríguez 2017; SPDnoticias 2017).

Car stealing has grown in recent years. For 2017, AMIS stated 90,187 robberies of insured cars on a national level and 10,587 in Mexico City (AMIS 2017). These figures represent an increase of 27.2 per cent and 21 per cent, respectively, from the previous year. The number of robberies of insured cars has increased since the second half of 2015, which is when the regulation of Uber in Mexico City was published (Semovi 2015). The types of cars that are associated with the highest level of robberies are also the type of cars which are most frequently used for Uber. There might be many reasons for the increase of car robbery, but one possible hypothesis might be the targeting Uber cars.

4.5 Summary

This analysis of the working conditions of Uber drivers in Mexico City concludes that the effects of Uber are both positive and negative. There are some desirable outcomes, such as increased flexibility for certain drivers, and an attractive income opportunity with a low entrance barrier. At the same, there are undesirable outcomes, such as a lack of social security, income volatility, and, in some cases, only illusory levels of flexibility because of the driver's need to work many hours to generate sufficient income. While the mechanisms underpinning the Uber model are the same in developing countries as in developed countries, the outcomes differ due to the different political-economic context. It is therefore crucial to consider the specific political-economic context when evaluating the effects of Uber and other similar transportation network companies.

5. Discussion and implications

Implications for drivers

This paper demonstrates that the effect of Uber on the drivers is contradictory, both positive and negative, and these effects depend on the political-economic context in which they occur. While Uber drivers experience some positive effects, overall these drivers are in a vulnerable position that is similar to the one of taxi drivers. Their income is very unstable, and, for drivers who do not own their Uber cars, their income is very low. Being self-employed means that the drivers have to face risks, which, for some, were previously covered through employer-provided benefits (Aloisi 2016; De Stefano 2016). This includes health insurance, pensions, and also the risk of an accident that could render inoperable the vehicle that is essential to drivers' ability to earn a living. These risks are shifted towards the individual, who is less capable to deal with these risks than an employer.

Uber argues that they incorporated around 70,000 drivers into the formal economy for the first time. This statement should be treated with caution. Uber argues that these drivers are incorporated into the formal economy because they must register with the Tax Administration Service (SAT) when they sign up as drivers. This, however, only applies to drivers who drive their own cars. Drivers who rent the cars do not have to register with the SAT. So, those who are incorporated into the formal economy are to a greater degree fleet owners, rather than car drivers. Furthermore, formality here does not mean social security because Uber drivers are not entitled to social security provided by the IMSS. Hence, Uber's argument does not hold, if formality is defined in terms of being eligible for social security. Instead, Uber drivers are maintained in or shifted into the informal sector. This tendency is in sharp contrast to the ILO's "Transition from the Informal to the Formal Economy Recommendation" (ILO 2015), which emphasises that formal employment is key to ensure sufficient social protection of workers, and that governments should therefore strive for a transition to a formal economy.

A further disadvantage of on-demand ride-sharing is that drivers are facing severe constraints when trying to represent themselves via the establishment of unions (Kuttner 2013; Nerinckx 2016; De Stefano 2016; Scholz 2017). Drivers work independently and are dispersed over the city. Face-to-face contact and direct interaction between the drivers are unlikely, making collective action difficult. Furthermore, the algorithm that calculates the price of each ride based on real-time data about supply and demand disincentivises collective actions such as strikes. As soon as a critical number of drivers go on a strike and stop driving, the price per ride goes up, and the incentive for drivers to abandon the strike is very high. Moreover, Uber drivers are not a homogenous group but are very diverse, making organising collective actions even more difficult. Despite these challenges, worker representation in the gig economy is not entirely absent. ILO research (Johnston and Land-Kazlauskas 2018) identifies four organisational structures that support workers' representation in the gig economy: new approaches of trade unions, online forums, worker centres and worker cooperatives.

The initial position of Uber has been not to recognise any kind of unions; this is intuitive, given the fact that Uber does not recognise the drivers as employees. An Uber driver in South Africa reported: "When we try to talk to them, they always say they do not recognise groups, they recognise individuals." (Daily Maverick 2017). Changes have taken place in recent years, however, and drivers have started to find ways to self-organise. In London, Uber drivers are being represented by the GMB Union and the Independent Worker's Union of Great Britain. The latter is currently involved in an ongoing legal case about whether Uber must recognise its drivers as employees, and pay them a minimum wage (Davies 2017). In Massachusetts and California, Uber agreed to support drivers to build a formal association (Kalanick 2016; Wong 2016). With regards to the Global South, Houeland (2018) highlights the struggles of transportation worker unions in the wake of the arrival of Uber in Africa. In Indonesia, 6,000 drivers joined a union to fight for higher pay and better working conditions (Black Rose Anarchist Federation 2018). This shows that while there are cases in which Uber drivers have organised collectively, this is not the rule. It is crucial that existing unions react to these new business models, and that they find ways to represent drivers.

Even if there are no unions of Uber drivers in Mexico City, the drivers use ICT-enabled platforms to share experiences and to provide peer support. These mechanisms are very helpful for the drivers to navigate the daily challenges of being an Uber driver.

Implications for the private sector

The platform companies and their investors are clearly the main winners of this new business model so far. In the case of Mexico, however, the main players are foreign companies (Uber from the United States, Cabify from Spain, Taxify from Estonia, Easy Taxi from Brazil and, recently, DiDi Chuxing from China). This means that the profits made by the ride-sharing companies in Mexico do not stay in the country. There are also some local alternatives emerging, such as City Drive and Yaxi, but their market share is very small, and it is uncertain how long they will survive. In Russia (Yandex), India (Ola), Middle East (Careem) and China (DiDi Chuxing), Uber's local rivals are quite successful. This, however, is dependent on long-term investments. The landscape regarding transportation network companies appears to be evolving, as exemplified by the particularly interesting hybrid case of Easy Taxi, which allows both, private cars and conventional taxis to register with the platform. This means that taxi drivers can also join ride-sharing platforms, and can benefit from the new matching mechanisms.

There are, however, further winners in the private sector. For now, and, especially in the case of Mexico City, car manufacturers and car-selling agencies benefit from the success of the ride-hailing networks. The same applies for insurance companies, such as AXA and Sura (Velasco 2017; Uber Mexico 2017). The price of car insurance for Uber cars has tripled in recent months (Castro 2017) as insurance companies adapt prices to the increased risks associated with Uber cars relative to cars that are used only privately. Uber cars have a much higher accident rate, a reason why insurance companies are charging up to four times more for an insurance for an Uber car compared to a private car. In the case of most platforms, insurance is compulsory to register a car with the platform. Other actors that benefit from the platform are telecommunication companies. Uber drivers need smartphones to operate, and they have to purchase mobile Internet access. Moreover, telecommunication companies have access to a large amount of data generated through the ride-hailing platforms. It remains to be seen whether they will be able to create value with these data.

There is no doubt that there are also losers in the private sector as the result of the entrance of transportation network companies. Small taxi and private transportation companies, especially, are experiencing massive pressure due to the competition from ride-sharing platforms. The taxi fleets at *Aeropuerto Internacional Benito Juárez*, the international airport of Mexico City, offer one example. Drivers of one airport taxi company stated that their demand has decreased by around 60 per cent since Uber started operating in Mexico City.

Implications for the governments and regulators

The main challenge for governments is to regulate TNCs to ensure that all stakeholder can benefit from these new business models. This report highlights three policy recommendations:

First, governments should try to expand the social protection of their citizens by aiming for universal social policies (Filgueira 2014; Martínez Franzoni and Sánchez-Ancochea 2016a). Universalism means that social services are offered to everyone independent from their employment status. The changing nature of employment, as exemplified by the ride-hailing networks, presents an opportunity to ensure social protection for a country's citizens and to make social security independent from formal employment. In the case of Mexico, far-reaching policy reforms would be necessary to achieve this. Initial steps could be to work towards universal pensions, or to make an affiliation with the IMSS obligatory for everyone. Furthermore, the relationship between fleet owners/administrative companies and car drivers could be regulated in the sense of an employer/employee relationship. Fleet owners who rent out a certain number of cars could be obliged to provide social security to the drivers.

It remains to be seen whether the incoming president Andrés Manuel López Obrador from the leftist political party, *Movimiento Regeneración Nacional* (MORENA), will implement reforms in that area. However, easy solutions for these issues are unlikely. State capacity and political will are crucial for the implementation of such reforms. Depending on the reform, there might also be opposition from the private and/or civil sectors.

Ensuring the social security of workers in the gig economy is one of the major challenges of the 21st century. This is a crucial matter that applies to countries all around the globe and not only to Mexico. Governments, organisations representing the interests of workers, and companies will have to search for effective ways to provide social security. Scholars will need to provide the needed evidence from multi-disciplinary perspectives. This includes a detailed understanding of how workers are affected by the gig economy and how these effects are shaped by political-economic contexts.

Second, governments should hold platform companies responsible and make sure that their business models are implemented in a responsible manner. This could include requiring platform companies to make contributions to the social security of their workers. To achieve such a goal, a close collaboration between state authorities and the platform companies would be necessary. Similar aims have been achieved elsewhere. For example, motorcycle drivers of the Indonesian transportation platform Go-Jek are covered by medical and accident insurance, an additional benefit provided by the platform company that significantly improves the labour conditions of the drivers (Ford and Honan 2017).

Some of the platform companies do show interest in at least taking part in these kinds of debates. In February 2018, Uber published a white paper on work and social protection in Europe (Uber 2018), in which they present their vision of independent work. Uber proposes a set of policy reforms in the fields of portable entitlements, lifelong learning, occupational licensing and access to state support, to make sure that people can work independently and flexibly without facing high risks due to a lack of social protections. The paper says little, however, about what Uber will contribute to guarantee the social security of the drivers. Instead, its analysis seems to aim to ensure the smooth running of Uber's business model.

Platform companies could also play an active role to facilitate worker representation. Scholz (2017) proposes a form of platform cooperation that relies on the empowering potential of the network economy to achieve better working conditions for the people working in the gig economy.

Third, governments can regulate ride-sharing platforms to make sure that they complement existing public transportation and that they help to reduce congestion and pollution. The backbone of transportation in megacities like Mexico City has to be public transportation. In 2017, an average of 34.56 million trips were made each weekday in the Mexico City Metropolitan Area (INEGI 2017c). Private car ownership in Mexico City has increased in recent years (Guerra 2015). More than 5 million cars were registered in the area in 2008 (Puche 2016). Zamudio and Alvarado (2014) calculate that the figure will grow to 7.5 million in 2020 and 9.5 million by 2030. The number of daily trips and the current degree of congestion make it evident that private transportation cannot be the main mode of transportation. It can, however, complement existing public transportation systems. Government regulation has to make sure that this is the case, and that ride-sharing platforms do not compete with public transportation and increase congestion. At the same time, ride-sharing platforms should support city governments by sharing their data and by helping to implement traffic solutions, such as intelligent traffic lights that use technology to adjust to changing traffic conditions. An example of that is DiDi's "Smart Transportation Brain" that uses real-time data and artificial intelligence-based technologies to improve traffic flow. It was launched in January 2018 and has been implemented by 20 Chinese cities so far. In Jinan, for example, intelligent traffic lights at 344 road crossings helped to reduce traffic delays by 10 to 20 per cent (Businesswire 2018).

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