The Ridesharing Revolution: Economic Survey and Synthesis

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Robert Hahn and Robert Metcalfe

409 12th Street SW ● Suite 700 ● Washington, DC 20024
Tel: (202) 828-4405 ● Email: info@techpolicyinstitute.org ● www.techpolicyinstitute.org

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Robert Hahn and Robert Metcalfe*

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Abstract

Digital ridesharing platforms, such as Uber and Lyft, are part of a broader suite of innovations that constitute what is sometimes referred to as the sharing economy. In this essay, we provide an overview of current research on the economic efficiency and equity characteristics of ridesharing platforms, and provide a research agenda that includes an examination of the natural evolution toward driverless cars. We have three main findings: first, relatively little is known about either the equity and efficiency properties of ridesharing platforms, but this is likely to change as companies and researchers focus on these issues. Second, we may be able to learn something about the likely diffusion and benefits of these technologies from experience with other policies and technologies. Third, while we believe these platforms will do substantially more good than harm, the measurement, distribution, and size of the gains from these technologies requires further research.

* Robert Hahn is professor and director of economics at the Smith School at the University of Oxford, a non-resident senior fellow at Brookings, a senior fellow at the Georgetown Center for Business and Public Policy, and a member of the Technology Policy Institute's board of academic advisors. Robert Metcalfe is Postdoctoral Research Scholar in Economics at the University of Chicago. We would like to thank Ted Gayer, Jonathan Hall, Scott Kominers, Jonathan Meer, Alex Teytelboym, Scott Wallsten, and Cliff Winston for helpful comments and Julia Schmitz, Brian Campbell and Samantha van Urk for excellent research assistance. The usual caveat applies.

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1. Introduction

Digital ridesharing platforms, such as Uber and Lyft, are part of a broader suite of disruptive, matching market innovations that constitute what is sometimes referred to as the "sharing economy" (Sundararajan, 2016). Other examples of the sharing economy include Airbnb, for short-term room and apartment rentals, and WeWork, for renting shared office space.[1] While there is not one widely agreed definition of the sharing economy, it often involves attempts to make more efficient use of labor and capital resources through the use of information technology that lowers the costs of matching buyer with sellers.

In this note, we provide an overview of current research on the economic efficiency and equity characteristics of ridesharing platforms, and suggest areas for research including the move toward driverless cars. We focus on platforms that connect drivers, who generally use their personal vehicles, with passengers.[2] These platforms, thus, help to create a market by matching buyers and sellers of ridesharing services. Our review is not meant to be exhaustive, but is intended to highlight some of the most important insights in this area as well as potential research opportunities.

Section 2 provides a brief overview of ridesharing and its growth. Section 3 discusses equity and efficiency impacts of ridesharing and discusses the future of ridesharing. Finally, section 4 briefly concludes.

2. Ridesharing: It's not what it used to be

Ridesharing is not new. It began during World War II. In 1942, the U.S. government required ridesharing arrangements in workplaces when no other transportation options were available in order to save rubber during the war (Chan and Shaheen, 2012). In the 1970s, the oil crisis and spike in gasoline prices encouraged another period of ride sharing. However, today's ridesharing revolution was made possible by the development of GPS, smart phone technology, and electronic payments. In the early 1990s, Kowshik et al. (1993) envisioned a future of ridesharing similar to

[1] There are many other markets with digital platforms that involve sharing, including finance, food, and labor.

[2] Thus, we do not consider services such as Zipcar.

what exists today that would use better matching techniques to provide dynamic ridesharing.

Ridesharing platforms connect drivers and vehicles with consumers who want rides at an agreed price.[3] Typically, a customer uses an app on her smartphone to request a ride at a particular time and place. The app on the phone then walks the customer through a series of steps, including the actual or expected price of the ride, the location of the driver, and the likely wait time. It also allows the customer or the driver to contact each other without giving out personal information. These platforms take advantage of GPS to arrange for the ride and help determine a driver's best route. They also provide other benefits for riders and drivers, including measures of rider and driver quality to foster trust (Luca, 2016), and an efficient payment system, frequently using a credit card that is entered into the platform's data base. The platforms also can help balance demand and supply by adjusting prices in real time to accommodate shortfalls in the supply of drivers or surges in demand. Ridesharing companies are able to implement "pay flexibility" (Wood, 1989), a term that refers to a firm's ability to adjust labor costs, particularly wages, to changing market conditions. In exchange for providing these various services, ridesharing platforms like Uber and Lyft take a percentage of the fare for each ride. The may vary between 0% and 30% of the ride fare, most often around 20%-25% (Huet, 2015).[4]

There is evidence that that employment from offering rides is becoming a more important part of the economy, especially in large metropolitan areas [5] Furthermore, there is evidence that the use of ridesharing platforms is growing rapidly. Since its market launch, Uber has dramatically increased the number of new "driver-partners" for the basic ridesharing service, from fewer than 1,000 in January 2013 to almost 40,000 new drivers starting in December 2014 (Hall and Krueger, 2015). Currently, more than half of American adults have heard of ridesharing apps like Uber and Lyft, with 15% actually using the services (Smith, 2016). In China, Didi facilitates 7 million rides per day (Floyd, 2016). The nature of the industry is likely to change dramatically in the future with the introduction of autonomous vehicles. Uber recently announced it will launch a fleet of autonomous

[3] Ridesharing companies are sometimes called ridesourcing companies or transportation network companies.

[4] Uber and Lyft were not the first companies in the new era of ridesharing. One of the first companies appears to be Avego in 2007--now Carma (https://en.wikipedia.org/wiki/Carma).

[5] This is based on data from non-employer firms. See Hathaway and Muro (2016): "No less than 81 percent of the four-year net growth in non-employer firms in the rides sector took place in the 25 largest metros, while 92 percent occurred in the largest 50 metros." Hall and Krueger (2016) and Agrawal et al. (2015) highlight the importance of the distributional aspects of the sharing economy.

cars in Pittsburgh this year, with the hope of eventually replacing all human "driver-partners" with self-driving cars (Chafkin, 2016).

3. Efficiency, equity and the future of ride-sharing platforms

This section is divided into three parts: efficiency impacts of ride-sharing platforms; equity impacts of ride-sharing platforms; and the future of ride-sharing platforms.

3.1 Efficiency

Many economic features of ridesharing platforms make them attractive to buyers and sellers (Einav et al., 2016). They use GPS and smart-phone technologies to match buyers and sellers at low cost. They provide a low-cost way of fostering trust in exchange, which makes use of buyer and seller ratings. They afford sellers (i.e., drivers) flexibility in when they choose to work.[6] Riders do not spend time paying for a ride because payment is done automatically with a credit card when the ride is over. In addition, many ridesharing platforms have a transparent way of adjusting prices to balance supply and demand and thus promote economic efficiency (Hall and Nosko, 2015).

Ridesharing platforms can have several economic benefits.[7] These platforms increase the transportation options available to consumers and businesses and are therefore likely to significantly increase consumer welfare. Lyft and Uber give the consumer multiple different types of rides to choose from. For example, riders can typically request a normal car and ride from a partner driver, carpooling at a cheaper price, a ride in a large car, or a luxury car.[8] These ridesharing platforms may also encourage higher utilization of the existing vehicle stock. One study, performed in five cities, found that Uber drivers had higher capacity utilization rates than taxis, likely due to Uber's more efficient ordering and pricing methods, its larger scale, as well as inefficiencies of taxi regulation (Cramer and Krueger, 2016). Some cities have allocated dedicated parking spots throughout the city to such ridesharing under the assumption that they may generate social benefits (Shaheen, 2010).

[6] The literature on ride-sharing sometime refers to drivers and "driver-partners". We use the word "drivers" to refer to drivers who work with ride-sharing platforms; we use the phrase "taxi drivers" to refer to people who drive what are conventionally referred to as taxis.

[7] There are many ride-sharing platforms throughout the world. Examples include: Sidecar (US), Ola (India), Didi (China), and GrabTaxi (Southeast Asia) The largest are Uber and Didi, valued at $62 billion and $20 billion, respectively (Floyd, 2016).We refer to Uber and Lyft throughout this article because these are two of the best known platforms in the United States.

[8] The UberX product is currently the most popular product in the Uber assortment of products (Cohen et al., 2016).

In addition, ridesharing could contribute to important externalities, such as congestion and emissions. The impact on overall pollution is an empirical question because there are two countervailing factors. Lowering the cost of transportation is likely to increase vehicle miles travelled, which would increase emissions. However, encouraging higher capacity utilization rates could reduce emissions per vehicle mile travelled by an individual. Initial survey results suggest that overall greenhouse gas emissions could decline (Martin and Shaheen, 2011; Li et al, 2016), but much more research is needed on actual consumer behavior to develop conclusive estimates.

The impact on congestion deserves further study. A significant portion of traffic in some cities, such as San Francisco and Los Angeles, is attributable to drivers searching for parking (Winston, 2013). Ridesharing means that people who use ridesharing instead of driving no longer need to search for these spaces, which could reduce congestion. Furthermore, there may be a reduction in congestion costs associated with taxis finding customers (to the extent that ridesharing substitutes for traditional taxi services). The overall impact on congestion is not clear, however, because more consumers will be making use of these services. Some consumers, for example, may switch from mass transit to ridesharing if they are perceived as substitutes. This shift could actually increase congestion.

Only one rigorous economic study we are aware of attempts to estimate the impact of ridesharing on consumer welfare. Cohen et al. (2016) estimate the demand curve for Uber in four cities in 2015. They use a regression discontinuity design that is based on Uber's surge pricing feature, which charges riders more during periods of high demand or low supply. The authors are able to identify several points along Uber's demand curve, which allows them to derive a reasonable approximation of UberX's entire demand curve. This, in turn, allows them to estimate consumer surplus (in this case, the difference between what riders were willing to pay and what they actually pay). They estimate that Uber's basic ride service (UberX) generated about $2.9 billion in consumer surplus for New York, Chicago, Los Angeles and San Francisco in 2015 (in 2015 dollars). Extended to the country as a whole, the authors estimate that consumer surplus gains would be about $6.8 billion. This consumer surplus value is larger than the current annual revenues of Uber worldwide, and does not include the benefits from other similar services, such as Lyft. Furthermore, their methodology is aimed at measuring the loss in consumer surplus if Uber stopped its service for a short period, such as a

day. If there were a ban on such ride-sharing services, the authors note the estimates of consumer surplus losses could be much higher.[9]

There is little analysis on how the entry of ridesharing companies affects taxi customers. One notable exception is Wallsten (2015), who examines how Uber's popularity in markets affects complaints about taxi rides in New York City and Chicago. He defines popularity as the Google Trend search index for searches for "Uber" in each city. He concludes that Uber's growth, as measured by local search popularity, is associated with a decline in some consumer complaints to regulators about taxis, such as those about air conditioning and heating, and "broken" credit card machines. Wallsten's study does not measure the impact of the change in complaints on consumer surplus; nor does it claim that Uber actually caused the reduction in complaints, though the author does try to control for other explanatory variables. Still, it is the first statistical evidence we have seen on the relationship between ride sharing and taxi service.

One of the interesting, and sometimes controversial, features of some ridesharing platforms is surge pricing. This pricing is used to balance supply and demand during peak periods or periods in which that supply of drivers is too low. The press sometimes picks up on the fact that surge prices can be quite high during severe weather events or New Year's Eve, up to 9.9 times the typical rates[10] (White, 2016). One obvious question is how surge pricing affects both drivers and riders. We have seen no direct research on this issue on the customer side other than Cohen et al. (2016), which does not focus on the surge pricing issue per se but uses it to identify the demand curve. Hall, Kendrick and Nosko (2015), analysing two case studies, suggest that surge pricing is helpful in keeping expected wait time to within five minutes and may also provide significant economic benefits for drivers. Chen and Sheldon (2015) explore how drivers respond to surge pricing using a discontinuity design. They argue that surge pricing increases the overall number of trips as well as efficiency (see also Cachon et al., 2016).[11]

[9] In an alternative analysis Buchholz (2015) suggests large inefficiencies in consumer welfare in the NYC yellow cab industry.

[10] Uber decided to cap its surge price multiplier during weather-related or other emergencies, usually at less than three times the normal rate (Berman, 2015).

[11] Many economists appear to believe that the consumer welfare impacts of ride sharing are positive and significant. In a survey of 40 leading economists by the Initiative on Global Markets at the University of Chicago, when asked "letting car services such as Uber or Lyft compete with taxi firms on equal footing regarding genuine safety and insurance requirements, but without restrictions on prices or routes, raises consumer welfare," the responses varied only in the intensity with which they agreed. 60 percent "strongly agree," 40 percent "agree," and none chose "uncertain," "disagree" and "strongly disagree." (IGM Forum, 2014).

3.2 Equity

Little rigorous research has explored the equity impacts of ridesharing platforms. Equity is not easy to define, but broadly speaking, it relates to the distributional impacts resulting from the introduction of ride-sharing platforms. We look at several issues, including the impact on owners, drivers, and customers.

Owners of taxi medallions are likely to be worse off as firms, such as Uber and Lyft, take some of their business, and thus the value of some taxi medallions can be expected to decrease. Anecdotal evidence suggests that the value of medallions has declined in some areas, such as New York (Barro, 2014). However, there appears to be little academic research on this subject.

Research on the welfare impact of ridesharing on Uber drivers and taxi drivers is beginning to emerge. Hall and Krueger (2015) examine characteristics of drivers who work with Uber. They note that drivers may be attracted to the platform because of the job flexibility it offers. Drivers who work with Uber may use it as a way of smoothing their income stream, and also to provide some needed income when searching for another job. Cramer's (2016) analysis suggests that taxi and limo drivers have not been significantly adversely affected by the introduction of Uber around the U.S.

The impact on customers is just beginning to be understood. Many consumers in large urban areas now have an additional option. They can now use a ridesharing service or hail a taxi. We suspect that this new equilibrium is likely to have made most customers better off, but have not seen research (other than Cohen et al., 2016), that bears on this issue. Furthermore, Cohen et al. only estimate the benefits for UberX users. Some individuals may be worse off if the number of taxis decrease and those individuals prefer to use taxis. However, we have little evidence of this.

In evaluating equity for ridesharing platforms, researchers can explore how the benefits are shared for those who have access to the platform. They can also examine how those who have access to the platform gain relative to those who do not. There is not much evidence on these issues. Because most people in the U.S. have smart phones or could afford a basic smart phone (Anderson, 2015), this not appear to be a significant barrier. At the same time, not all consumers have credit cards, and this could serve as a barrier to use. Thus, it could be useful to explore the extent to which particular groups may be disadvantaged as a result of the introduction of this technology.

The question arises as to what kind of individuals benefit from the introduction of ridesharing. Smith (2016) provides some survey evidence on this issue. In 2015, the Pew Research Center surveyed 4,787 adult Americans on issues related to the digital economy. Part of the survey was focused on ridesharing. The survey found three interesting statistics: (i) about 15% of Americans use ridesharing apps, but one-third do not know about these services; (ii) the use of ridesharing platforms is more popular among young adults who live in urban areas who are well educated; and (iii) frequent users of ridesharing services are less likely to own a car and more likely to use other transportation options such as public transport.

This survey represents a snapshot in time of ridesharing usage. We suspect that usage patterns have changed and will change dramatically over time as a result of changes in supply (*e.g.*, offering ride sharing services in more areas) and increasing awareness by the broader population of some of the benefits of these services.

A second study on access, funded by Uber, examined the issue of access to transport in poorer neighborhoods (Smart et al., 2015). The project paid subjects to act as customers to compare the quality of taxi service versus UberX rides in various poor neighborhoods in Los Angeles. The subjects were told of a location to get to elsewhere in Los Angeles, and then one of them was randomly told to use UberX and the other was randomly told to use a traditional yellow cab. The results were striking. The researchers found that the average cost and wait time for an UberX ride was $6.40 and 6 minutes 49 seconds, but for a traditional cab, the average cost was $14.63 and the average wait time was 17 minutes and 42 seconds. These differences are large and they were found in all poor LA neighborhoods. They show that Uber may charge less and provide better service in poor neighborhoods. It does not, however, directly address the extent to which ride-sharing platforms increase opportunity for the poor, or the extent to which ride-sharing platforms provide economic benefits for the poor. Given that around 75% of low-skilled and middle-skilled jobs require more than 90 minutes on public transport (Brookings, 2011), ridesharing platforms might offer more economic opportunities for the poor.

A recent study suggests that there could be discrimination by drivers who use ridesharing platforms. Ge et al. (2016) analyzed 1500 rides in Seattle and Boston on specific routes. They found that African American passengers had longer wait times in Seattle; cancellations were twice as frequent with African American-sounding names compared with white sounding names in Boston; male

passengers with African American-sounding names had their trips canceled three times more often than when they used a white-sounding name in low density areas; and female passengers were taken on more expensive, longer rides in Boston. We think the issue of discrimination deserves further study. Moreover, it is unclear whether online ridesharing platforms are any worse or better than traditional taxis.

In addition, scholars should explore the most cost-effective ways to reduce potential discrimination.[12] At the same time, even if there is discrimination, it may be the case that discrimination could be reduced with the introduction of more competition, and this should be investigated as well. Finally, even if overall discrimination is not reduced with the introduction of ridesharing platforms, the existence of more competition may make groups that are discriminated against better off by providing additional options that were not available before.

One potential criticism of ride-sharing based on equity concerns is that those who directly benefit are not necessarily poor (e.g., well-educated, urban, young). We think this criticism may be misplaced. The early adopters of new technologies (e.g., mobile phones and personal computers) frequently have greater resources and education. Over time, however, the technologies diffuse and the broader population frequently enjoys great benefits. Since the Pew Research Center began to track it in 2011, smartphone ownership increased from 35% to 68% in 2015. In 2011, higher household income, education level, and more urban locations all strongly correlated with higher smartphone ownership. For example, only 18% of adults without a high school diploma owned a smartphone in 2011, compared to 48% of those with a college degree during the same period (Smith, 2011). By 2015, those without a high school diploma were only one of two demographic groups[13] in which smartphone ownership, 41% was less than half (Anderson, 2015). The point is that one should view the evolution of technologies, platforms, and market design more generally as a dynamic process in which the beneficiaries may change over time.

3.3 The Future of Ridesharing

To the extent there are concerns regarding equity and ridesharing platforms today, the picture is likely to look very different a decade from now. We comment on two features of the ridesharing revolution that could affect its future. First, several

[12] Edelman and Luca (2014) found that there was racial discrimination on the Airbnb platform and Airbnb have developed a plan to address this issue (see Murphy, 2016)
[13] The other demographic group is those older than 65, 30% of whom own a smartphone.

interest groups are trying to raise the cost of ridesharing by imposing barriers to entry or trying to obtain greater benefits for driver partners. Second, it is likely that the technology of autonomous vehicles will dramatically affect ridesharing platforms. We consider these in turn, but the two are linked from an economic perspective.

Barriers to entry into particular markets have been raised through the use of outright bans and through the use of imposing restrictions on ridesharing platforms. For example, Uber and Lyft have faced resistance and outright bans in a number of cities throughout the world. While the use of such barriers may protect taxi medallion owners, it is unclear the extent to which they protect drivers, since drivers have an alternative source of employment. Furthermore, such barriers are likely to adversely affect most consumers, who are not given the option of using a ridesharing service in selected locales.

Where ridesharing is allowed, there is sometimes political pressure to provide greater rewards to driver partners. Drivers and lawyers in many parts of the world have brought suits against firms, such as Uber, in hopes of allowing drivers to enjoy greater economic rewards for their services. Often, the cases are framed in terms of whether drivers should be viewed as employees of the owner of the ridesharing platform, and thus receive additional benefits. A recent article in the *Financial Times,* for example, noted that a tribunal in London ruled in favor of Uber driver partners receiving minimum wage and pay for holidays (O'Connor, 2016).[14]

From an economic perspective, increasing the cost of drivers will serve to increase the cost of supply to the customer, and hence, the price of these services. This increase in cost will inevitably lead ridesharing platforms to search for lower cost ways of supplying the service or related services. Thus, there is a paradox here. To the extent the drivers and/or lawyers are successful in getting the platforms to give drivers a bigger share of the pie, they may also increase the likelihood that these platforms move toward using driverless cars (or "autonomous vehicles") sooner.

Notwithstanding the efforts of drivers to increase economic rewards, technology is propelling many firms to take a serious look at using autonomous vehicles with ridesharing. Some of the major ridesharing companies are running tests with such vehicles now. Indeed, driverless cars could largely displace conventional vehicles

[14] The U.S. Federal Trade Commission (2016) has recognized the importance of more consistent policymaking on sharing economy platforms and is developing analysis on how best to regulate such markets not to decrease innovation.

for ridesharing, and perhaps generally, within a decade or two. This, of course, could have a dramatic impact on ridesharing and consumer welfare. First, there are potentially significant consumer welfare gains from driverless cars used on a ridesharing platform because the price offered to consumers could drop. In addition, consumers may benefit from a decrease in congestion as autonomous vehicles displace conventional cars (see, e.g., Winston and Mannering, 2013).[15] Second, the employment benefits that driver partners now enjoy may no longer exist.[16] They may lose their jobs or part-time jobs. If there is a large displacement of employees with few alternatives, the losers from this new technology may need to be compensated or retrained. Third, while there will likely be an explosion in the use of this driverless technology for ridesharing as costs are reduced, the precise structure of the market is hard to know.

This technology revolution provides another reason for taking a *dynamic* view of these platforms in evaluating their economic efficiency and equity implications. Not all groups will benefit equally, but the benefits of this revolution are likely to be enormous. A first order issue is to explore the relative benefits and costs of reducing barriers to entry into this new market. Uber and Lyft use a platform that could be replicated, and more competitors could enter if regulatory barriers were eased. There are also low barriers to switching between ridesharing platforms, suggesting that it may difficult to lock customers in to a particular service.

The regulation of ridesharing will have a significant impact on the evolution of ridesharing platforms. Weyl and White (2014) make a compelling case that the way city governments regulate platforms, such as Uber, is problematic. Some aspects of ridesharing platforms are essentially self-regulating through the review system that is aimed at building trust. Cohen and Sundarajan (2015) argue that self-regulation should be considered as an alternative to traditional regulation in this industry.

From an economic efficiency point of view, there is little reason to impose additional regulations on ridesharing platforms, especially regulations aimed at moving into new markets. The same can be said of autonomous vehicles that may use ridesharing platforms, but these vehicles provide a host of regulatory issues that are beyond the scope of this paper (see, e.g., Thierer and Hagemann, 2015).

[15] The impact on congestion will depend on the increase in the use of such vehicles, particularly during peak periods, and the impact these vehicles may have on the distribution of the peak. Another potential large benefit of these vehicles is the reduction in traffic accidents and fatalities per passenger vehicle mile travelled. A reduction in accidents could in turn reduce expected travel times. Until we have more experience with autonomous vehicles, these claimed benefits will remain highly uncertain.

[16] There could be substantial dislocation resulting from loss of employment for truck drivers as well.

4. Conclusion

Relatively little is known about either the efficiency and equity properties of ridesharing platforms, but this is likely to change as companies and researchers focus on these issues. We know a bit about how consumers benefit (*e.g.*, using traditional measures of consumer surplus), and we believe that those benefits are significant and will continue to grow.[17] We know a little bit about the positive competitive effects of the introduction of ride-sharing platforms (e.g., in terms of a reduction in complaints). We know a little bit about the impact of ridesharing on externalities, such as pollution and congestion. And we know a little bit about equity impacts (*e.g.*, in terms of who uses these services). Based on what we know, we think the advent of ridesharing in conjunction with autonomous vehicles is likely to produce significant benefits for society.

We are optimistic that important new insights will come in the next decade on the economic impacts of ride-sharing platforms. Companies, such as Uber and Lyft, have an incentive to highlight the benefits and downplay the social costs of the services they offer. Academics have an incentive to understand the implications of these platforms because of the importance of the sharing economy in everyday life (Azevedo and Weyl, 2016). These sharing platforms provide fascinating examples of large scale matching mechanisms at work. They have the potential to provide a huge amount of information on how people search for and buy goods, thus offering researchers an important opportunity to test and develop economic theory (Einav and Levin, 2014). They also offer the potential to conduct experiments on both sides of the market to better understand how to increase consumer welfare and also address externalities, such as congestion and pollution.[18] Thus, we may be able to learn something about the likely diffusion and benefits of these technologies

[17] We think taking a broader perspective on consumer welfare would be useful. For example Parfit (1984) suggests three way of conceptualizing welfare: needing, including measures such as income, wealth, and consumption; wanting, which could be measured by consumer surplus or willingness to pay, and liking, which could be measured through subjective wellbeing (evaluations and experiences). All three areas deserve special attention of how the ridesharing platforms can change welfare. In the case of Cohen et al. (2016), we use people's willingness to pay to estimate the total welfare across the U.S. We have no understanding about how that WTP is distributed around the economy and whether we are satisfying the people's with the largest to gain from the product.

[18] There is little experimental research on trying to understanding different interventions that can be used to make more efficient transport decisions. The work to date has analyzed how to encourage airline captains to fly more efficiently (Gosnell et al., 2016) and how to encourage vehicle inspections (Namazu et al., 2016).

from experience with related technologies and experiments with the technologies themselves.

As with the emergence of any potentially disruptive technology, there may be significant dislocation associated with ridesharing as it evolves. We think one promising way of addressing potential employment losses is through rigorous application of field experiments to identify what works best in terms of finding suitable alternatives for displaced employees. At the same time, we think that it would be imprudent to try to put the “genie back in the bottle.” The potential societal gains from this evolving technology is simply too great.

A theme of this paper is that it is important to take a dynamic perspective in viewing both the efficiency and equity impacts of ride-sharing platforms. Similar perspectives have been helpful in understanding the economic impacts of other significant technologies, such as mobile phones and personal computers. The lessons learned from the evolution of ridesharing could also be beneficial for understanding how digital technologies and sharing markets could affect other markets, such as healthcare (Detsky et al., 2016; Powers et al., 2016).

There is a need to do more analysis of the benefits and costs of ride-sharing platforms for society. Although we believe these platforms will continue to do substantially more good than harm, the measurement, distribution and size of the gains from these technologies requires further research.

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