

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/332747759>

# Navigating Ride-Sharing Regulations: How Regulations Changed the 'Gig' of Ride-Sharing for Drivers in Taiwan

Conference Paper · April 2019

DOI: 10.1145/3290605.3300366

CITATIONS

6

READS

252

5 authors, including:



**Ning Ma**

University of British Columbia - Vancouver

9 PUBLICATIONS 31 CITATIONS

[SEE PROFILE](#)



**Benjamin Hanrahan**

Pennsylvania State University

50 PUBLICATIONS 573 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Knowledge sharing tools in organizations: intelligent UIs for corporate blogs and wikis [View project](#)



Uber Driver Work Practice [View project](#)

# Navigating Ride-Sharing Regulations: How Regulations Changed the ‘Gig’ of Ride-Sharing for Drivers in Taiwan

Anita Chen\*, Chien-Wen Yuan†, Ning F. Ma\*, Chi-Yang Hsu, Benjamin V. Hanrahan\*

\*Pennsylvania State University, †Fu-Jen University

aqc5395@psu.edu, 138679@mail.fju.edu.tw, nzm37@psu.edu, cxh5437@psu.edu, bvh10@ist.psu.edu

## ABSTRACT

Ride-sharing platforms have rapidly spread and disrupted ride hailing markets, resulting in conflicts between ride-sharing and taxi drivers. Taxi drivers claim that their counterparts have unfair advantages in terms of lower prices and a more stable customer base, making it difficult to earn a living. Local government entities have dealt with this disruption and conflict in different ways, often looking towards some form of regulation. While there have been discussions about what the regulation should be, there has been less work looking at what impacts regulations have on ride-sharing drivers and their usage of the platforms. In this paper we present our interview study of ride-sharing drivers in Taiwan, who have gone through three distinct phases of regulation. Drivers felt that regulations legitimized their work, while having to navigate consequences related to regulated access to platforms and fundamental changes to the “gig” of ride-sharing.

## CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in collaborative and social computing**;

## KEYWORDS

Regulation, On-demand work, Ride-Sharing, Uber

## ACM Reference Format:

Anita Chen, Chien-Wen Yuan, Ning F. Ma, and Benjamin V. Hanrahan. 2019. Navigating Ride-Sharing Regulations: How Regulations Changed the ‘Gig’ of Ride-Sharing for Drivers in Taiwan. In *CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019)*, May 4–9, 2019, Glasgow, Scotland UK. ACM, New York, NY, USA, 12 pages. <https://doi.org/10.1145/3290605.3300366>

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org).

*CHI 2019*, May 4–9, 2019, Glasgow, Scotland UK

© 2019 Association for Computing Machinery.

ACM ISBN 978-1-4503-5970-2/19/05...\$15.00

<https://doi.org/10.1145/3290605.3300366>

## 1 INTRODUCTION

Ride-sharing platforms, particularly Uber, have spread rapidly across the world [18, 37] and disrupted more traditional ride-hailing markets [23]. This has resulted in a rivalry between ride-sharing drivers and taxi drivers [49]. Taxi drivers claim that ride-sharing drivers have an unfair competitive advantage due to less regulation [46] and quicker access to customers [12], which makes it more difficult for taxi drivers to earn a living [26]. Different government entities have dealt with this disruption in different ways, from largely ignoring ride-sharing (e.g., the U.S. federal government) to temporarily blocking Uber (e.g., Pittsburgh) [11]. Generally, these efforts are meant to increase the safety of using these platforms, the drivers’ rights, as well as provide some market balance between ride-sharing and taxis services. The form that these different efforts take is usually some sort of regulation that varies depending on numerous external, political, cultural contexts. For example, New York City plans to limit the number of Uber drivers by creating a new licensing framework [4]. While in London, the government refused to renew Uber’s expiring license and barred Uber from operating for 15 months [45]. Once London did reinstate Uber’s operating license, they did so with more stringent regulations, such as requiring insurance for drivers and limiting the amount of time a driver can drive each day. In Turkey, Uber drivers are now required to get professional license plates (similarly to taxis), which are accompanied by a large administrative fee [3]. While each of these regulatory efforts is instantiated differently, they are all aimed at creating levers of control over similar aspects of ride-sharing platforms.

Given that these different regulations are being enacted, there has been speculation about how these regulations may impact the practices of ride-sharing drivers [33], but there have been few, if any, studies. As such, in this paper we present our investigation into regulations of ride-sharing in Taiwan and their impact on the practices and technology use of ride-sharing drivers. Taiwan is a particularly interesting example in that the Taiwanese government has gone through three distinct phases of regulation *unregulated*, *suspended*, and *regulated*. We explain the specific regulations that Taiwan enacted for ride-sharing in the next section.

To understand how ride-sharing drivers were reacting and coping with regulations, we conducted an interview study of 19 drivers. These interviews were semi-structured, aiming to probe drivers' experiences, practices, and perceptions around driving for ride-sharing platforms (which was primarily Uber). We found that regulations have had several significant impacts on drivers. First, the regulations have introduced a new stakeholder (the car rental agencies) into ride-sharing that directly impacts drivers. Also, both entering and exiting the market now have significant costs associated with them, and as such, impacted key features of the ride-sharing 'gig'. Despite these changes, new drivers were still joining the market and some drivers felt that the regulations legitimized ride-sharing as a real job. Our contributions in this paper are illustrating how the ride-sharing drivers we talked with view regulations, how regulations changed their relationship with the platforms, outlining the benefits/detriments drivers incurred as a result of the regulations, and how regulations impacted how they used technology. The manner in which regulations and policies shape technology use is relevant to the HCI and design community as policy and practice are 'inseparable' [24], meaning that further research into how users appropriate technology in response to regulations can inform the design of future platforms. Previous research has shown that design has to be part of the solution to help workers navigate the policies and structure that they work within [20, 22, 48].

## 2 REGULATIONS AND THE RIDE-HAILING MARKET IN TAIWAN

Over the course of five years from 2013 to 2018, the ride-hailing market has gone through three distinct phases of regulation in Taiwan:

- *unregulated* - Uber entered the Taiwan market in 2013 and became one of the company's fastest growing markets by 2016 [25];
- *suspended* - the Taiwanese government suspended Uber for two months from February to April in 2017 and fined the company \$10.57 million USD [2]; and
- *regulated* - the Taiwanese government imposed a number of consequential regulations upon reinstating Uber, which is the current phase and the one in which we conducted our study.

When Uber was again allowed to operate in Taiwan during the *regulated* phase, Uber remained under its 2013 classification as a *technology platform* instead of a *transportation company*. This means that Uber is required to partner with locally licensed transportation companies in order to operate in Taiwan [47]. This has led to the introduction of *car rental agencies*, which are now a central feature of the ride-sharing market in Taiwan, in that each driver must contract with an

agency to drive for Uber in Taiwan. As a part of the regulations, drivers are now required to pass a background check, have a citizenship card, obtain a professional license plate and license, have an approved vehicle and obtain 'commercial' car insurance that includes passenger coverage, none of which was required during the *unregulated* phase.

The most significant of all of these regulations, insofar as drivers were concerned, were the ones that required the drivers to join a car rental agency. The car rental agency creates an intermediary between ride-sharing platforms (e.g., Uber) and drivers and was meant to make ride-sharing function more similarly to Taiwan's existing taxi industry. Only drivers who fulfill the regulation requirements and belong to a car rental agency can drive for Uber. There are also additional fees that Uber drivers in Taiwan must regularly pay as part of belonging to a car rental agency, this creates a type of ongoing expenditure that is different from Uber drivers in other countries. While these regulations are structured after taxis, ride-sharing still has less regulatory requirements than taxis. All that said, the day-to-day practices of ride-sharing drivers (e.g., finding rides and getting paid) are largely similar to drivers in other ride-sharing markets.

Similarly to other countries' regulations, the regulations on ride-sharing in Taiwan were designed to increase passenger safety and to balance the market between taxis and ride-sharing drivers. This transformed the nature of Uber drivers from using *idle personal property* to being a licensed *professional service* [41]. Taiwan's regulations on ride-sharing platforms also gave the drivers some legal rights by transitioning ride-sharing from an illegal passenger transportation systems. The regulations in Taiwan are similar in motives with other governmental agencies that are attempting to regulate the impact of ride-sharing platforms on local taxi industries, increase passenger safety, and increase fairness for ride-sharing drivers. Given that the regulations in Taiwan have some similarity to the regulatory objectives of other governmental agencies, and that Taiwan has gone through distinct phases (e.g., *unregulated*, *suspension*, *regulated*), we claim that Taiwan is an interesting setting in which to study the impacts of regulations on ride-sharing drivers.

## 3 RELATED WORK

Ride-sharing platforms have been defined as part of the gig economy [14, 43]. In terms of what this means, or what makes a job a gig, there have been different takes on the same basic structural instability [33] and piecemeal nature [5] of the work. Researchers have also offered a series of aspects that help to put a clear definition of what a gig looks like [15], which we enumerate as: 1) low barriers to entering the market, 2) flexibility in determining working hours, 3) minimal training costs, 4) few workplace protections, and 5) classifying workers as "independent contractors" by the

platform maintainers/owners. That said, the thing that gig workers prioritize over any of the benefits related to flexibility is remuneration [8, 27, 30]. Compensation is considered more important [21] by ride-sharing drivers in low income brackets, and gig workers have stated that these jobs are an important and stable source of “fall-back” income [30, 31].

While driving a taxi is viewed as a legitimate profession, the status of ride-sharing drivers is often more ambiguous and is seen as a legal ‘grey’ area [13, 28]. Part of this ambiguity is the result of ride-sharing companies identifying themselves as technology platforms rather than as temporary staffing agencies [6]. This classification means that the company is only responsible for facilitating a temporary contract [17] between ride-sharing drivers and customers. Many studies have stated that independent contractor is a misclassification [29, 32, 50] of ride-sharing drivers and that they should instead be classified as employees, so that they have worker benefits [14, 34]. The classification as technology platforms has allowed ride-sharing companies to avoid legal responsibilities for their drivers [16], such as requesting permit inspection, vehicle maintenance, driver/passenger insurance, and driver training and screening [34, 36].

Governments have started to put ride-sharing companies under scrutiny due to this ambiguity and are considering regulations that protect drivers’ and passengers’ rights [35]. Several attempts of legislation at the state level in the U.S. have been aimed at the legality of ride-sharing, requirements for drivers’ and passengers’ safety [44], adequacy of insurance coverage and background checks for drivers, disclosure requirements for regulators and insurers, generation of employment opportunity, and conflict management with the taxi industry [42]. This discussion of legislation for ride-sharing is in its early stage and many of these efforts center around the model provided by taxi regulations [39], and as such aim to reclassify ride-sharing drivers from *gig workers* to *intermediary workers* or *workers* [34, 50]. However, the effect of these regulations on workers, their work, technology usage, and their perceptions about these regulations has yet to be fully studied.

In lieu of regulatory actions in some localities, taxi and ride-sharing drivers in the U.S. have taken various collective actions in response to what they perceive as unfair employment status and pay cuts from ride-sharing companies [10]. These grassroots actions often face challenges of mobilization and organization as well as low turn-out (similar to collective action on other platforms [40]); as a result, these actions result in limited effects and ride-sharing companies still cut their rates after labor strikes [9]. Although ride-sharing companies resist changing from a technology platform to being an employer [34], the need for worker protection (both ride-share and taxi drivers) has seemed to invite an inevitable quest for regulation [28].

At the same time, traditional regulations for taxis may not be sufficient, nor effective in the ride-sharing context [7, 36]. Regulators have speculated that fitting ride-sharing platforms with the same regulations as taxis would reduce innovation [31, 36], negatively impacting consumer ride-hailing choices, and diminishing ride-sharing as a potential economic equalizer for low income individuals. On the other hand, proponents of regulating platforms claim that imposing regulations will legitimize ride-sharing and provide workers with protections [13, 34]. That said, more empirical studies of how regulations actually impact workers are still needed to verify these speculations and claims.

As such, current literature surrounding the global trend of regulating ride-sharing platforms focuses on predictions [31, 36] of regulatory effects and the reasons why regulations are needed [12, 49], rather than on the impact that they have on workers and their usage of said platforms. Moreover, the traditional presumption that regulations and policy changes are a direct response to complaints about platforms by aggrieved stakeholders, has been challenged as being a more complex interaction [24]. On the other hand, researchers have found opportunities for design to better support workers given policy frameworks [20, 22] or ways that policies can be changed to better support workers given the current tools [48]. Clearly, the interaction between these regulations/policies and design, have a significant impact on the actual practices of workers.

Our study fills the gap by gathering in-depth qualitative investigation into how ride-hailing drivers respond to regulations, how they appropriate technology due to regulations, and how their platform usage and practices are impacted.

## 4 METHOD

We conducted semi-structured interviews with 19 drivers around drivers’ experiences, practices, and perceptions about the different phases and impacts that regulations had on ride-sharing in Taiwan. Six of our participants began driving in the *unregulated* phase and continued to drive through and after Uber’s *suspended* phase (labeled as “BR” in the Findings section) and 13 joined the ride-sharing market during the *regulated* phase (labeled as “AR” in the Findings section). Among our participants, the average age was 41 and ranged from 25 years to 58 years of age; 18 of our participants were male and 1 was female. In total, we had 11 full-time drivers (three of whom had transitioned from part-time to full-time in response to regulations), and 8 part-time drivers.

*Procedure.* We posted our recruiting message in public Uber Facebook groups in Taiwan as well as private LINE driver groups (LINE [1] is a direct messaging and group chat application that is used widely in Taiwan). Alongside this process,

we also used snowball sampling to recruit drivers. We conducted one-on-one, in-person interviews with each participant. Each interview took approximately one hour to complete and each participant received 500 \$NT (an equivalent to \$17 USD) for participating. We conducted a semi-structured interview covering the following topics: reasons for driving, how they learned about ride-sharing, what platforms they used for ride-sharing, full-time vs. part-time, perceptions about the regulations, and how regulations impacted them. We conducted all interviews in the participants' native language, Mandarin Chinese. With the participants' consent, we recorded the interviews and kept notes. We later transcribed the interviews into Mandarin Chinese and then translated them into English. We used iterative coding to analyze the results, and all authors met weekly to discuss the themes until they converged.

## 5 FINDINGS

In our investigation into ride-sharing (the drivers we talked to primarily drove for Uber) in Taiwan we wanted to know how drivers perceived the regulations and what effects regulations had on their work and technology use. Here we present a set of topics that emerged from our interviews.

### Drivers' Legitimization through Regulations

While the drivers we spoke to had various reactions to the regulations, they generally viewed them more positively than negatively. An important detail behind this reaction was the instability and uncertainty that drivers acutely felt during the two months that Uber had been suspended. These feelings did predate the suspension, as drivers were already uncertain as to whether Uber was legal and they worried that Uber was going to be shut down.

It was May 27, I remember it vividly. At that time when I joined Uber, my wife asked 'is this legal or is it illegal.' Later that day [we] heard the Department of Transportation would suspend Uber. *Don don [dramatic sound effect]* - P7 (AR)

Later, when Uber was eventually reinstated and officially regulated, it gave drivers an increased sense of stability. In essence, the regulations were seen as the government legitimizing Uber – and as a result ride-sharing in general. This legitimacy meant that while the cost of ride-sharing went up, driving was still (or in some cases even more) worth it for the drivers because of the increased stability.

I think even with the regulations, it's still better than before [the regulations]. Uber is still better than working in an office, profit and freedom is still higher [than an office job] - P11 (AR)

Some of the other benefits drivers saw with the onset of regulations, seemed like knock-on effects of legitimacy

and were related to feelings of safety and protection. From what we learned, this was due in part because of the more appropriate types of insurance which were made available to ride-sharing drivers, as well as the simple fact that ride-sharing had moved from a grey market to a sanctioned one. This can be seen specifically when P12 discussed driving after the regulations were imposed. P12 clearly valued the increased sense of legitimacy both for pragmatic reasons (e.g., not having to hide when there is an accident) and in terms of their own self image (e.g., how they imagine others will perceive them).

If I had a collision with someone else, I don't have to worry that I am driving for Uber illegally when an accident happens. [...] The other thing is if you drive for Uber without legal protection, how will you face your family? How do you explain to your children and your parents? This is very important. - P12 (BR)

These pragmatic concerns about driver and passenger safety, were echoed by other participants, e.g., P6 linked the regulations with increased safety in part because the government has taken action that allows them to obtain insurance.

Think about it, if you personally own a car, what insurance would you buy? [...] But when the government combined Uber with the car rental system, insurance is included in the picture. It is safer for the driver and the passenger - P6 (AR)

In the case of the regulations of ride-sharing – specifically Uber – in Taiwan, it seemed clear that drivers enjoyed the increased sense of legitimacy in two respects: first, the pragmatic effects of having access to insurance and bureaucratic processes; second, their personal identity as ride-sharers because they were no longer participating in a grey market. While drivers thought positively about the general application or existence of regulations, when it comes to the specifics of exactly *how* these regulations were implemented, there were sore spots that we discuss in the next section.

### Sore Spots within the Implementation of Regulation

While, generally, participants viewed the onset of regulation as positive, they still felt understandably powerless towards the actual details of the regulations and their potential impacts (e.g., Uber leaving Taiwan). This was primarily because the drivers felt that they were unable to voice their complaints and had no concrete avenue of recourse for Uber or their government.

[...] in this job we have no protection if Uber really disappeared or changed, we can only rub our nose and accept it. There's no way to go to the U.S. head office to protest. - P15 (AR)

The four participants who had the most negative views on regulations had driven for Uber during the unregulated phase. These drivers cited the increased cost of driving and the more formal relationship with a car rental agency as the largest negative aspect. Underpinning these complaints were their feelings that these changes moved ride-sharing towards being more like a job than a gig. Part of these feelings came across as a lack of uniformity in how car rental agencies were conducted and regulated.

Fees for joining a car rental agency need to be in uniform. Every agency needs to charge the same and has the same amount of fees. The truth is this car rental agency charges \$10,000 NT (\$362 USD) and the other \$10,500 NT (\$343 USD). Where's the \$500 NT (\$16 USD) difference from? - P18 (AR)

Even though drivers felt the benefits of increased legitimacy in the Taiwan market, in many ways the regulations actually increased the opacity of how the market functioned and how to access it. Specifically, there is almost no information available to drivers about what the regulations are and what they mean to drivers, particularly when it comes to car rental agencies.

Information about the regulations is considered as not enough, and that information about car rental agencies is not transparent. - P11 (AR)

The lack of information resulted in drivers having to further depend on word-of-mouth or internet searches to deal with this opacity. A few of the participants framed this as the personal responsibilities of the job. Potential drivers need to scour the internet for information (P19), or to personally visit the car rental agencies site (P11, P3).

It is actually not enough for others to tell you how you should join Uber. You must find your own information using your personal determinations, or from the internet. - P19 (AR)

While the existence of regulations benefited the drivers by moving Uber out of the grey market, their implementation increased the burden of being a ride-sharing driver by levying additional fees, having to sort through what the regulations were, and finding an appropriate car agency. However, the drivers we talked to were still positive about the job of ride-sharing.

### **Drivers Still Find Driving 'Worth It'**

While most of the drivers we talked to started driving after the regulations were imposed, we spoke with a few drivers who had driven before the regulations had been enacted and had decided to continue driving. The reasons they cited for

driving remained autonomy (particularly in terms of time-flexibility), sufficient earning (the new fees were acceptable), and lack of other options. These reasons line up with previous studies of ride-sharing [27], and it seems that the regulations did not eliminate them. Below, two drivers talked about how time flexibility (autonomy) remained a benefit of driving and discussed that the fees were relatively easy to absorb. P16 had a full-time job as a tour guide and drove for Uber during his off time.

Time-flexibility is the most important thing, no other job would let me suddenly stop to host tours and pick up after the tourism season ends. - P16 (BR)

At first, I did not know whether to join or if the costs of the agency were okay. [...] This would be small costs, \$13,000 NT (\$420 USD) a year, then every month would be around \$1000 NT (\$30 USD). If I drink fewer milk tea, then I'll have the funds. - P13 (AR)

The third reason for ride-sharing drivers to participate in the market was the lack of other viable economic options – a reason that has been cited in other gig-economies [30]. Occasionally these drivers cited that they faced age discrimination and Uber provided them with an alternative earning opportunity (P1, P6). Drivers stated that ride-sharing has lower skill requirements (P8) and that “*if you have no other skill sets, then it's a good job*” - P3.

The only good thing about driving for Uber is freedom, but that's mainly a foil for the lack of other jobs. It's difficult finding another job when you're middle-aged. - P1 (AR)

Furthermore, despite the growing similarity between taxis and ride-sharing in Taiwan, the drivers in our sample ultimately decided to drive for ride-sharing because of taxis' additional requirements, negative connotations, and reduced autonomy. While taxis in Taiwan often have benefits over ride-sharing drivers (e.g., government subsidy, security, and income stability), the drivers in our sample ultimately chose to drive for ride-sharing platforms (primarily Uber). Part of this was due to taxis in Taiwan requiring an additional road test certification that must be renewed every three years, and that drivers are required to modify their cars and wear a uniform. Being forced to be so conspicuous at all times had several negative connotations and stigmas that drivers cited as reasons not to be a taxi driver.

If you're driving your car, a taxi, when you're on a holiday, how can you feel like you're not still working as a taxi driver? - P17 (BR)

The main reason I don't want to drive a taxi is because I don't want to be associated with the stigma of the 'taxi yellow'. - P19 (AR)

That said, the costs did cause some drivers to spend more hours driving. This was part of a general theme we heard from our drivers: enacting the regulations was transitioning the gig of ride-sharing to be more like a job, which had positives and negatives.

### **Impact of Regulations on the Ride-Sharing 'Gig'**

While there are several aspects of the regulations that impact the gig of ride-sharing, the aspect that most significantly changed the nature of ride-sharing was the increased costs of entering and exiting the market. For example, when Uber was first deployed in Taiwan, it was 1) relatively easy to join, 2) effortless to leave, and 3) drivers could use the car they already had. However, now that the regulations have been implemented, this is no longer the case, as there are now signing and termination fees associated with car rental agencies. This seemed to fundamentally change how drivers viewed ride-sharing, in that they viewed it more as a *job* (where they invested and worked more regular hours) and less like a *gig* (where they viewed it more like something to just pick up whenever they felt like it). Here P2 outlined how he viewed the job as a "self-employed" job and that as long as he saw it this way, he would have a stable income and stable working hours.

The income is relatively stable, because after all, this is simply being 'self-employed'. For example, if you want to structure your time, you must start working at the same time every day. - P2 (BR)

Similarly, grouping drivers under car rental agencies also contributes to drivers' shifting perception of ride-sharing from an "independent driver on a platform" (P6) to an "established professional job" (P5). Drivers again attributed part of this transition directly to covering the fees to make ride-sharing platforms worth it.

If your investment cost increases, this will cause your pressure and stress to increase, which will result in an increase in your working hours. I basically have to pay \$2000 NT (\$65 USD) to \$3000 NT (\$97 USD) and I still have to pay rent on the car. - P12 (BR)

In the end, P3 summed up how a lot of drivers viewed ride-sharing: it was just like working any other job.

It is just like working for any company. You must have a plan for the long-term. It's not just about money, this also involves the relationship with your family and you must discuss this Uber commitment. - P3 (AR)

These increased expenses were rooted in the car rental agencies, which in total had a larger impact on drivers, if not exactly the nature of ride-sharing.

### **Car Rental Agencies' Impact on Ride-Sharing**

Most of the regulations that were enacted in Taiwan revolved around, or were administered in part by, the car rental agencies. Drivers are now required to obtain a contract with a car rental agency to obtain proper licensing; however, as far as we could tell, there were no real day-to-day interactions required by this relationship (although some agencies did have more interactions with their drivers than others). That is, agencies do not necessarily have to act as dispatchers or mediate the interactions between drivers, platforms, and passengers (although some of the agencies did have alternative mechanisms for providing drivers with passengers, which we discuss in the next section). While car rental agencies do mimic the structure of how taxis operate in Taiwan and are clearly an attempt to make ride-sharing resemble taxi driving, insofar as obtaining and giving rides, ride-sharing remained basically the same when driving for Uber or other platforms.

The exact manner in which these car rental agencies structure their relationship with drivers requires a bit of explanation. Each driver contracts with a single agency and as part of this contract, the driver has to transfer ownership of their vehicle to the car rental agency (even if it is the driver's personal car). In other words, the car rental agency owns the car in a legal sense (similar to how taxi companies own the taxi fleet) and provides each of their contracted drivers with professional license plates. Some car agencies give drivers an extra contract that states ownership will be transferred back to the driver when they terminate their other contracts. This obviously creates some problems for drivers.

Because of the regulation, your car – your personal car – needs to have its rights transferred to the car rental agency. Then what kind of [ownership rights] protection do I have? - P1 (AR)

Furthermore, if a driver wishes to terminate their contract with a car rental agency early, then there are often fairly severe fees associated with it.

I wanted to switch to another car rental agency...when I invested more time in learning how it worked, I realized 'wow, I need a lot of money to terminate [my contract]'. - P15 (AR)

Other terms of the contract vary widely from agency to agency in terms of types of cars available (should drivers decide to rent a car from the agency instead of leasing their own car to the agency), annual fees, signing fees, and provided benefits, as well as the severity of the termination fee.

This means that figuring out which car rental agency to join is an incredibly important decision for each driver.

You have to be very careful with the car rental agency. There are some that will impose really bad terms in the contracts - P16 (BR)

However, drivers face this decision without much information about which car rental agency to join, and once they do join, sometimes they face various fees that they do not understand. This leads to a sense of frustration, particularly if they cannot see any benefit of paying these fees or action from the agency using these fees.

The good thing is we have more selections like if this car rental agency is too shady, I'm going to go to another. The bad thing is that there's too many choices. How do you choose one car rental agency, if you ask then it's still word of mouth and Uber also does not tell you and will not possibly help you do this - P17 (BR)

There are even some charges that we can't see. I always think that our car rental agency has not done anything, but I just have to pay it every month. - P10 (AR)

These various conditions are a result of the lack of uniformity in how car rental agencies structure the terms of their contract. This in turn leads to what some participants considered predatory practices, which were particularly harmful for new drivers.

The range of signing fees in the current market is a total mess. Some car rental agencies exploit the drivers. For example, some car rental agencies get 30 percent cut from the fare, while the driver only earns 70 percent after Uber's 25 percent fee - P17 (BR)

One participant explained the risks by outlining what it would be like for a new driver to find an agency and discover the consequences of their decisions.

Maybe, young people that just entered the job market and don't have enough funds, will go to a car rental agency to rent a car. Then in one month, maybe he'll end up paying \$20,000 NT (\$650 USD) a month at that agency. His pressure will be very high, he will most definitely need to drive twice as much or three times or even four times as many hours. - P12 (BR)

Another aspect that car rental agencies control is access to the various platforms through the contracts which they sign platform owners (including Uber). In other words, each car rental agency has its own contract with Uber, and we did not see any difference between the fees that Uber took from the individual rides themselves. In this way, the car

rental agency mediates the access its drivers have to the ride-sharing markets, impacting the flexibility and resources a driver can acquire. Furthermore, these agencies also reserve the right to determine if they should cover any of the drivers' fees. Some agencies cover basic fees, such as illegal parking (e.g., P4) but others require the drivers to pay for their own fines. Clearly, there is quite a lot of variation in how these different car rental agencies work and drivers find this problematic and see the need for increased regulation of the agencies.

You would need to regulate every single car rental agencies. - P16 (BR)

Some of our participants (e.g., P1, P17, P3) echoed this viewpoint and stated that they did in fact regret joining their current car rental agency. Part of the frustration with car rental agencies was due to the lack of a clear purpose or set of benefits. However, there were cases where drivers did see direct and meaningful benefits from their car rental agency.

### **An Exemplar Car Rental Agency**

Although most participants were either indifferent or negative in regards to their car rental agencies, we did have participants say that they worked with "*kind-hearted and conscientious agencies*" - P4. According to these participants, the car rental agency they worked with provided benefits, such as access to additional customers through LINE group chats, where busy drivers would post overflow customers for the group. These LINE groups served as an extra source of customers and brought a sense of security and assurance of more stable income.

I think this car rental agency is more reliable because we have a LINE group. Everyone who is in the group talks about this agency. The owner of the agency is also in the LINE group and drives for Uber. He also complains when he encounters a problem when driving. - P10 (AR)

One agency that we heard from our participants in particular, provided additional benefits to drivers, such as rooms in the city where drivers could take naps or rest, as well as job-retraining programs. These training programs are meant to prepare drivers for rainy days in case Uber is suspended again or the regulations change. The program was designed to give drivers the option of being a tour guide; the program was taught by drivers in the agency who primarily work and earn income as a tour guide. According to participants P4, P7, and P16 this specific agency wanted their drivers to feel a sense of community and that they were taken care of them.

Our company helps us to take the tour guide test. Our company will also invite a tour guide and hire a tour bus to take us drivers to Jiufen, Jinguashi, and Elephant Trunk Rock. What if



you get a passenger, how will you take them on a tour? Where can the car park? From where do you start? How would you schedule a day tour? How do you organize an eight hour day? These questions about [potential] customers will be answered. We said that if Uber is unstable and could leave at any time, at least we can still have some route to retreat. P4 (AR)

### Appropriated and Alternative Platforms

*LINE Groups.* One practice that emerged during the initially unregulated phase when Uber was deployed in Taiwan as well as when Uber was suspended and then appropriated by car rental agencies, was the use of LINE groups as informal ride-sharing apps (LINE is a group chat/calling app where users can create large “chatrooms”), a purpose for which it is clearly not designed. This practice arose as more drivers suspected that the Taiwanese government would suspend or shut down access to the Uber market. During this time, drivers recruited riders (via word of mouth) to join their LINE groups so that passengers could request rides in these LINE groups outside of the Uber platform. Each of our participants used these LINE groups, and several (P7, P8, P9, P15) stated that these groups brought in a significant share of their income and that not using these groups after the regulations would put them at a disadvantage. And for some drivers, these LINE groups served as a crucial source of income during Uber’s suspension in Taiwan.

These LINE groups have different requirements for joining them. Some groups were free to join but required drivers to introduce customers to maintain their membership, while others had monthly fees, and still others took a commission per ride arranged via the group. Some groups had a dispatcher, while most were first-come-first-served. The fares for riders in LINE groups were usually less than that on Uber, and the fee percentage taken from drivers was also less, as such many drivers and riders came to prefer these groups. The drivers themselves used the LINE groups as a way to increase the flexibility and bypass some platform restrictions, e.g., Uber does not have a mechanism for repeat or returning customers.

LINE groups are a violation of Uber’s regulations, but if I don’t pick up these types of passengers, then my salary will be pressed very low. But, say for example, if it’s a foreign professor and I drive him to dinner, then he says, ‘Hey, this weekend I will go back to the USA,’ I might ask if I can drive him to the airport. - P3 (AR)

A common way that rides were posted to these groups was through drivers posting their extra rides that they could

not (or would not) pick up. In a lot of groups, these drivers could earn some flat percentage of that ride as a commission.

Why not use these groups, when I get a percent cut for trips for each ride I toss into the group. It’s like getting paid for doing nothing. - P7 (BR)

All that said, using these LINE groups to arrange rides is illegal and if a driver was caught using them, they would be fined. The drivers who arranged rides on LINE stated that while it was illegal, it was still better for both passengers and drivers (P12). Moreover, the majority of the drivers we interviewed (n = 15) continued to use these groups to arrange rides even after Uber was reinstated.

*LINE Groups and Car Rental Agencies.* Participants reported that these LINE groups are now being used at car rental agencies, sometimes to post extra rides and sometimes as a substitute for a dispatch system. That said, the legality of this practice is still somewhat ambiguous. Some drivers feel that the way that their agencies use these groups turns into a bit of a “race,” in that the rides posted on these apps are at a first-come-first-served basis.

Personally, my reaction speed is not very fast, ah not as fast as the young people’s hands and feet. Most often, I cannot out race them in claiming the dispatch. - P12 (BR)

I have thought about this problem. In your LINE group if they toss out a few dispatches [customers], then don’t you need to fight to claim it? But you can’t possibly always be watching your phone, and watching your phone while driving is a very dangerous thing. I think that this is very tiring ah. Why should I make myself so distressed by using LINE groups? P16 (BR)

*Alternative Platforms.* One of car rental agencies’ largest levers of control is the access that they can offer drivers to different platforms. The different platforms became more prominent after the regulations were enacted, and several domestic ride-sharing applications entered the market and began to carve out unique niches in the ride-sharing market. For instance, *Jiao Che Ba* is a platform that focuses on driving for corporate employees, who have relatively constant and predictable commuting needs. *Jiao Che Ba* is a platform similar to Uber, in that it is classified as an information platform which requires drivers to contract with a car rental agency in order for them to use it (i.e. the same as Uber’s arrangement).

Taxi unions have also developed platforms to compete against Uber. In particular, one of the largest Taiwanese taxi unions called *Taiwan Taxi* now offers the *Multiple Taxi* (or 55688) app, which dispatches rides similarly to Uber does and is available to both taxi and ride-sharing drivers. This app particularly blurs the line between taxi and ride-sharing

drivers because the market/job structure is more similar to taxis than ride-sharing platforms like Uber, in that: 1) all drivers have the same certification requirements; 2) there is also a phone dispatcher; 3) the charges are calculated via a metered fare system; and 4) drivers are required to obtain a specific taxi meter and post government sponsored advertisements. The only distinction between the taxi and ride-sharing groups on *Multiple Taxi* is that the ride-sharing vehicles do not have to be painted yellow, while the official taxis are required to do so.

While the availability and development of alternative ride-sharing apps seems like a promising and lucrative alternative to Uber, there are issues with these platforms as well. Taking *Multiple Taxi* as an example; our participants explained that there is a limited amount of information about how to join the platform and how it works.

Even though I had already started driving for Uber, I still wanted to go find information about how to drive for *Multiple Taxi*. I got information from the Taiwan Taxi Union, but it [the information] is still very fragmentary. Even after I asked, I still know nothing. - P10 (AR)

While these platforms are not a panacea for drivers' problems, drivers still look to use and leverage these different platforms to access different customer bases. This is because (like in the U.S.) participants stated that driving for multiple platforms decreases downtime between customers (P11), and that the alternative platforms take a smaller cut of the money than Uber (P11, P2), that is, 15 percent compared to Uber's 25 percent.

For instance, if I have a trip somewhere and after I need to return, I will use multiple platforms to go back and forth-then I won't have an empty car. On 777 [an airport ride-hailing platform] I can immediately find additional customers if Uber has none. - P9 (BR)

However, drivers claimed that Uber attempts to restrict car rental agencies from signing contracts with other platforms (although we do not know for sure if this happens) and that some car rental agencies dissuaded drivers from using anything other than Uber (for which we did hear specific evidence).

According to the regulation, it is legal to use multiple platforms, but Uber says it's not allowed because they don't want their drivers to pick up other platform's dispatches. - P9 (BR)

Our car rental agency prevents us from using multiple platforms. Our boss has very clear rules, which is that if you get caught using multiple

platforms, at the end you'll be kicked out from the car rental agency right away. - P13 (AR)

The drivers and their car rental agencies seem to fear that Uber will terminate its contract if they use other platforms, which would bar the drivers from using Uber and result in significant losses in revenue. However, drivers clearly want to have multiple platforms to use and car rental agencies are competing with each other to attract drivers. This is part of the reason LINE groups are used frequently by car rental agencies as well, as they are not really a ride-sharing platform but have been appropriated for that purpose.

## 6 LIMITATIONS

It is important to note that our study features several limitations in its generalizability in terms of our sample size and our locality. Our sample does not include drivers that had quit as a result of regulations, and may not be representative of the entire demographic range of drivers in Taiwan. However, we deliberately sampled drivers that had continued to drive for Uber as well as those who joined afterwards. We highlighted the continued impacts of the regulations and drivers' reasons for joining Uber. Moreover, while our participants are predominantly male, we were able to gather data from a wide spectrum of drivers. The participant features were balanced in their usage of Uber and other ride-sharing platforms as a part-time or full-time job, as well as the time of their entry into Uber—both before and after regulations were implemented.

We researched the impact of stringent and specific regulations on drivers from Taipei, Taiwan. The lack of global uniformity or standards in regulations means that we can not generalize to each type of regulation. However, Taiwan's regulations of Uber are similar to those that are currently being implemented in Japan, Turkey, Hong Kong, etc. Governments in these locations are regulating their ride-sharing drivers to have professional licenses, similar to their taxi industries. Furthermore, we also did not interview potential ride-sharing drivers who could not or chose not to drive because of the higher entry and exit costs. Therefore, further research is needed to study the effect of regulations on driver attrition from ride-sharing and potential drivers who decided not to drive for Uber as a result of regulations.

## 7 DISCUSSION

Imposing regulations on ride-sharing in Taiwan had a wide range of effects on drivers and their usage of platforms and technology. As suggested in the previous literature [13, 34], the existence of regulation lent legitimacy to ride-sharing and the drivers. This legitimacy was assessed in a variety of ways by the drivers. First, they considered that they had better access to insurance and legal recourse (particularly in the

case of accidents). Having an accident before the regulations was clearly a concern for our participants, which seemed to have contributed to their anxiety in driving for ride-sharing platforms. Drivers also seemed to feel that their identity as a driver was legitimized, and that they did not need to hide that they worked on the platform from friends and family. Therefore, in the case of Taiwan, drivers did feel less precarious once the regulations were imposed and seemed to feel like driving was more of a job than a gig.

That said, they did not necessarily enjoy the actual implementation of the regulations, nor did all drivers enjoy that driving has become more of a job than a gig. This was particularly true for the increased cost of entering/exiting the market and the regular membership fees associated with car rental agencies. However, that it was more difficult to enter the ride-sharing market, did seem to us to mitigate some of the problems presented in past literature, particularly in terms of the high numbers of drivers that would at times saturate a market and drive fares down because there were too many drivers [27, 38], that is after the regulations were enacted the day-to-day fares seemed consistent and stable for our participants. That is, in some ways we were surprised by the things we did not hear from our participants about this type of saturation. Specifically, our participants did not mention that the fares were dropping nor where they concerned with finding the best spot for certain times in the day. In fact, they even mentioned sending overflow passengers to the LINE groups. Perhaps the regulations that increased the cost of entering/exiting the market did in fact substantially limit the number of drivers.

Our study suggests that there is more of a continuum between jobs and gigs, and not simply an either/or. As different facets of what makes a gig are adjusted, gig workers themselves start to treat the gig more as a job. That is, when the barriers to entering the market go up, common features of gig-economies also change, e.g. saturating the market with labor and driving down price. However, increasing the cost of operating in the market also has the effect of reducing the flexibility of workers to determine the number of hours that they work. Increasing worker protections turns out to decrease their feeling of instability and their precarious position. More research is needed to map out what the impacts of changing these different facets are, how different stakeholders are impacted, and to whom the different facets actually matter and benefit.

### The Role of Design

During our research, we found that the ‘policy knot’ [24] was a very apt metaphor for the situation that we encountered. Based on our experience, we would perhaps add – or at least better emphasize – the role of appropriation in this knot, which further complicates the situation. Design had

a clear impact on regulation in the case of ride-sharing in Taiwan and regulation had a clear impact on practices. First, the introduction of Uber itself obviated the need for additional regulations because the new capabilities exposed a gap in the regulatory structure. Second, once regulations were introduced, the practices of the drivers and passengers clearly changed. That said, the design of the platforms themselves were less responsive (sometimes out of circumstance, e.g., when Uber was suspended) to the changes in practice. Specifically, once regulations are introduced and practices are changed, the flexibility of the design to adapt and be appropriated for new practices also plays a role. When operating in these more complex design environments, designing for users while ignoring the disruption of regulations, can seriously impede the use of the platform. Based on our experience and previous literature [20, 22, 24], designing (particularly when it is for the gig-economy) without considering the regulations and policies, creates breakdowns in the market and its practices [19].

All that said, a major design implication that emerged from our study is what *usability* means to the workers. The drivers’ (and the passengers’) appropriation of and preference for LINE groups for coordinating rides – a platform that is *clearly* not designed for easily arranging rides – suggests the importance of flexibility in supporting work. To us, this preference for the appropriated technology says a few things. First, the design of these platforms really only matters to drivers insofar as it gives them access to passengers. However, the manner in which design prescribes the actual mechanics of how to complete and arrange rides is seen as negative, in that it does not let the driver shape their practice and utilize their expertise and experience (e.g. arranging repeat or overflow passengers). We would speculate that most of our interviewees would just as well (or even prefer to) use LINE to primarily arrange, if its usage as an informal ride-hailing system was legalized. After all, it affords drivers the ability to arrange their rides, repeat specific clients, and get a higher cut of the cheaper fare, which many passengers preferred as well. For drivers, this means that if they can find a reliable source of passengers without an official ride-sharing platform, the platform does not provide any real value to them. This is particularly evident when the regulations that these drivers operate under provide more checks and legitimization of their work (e.g. background checks). It would seem that as regulation provides this structure (to a point), appropriation gets easier to do, meaning that it will happen more frequently, especially if the platforms maintain their rigid implementation of practices. The genie is out of the bottle, so to speak, and once the act of ride-sharing is legitimized by the government, the legitimacy that the platform itself brings is worth less and drivers may find more ways to appropriate other technologies to arrange rides with passengers.

## REFERENCES

- [1] [n. d.]. LINE. <https://line.me/en/>. Accessed:2019-01-05.
- [2] 2017. Uber Will Suspend Service in Taiwan After Being Slapped With Over \$10 Million in Fines. <http://fortune.com/2017/02/02/uber-suspend-service-taiwan-fines/>. Accessed:2019-01-05.
- [3] 2018. Legal blows to Uber raise taxi plate prices in Istanbul. <http://www.hurriyetdailynews.com/legal-blows-to-uber-raise-taxi-plate-prices-in-istanbul-132696>. Accessed:2019-01-05.
- [4] 2018. The New York City Council - File : Int 0838-2018. <http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3479666&GUID=01C67FF7-C56D-474A-BA53-E83A23173FA7>. Accessed:2019-01-05.
- [5] Ali Alkhatib, Michael S. Bernstein, and Margaret Levi. 2017. Examining Crowd Work and Gig Work Through The Historical Lens of Piecework. In *Proceedings of the 2017 CHI Conference (CHI '17)*. ACM, New York, NY, USA, 4599–4616.
- [6] Antonio Aloisi. 2015. Commoditized workers: Case study research on labor law issues arising from a set of on-demand/gig economy platforms. *Comp. Lab. L. & Pol'y J.* 37 (2015), 653.
- [7] Katie Barglind. 2015. Innovation, Technology, and Transportation: The Need to Address On-Demand Ridesharing and Modernize Outdated Taxi Regulations in the US. *Wis. Int'l LJ* 33 (2015), 701.
- [8] Lars Böcker and Toon Meelen. 2017. Sharing for people, planet or profit? Analysing motivations for intended sharing economy participation. *Environmental Innovation and Societal Transitions* 23 (2017), 28–39.
- [9] Harry Campbell. 2018. Uber To Cut Rates In More Than 100 Cities. <https://therideshareguy.com/uber-to-cut-rates-in-more-than-100-cities/>
- [10] Ruth Berins Collier, VB Dubal, and Christopher Carter. 2017. Labor platforms and gig work: The failure to regulate. (2017).
- [11] Ruth Berins Collier, VB Dubal, and Christopher Carter. 2018. Disrupting Regulation, Regulating Disruption: The Politics of Uber in the United States. (2018).
- [12] Judd Cramer and Alan B Krueger. 2016. Disruptive change in the taxi business: The case of Uber. *American Economic Review* 106, 5 (2016), 177–82.
- [13] Yanelys Crespo. 2016. Uber v. Regulation: 'Ride-Sharing' Creates a Legal Gray Area. *U. Miami Bus. L. Rev.* 25 (2016), 79.
- [14] Valerio De Stefano. 2016. Introduction: Crowdsourcing, the Gig-Economy and the Law. *Comparative Labor Law Policy Journal* 37, 3 (2016).
- [15] Jane Dokko, Megan Mumford, and Diane Whitmore Schanzenbach. 2015. Workers and the online gig economy. *The Hamilton Project* (2015).
- [16] Rashmi Dyal-Chand. 2015. Regulating Sharing: The Sharing Economy as an Alternative Capitalist System. *Tul. L. Rev.* 90 (2015), 241.
- [17] Koen Frenken and Juliet Schor. 2017. Putting the sharing economy into perspective. *Environmental Innovation and Societal Transitions* 23 (2017), 3–10.
- [18] Mareike Glöss, Moira McGregor, and Barry Brown. 2016. Designing for labour: uber and the on-demand mobile workforce. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 1632–1643.
- [19] Benjamin V Hanrahan, David Martin, Jutta Willamowski, and John M Carroll. 2018. Investigating the Amazon Mechanical Turk Market Through Tool Design. *Computer Supported Cooperative Work (CSCW)* 27, 3-6 (2018), 1255–1274.
- [20] Benjamin V. Hanrahan, Jutta K. Willamowski, Saiganesh Swaminathan, and David B. Martin. 2015. TurkBench : Rendering the Market for Turkers. *Proceedings of the ACM CHI'15 Conference on Human Factors in Computing Systems* (2015), 0–3.
- [21] Katharina Hellwig, Felicitas Morhart, Florent Girardin, and Mirjam Hauser. 2015. Exploring different types of sharing: A proposed segmentation of the market for “sharing” businesses. *Psychology & Marketing* 32, 9 (2015), 891–906.
- [22] Lilly C Irani and M Silberman. 2013. Turkopticon: Interrupting worker invisibility in amazon mechanical turk. In *Proceedings of the 2013 CHI Conference*. ACM, 611–620.
- [23] Emily Isaac. 2014. *Disruptive innovation: Risk-shifting and precarity in the age of Uber*. Berkeley Roundtable on the International Economy, [University of California, Berkeley].
- [24] Steven J Jackson, Tarleton Gillespie, and Sandy Payette. 2014. The policy knot: re-integrating policy, practice and design in csw studies of social computing. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing*. ACM, 588–602.
- [25] Ralph Jennings. 2016. Why Uber Can Defiantly Flout The Law In Taiwan. <https://www.forbes.com/sites/ralphjennings/2016/11/18/uber-is-getting-an-upper-hand-in-hostile-but-pivotal-taiwan/>. Accessed:2019-01-05.
- [26] Merethe Dotterud Leiren and Jørgen Aarhaug. 2016. Taxis and crowd-taxis: sharing as a private activity and public concern. *Internet Policy Review* 5, 2 (2016).
- [27] Ning F. Ma, Chien Wen Yuan, Moojan Ghafurian, and Benjamin V. Hanrahan. 2018. Using Stakeholder Theory to Examine Drivers' Stakes in Uber. In *Proceedings of the 2018 CHI Conference*. ACM.
- [28] Arvind Malhotra and Marshall Van Alstyne. 2014. The dark side of the sharing economy ... and how to lighten it. *Commun. ACM* 57, 11 (2014), 24–27.
- [29] Patrick Marshall. 2015. Issue: The sharing economy: The sharing economy.
- [30] David Martin, Benjamin V Hanrahan, Jacki O'Neill, and Neha Gupta. 2014. Being a Turker. In *Proceedings of the 2014 CSCW Conference*. ACM, 224–235.
- [31] John O McGinnis. 2018. The Sharing Economy as an Equalizing Economy. (2018).
- [32] Benjamin Means and Joseph A Seiner. 2015. Navigating the Uber Economy. *UCDL Rev.* 49 (2015), 1511.
- [33] Paolo Parigi and Xiao Ma. 2016. The Gig Economy. *XRDS* 23, 2 (Dec. 2016), 38–41. <https://doi.org/10.1145/3013496>
- [34] Jeremias Prassl and Martin Risak. 2015. Uber, Taskrabbit, and Co.: Platforms as Employers-Rethinking the Legal Analysis of Crowdwork. *Comp. Lab. L. & Pol'y J.* 37 (2015), 619.
- [35] Aliya Ram. 2018. Uber faces tough new regulations in London. <https://www.ft.com/content/3796d1e0-124c-11e8-8cb6-b9ccc4c4d8bb>
- [36] Catherine Lee Rassman. 2014. Regulating rideshare without stifling innovation: Examining the drivers, the insurance gap, and why Pennsylvania should get on board. *Pitt. J. Tech. L. & Pol'y* 15 (2014), 81.
- [37] Lisa Rayle, Susan Shaheen, Nelson Chan, Danielle Dai, and Robert Cervero. 2014. *App-based, on-demand ride services: Comparing taxi and ridesourcing trips and user characteristics in san francisco university of california transportation center (uctc)*. Technical Report. UCTC-FR-2014-08.
- [38] Alex Rosenblat and Luke Stark. 2016. Algorithmic Labor and Information Asymmetries: A Case Study of Uber's Drivers. *International Journal of Communication* 10 (2016), 3758–3784.
- [39] Riebana Sachs. 2015. The Common Carrier Barrier: An Analysis of Standard of Care Requirements, Insurance Policies, and Liability Regulations for Ride-Sharing Companies. *DePaul L. Rev.* 65 (2015), 873.
- [40] Niloufar Salehi, Lilly C. Irani, Michael S. Bernstein, Ali Alkhatib, Eva Ogbe, Kristy Milland, and Clickhappier. 2015. We Are Dynamo: Overcoming Stalling and Friction in Collective Action for Crowd Workers.

In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. ACM, New York, NY, USA, 1621–1630. <https://doi.org/10.1145/2702123.2702508>

- [41] Shelly Shan. 2016. Uber resumes ride-hailing service in Taiwan after talks with authorities. <http://www.taipeitimes.com/News/taiwan/archives/2016/08/11/2003652900>. Accessed:2019-01-05.
- [42] Sean Slone. 2016. *State Regulation of Rideshare Companies*. WS Hein.
- [43] Andrew Stewart and Jim Stanford. 2017. Regulating work in the gig economy: What are the options? *The Economic and Labour Relations Review* 28, 3 (2017), 420–437. <https://doi.org/10.1177/1035304617722461>
- [44] Adrián Todolí-Signes. 2017. The End of the Subordinate Worker? Collaborative Economy, On-Demand Economy, Gig Economy, and the Crowdworkers' Need for Protection. (2017).
- [45] Gwyn Topham. 2018. Sadiq Khan wants to restrict number of Uber drivers in London. <https://www.theguardian.com/technology/2018/aug/15/sadiq-khan-wants-to-restrict-number-of-uber-drivers-in-london>. Accessed:2019-01-05.
- [46] Scott Wallsten. 2015. The competitive effects of the sharing economy: how is Uber changing taxis. *Technology Policy Institute* 22 (2015).
- [47] J.R. Wu. 2017. Uber resumes ride-hailing service in Taiwan after talks with authorities. <http://reut.rs/2oqgRh7>. Accessed:2019-01-05.
- [48] Ming Yin, Siddharth Suri, and Mary L Gray. 2018. Running Out of Time: The Impact and Value of Flexibility in On-Demand Crowdwork. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM, 430.
- [49] Jiayi Joey Yu, Christopher S Tang, Zuo-Jun Max Shen, and Xiqun Chen. 2017. Should On-Demand Ride Services Be Regulated? An Analysis of Chinese Government Policies. (2017).
- [50] Mimi Zou. 2017. The Regulatory Challenges of 'Uberization' in China: Classifying Ride-Hailing Drivers. (2017).